KNOCKDOWN OF CONNECTIVE TISSUE GROWTH FACTOR (CTGF), TRANSFORMING GROWTH FACTOR BETA 1 (TGF-B1) AND TRANSFORMING GROWTH FACTOR BETA RECEPTOR 2 (TGF-BR2) BY THE TOPICAL APPLICATION OF SHORT INTERFERING RNA MOLECULES IN RABBIT CORNEAL FIBROBLASTS

By

SRINIWAS SRIRAM

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To mom and dad

ACKNOWLEDGMENTS

I would like to thank my two mentors, Dr. Alfred Lewin and Dr. Gregory Schultz, without whom my journey of scientific exploration would not have been nearly as fulfilling or complete. Their technical assistance and practical guidance have been vital in the successful completion of my thesis.

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Finally, the affirmation provided by family and friends during this period also promoted the achievement of this project. My father lent support and guidance to me during this period and continues to be my role model as he has been throughout the years. My mother embraced me with open arms during the high and low points of this project as she has done during all of the projects life has presented.

The help extended by these individuals as well as others too numerous to mention have been essential to my success.

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LIST OF ABBREVIATIONS

CCN2 / CTGF	Connective Tissue Growth Factor
ECM	Extracellular matrix
ELISA	Enzyme-linked immunosorbent assay
GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
HEPES	4-(2-hydroxyethyl)-1-piperazineethanesulfonic acid
PBS	Phosphate Buffered Saline
RBCF	Rabbit Corneal Fibroblasts
siRNA	Short Interfering Ribonuclease acid
TGF-ß	Transforming Growth Factor - Beta
TGF-ßR2	Transforming Growth Factor Type II Receptor

Abstract of Thesis Presented to the Graduate School
of the University of Florida in Partial Fulfillment of the
Requirements for the Degree of Master of Science

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By

Sriniwas Sriram

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Chair: William Ogle
Major: Biomedical Engineering

Purpose: Transforming Growth Factor ß (TGF-ß) is a key mediator of the fibrotic response to wounding. It is up regulated during different types of wound healing in the eye, liver, and skin. Connective Tissue Growth Factor (CTGF) acts as a downstream mediator of TGF-ß in promoting scar formation. Both CTGF mRNA and CTGF protein are induced by TGF-ß in fibroblastic cells. The purpose of the study was to determine if short interfering RNAs (siRNAs) targeting TGF-ß1, CTGF and type II receptor of TGF-ß1 (TGF-ßR2) could be used to suppress the action of TGF-ß and CTGF.

Methods: The mRNA sequences of human, mouse, rat and rabbits were aligned to compare their homology. Potent siRNA sequences designed from the coding region of the rabbit gene sequence specific to the growth factors being targeted were transfected into cultured rabbit corneal fibroblasts (RBCF). To observe knockdown, the growth factors were initially stimulated to increase their respective concentrations. The proteins and mRNA levels were then determined by Enzyme-linked immunosorbent assay (ELISA) and quantitative real time PCR (q-RT PCR).

Results: Knockdown in the expression of all three growth factors was observed in the samples transfected with siRNAs. More specifically, TGF-ß1 siRNAs caused a relative significant ($p<0.05\%$) reduction of ~88% in the protein expression when compared to the scrambled control. The q-RT PCR results showed a similar significant mRNA level knockdown of ~94% for the same siRNA sample. Two TGF-ß1 siRNA sequences that abrogated protein and mRNA level expressions in vitro were identified.

Conclusions: TGF-ß1 specific siRNAs were efficacious in knocking down the TGF-ß1 action both in the protein and mRNA level. A direct application of siRNA into eyes to downregulate the TGF-ß1 expression may provide a novel therapy for preventing corneal inflammation and scarring.

CHAPTER 1
INTRODUCTION

RNA interference

Post-transcriptional gene silencing (PTGS) is a method that silences gene expression by modifying mRNA using double-standard RNA (dsRNA). This method termed, RNA interference (RNAi) is a cellular mechanism that acts to change the gene expression at the post-transcriptional level as opposed to the pre-transcriptional level in DNA gene therapy where the changes are made before information is transcribed from the DNA (Fire, 1999). It was first discovered in plants in the 1990s and has since been observed in animal cells. It utilizes the cells natural defense against double stranded RNA, possibly related to an antiviral defense mechanism.

Studies have also shown that siRNA-mediated gene silencing is more effective than other antisense methods such as antisense oligodeoxynucleotides, ribozymes and DNAzymes (Khan et al., 2004). There are many advantages of siRNA based therapy that makes the technology so desirable. Firstly, it can have a high degree of specificity and gene silencing efficiency. It is relatively non-immunogenic in the correct dosage and can be made resistant to degradation via ribonucleases. Additionally, there is no integration of siRNA with the host DNA, thus eliminating concerns for unintentional mutagenesis that is often a safety concern for gene therapy. While DNA gene therapy methods require DNA plasmid to reach the host cell nucleus to induce the desired gene expression, RNAi occurs in the cytosol of a cell, allowing for easier delivery. These inherent advantages of RNAi makes it a more viable method of altering gene expression than other methods (Martinez et al., 2002).

Mechanism of RNAi

Long double stranded RNA (dsRNA) is processed to short interfering RNAs (siRNAs) by the action of a dsRNA-specific endonuclease known as Dicer (Bernstein et al., 2001; Hammond et al., 2001). The resultant siRNAs are 21 to 24 nucleotide in length, are double stranded and have 3' overhangs of 2nucleotides (Stevenson, 2004).

The basic schematic of RNA interference is given in Figure 1-1. The requirement for dsRNA processing by Dicer can be bypassed by incorporating exogenous synthetic siRNAs or endogenously expressing siRNAs into the RNA-induced silencing complex (RISC). A helicase in RISC unwinds the duplex siRNA, which then pairs by means of its unwound antisense strand to messenger RNAs (mRNAs) that bear a high degree of sequence complementarity to the siRNA (Stevenson, 2004). The target mRNA is then cleaved leading to its subsequent knockdown.

siRNAs and microRNAs (miRNAs) are two small RNAs in the RNAi pathway that are generated via processing of longer dsRNA and stem loop precursors (Yin and Wan, 2002). Dicer enzymes play a critical role in the formation of these two effectors by cleaving dsRNAs in an ATP-dependent manner (Angaji et al., 2010). siRNA-programmed RISC (siRISC) silences expression by cleaving a perfectly complementary target mRNA, whereas miRNA-induced silencing complexes (miRISC) inhibits translation by binding imperfectly matched sequences in the 3′ UTR of target mRNA (Chu and Rana, 2006).

siRNA Design

There are multiple considerations in order to achieve efficient RNAi *in vivo* by delivering exogenous siRNA. siRNA has to be designed to avoid unintended (off-target) effects targeting only hybridization-accessible regions within the target mRNA (Walton

et al., 2010). In addition, siRNA can also induce adverse effects such as immune responses or interferon responses through RNA-activated Protein Kinase (Samuel-Abraham and Leonard, 2010). Therefore, a combination of computer algorithms and experimental validation should be employed to determine the optimized siRNA sequences that are complementary to target mRNA while inducing minimal immune responses (Amarzguioui and Prydz, 2004).

siRNA Delivery

siRNA can be delivered either exogenously to cells, or expressed endogenously via plasmid transfection or viral siRNA expression vectors. The types of target tissues and cells dictate the optimum administration routes of local versus systemic delivery. For example, siRNA can be directly applied to the eye, skin or muscle via local delivery, whereas systemic siRNA delivery is the only way to reach metastatic and hematological cancer cells. Local delivery offers several advantages over systemic delivery, such as low effective doses, simple formulation, low risk of inducing systemic side effects and facilitated site-specific delivery (Dykxhoorn et al., 2006).

Therefore, if applicable, a more cost-efficient strategy for siRNA delivery would be the local delivery method. Although, viral vectors act as efficient delivery systems they can potentially induce accidental gene expression changes following integration to host genome or induce toxic responses. Hence, a safer option would be to use the non-viral delivery system if efficient delivery of exogenous siRNA to the cytoplasm can be achieved (Shim and Kwon, 2010).

Since, siRNAs are negatively charged and readily bind to cationic molecules, delivery carriers usually consist of cationic polymers, peptides or liposomes that form complex by ionic interactions (Zimmermann et al., 2006). The resulting complex

facilitates cellular uptake via the endocrytic pathway, providing excellent protection of siRNAs from nuclease attack. Lipid based transfection reagents are the most common approach for nucleic acid delivery to cells in vitro.

The cationic lipids in these reagents provide a suitable platform for incorporating the negatively charged siRNA. However, cationic lipid based reagents are considered too toxic for systemic siRNA delivery *in vivo* (Peer et al., 2008). Similar to liposomes, cationic polymers can also serve as efficient transfection reagents because they can bind and condense nucleic acids into stabilized nanoparticles. Figure 1-1 shows the encapsulation of siRNA in a polymer based delivery system (Kim et al., 2009). Polyethyleneimine (PEI) is a synthetic polymer that has been used in branched or linear forms of different lengths for nucleic acid delivery both locally as well as systemically (Shim and Kwon, 2008). The Mirus TransIT – TKO® transfection reagent, a non-liposomal cationic proprietary polymer/lipid formulation, was used for all the transfections in the experiments (Mirus, 2011).

Some Concerns in Using RNAi Therapy

Indication of off target effects came from studies conducted by Merck-Rosetta. Their results showed that the expression levels of dozens of non-targeted transcripts were altered when siRNAs were applied ectopically. They also suggested that even short complementary stretched of siRNAs with non-targeted transcripts can affect their expression(Jackson and Linsley, 2010).

It was understood that microRNAs affect down-regulation of target proteins and in some cases trigger non-specific degradation by binding to the 3’-UTR, which in turn inhibits protein translation. It was quickly realized that ectopically applied siRNAs were affecting non-targeted gene expression via microRNA like functions. This off-targeting

by siRNAs can be easily controlled by a 2'-OMe modification at the second ribose from the 5'-end of the siRNA. Although this solution should be used for all *in vivo* siRNA applications, it is not the case probably due to the long time it takes to develop a compound for clinical trials (Jackson et al., 2006).

There have also been reports in the literature showing that certain sequence motifs in siRNA triggers type I interferon production via activation of toll-like receptors (TLRs) 7 and 8 thereby compromises the sequence specific knockdown effects of the RNAi pathway (Hornung et al., 2005; Robbins et al., 2008).

The promise of RNAi as a powerful new approach for therapeutic treatment of disease has propelled early stage clinical testing of siRNAs for a variety of diseases. Strategies must be developed to capitalize upon the endogenous mechanism without disrupting the natural pathway to achieve maximal benefit from RNAi therapeutics(Tiemann and Rossi, 2009).

Corneal Wound Healing

The main purpose of the wound healing process is to regain the anatomical and functional abilities of the tissue in the fastest way. The corneal wound healing response is a complex cascade involving cytokine mediated interactions between the epithelial cells, stromal keratocytes, corneal nerves, lacrimal glands, tear film and cells of the immune system(Eraslan and Toker, 2009).

Elsewhere in the body, wound healing culminates in scar formation and vascularization whereas one of the most crucial aspects of corneal wound healing is how the healing processes aim to minimize these end results, which would otherwise have serious visual consequences. Corneal epithelium responds rapidly to injury, healing a wound by migrating as a sheet to cover the defect and to reestablish its

barrier function. Successful wound healing involves a number of processes including cell migration, cell proliferation, re-stratification, as well as matrix deposition and tissue remodeling (Lu et al., 2001). Figure 1-4, shows the major phases involved in corneal wound healing. Cell migration and proliferation which are driven by growth factors released coordinately into the injury sites are particularly critical. Epithelium plays a central role in the wounded cornea, not only as a key cell type in repairing the cornea but also as the source of a number of growth factors (Yu et al., 2010). A variety of growth factors are suggested to play a role in the regulation of corneal epithelial function and wound healing. We would be focusing on the role of TGF-ß and CTGF.

Transforming Growth Factor Beta's and Wound Healing

The TGF-ß superfamily currently consists of more than 25 molecules, isolated from many species, encompassing a wide range of functions. They are multipotent cytokines that are important modulators of cell growth, inflammation, matrix synthesis and apoptosis(O'Kane and Ferguson, 1997).

Active TGF-ß is a 25-kDa disulfide-linked homodimer. TGF-ß Receptors I and II are transmembrane glycoproteins of 55 and 70 kDa. Betaglycan (TGF-ß receptor III) is a cell surface proteoglycan that has both heparan and chondroitin sulfate chains on its extracellular domain (Song et al., 2000).

The TGF-ß family of proteins are synthesized and secreted as large pro-peptide molecules consisting of three regions; an amino terminal (5') signaling sequence, a pro-domain / Latency Associated Peptide (LAP) and a mature protein carboxy (3') domain. In addition, Latent TGF-ß can contain a protein of variable size called the Latent TGF-ß Binding Protein (LTBP). Unless an LTBP gene is co-transfected, there is little secretion of TGF-ß even if the cells are transfected with the full (signal. pro- and active domain)

sequence. This indicates that the large latent complex (TGF-ß plus the LAP and an LTBP) is a frequently secreted form. Both the LTBP and LAP must be removed before the mature protein can function, therefore activation of TGF-ß is a crucial target for biological control of the molecule (Saharinen et al., 1996).

The multiple activators of latent TGF-ß complex comprise of seemingly unrelated group of molecules. The three TGF-ß isoforms – TGF-ß1, TGF-ß2 and TGF-ß3 are quite similar in their effects *in vitro*, yet *in vivo*, the spatial and temporal distribution and actions of these isoforms is quite specific. TGF-ß1 is most abundant in all tissues and cells, then TGF-ß2 and least of all, TGF-ß3. TGF-ß2 is present mostly in bodily fluids such as saliva, amniotic fluid, breast milk and the eye whereas TGF-ß3 is not present at all in great amounts in either fluids or tissues.

Activation of TGF-ß1 and Role of TGF-ßR2

The conversion of latent TGF-ß to active TGF-ß regulates the activity of the extracellular concentration of TGF-ß. This conversion takes place through a complex process of proteolytic activation and dissociation of latency protein subunits. Figure 1-5. Shows the basic steps involved in the activation of latent TGF-ß. Tissues contain significant quantities of latent TGF-ß and activation of only a small fraction of this latent TGF-ß generates maximal cellular responses (Annes et al., 2003).

The action of TGF-ß is mediated by TGF-ß receptor types I (TGF-ß R1) and II (TGF-ßR2), both of which are serine and threonine kinases. The binding of TGF-ß to TGF-ßR2 initiates signal transduction, which is followed by its association with TGF-ßR1. TGF-ßR2 phosphorylates multiple serines and threonines in t`he cytoplasmic region of TGF-ßR1. The activated TGF-ßR1 in turn phosphorylates and activates the transcription factors, Smads (Massague, 1998; Massague, 2000).

The important role of TGF-ß in the wound repair has led to the use of anti-TGF-ß antibody (Cordeiro et al., 1999a) and antisense oligonucleotides (Cordeiro et al., 2003) to block the TGF-ß action. However, these studies in general have targeted the ligand rather than the receptor. Since, a major limiting step in the cellular activation of TGF-ß appears to be the ligand engagement by TGF-ßR2; we designed siRNAs targeting this receptor.

Role of Connective Tissue Growth Factor

CTGF is upregulated in both fibroblasts and epithelium after corneal wound healing (Blalock et al., 2003). Although it participates in the regulation of diverse biological processes related to growth and development, the overexpression of CTGF is correlated with severe fibrotic disorders, including fibrosis in skin, kidney, liver, lung, and vasculature. CTGF was initially identified as a growth factor, then classified as a matricellular protein, and most recently appreciated as a matrix component (Grotendorst, 1997).

It is a member of the CCN2 family of secreted, cell surface, and extracellular matrix (ECM)–associated 35- to 40-kDa proteins. The diverse range of biological functions affected by CCN2 proteins is enabled by a unique multi-modular structure characteristic of the CCN2 family whereby each protein is comprised of four functional domains. Ligands such as growth factors and cell surface proteins interact specifically and uniquely with each domain, enabling CTGF and other CCN2 proteins to influence cellular functions through modulation, potentiation and integration of ligand signals, signal cross-talk, and intracellular signaling pathways. The different domains of CTGF are given in Figure 1-7. .

Grotendorst and Duncan reported that different domains of the CTGF protein are responsible for the mediation of the proliferation and differentiation/collagen synthesis activities of CTGF. The N-terminal domain of CTGF mediates differentiation and collagen synthesis in concert with IGF-2. The C-terminal domain of CTGF mediates cell proliferation in concert with EGF (Grotendorst and Duncan, 2005).

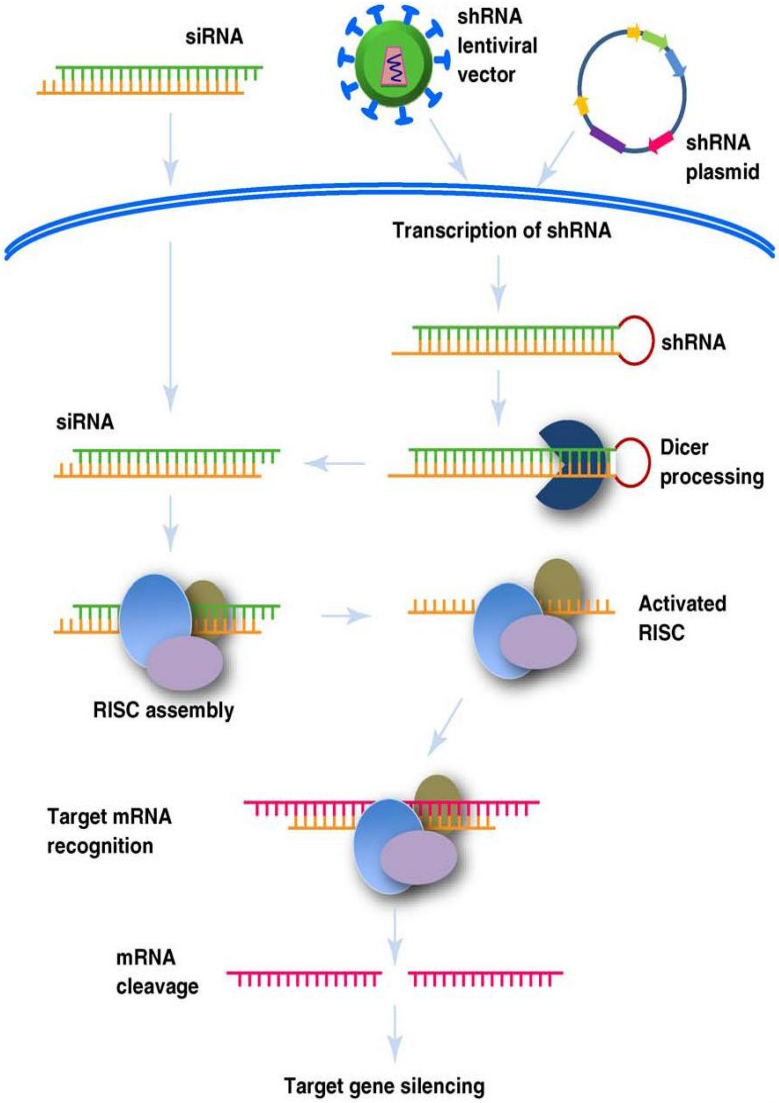

Figure 1-1. Schematic of RNA interference (Source: Kim, S. S., Garg, H., Joshi, A. and Manjunath, N. (2009). Strategies for targeted nonviral delivery of siRNAs in vivo. Trends Mol Med 15, 491-500.)

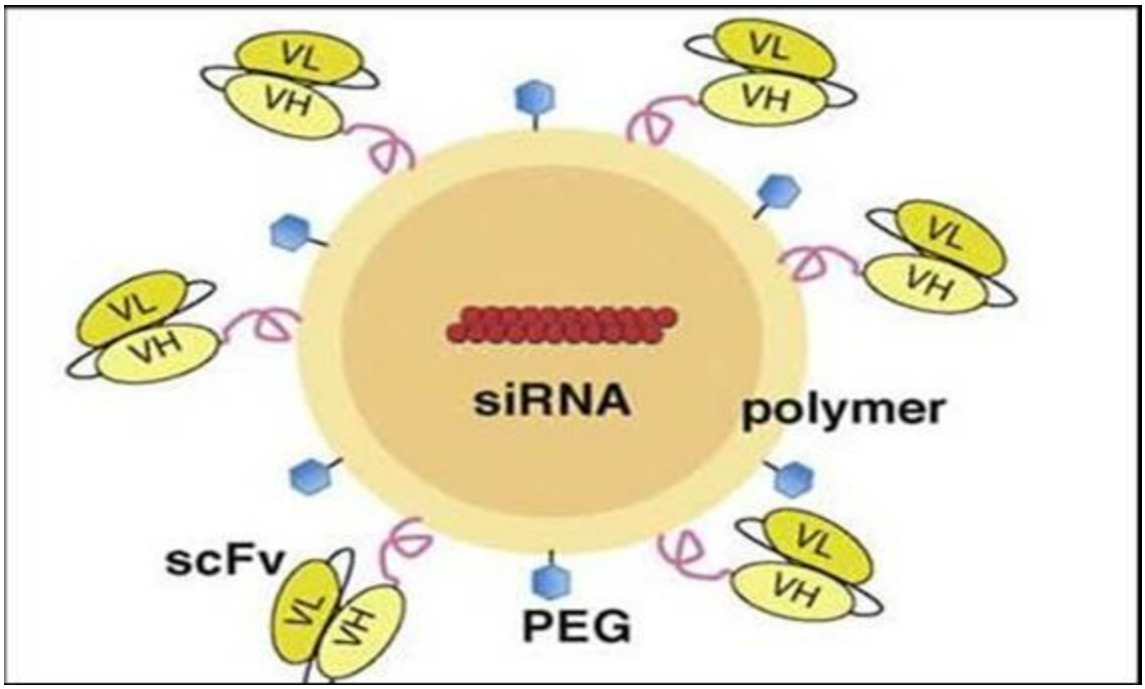

Figure 1-2. Polymer based delivery system (Source: Kim, S. S., Garg, H., Joshi, A. and Manjunath, N. (2009). Strategies for targeted nonviral delivery of siRNAs in vivo. Trends Mol Med 15, 491-500.)

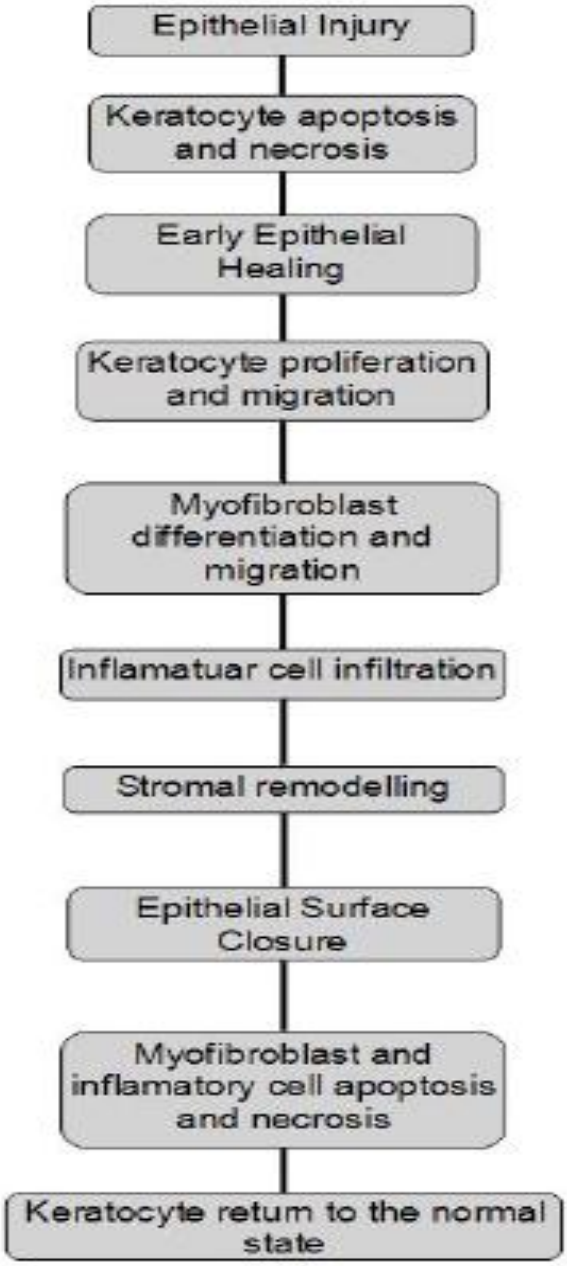

Figure 1-3. Corneal wound healing steps (Source: Eraslan, M. and Toker, E. (2009). Mechanisms of Corneal Wound Healing and its modulation following Refractive Surgery. Marmara Medical Journal 22, 169-178.)

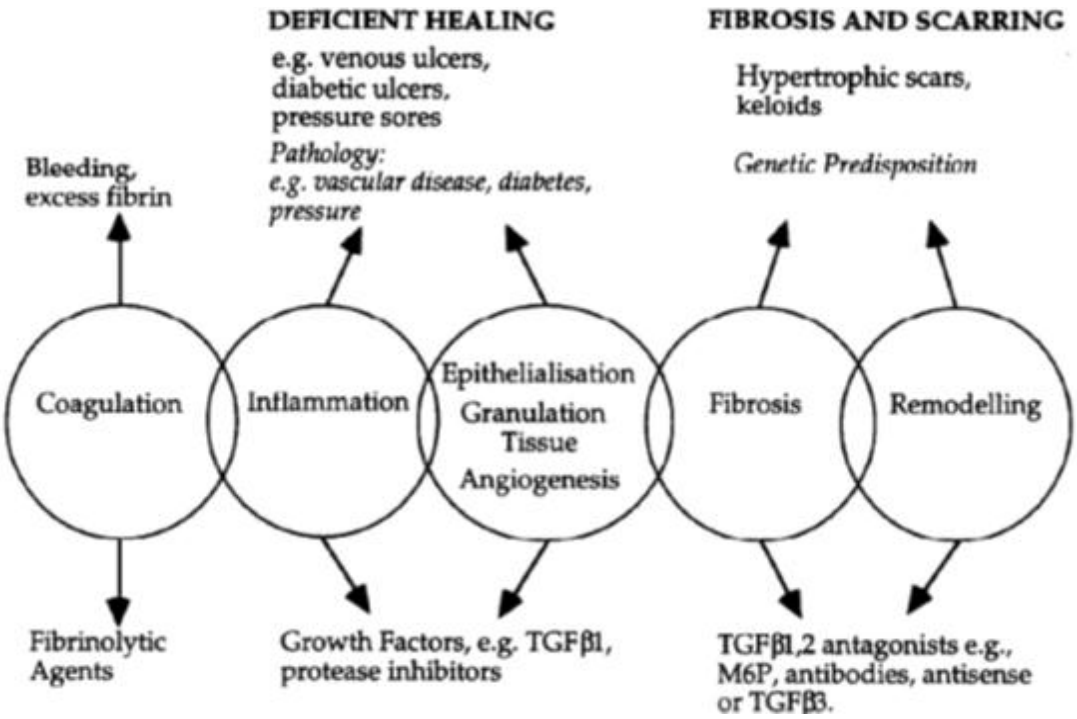

Figure 1-4. Major phases of wound healing and their associated pathologies (Source: O'Kane, S. and Ferguson, M. W. J. (1997). Transforming growth factor βs and wound healing. The International Journal of Biochemistry & Cell Biology Volume 29, 63-78.)

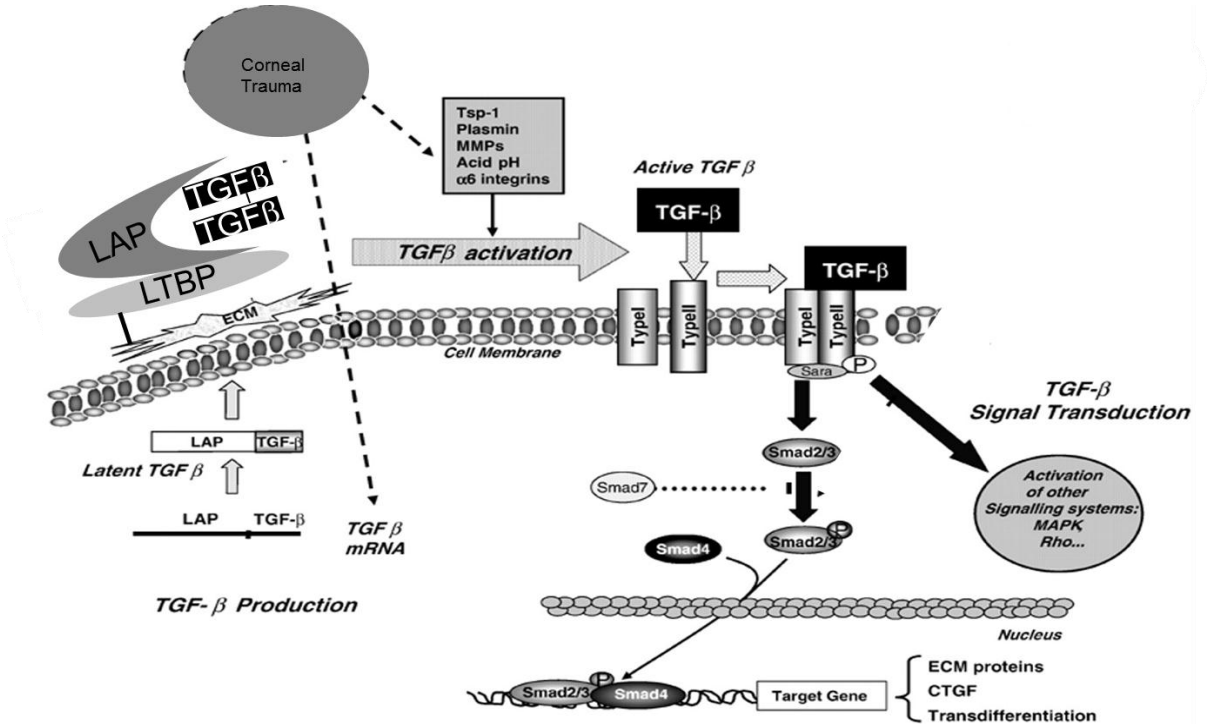

Figure 1-5. TGF-ß activation and signaling systems (Source: Ruiz-Ortega, M., Rodriguez-Vita, J., Sanchez-Lopez, E., Carvajal, G. and Egido, J. (2007). TGF-beta signaling in vascular fibrosis. Cardiovasc Res 74, 196-206.)

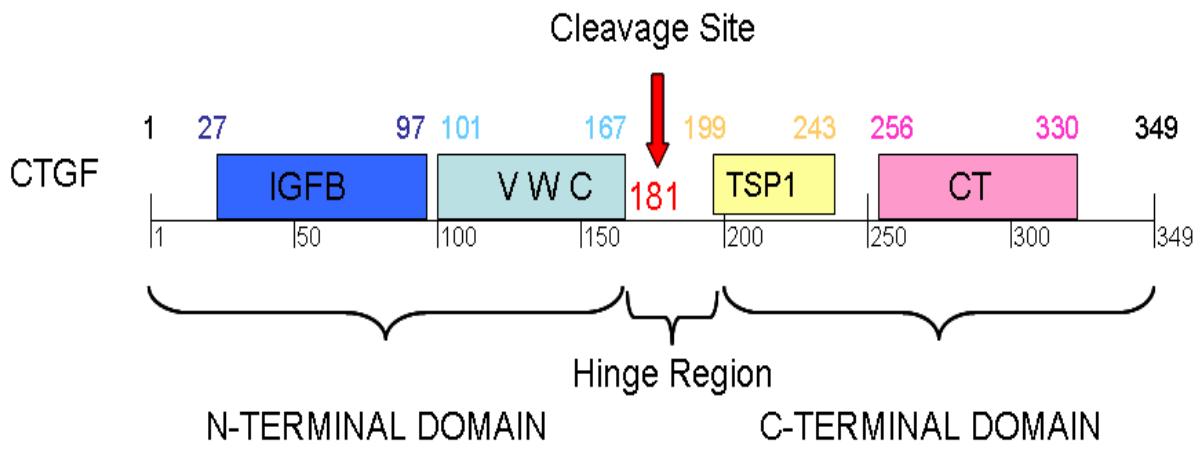

Figure 1-6. Domains of CTGF

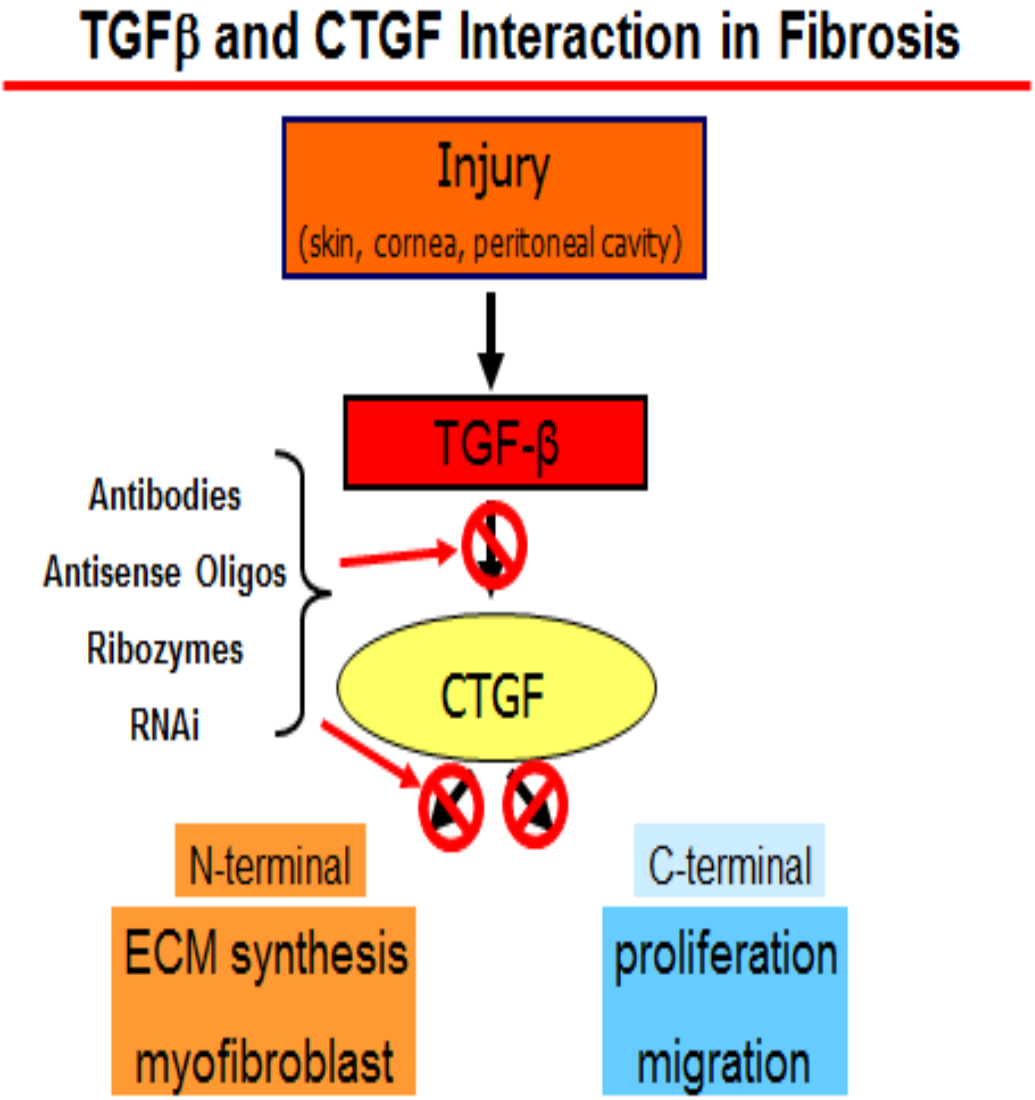

Figure 1-7. Interaction of TGF-ß and CTGF in fibrosis

CHAPTER 2
METHODS

siRNA Design

The first step in the design of a siRNA is to find the messenger RNA (mRNA) sequence or the sequence accession number. NCBI's online database, RefSeq was used as they represent non-redundant, curated and validated sequences. RefSeq mRNA sequences are referenced by unique accession numbers starting from NM or XM followed by 6 digits. Accession numbers for all the three growth factors being tested – CTGF, TGF-ß, TGF-ßR2 and GAPDH are given in Table 2-1.

Targeting Coding Region

For a siRNA to be effective, it should target the coding region of the gene. However, the coding region of the growth factors that is being targeted has not been sequenced in the rabbit genome. Hence, in order to improve the knockdown efficiency, the designed siRNA's were aligned and compared with the corresponding sequences of three different species – mouse, rat and human. siRNA's were then designed for those rabbit gene sequences which were homologous to the coding regions of all the three species. The sequences were aligned using the software – Vector NTI from Invitrogen. An initial pool of siRNA sequences were designed using the online tools of the companies –Applied Biosystems and Thermo Scientific. The siRNA selections were based on the common guidelines, choosing around 21 nucleotides with TT overhangs that have 30-70% GC content. The most common sequences were then picked out and custom engineered from Dharmacon. The final target sequence of the siRNA's of all the three growth factors are given in Table 2-2.

Off Target Effects

It is important to ensure that a region targeted by the siRNA's does not share significant homology with other genes or sequences in the genome. Hence, in order to minimize the off-target effects, the sequences are searched for homology with other genes using the BLAST design tool from NCBI. There were no homologous regions to the sequences listed in the table. In addition, a nonspecific, scrambled siRNA duplex was used as a control to monitor the disruptive effects of transfection on the cell.

Cell Isolation and Culture

Primary fibroblasts were isolated from rabbit cornea. The corneas were peeled off from the eye, scrapped clean of debris and cut into small pieces. The cornea fragments were subsequently washed with serum-free Dulbecco's Modified Eagle's Medium (DMEM) and seeded onto 25-mm tissue culture plates using media prepared from a mixture of DMEM, 15% heat inactivated fetal bovine serum and 1.5% antibiotic-antimycotic (ABAM). These rabbit fibroblast cells were incubated in 5% CO_2 at 37°C. After 3 days, cells were emerging from the corneal fragments. The fragments were discarded and the cells were seeded onto T-75 flasks. The media was changed every 3 days and the cells were sub-cultured if the confluency exceeded 80%.

Transfection Efficiency

siRNA's can be transiently transfected using commonly available transfection reagents. However, to achieve maximum effectiveness, transfection optimization experiments are required. In preparation for transfection, cells from T-75 flasks are trypsinized and plated onto 96 well plates. The cells were serum starved for 48 hours. The cells were transfected with GAPDH specific siRNA (2uM) duplex and a scrambled siRNA (2uM) using Mirus transfection reagent (0.3uL, 0.5uL and 0.7uL). The media was

changed to normal growth medium after 6 hour and back to serum free after 24 hours. The cells were tested 48 hours after transfection using the KDalert Tm GAPDH analysis kit (Applied Biosystems). Also as controls, the corneal fibroblasts were either untreated or treated only with Mirus transfection reagent. KDalert Tm

Stimulation Experiment

To stimulate the expression CTGF, TGF-ß1 and TGF-ßR2, rabbit corneal fibroblast cells were seeded and cultured in three 96 well plates. They were serum starved for 48 hours. CTGF was stimulated by treating one of the plates with TGF-ß1 (3 doses) while TGF-ß1 and TGF-ßR2 were stimulated by treating the plates with varying concentrations of estradiol (3 doses) dissolved in Absolute ethanol and salt solution. 24 hours after the final dose, the medium was collected in micro centrifuge tubes while cell lysates were extracted using cell lysis buffer prepared from PBS supplemented with 0.1% Triton® X and protease inhibitors (Roche Cat#1836153). The extracts were stored at -20°C until further analysis.

TGF-ß1 Quantitation

The frozen samples were thawed on ice. An enzyme-linked immunosorbent assay (ELISA) kit specific for the quantitation of TGF-ß1 was purchased from R&D Systems, Inc and used according to the protocol provided. A standard sandwich ELISA incorporating an immobilized primary antibody in each well of a 384-well Nunc plate was performed. The latent TGF-ß1 in samples must be activated to an immunoreactive form that can be detected by an ELISA. Hence, the samples were treated with 1N HCl and incubated at room temperature for 10 minutes. They were then neutralized by a mixture of 1.2N NaOH and 0.5M HEPES. The activated samples were then added to plates seeded with primary antibody overnight. The plates were washed with a washing buffer

(0.05% Tween20 in PBS) after each step to remove any non-specifically bound proteins. A biotin-linked secondary antibody was added and incubated with streptavidin conjugated to horseradish-peroxide for 20 minutes. The reaction was visualized by the addition of a substrate solution (H_2O_2 and tetramethylbenzidine) followed by the addition of a stop solution (2N H_2SO_4). The plates are read on a spectrophotometer at 450nm.

CTGF and TGF-ßR2 Protein Quantitation

CTGF and TGF-ßR2 protein quantitation were performed in a similar manner as previously described for TGF-ß1. Both the proteins do not require activation to be detected by the ELISA. The antibodies for the CTGF and TGF-ßR2 were separately ordered from R&D Systems.

siRNA Knockdown Study

Two 96 well plates, one to test the protein level knockdown and the other to test the mRNA expression knockdown, were seeded for each of the three growth factor. The cells were serum starved for 2 days and treated with three doses of TGF-ß1 (4ng/mL per day) and estradiol (8ug/mL per day) respectively. The plates are then transfected with siRNA (15nM, 30nM, 60nM and 90nM) using the previously optimized concentration of transfection reagent. Medium was changed to DMEM after 6 hours and then back to serum free after 24 hours post-transfection. For testing protein expression, medium was collected in micro centrifuge tubes and cell extracts were lysed using a cell lysis buffer prepared from PBS supplemented with 0.1% Triton X and protease inhibitors. The RNA samples were stabilized using an RNAlater RNA Stabilization Reagent (Qiagen, Inc., Cat. # 76104). The samples were frozen at -20°C until further use.

CTGF, TGF-ß1 and TGF-ßR2 Quantitation

Quantitation of CTGF, TGF, TGF-ßR2 mRNA using q RT-PCR

A Qiagen RNeasy mini isolation kit (Qiagen, Inc., Cat. #74104) was used according to the manufacturer's directions to extract RNA from the stabilized samples. The amount of RNA in the samples was determined using a ND-2000 1-position spectrophotometer (Thermo Scientific Nano drop). The probes and primers were optimized to get the final probe and primer concentration. TAQMan™ gene expression assays specific to CTGF, TGF, TGF-ßR2 and the housekeeping gene GAPDH were acquired from Applied Biosystems, Inc. and combined with the reverse-transcribed cDNA and the 2-fold concentrated TAQMan™ Universal PCR Master Mix in a 96-well PCR reaction plate. Real-Time PCR (RT-PCR) was performed on an Applied Biosystems 7900HT Fast Real Time PCR System utilizing the manufacturer's recommended thermal cycling conditions. The relative gene expression of the growth factors was calculated using the $2^{-\Delta\Delta Ct}$ method.

Statistical Analysis

All statistical analyses were conducted using GraphPad prism version 5.00 for Windows (GraphPad Software, San Diego California USA, www.graphpad.com). All observed statistical differences in this thesis that were in excess of a 95% confidence interval were considered statistically significant. For protein expression comparisons, Analysis of Variances (ANOVA) was performed between control, scrambled and all of the siRNA samples. Tukeys post-hoc assessments were performed to elucidate the magnitude of the differences.

Table 2-1. Accession number of target growth factors

Growth Factor	Species	Accession Number
CTGF	Human	NM_001901
	Rat	NM_022266.2
	Rabbit	AB217855.1
	Mouse	NM_010217
TGF-ßR2	Human	NM_001024847.2
	Rat	NM_031132
	Rabbit	BD061291.1
	Mouse	NM_009371
TGF-ß1	Human	NM_000660
	Rat	NM_021578
	Rabbit	XM_002722312.1
	Mouse	NM_011577.1

Table 2-2. siRNA target sequences

Growth Factor	Target sequences
CTGF	AAGCTGACCTGGAAGAGAA
	AAGAAGAGCATGATGTTCA
	AAGAAGGGCAAGAAGTGCA
TGF-ßR2	GGAAAGAACATGTGAGCAA
	CGACAGGACTATAAAGATA
	CAAACTACCTACAGAGATT
TGF-ß1	GCUGACACCCAGUGACACA
	GCTGAGAGGTGGAGAGGAA
	GGAGAGAGCTAAACAGAAG

Table 2-3. TAQMAN™ RT PCR Primers and probe sequences

Growth Factor	Species	Accession Number
CTGF	Forward	AGGAGTGGGTGTGTGATGAG
	Reverse	CCAAATGTGTCTTCCAGTCG
	Probe	ACCACACCGTGGTTGGCCCT
TGF-ßR2	Forward	CGTCGAGACTCCATCTCAAA
	Reverse	AAACAGCCCACAAATGTCAA
	Probe	TCAGCTTTGCACAAGGGCCCT
TGF-ß1	Forward	CCTGTACAACCAGCACAACC
	Reverse	CGTAGTACACGATGGGCAGT
	Probe	CTCCAGCGCCTGTGGCACAC
GAPDH	Forward	GAGACACGATGGTGAAGGTC
	Reverse	ACAACATCCACTTTGCCAGA
	Probe	CCAATGCGGCCAAATCCGTT

CHAPTER 3
RESULTS

Transfection reagents were used to transfect the RBCF cells with the designed siRNAs. RBCF cells were cultured and seeded onto 96 well plates. Following 48 hours of serum starvation, the cells were transfected with pre-designed commercially available GAPDH siRNA using the silencer siRNA transfection kit (Ambion). The KDalert Tm GAPDH Assay measures the conversion of NAD+ to NADH by GAPDH in the presence of phosphate and G-3-P. Under the recommended assay conditions, the rate of NADH production is proportional to the amount of GAPDH enzyme present. This assay can hence be used to quantitatively determine the amount of GAPDH protein in a sample.

Optimal balance factor (OBF) takes into account both knockdown efficiency and the effect of a scrambled siRNA on cells. Different reagent concentrations were tested to optimize transfection complex formation (Applied-Biosystems, 2009).

$$OBF = \Delta A_{615\text{-}Neg} \times \% \text{ knockdown}$$

$$= \Delta A_{615\text{-}Neg} * \{100 - [100 \times (\Delta A_{615\text{-}GAPDH} / \Delta A_{615\text{-}Neg})]\}$$

It has been reported in the literature that estradiol stimulated the production of TGF-ß (Takahashi et al., 1994; Wira et al., 2002). TGF-ß was similarly used as a stimulant for increasing the concentration of CTGF. In separate experiments, various concentrations of both the stimulants were tested. It was found that a three day dose of estradiol (8ug/mL) and TGF-ß (4ng/mL) as opposed to a single high dose resulted in an increase in the concentration of TGF-ß and CTGF respectively. More specifically, there was an increase in the protein concentration in the media when compared to the cell extract. This can probably be explained by the fact that both TGF-ß1 and CTGF are secreted proteins.

Following stimulation, the protein level knockdown efficiency of the siRNA sequences was calculated by performing ELISA on the stimulated cell cultures. Both the media and the cell extract were tested and compared against the controls to calculate knockdown. The results were analyzed using ANOVA and the sequences with significant knockdown were further analyzed using q-RT PCR.

Custom designed TAQMAN™ probes and primers were designed for each of the three growth factors. The q-RT PCR results showed that there was reduced mRNA level expression in the samples when compared with the controls, confirming knockdown efficiency of the siRNA sequences.

Experiment I

Stimulation of TGF-ß1

The effect of estradiol on TGF-ß1 production by Rabbit corneal fibroblasts in culture is given in Figure 3-3. Isolated Rabbit corneal fibroblast cells were treated with varying concentrations of estradiol for 1, 2, and 3 days and incubated in serum free media for 3 days. Following a change of media at 1 and 2 day of culture, media and cell extract was collected 24 h later (day 4). The isolated media and cell extract were collected and stored at 20°C until assayed for TGF-ß1 as described in Materials and Methods (n =3). Figure 3-3 and Figure 3-4 show the result of ELISA on both the cell extract and media. In the cell extract, there was no major increase in the concentration of TGF-ß1 when compared to the controls. However in the media, at a stimulation concentration of 8ug/mL per day, there was a definite increase in the levels of TGF-ß1 when compared to the controls.

TGF-ß1 Knockdown Experiment

Isolated Rabbit corneal fibroblast cells were treated with the previously optimized, 8 ug/mL concentration of estradiol for 1, 2, and 3 days and incubated in serum free media for 3 days. Following a change of media at day 1 of culture, the cells were transfected with the designed siRNA sequences. Four different concentrations of siRNA – 15nM, 30nM, 60nM and 90nM were experimented for transfection. As optimized by the previous experiment, a concentration of 0.3uL of transfection reagent was used for all siRNA transfection. Six hours following transfection, the media was changed to normal growth media with 15% Fetal Bovine Serum to buffer the effect of transfection on the cells. 18 hours after the media change the cells are reverted back to serum free media. The remaining two doses of estradiol were administered on days 2 and 3. The isolated media and cell extract were collected on Day 4 and stored at 20°C until assayed for TGF-ß1 as described in Materials and Methods (n =3).

Figure 3-5. gives the result of ELSIAs performed on the extracted media and cell extract. The graph shows the concentration of TGF-ß1 over different concentrations of siRNA. The arrow bars represent the standard deviation and the symbol * over the bars signify statistically significant data where $p<0.05$. It was observed that, when compared to controls, the concentration of TGF-ß1 was significantly reduced in the media of cells treated with siRNA sequences 1 and 2 at concentrations of 15nM and 30nM. Although there was significant reduction in the TGF-ß1 concentration in the cell extract of cells treated with siRNA concentration of 15nM, none of the other samples show significant reduction.

The results were further corroborated by calculating the respective knockdown percentages of the siRNA treatments. Figure 3-6 and 3-7 give the media and cell extract

knockdown percentages of the siRNA sequences. The results show that the highest knockdown percentage obtained by using siRNA1 was 88% at a concentration of 30nM while siRNA 2 at concentrations of 60nM respectively gave a knockdown percentage of 89% in the media extract. No knockdown exceeding 60% was observed in the cell extract of the samples.

mRNA was extracted from samples in which there was significant knockdown observed. These samples were then subjected to q-RT PCR to measure the mRNA level knockdown. The primers and probes were optimized using the manufacturer's protocol. GAPDH was used as the control. Figure 3-8 gives the mRNA level knockdown percentages obtained by performing TAQMAN™ q-RT PCR. The resulting knockdown percentages obtained were similar to those obtained from ELISA at the protein level. siRNA 1 at a concentration of 30nM showed a knockdown percentage of 94% while siRNA 2 gave a knockdown percentage of 88% at a concentration of 60nM.

Figure 3-9. shows the ratio of expression of the samples when compared to the scrambled cells. The cells without transfection had the highest ratio of expression of 1.0 when compared to the transfected cells. Although the scrambled siRNA were designed not to affect the expression, it does have a slight effect probably due to the stress on cells from the transfection process.

Experiment II

Stimulation of CTGF

The effect of TGF-ß1on CTGF production by Rabbit corneal fibroblasts in culture is given in Figure 3-9. Isolated Rabbit corneal fibroblast cells were treated with varying concentrations of TGF-ß1for 1, 2, and 3 days and incubated in serum free media for 3 days. Following a change of media at 1 and 2 day of culture, media and cell extract was

collected 24 h later (day 4). The isolated media and cell extract were collected and stored at 20°C until assayed for CTGF as described in Materials and Methods (n =3). Figure 3-10 and Figure 3-11 show the result of ELISA on both the cell extract and media. In the cell extract, there was no major increase in the concentration of CTGF when compared to the controls. However in the media, at a stimulation concentration of 4ng/mL per day, there was a definite increase in the levels of TGF-ß1 when compared to the controls. Single high doses of 10 ng/mL and 20 ng/mL also failed to stimulate the production of TGF-ß1.

Effective knockdown was calculated for all three administered siRNAs based on the level of protein concentration in the controls. The mean knockdown percentage of the triplicates was calculated to get an average value. siRNA sequences 3 was found to be effective in knocking down the protein concentration levels of CTGF.

The knockdown percentages were calculated relative to that of the scrambled siRNA. The knockdown percentages were similar to those calculated from the protein level concentrations. The triplicate samples were tested in duplicates.

CTGF Knockdown Experiment

Isolated Rabbit corneal fibroblast cells were treated with the previously optimized, 4 ng/mL concentration of TGF-ß1for 1, 2, and 3 days and incubated in serum free media for 3 days. Following a change of media at day 1 of culture, the cells were transfected with the designed siRNA sequences. Four different concentrations of siRNA – 15nM, 30nM, 60nM and 90nM were experimented for transfection. As optimized by the previous experiment, a concentration of 0.3uL of transfection reagent was used for all siRNA transfection. Six hours following transfection, the media was changed to normal growth media with 15% Fetal Bovine Serum to buffer the effect of transfection

on the cells. 18 hours after the media change the cells are reverted back to serum free media. The remaining two doses of TGF-ß1are administered on days 2 and 3. The isolated media and cell extract were collected on Day 4 and stored at 20°C until assayed for CTGF as described in Materials and Methods (n =3).

Figure 3-12. gives the result of ELSIAs performed on the extracted media and cell extract. The graph shows the concentration of CTGF over different concentrations of siRNA. The arrow bars represent the standard deviation and the symbol * over the bars signify statistically significant data where $p<0.05$. It was observed that, when compared to controls, the concentration of CTGF was significantly reduced in the media of cells treated with siRNA3 at a concentration of 60nM. There was significant reduction in the CTGF concentration in the cell extract of cells treated with siRNA concentration of 90nM. However, the knockdown effects were observed only at a high concentration of siRNA and none of the other samples show significant reduction.

The results were further corroborated by calculating the respective knockdown percentages of the siRNA treatments. Figure 3-13 and 3-14 give the media and cell extract knockdown percentages of the siRNA sequences. The results show that the highest knockdown percentage obtained by using siRNA3 was around 80% at a concentration of 60nM in the media extract. No knockdown percentage exceeding 60% was observed in the cell extract of the samples.

mRNA was extracted from samples in which there was significant knockdown observed. These samples were then subjected to q-RT PCR to measure the mRNA level knockdown. The primers and probes were optimized using the manufacturer’s protocol. GAPDH was used as the control. Figure 3-15 gives the mRNA level

knockdown percentages obtained by performing TAQMAN™ q-RT PCR. Although, the q-RT PCR results show some knockdown for siRNA 3 sequences at 60nM concentration, the standard deviation of the results were high.

Figure 3-16. shows the ratio of expression of the samples when compared to the scrambled cells. The cells without transfection had the highest ratio of expression of 1.0 when compared to the transfected cells. However, the standard deviations of all the samples were high to make meaningful conclusions.

Experiment III

TGF-ß-R2 Knockdown Experiment

Isolated Rabbit corneal fibroblast cells were treated with the previously optimized, 8 ug/mL concentration of estradiol for 1, 2, and 3 days and incubated in serum free media for 3 days. Following a change of media at day 1 of culture, the cells were transfected with the designed siRNA sequences. Four different concentrations of siRNA – 15nM, 30nM, 60nM and 90nM were experimented for transfection. As optimized by the previous experiment, a concentration of 0.3uL of transfection reagent was used for all siRNA transfection. Six hours following transfection, the media was changed to normal growth media with 15% Fetal Bovine Serum to buffer the effect of transfection on the cells. 18 hours after the media change the cells are reverted back to serum free media. The remaining two doses of estradiol are administered on days 2 and 3. The isolated media and cell extract were collected on Day 4 and stored at 20°C until assayed for TGF-ßR2 as described in Materials and Methods (n =3).

Figure 3-17 gives the result of ELSIAs performed on the extracted media and cell extract. The graph shows the concentration of TGF-ßR2 over different concentrations of siRNA. The arrow bars represent the standard deviation and the symbol * over the bars

signify statistically significant data where $p<0.05$. It was observed that, when compared to controls, the concentration of TGF-ßR2 was significantly reduced in the media of cells treated with siRNA sequence 1 at a concentration of 90nM. Although knockdown of TGF-ßR2 concentration was observed in the cell extract of cells treated with siRNA, there was no significant reduction observed. However, the knockdown effects were observed only at a high concentration of siRNA and none of the other samples show significant reduction.

The results were further corroborated by calculating the respective knockdown percentages of the siRNA treatments. Figure 3-18 and 3-19 give the media and cell extract knockdown percentages of the siRNA sequences. The results show that the highest knockdown percentage obtained by using siRNA1 was around 70% at a concentration of 90nM in the media extract. No knockdown percentage exceeding 60% was observed in the cell extract of the samples.

In all of the following graphs, standard deviations are presented as air bars and statistically significant data are represented as * where $p < 0.01$.

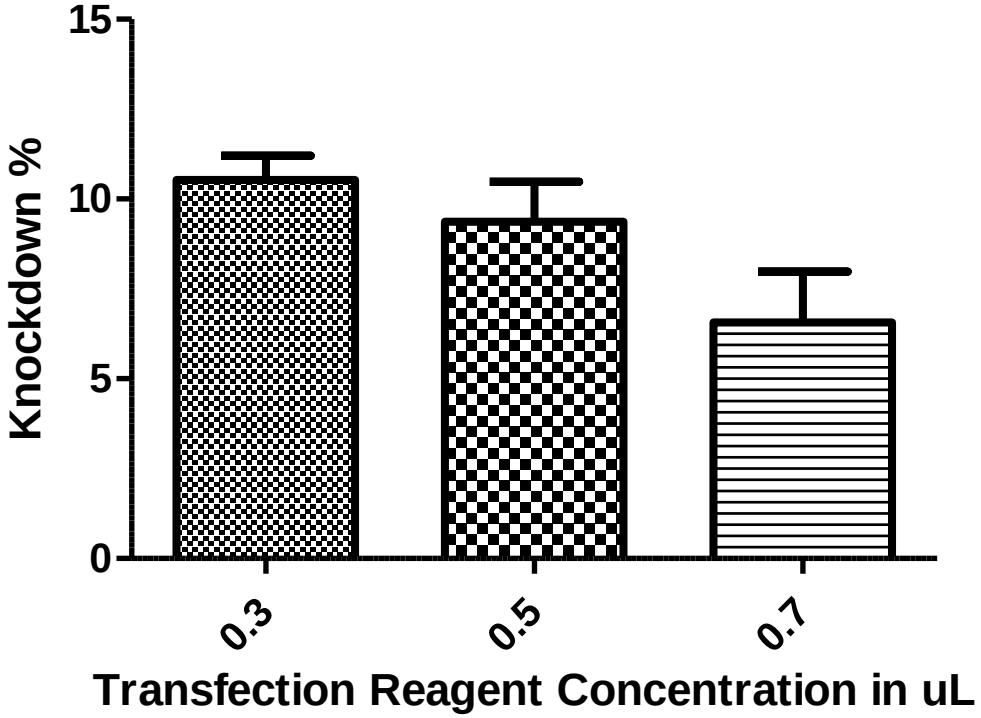

Figure 3-1. Transfection reagent optimization results, knockdown percentage

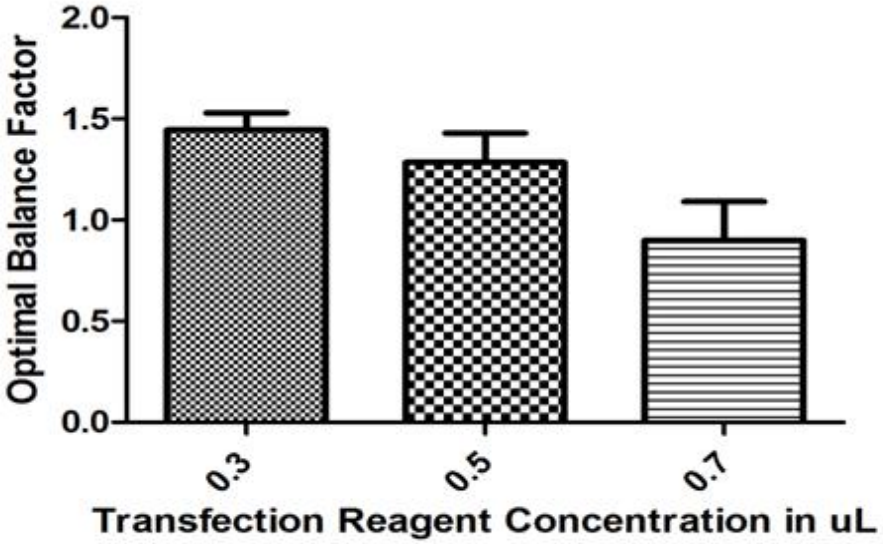

Figure 3-2. Transfection reagent optimization results, optimal balance factor.

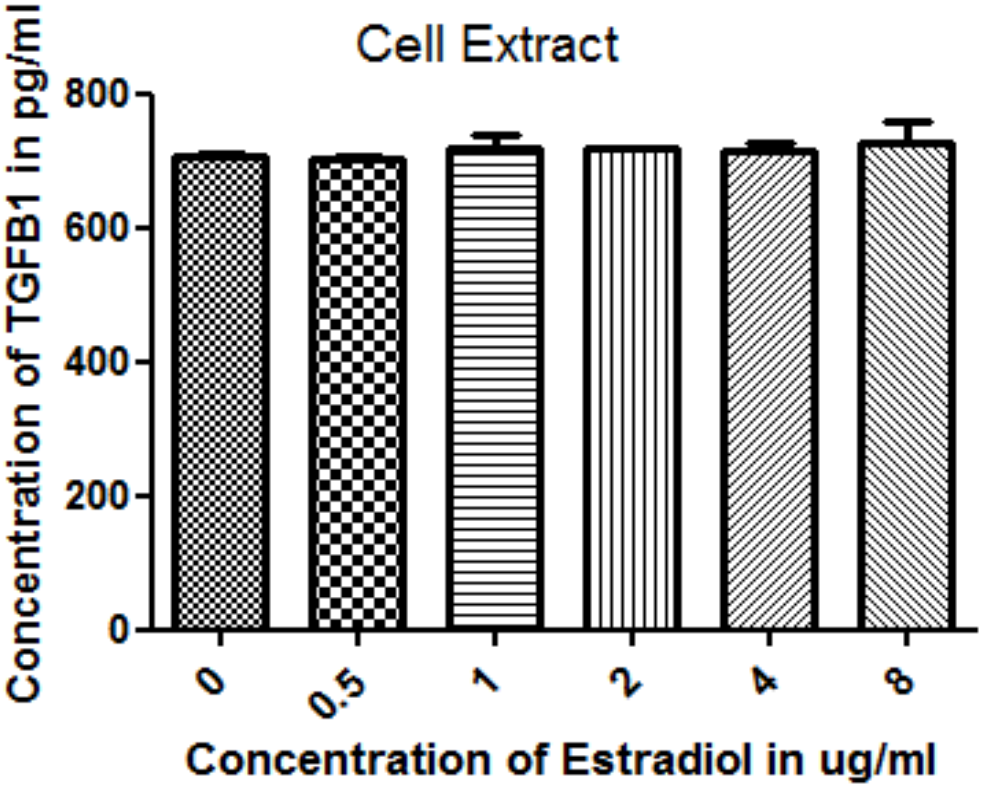

Figure 3-3. TGF-ß1 stimulation, cell extract

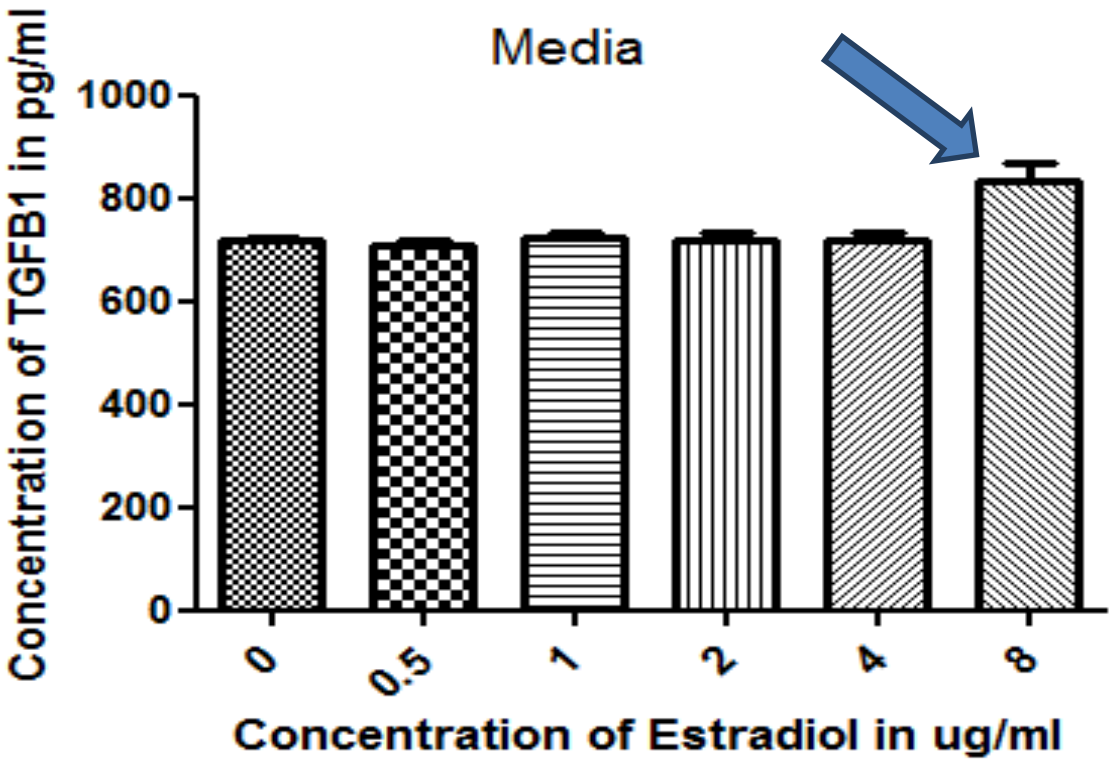

Figure 3-4. TGF-ß1 stimulation, media (Arrow mark indicates highest concentration)

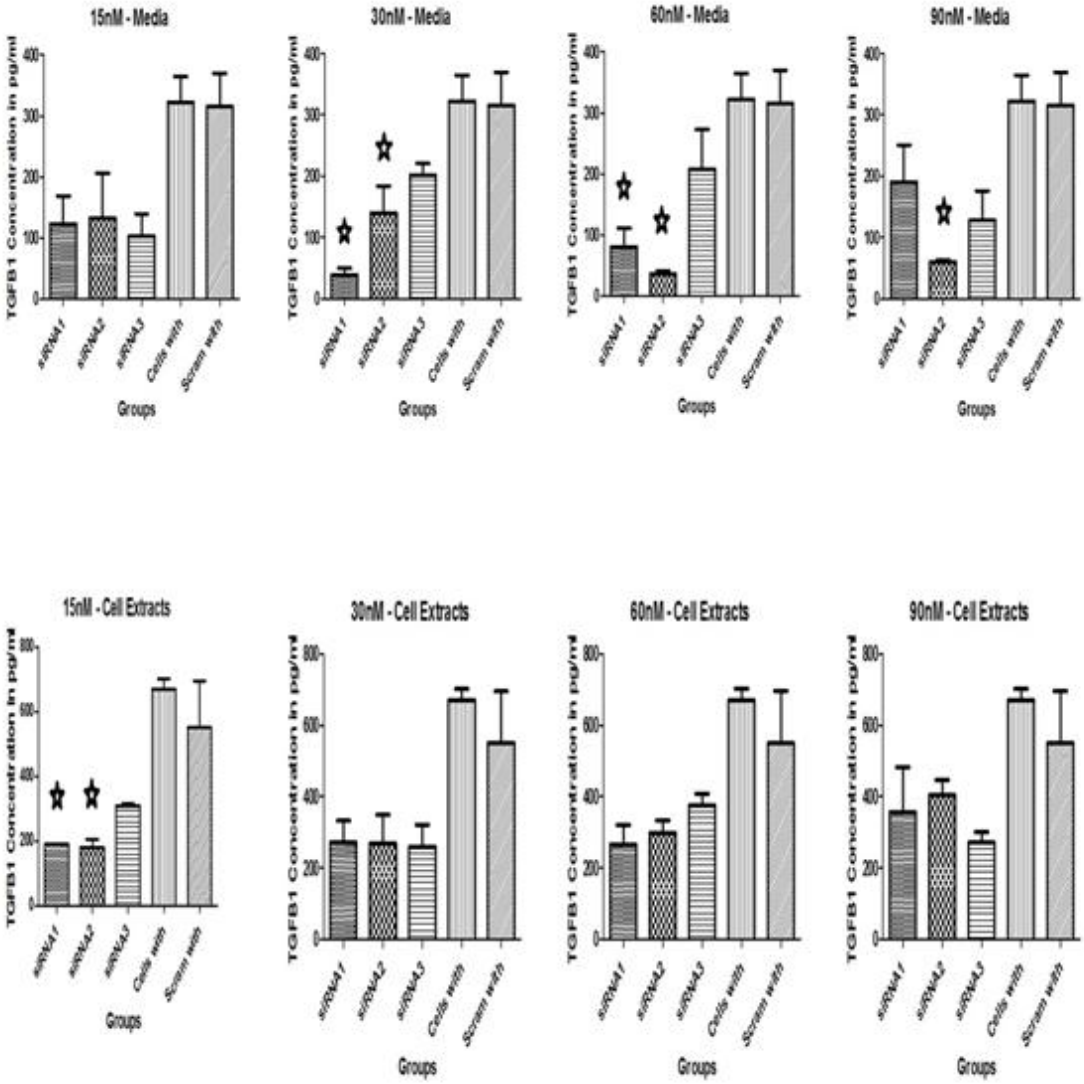

Figure 3-5. TGF-ß1 siRNA knockdown ELISA results

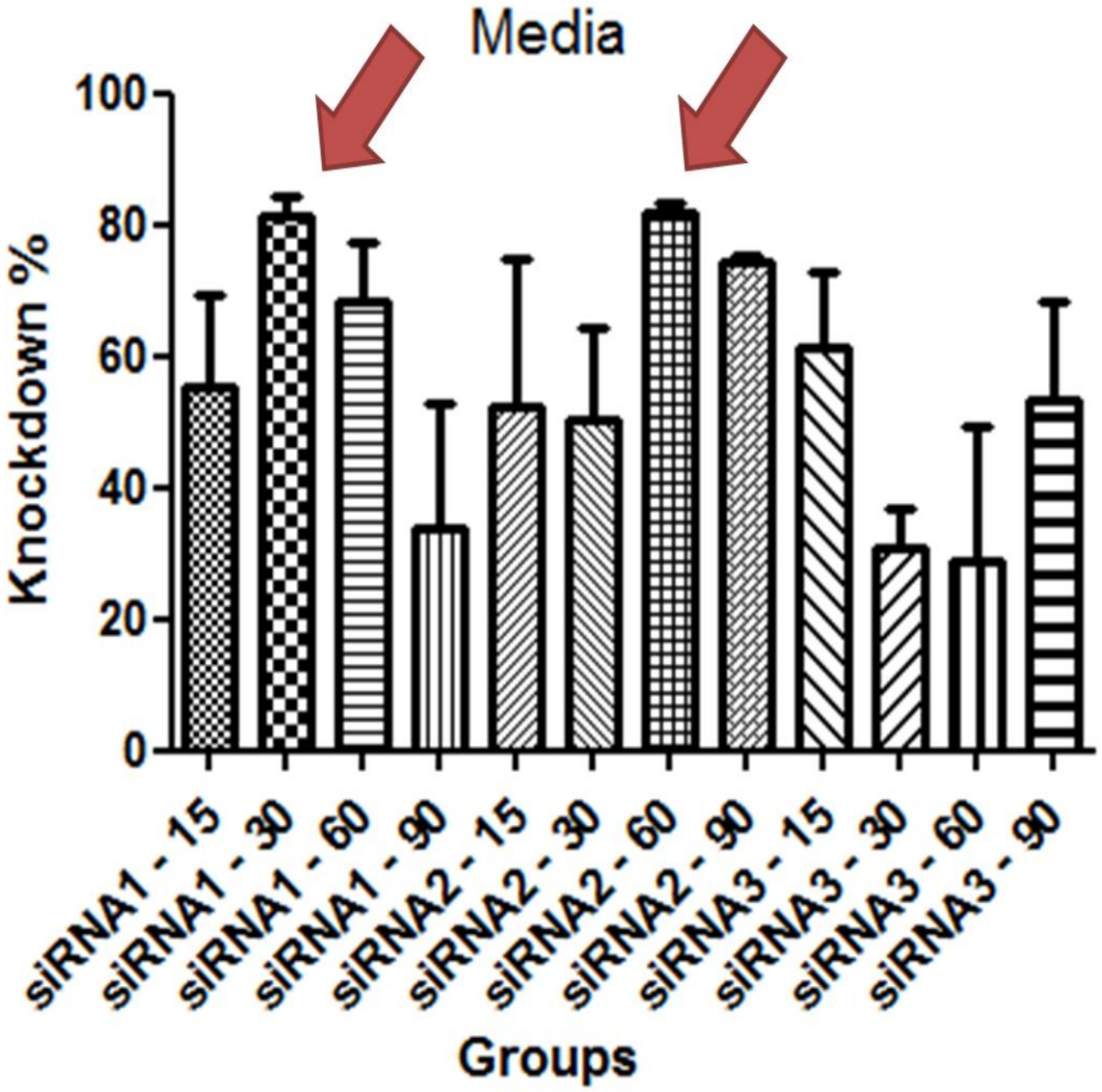

Figure 3-6. TGF-ß1 siRNA knockdown percentage, media (Arrow mark indicates highest knockdown)

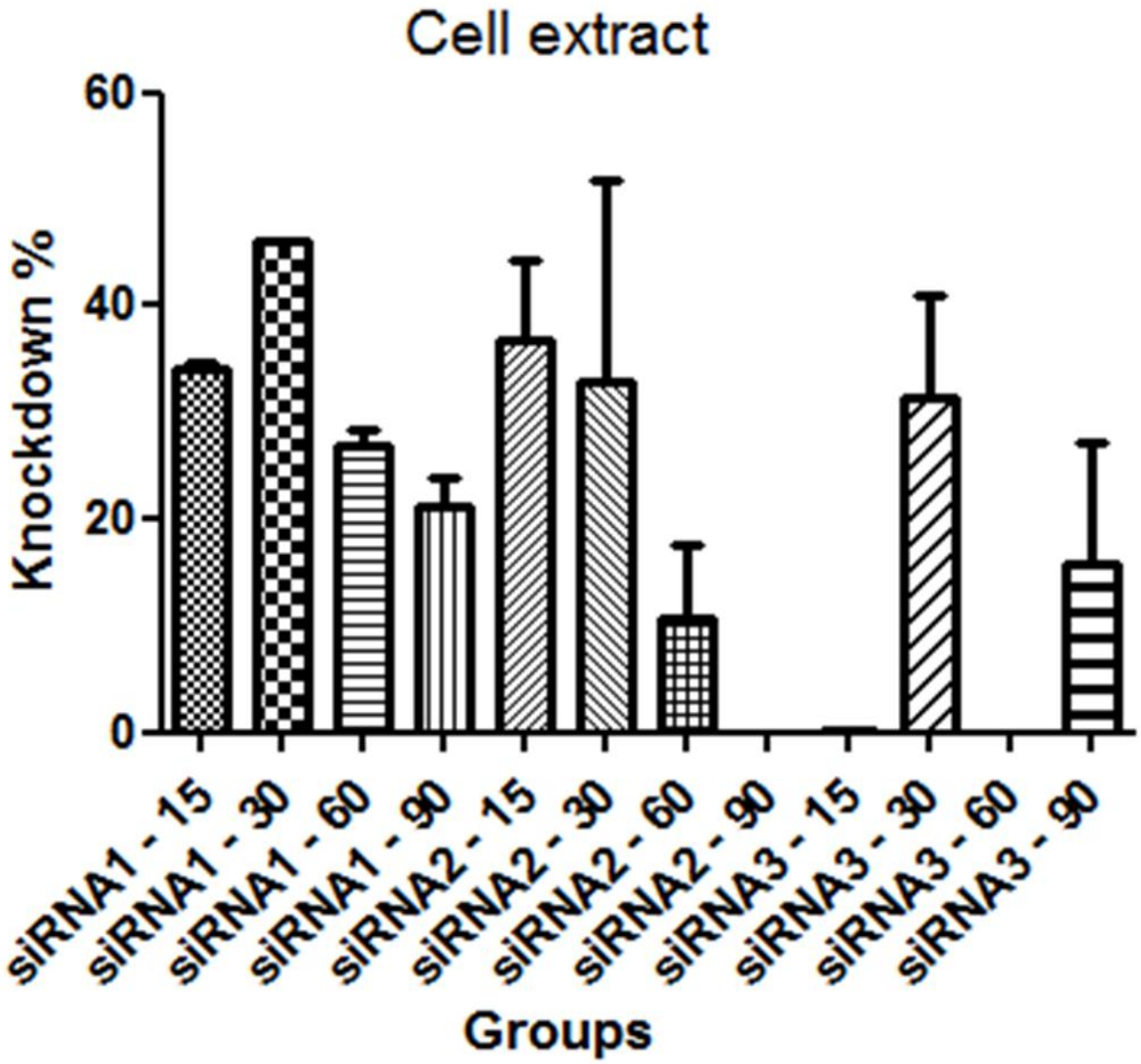

Figure 3-7. TGF-ß1 siRNA knockdown percentage, cell

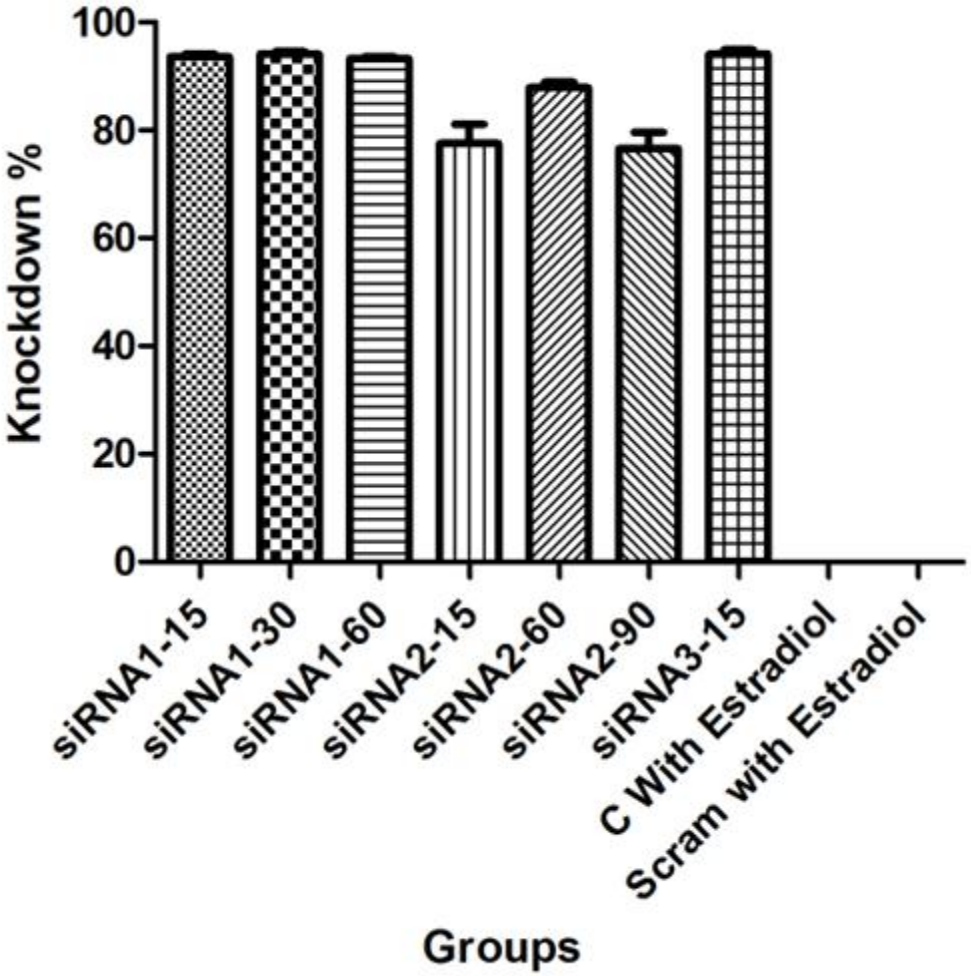

Figure 3-8. TGF-ß1 siRNA knockdown q-RT PCR results, knockdown

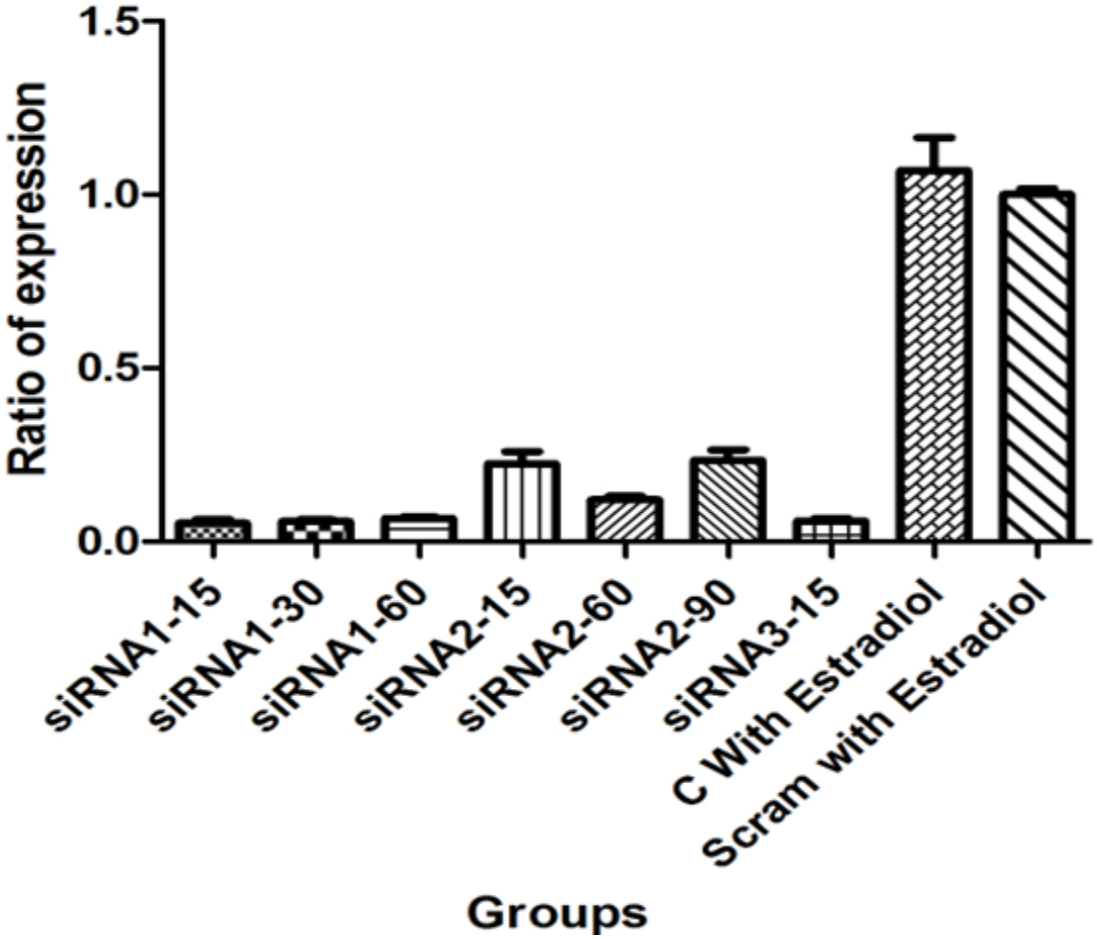

Figure 3-9. TGF-ß1 siRNA knockdown q-RT results, ratio of expression

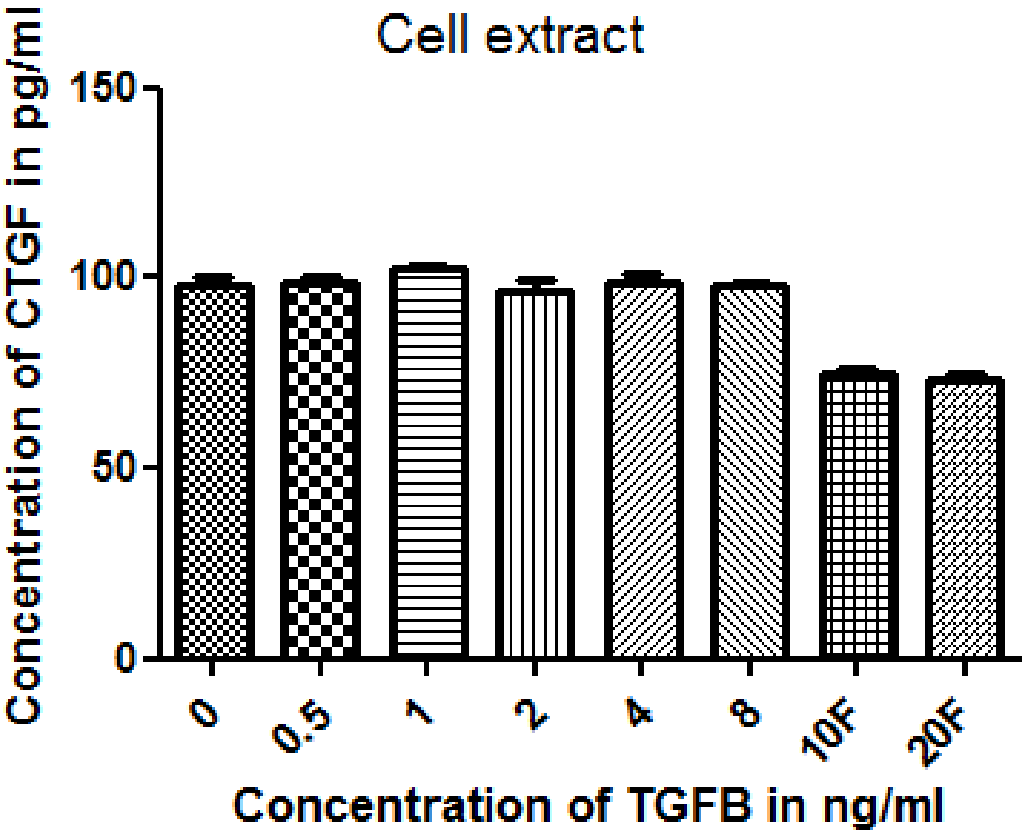

Figure 3-10. CTGF stimulation, cell

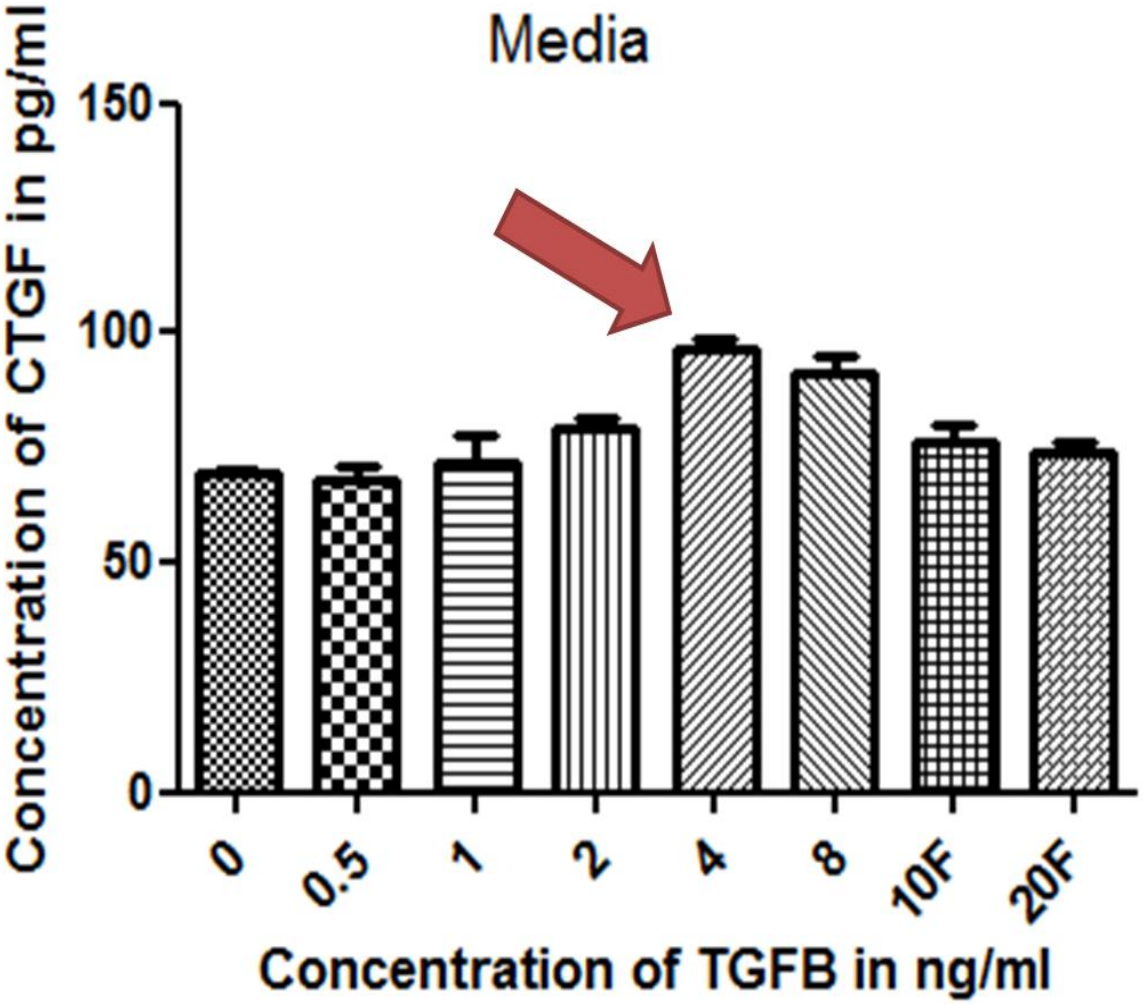

Figure.3-11. CTGF stimulation, media (Arrow mark indicates highest concentration)

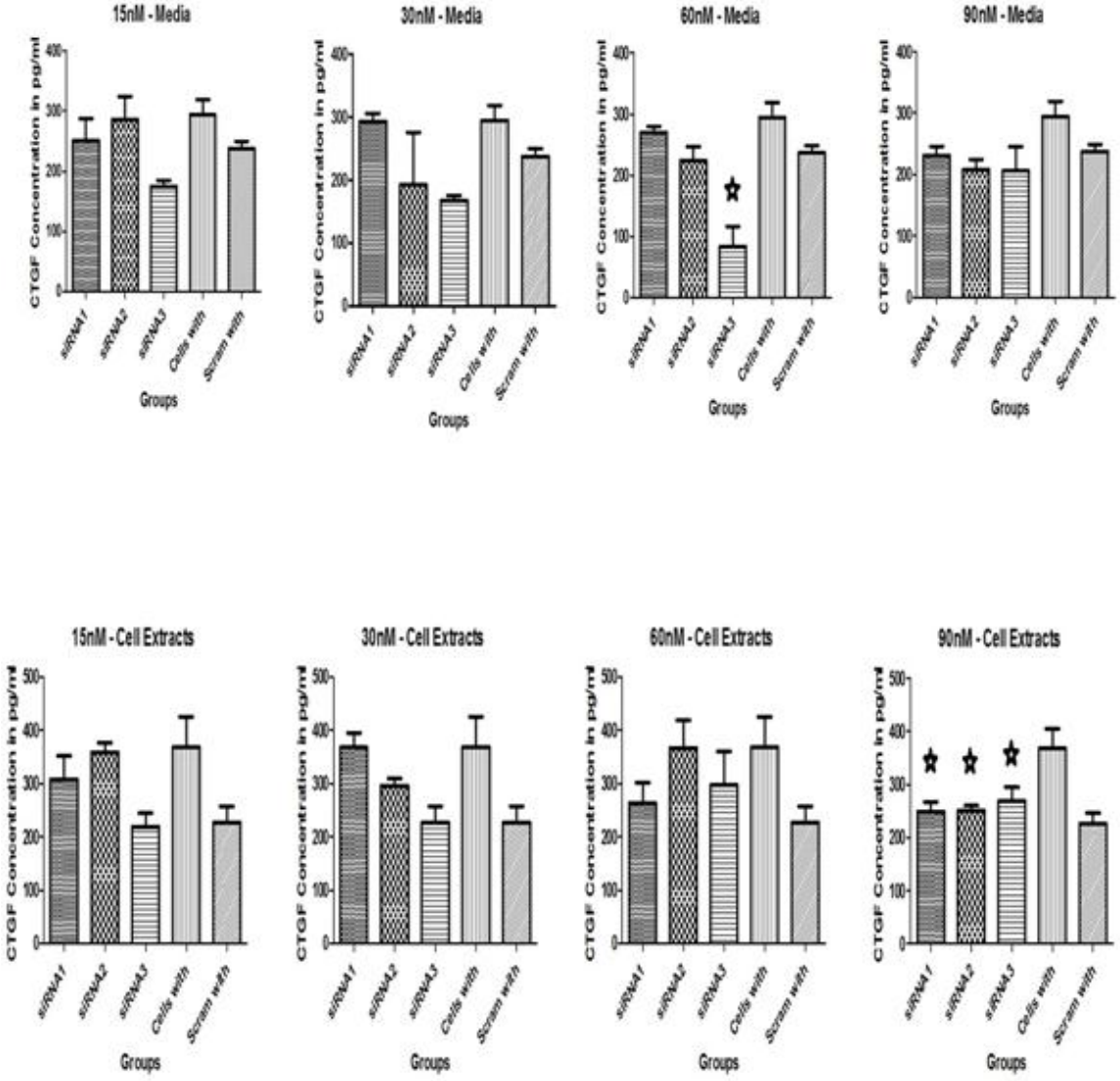

Figure 3-12. CTGF knockdown ELISA results

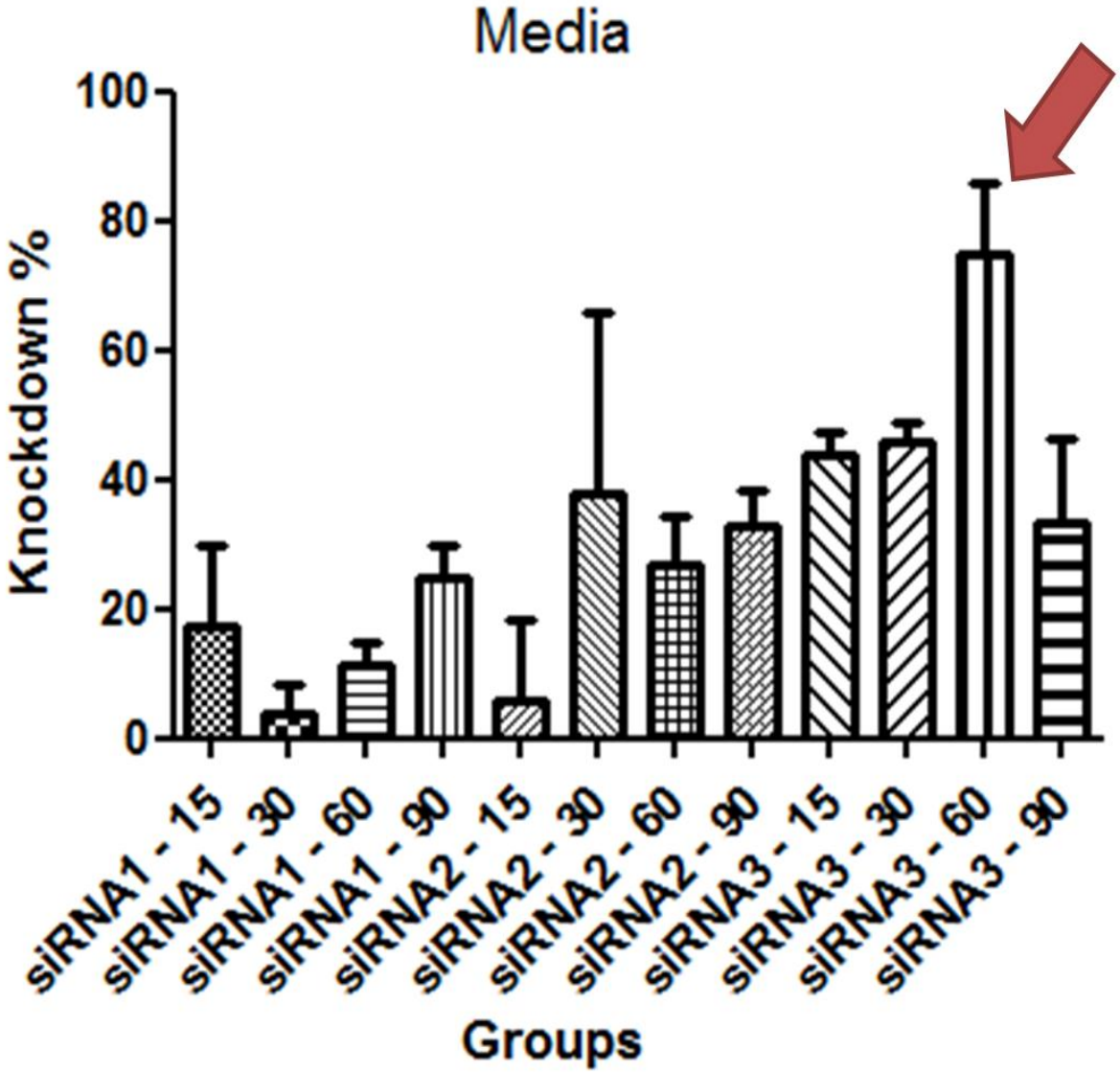

Figure 3-13. CTGF siRNA knockdown percentage, media (Arrow mark indicates highest knockdown)

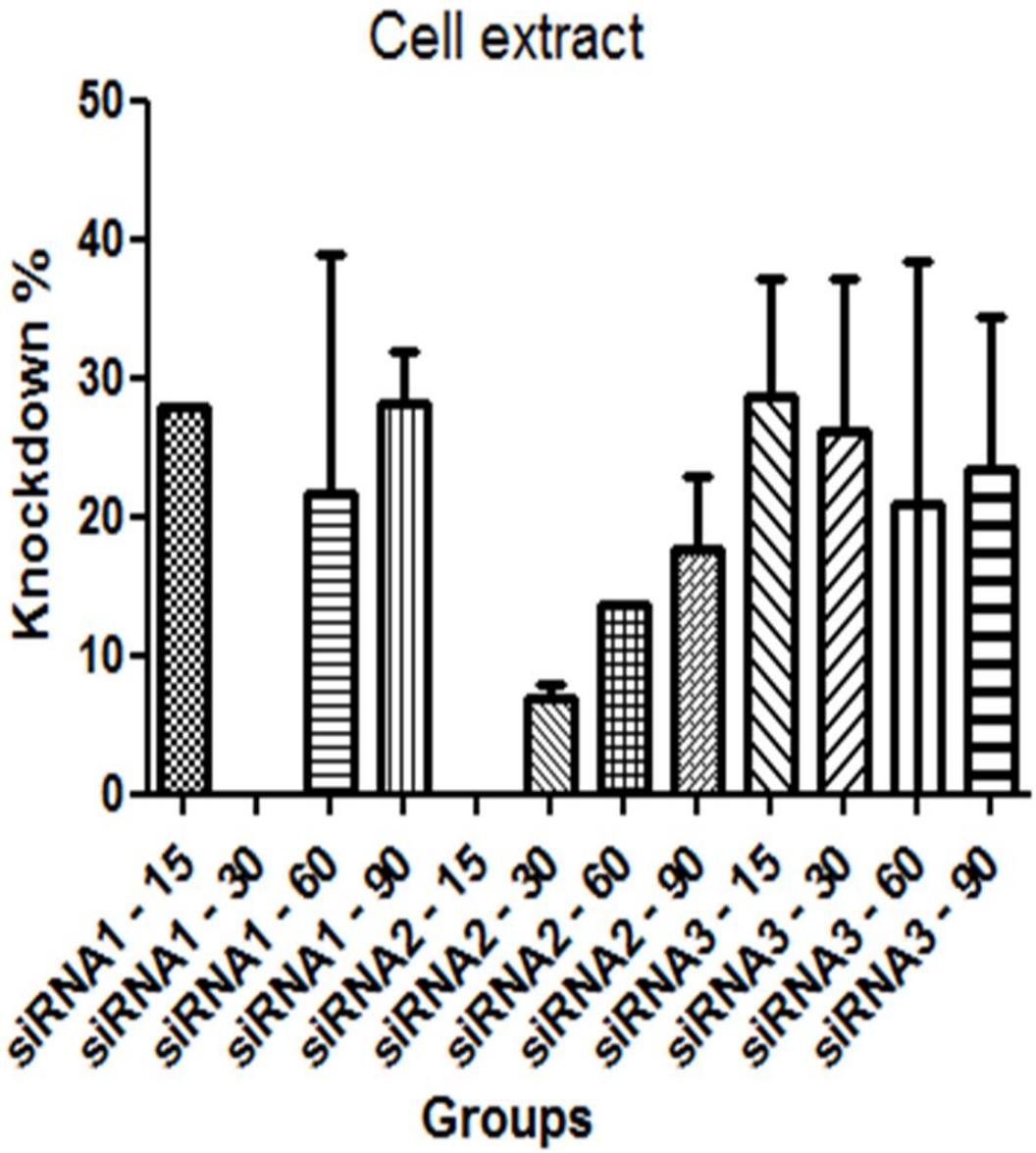

Figure 3-14. CTGF siRNA knockdown percentage, cell

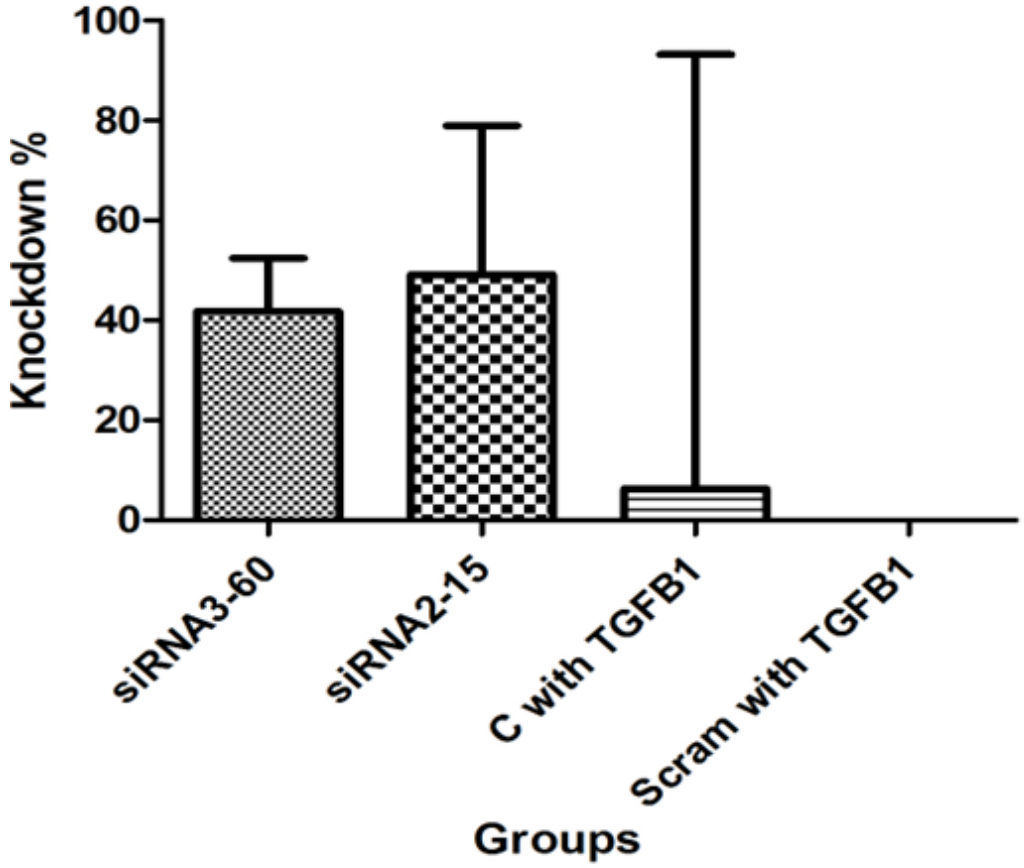

Figure 3-15. CTGF siRNA knockdown q-RT results

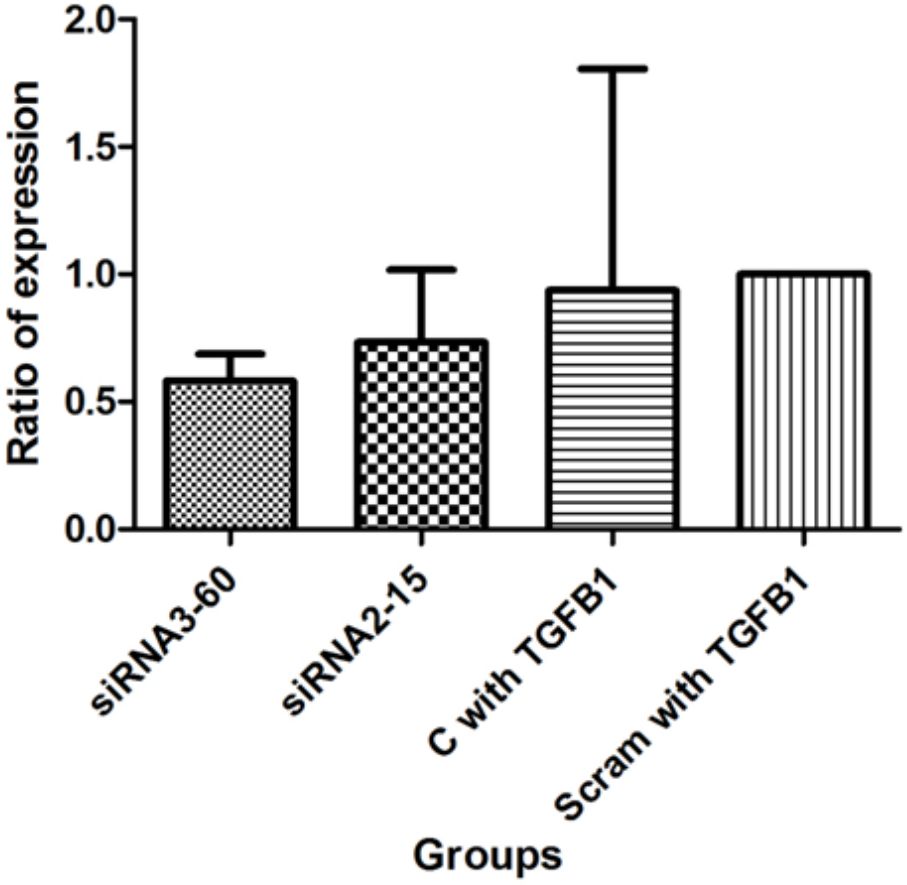

Figure 3-16. CTGF siRNA knockdown q-RT results

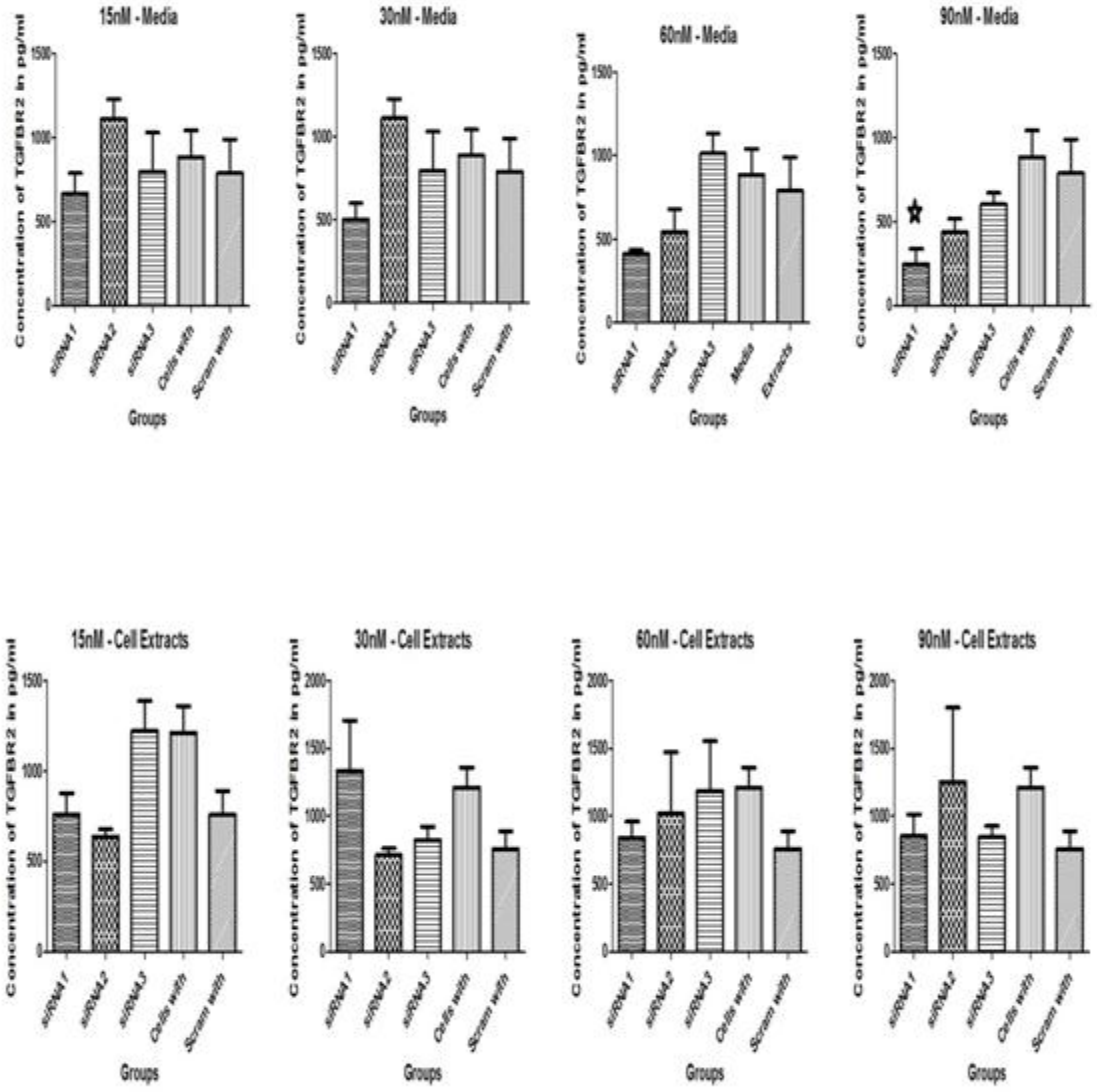

Figure 3-17. TGF-ßR2 siRNA knockdown ELISA results

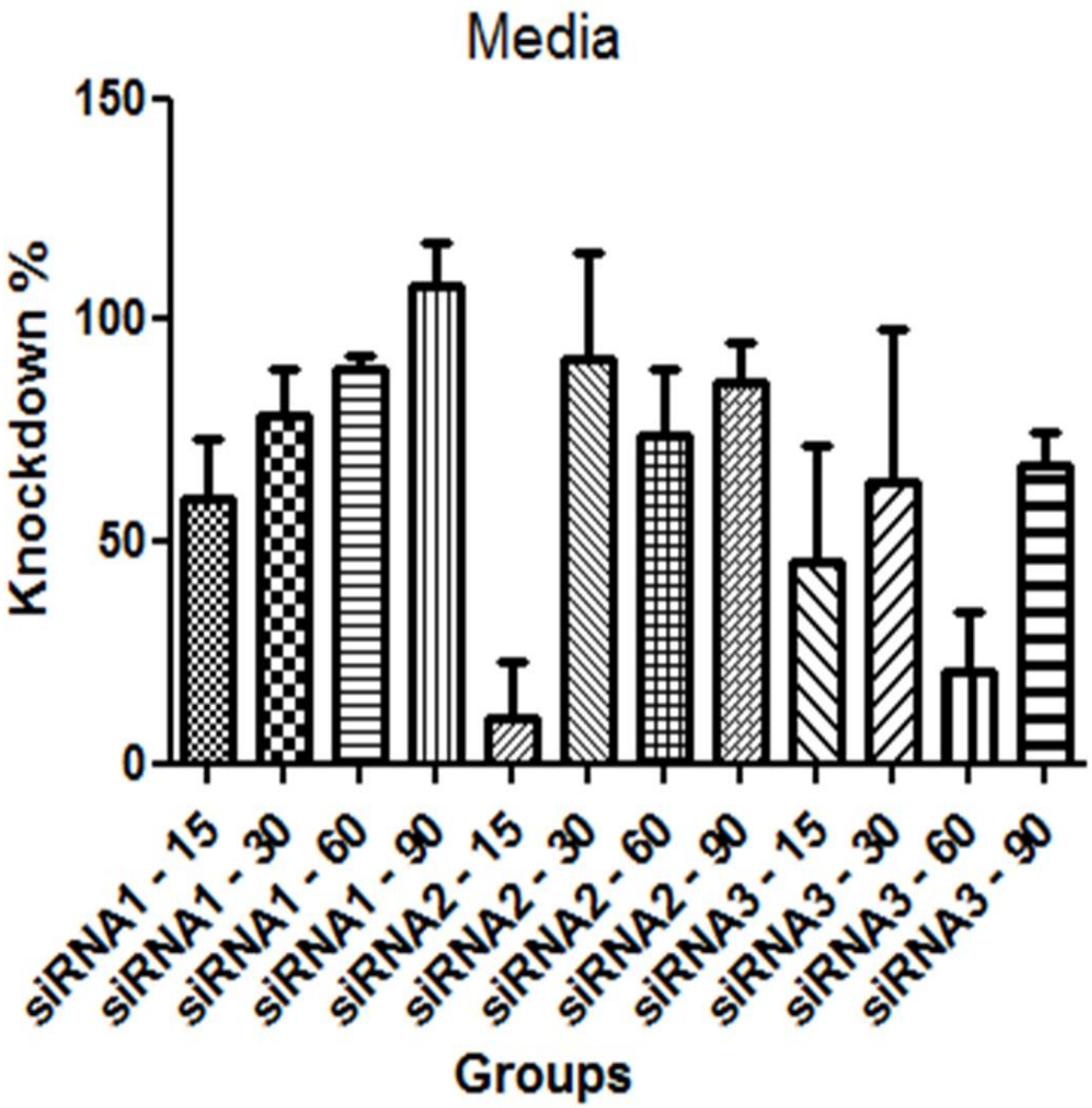

Figure 3-18. TGF-ßR2 siRNA knockdown percentage, media

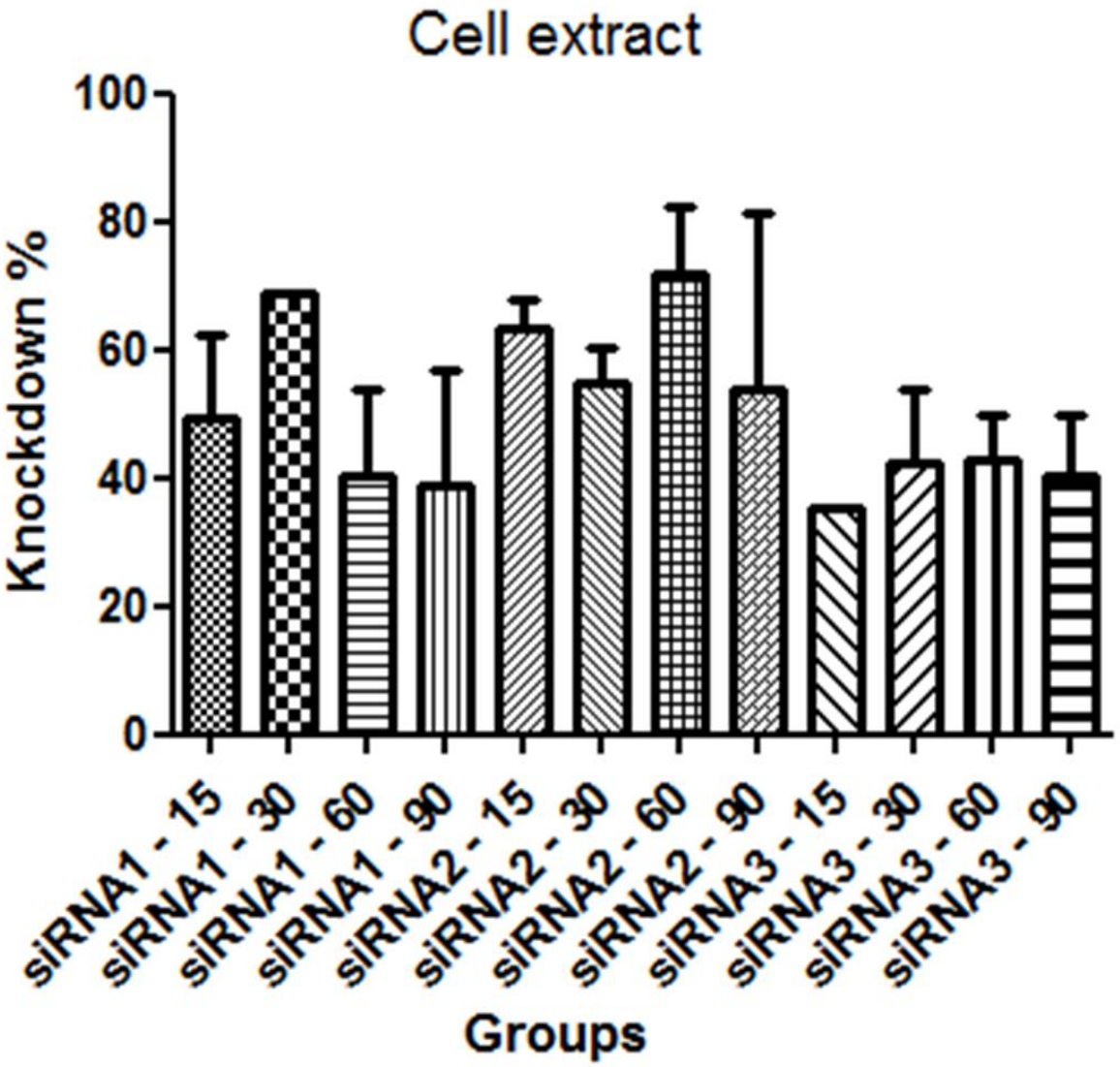

Figure 3-19. TGF-ßR2 siRNA knockdown percentage, cell

CHAPTER 4
DISCUSSION

The goal of this study was to evaluate the knockdown efficiencies of different custom designed siRNA sequences against TGF-ß1, TGF-ßR2 and CTGF at the protein as well as the mRNA level. Literature reports that TGF-ß's expression is largely up-regulated at wounded sites when compared to the normal tissue. It has also been shown that CTGF acts as a downstream mediator of TGF-ß during the wound healing process (Grotendorst, 1997). It was hypothesized that blocking the expression of CTGF and TGF-ß would help regulate the scarring of tissues. The mRNA sequences of human, mouse, rat and rabbits were aligned to check their homology. The coding regions of all the mRNA sequences were found to be highly similar. In this regard, potent siRNA sequences with high knockdown efficiency against each of the three identified growth factors were identified.

Ocular fibrotic wound response is a major cause of impaired vision and blindness, especially following surgical treatment for glaucoma (Migdal et al., 1994). Excessive post-operative scarring often leads to failure of filtration surgery. While conjuctival anti-scarring treatments like mitomycin C and 5-fluorouracil benefit a number of patients, these agents are associated with potentially blinding complications including hypotony, maculopathy and infection(Cordeiro et al., 1999b; Khaw et al., 1993). Therefore, an important target in preventing inflammation and fibrosis is to sequester mature TGF-ß and CTGF. Antibodies to TGF-ß (Jester et al., 1997),TGF-ßR2 (Khaw et al., 1993) and CTGF(Blalock et al., 2003) have been reported to reduce conjuctival scarring. In addition, antisense oligonucleotides and ribozymes were also shown to be effective in wound healing in animal and cell culture studies (Blalock et al., 2003; Cordeiro et al.,

2003). However, the neutralizing antibody approach exhibits relatively weak effects in general as it may not gain full access to the targeted molecules (Yamamoto et al., 2000). Antisense phosphorothioate oligonucleotides and ribozymes can be successful, but their effectiveness , stability, and specificity are still in debate(Stein, 2001). It should also be noted that the TGF-ß1and CTGF produced in lachrymal glands secreted into tears would not be altered by treatment of the cornea. The concentrations of the siRNA are generally in the µM range, whereas our present study shows that TGF-ß1 siRNA is efficacious at 15nM.

Experiment I

The production of TGF-ß1 was greater in the culture media of cells treated with estradiol when compared to the unstimulated controls. Although, the concentration of TGF-ß1 in the cell extract was higher than in the media, the amount of stimulation was lower (Annes et al., 2003). In other words, the difference in the levels of concentration between the controls and the stimulated samples were higher in the media than in the cell extract. This could be due to the fact that TGF-ß1 is a secreted protein and a preset amount of latent TGF-ß1 is already sequestered in the cell. Hence, in response to the stimulation this latent TGF-ß1 would be activated, initiating the cell response to the stimulation. This accounts for the high concentration of TGF-ß-1 in the cell extract.

The siRNA sequences were tested at various concentrations. Two of the designed siRNA sequences gave significant knockdown percentages at lower concentrations of 15nM and 30nM. The knockdown percentages were also similar when compared to both the media and cell extract. siRNA3 may not have targeted the coding region, which may be the reason for the lower knockdown percentages.

The samples with significant knockdown percentages were subjected to q-RT PCR analysis. The relative expression of stimulated cells without siRNA transfection was higher than the cells transfected with siRNA. Although the scrambled siRNA did not target a coding region and was not supposed to reduce the expression, there was a slight reduction in the average relative expression. This may be due to the stress on a cell during the transfection process. The knockdown percentages were calculated from the relative expression. The results show that there is no knockdown observed in the controls. Also, the knockdown percentages of the siRNA sequences were similar to those observed in protein level using ELSIA.

Experiment II

The production of CTGF was greater in the culture media of cells treated with estradiol when compared to the unstimulated controls. CTGF being a secreted protein would be expected to have a higher concentration in the media than the cell extract.

Only one of the three designed siRNA sequences (siRNA sequence 3) gave significant knockdown when compared to the controls. This may be due to the fact that the siRNA sequences designed did not target the coding region. In the cell extract, there were significant knockdown percentages at 90nM concentration of three siRNA sequences. However, these sequences might not be the most efficient in knocking down due to the high concentration of siRNA required for their effect.

mRNA samples from siRNA sequence 3 along with a dummy inefficient siRNA was isolated and subjected to q-RT PCR analysis. Although there was some knockdown observed, the results from the q-RT PCR were inconclusive. The standard deviations of the controls were high due to low number of verifiable data. This may have been due to inefficient design of primer sequences.

Experiment III

The production of TGF-ßR2 was greater in the cell extract of cells treated with estradiol when compared to the unstimulated controls. TGF-ßR2 being a membrane bound protein would be expected to have a higher concentration in the cell extract than the media (Nakamura et al., 2004).

None of the siRNA sequences showed significant knockdown when compared to the controls. siRNA sequence 1 showed significant knockdown percentage in the media at a high concentration of 90nM. However, there was no corresponding knockdown in the cell extracts and hence was not verifiable. The reason for such low knockdown percentages may be that the sequences are not targeting the coding region of the TGF-ßR2 gene.

mRNA samples from siRNA sequence 1 along with a dummy inefficient siRNA was isolated and subjected to q-RT PCR analysis. No results were observed from the q-RT PCR analysis. This may be due to inefficient design of primers or there might not have been a sufficient quantity of mRNA isolated from the samples.

The experiments successfully indicate that the expressions of TGF-ß1, TGF-ßR2 and CTGF can be silenced by efficiently designed siRNA sequences. Both the protein level concentrations as well as the mRNA expressions were tested and evaluated to prove this effect.

CHAPTER 5
CONCLUSIONS

Overall Conclusions

In this study, we had investigated the knockdown percentages of three individual siRNA sequences designed against three growth factors namely – TGF-ß1, CTGF and TGF-ß-R2. Prior to the knockdown experiments, the expression of these growth factors were stimulated to mimic the cellular wound healing process. The siRNA sequences designed for TGF-ß1 gave significant knockdown in both the protein and mRNA level.

Future Work

CTGF acts as a downstream mediator of TGF-ß in promoting scar formation. Both CTGF mRNA and CTGF protein are induced by TGF-ß in fibroblastic cells. Hence, a siRNA sequence targeting TGF-ß1 should in theory knockdown the activity of CTGF. Protein and mRNA level expression of CTGF in the samples from TGF-ß1 siRNA knockdown experiments should be tested for CTGF knockdown.

Although we observed some protein level knockdown in the CTGF knockdown experiments, the q-RT PCR results were not verifiable. The primer sequences have to be redesigned and the q-RT PCR analysis has to be repeated. Finally in the TGF-ßR 2 experiments, we were not able to observe significant knockdown in the cell extract nor were we able to obtain q-RT PCR results. Thus, the siRNA sequences and the primers have to be redesigned and tested again.

The overall design of the experiment can further be improved by testing the viability of delivering two siRNA sequences together at the same time. This may in theory knockdown both the growth factors at the same time, making it more efficient. Increasing the number of markers associated with the activity of growth factors can also

increase the confidence with which the knockdown can be established. The final step in advancing the experiment would be to test the siRNA sequences in animal models. This would enable us to observe the off target effects of the siRNA sequences.

Table 5-1. TGF-ß1 Knockdown percentages, protein and mRNA level

Groups	Media	Cell extracts	q-RT PCR Results
siRNA1 - 15	61.9	71.6	93.7
siRNA1 - 30	87.9	59.5	94.1
siRNA1 - 60	74.9	60.1	93.3
siRNA2 - 15	58.9	72.9	77.6
siRNA2 - 60	88.7	55.3	87.9
siRNA2 - 90	81.3	39.5	43.6
siRNA3 - 15	68.1	53.8	94.1

APPENDIX A
TGFB1 ALIGNMENT SEQUENCES

```
                              TGFB1 alignment

                                                                   Section 1
                           (1) 1        10        20        30        40        50        61
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI       (1) GGCGAGGCGAGGTTTGCTGGGGTGAGGCAGCGGCGCGGCCGGGCCGGGCCGGGCCACAGGC
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus       (1)
                                                                   Section 2
                          (62) 62      70        80        90        100       110       122
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI      (62) GGTGGCGGCGGGACCATGGAGGCGGCGGTCGCTGCTCCGCGTCCCCGGCTGCTCCTCCTCG
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus      (62)
                                                                   Section 3
                         (123) 123    130       140       150       160       170        183
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI     (123) TGCTGGCGGCGGCGGCGGCGGCGGCGGCGGCGCTGCTCCCGGGGGCGACGGCGTTACAGTG
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus     (123)
                                                                   Section 4
                         (184) 184   190       200       210       220       230        244
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI     (184) TTTCTGCCACCTCTGTACAAAAGACAATTTTACTTGTGTGACAGATGGGCTCTGCTTTGTC
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus     (184)
                                                                   Section 5
                         (245) 245  250       260       270       280       290          305
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI     (245) TCTGTCACAGAGACCACAGACAAAGTTATACACAACAGCATGTGTATAGCTGAAATTGACT
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus     (245)
                                                                   Section 6
                         (306) 306           320       330       340       350           366
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI     (306) TAATTCCTCGAGATAGGCCGTTTGTATGTGCACCCTCTTCAAAAACTGGGTCTGTGACTAC
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus     (306)
                                                                   Section 7
                         (367) 367          380       390       400       410            427
    MOUSE TGFB1 NCBI       (1) -------------------------------------------------------------
      RAT TGFB1 NCBI       (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI       (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI     (367) AACATATTGCTGCAATCAGGACCATTGCAATAAAATAGAACTTCCAACTACTGGTTTACCA
   RABBIT TGFB1 NCBI       (1) -------------------------------------------------------------
           Consensus     (367)


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TGFB1 alignment

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------------------------------------------------------------------------------------ Section 8
                     (428) 428         440       450       460       470             488
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (428) TTGCTTGTTCAGAGAACAATTGCGAGAACTATTGTGTTACAAGAAAGCATTGGCAAAGGTC
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (428)
------------------------------------------------------------------------------------ Section 9
                      (489) 489        500       510       520       530              549
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (489) GATTTGGAGAAGTTTGGAGAGGAAAGTGGCGGGGAGAAGAAGTTGCTGTTAAGATATTCTC
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (489)
----------------------------------------------------------------------------------- Section 10
                      (550) 550       560       570       580       590       600     610
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (550) CTCTAGAGAAGAACGTTCGTGGTTCCGTGAGGCAGAGATTTATCAAACTGTAATGTTACGT
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (550)
----------------------------------------------------------------------------------- Section 11
                      (611) 611      620       630       640       650       660      671
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (611) CATGAAAACATCCTGGGATTTATAGCAGCAGACAATAAAGACAATGGTACTTGGACTCAGC
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (611)
----------------------------------------------------------------------------------- Section 12
                      (672) 672     680       690       700       710       720       732
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (672) TCTGGTTGGTGTCAGATTATCATGAGCATGGATCCCTTTTTGATTACTTAAACAGATACAC
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (672)
----------------------------------------------------------------------------------- Section 13
                      (733) 733    740       750       760       770       780        793
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (733) AGTTACTGTGGAAGGAATGATAAAACTTGCTCTGTCCACGGCGAGCGGTCTTGCCCATCTT
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (733)
----------------------------------------------------------------------------------- Section 14
                      (794) 794   800       810       820       830       840         854
     MOUSE TGFB1 NCBI   (1) -------------------------------------------------------------
       RAT TGFB1 NCBI   (1) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (794) CACATGGAGATTGTTGGTACCCAAGGAAAGCCAGCCATTGCTCATAGAGATTTGAAATCAA
    RABBIT TGFB1 NCBI   (1) -------------------------------------------------------------
            Consensus (794)
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TGFB1 alignment

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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
Section 15
                                  (855) 855  860        870        880        890        900        915
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                  (855) AGAATATCTTGGTAAAGAAGAATGGAACTTGCTGTATTGCAGACTTAGGACTGGCAGTAAG
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                         (855)
Section 16
                                  (916) 916          930        940        950        960        976
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                  (916) ACATGATTCAGCCACAGATACCATTGATATTGCTCCAAACCACAGAGTGGGAACAAAAAGG
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                         (916)
Section 17
                                  (977) 977          990        1000       1010       1020       1037
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                  (977) TACATGGCCCCTGAAGTTCTCGATGATTCCATAAATATGAAACATTTTGAATCCTTCAAAC
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                         (977)
Section 18
                                 (1038) 1038        1050       1060       1070       1080       1098
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                 (1038) GTGCTGACATCTATGCAATGGGCTTAGTATTCTGGGAAATTGCTCGACGATGTTCCATTGG
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                        (1038)
Section 19
                                 (1099) 1099       1110       1120       1130       1140       1159
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                 (1099) TGGAATTCATGAAGATTACCAACTGCCTTATTATGATCTTGTACCTTCTGACCCATCAGTT
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                        (1099)
Section 20
                                 (1160) 1160       1170       1180       1190       1200       1210      1220
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                 (1160) GAAGAAATGAGAAAAGTTGTTTGTGAACAGAAGTTAAGGCCAAATATCCCAAACAGATGGC
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                        (1160)
Section 21
                                 (1221) 1221       1230       1240       1250       1260       1270      1281
MOUSE TGFB1 NCBI                    (1) ------------------------------------------------------------
RAT TGFB1 NCBI                      (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI                (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI                 (1221) AGAGCTGTGAAGCCTTGAGAGTAATGGCTAAAATTATGAGAGAATGTTGGTATGCCAATGG
RABBIT TGFB1 NCBI                   (1) ------------------------------------------------------------
Consensus                        (1221)
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                                                                                    Section 22
                      (1282) 1282   1290      1300      1310      1320      1330        1342
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1282) AGCAGCTAGGCTTACAGCATTGCGGATTAAGAAAACATTATCGCAACTCAGTCAACAGGAA
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1282)
                                                                                    Section 23
                      (1343) 1343   1350      1360      1370      1380      1390        1403
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1343) GGCATCAAAATGTAATTCTACAGCTTTGCCTGAACTCTCCTTTTTTCTTCAGATCTGCTCC
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1343)
                                                                                    Section 24
                      (1404) 1404  1410      1420      1430      1440      1450         1464
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1404) TGGGTTTTAATTTGGGAGGTCAATTGTTCTACCTCACTGAGAGGGAACAGAAGGATATTGC
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1404)
                                                                                    Section 25
                      (1465) 1465 1470      1480      1490      1500      1510          1525
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1465) TTCCTTTTGCAGCAGTGTAATAAAGTCAATTAAAAACTTCCCAGGATTTCTTTGGACCCAG
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1465)
                                                                                    Section 26
                      (1526) 1526          1540      1550      1560      1570           1586
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1526) GAAACAGCCATGTGGGTCCTTTCTGTGCACTATGAACGCTTCTTTCCCAGGACAGAAAATG
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1526)
                                                                                    Section 27
                      (1587) 1587         1600      1610      1620      1630            1647
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1587) TGTAGTCTACCTTTATTTTTTATTAACAAAACTTGTTTTTTAAAAAGATGATTGCTGGTCT
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1587)
                                                                                    Section 28
                      (1648) 1648        1660      1670      1680      1690             1708
      MOUSE TGFB1 NCBI    (1) -------------------------------------------------------------
        RAT TGFB1 NCBI    (1) -------------------------------------------------------------
   RABBIT II TGFB1 NCBI   (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (1648) TAACTTTAGGTAACTCTGCTGTGCTGGAGATCATCTTTAAGGGCAAAGGAGTTGGATTGCT
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (1648)
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Section 29
                    (1709) 1709      1720      1730      1740      1750      1769
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (1709) GAATTACAATGAAACATGTCTTATTACTAAAGAAAGTGATTTACTCCTGGTTAGTACATTC
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (1709)

Section 30
                    (1770) 1770      1780      1790      1800      1810      1820      1830
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (1770) TCAGAGGATTCTGAACCACTAGAGTTTCCTTGATTCAGACTTTGAATGTACTGTTCTATAG
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (1770)

Section 31
                    (1831) 1831      1840      1850      1860      1870      1880      1891
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (1831) TTTTTCAGGATCTTAAAACTAACACTTATAAAACTCTTATCTTGAGTCTAAAAATGACCTC
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (1831)

Section 32
                    (1892) 1892      1900      1910      1920      1930      1940      1952
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (1892) ATATAGTAGTGAGGAACATAATTCATGCAATTGTATTTTGTATACTATTATTGTTCTTTCA
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (1892)

Section 33
                    (1953) 1953      1960      1970      1980      1990      2000      2013
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (1953) CTTATTCAGAACATTACATGCCTTCAAAATGGGATTGTACTATACCAGTAAGTGCCACTTC
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (1953)

Section 34
                    (2014) 2014      2020      2030      2040      2050      2060      2074
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2014) TGTGTCTTTCTAATGGAAATGAGTAGAATTGCTGAAAGTCTCTATGTTAAAACCTATAGTG
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2014)

Section 35
                    (2075) 2075      2080      2090      2100      2110      2120      2135
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2075) TTTGAATTCAAAAAGCTTATTTATCTGGGTAACCCAAACTTTTTCTGTTTTGTTTTTGGAA
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2075)
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Section 36
                    (2136) 2136        2150      2160      2170      2180        2196
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2136) GGGTTTTTGTGGTATGTCATTTGGTATTCTATTCTGAAAATGCCTTTCTCCTACCAAAATG
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2136)

Section 37
                    (2197) 2197        2210      2220      2230      2240        2257
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2197) TGCTTAAGCCACTAAAGAAATGAAGTGGCATTAATTAGTAAATTATTAGCATGGTCATGTT
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2197)

Section 38
                    (2258) 2258        2270      2280      2290      2300        2318
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2258) TGAATATTCTCACATCAAGCTTTTGCATTTTAATTGTGTTGTCTAAGTATACTTTTAAAAA
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2258)

Section 39
                    (2319) 2319        2330      2340      2350      2360        2379
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2319) ATCAAGTGGCACTCTAGATGCTTATAGTACTTTAATATTTGTAGCATACAGACTAATTTTT
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2319)

Section 40
                    (2380) 2380      2390      2400      2410      2420      2430    2440
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2380) CTAAAAGGGAAAGTCTGTCTAGCTGCTTGTGAAAAGTTATGTGGTATTCTGTAAGCCATTT
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2380)

Section 41
                    (2441) 2441      2450      2460      2470      2480      2490    2501
MOUSE TGFB1 NCBI      (1) ------------------------------------------------------------
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2441) TTTTCTTTATCTGTTCAAAGACTTATTTTTTAAGACATGAATTACATTTAAAATTAGAATA
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2441)

Section 42
                    (2502) 2502    2510      2520      2530      2540      2550      2562
MOUSE TGFB1 NCBI      (1) ------------------------------------------------CGCCGCCGCCGCCG
RAT TGFB1 NCBI        (1) ------------------------------------------------------------
RABBIT II TGFB1 NCBI  (1) ------------------------------------------------------------
HUMAN TGFB1 NCBI (2502) TGGTTAATATTAAATAATAGGCCTTTTTCTAGGAAGGCGAAGGTAGTTAATAATTTGAATA
RABBIT TGFB1 NCBI     (1) ------------------------------------------------------------
Consensus (2502)
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                                                                                    Section 43
                          (2563) 2563   2570          2580          2590          2600          2610         2623
        MOUSE TGFB1 NCBI    (15) CCCTTCGCGCCCCAGGCCGTCCCCCTCCTCCTCCCGCCGCGGATCCTCCAGACAGCCAGGC
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2563) GATAACAGATGTGCAAGAAAGTCACATTTGTTATGTATGTAGGAGTAAACGTTCGGTGGAT
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2563)
                                                                                    Section 44
                          (2624) 2624  2630          2640          2650          2660          2670         2684
        MOUSE TGFB1 NCBI    (76) CCCCGGCCGGGGCAGGGGGGACGCCCCTTCGGGGCACCCCCGGCTCTGAGCCGCACTCGGA
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2624) CCTCTGTCTTTGTAACTGAGGTTAGAGCTAGTGTGGTTTTGAGGTCTCACTACACTTTGAG
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2624)
                                                                                    Section 45
                          (2685) 2685 2690          2700          2710          2720          2730         2745
        MOUSE TGFB1 NCBI   (137) GTCGGCCTCCGCTGGGAGCCGGCAAAGGAGCAGCCGAGGAGCCGTCCGAGGCCCCAGAGTC
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2685) GAAGGCAGCTTTTAATTCAGTGTTTCCTTATGTGTGCGTACATTGCAACTGCTTACATGTA
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2685)
                                                                                    Section 46
                          (2746) 2746          2760          2770          2780          2790         2806
        MOUSE TGFB1 NCBI   (198) TGAGACCAGCCGCCGCCGCAGGGAGGAGGGGGAGGAGGAGTGGGAGGAGGGACGAGCTGGT
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2746) ATTTATGTAATGCATTCAGTGCACCCTTGTTACTTGGGAGAGGTGGTAGCTAAAGAACATT
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2746)
                                                                                    Section 47
                          (2807) 2807         2820          2830          2840          2850         2867
        MOUSE TGFB1 NCBI   (259) TGAGAGAAGAGGAAAAAAGTTTTGAGACTTTTCCGCTGCTACTGCAAGTCAGAGACGTGGG
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2807) CTGAGTATAGGTTTTTCTCCATTTACAGATGTCTTTGGTCAAATATTGAAAGCAAACTTGT
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2807)
                                                                                    Section 48
                          (2868) 2868        2880          2890          2900          2910         2928
        MOUSE TGFB1 NCBI   (320) GACTTCTTGGCACTGCGCTGTCTCGCAAGGAGGCAGGACCTGAGGACTCCAGACAGCCCTG
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2868) CATGGTCTTCTTACATTAAGTTGAAACTAGCTTATAATAACTGGTTTTTACTTCCAATGCT
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2868)
                                                                                    Section 49
                          (2929) 2929       2940          2950          2960          2970         2989
        MOUSE TGFB1 NCBI   (381) CTCACCGTCGTGGACACTCGATCGCTACCCGGCGTTCCTCAGACGCCCCTATTCCGGACCA
          RAT TGFB1 NCBI     (1) -------------------------------------------------------------
     RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
        HUMAN TGFB1 NCBI  (2929) ATGAAGTCTCTGCAGGGCTTTTACAGTTTTCGAAGTCCTTTTATCACTGTGATCTTATTCT
       RABBIT TGFB1 NCBI     (1) -------------------------------------------------------------
               Consensus  (2929)
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TGFB1 alignment

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                                                                             Section 50
                     (2990) 2990      3000      3010      3020      3030      3040   3050
    MOUSE TGFB1 NCBI  (442) GCCCTCGGGAGCCACAAACCCCGCCTCCCGCGAAGACTTCACCCCAAAGCTGGGGCGCACC
      RAT TGFB1 NCBI    (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (2990) GAGGGGAGAAAAAACTATCATAGCTCTGAGGCAAGACTTCGACTTTATAGTGCTATCAGTT
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (2990)
                                                                             Section 51
                     (3051) 3051     3060      3070      3080      3090      3100    3111
    MOUSE TGFB1 NCBI  (503) CCTTGCACGCCGCCCTCCCCCCAGCCTGCCTCTTGAGTCCCTCGCATCCCAGGACCCTCTC
      RAT TGFB1 NCBI    (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3051) CCCCGATACAGGGTCAGAGTAACCCATACAGTATTTTGGTCAGGAAGAGAAAGTGGCCATT
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3051)
                                                                             Section 52
                     (3112) 3112    3120      3130      3140      3150      3160     3172
    MOUSE TGFB1 NCBI  (564) TCCCCCGAGAGGCAGATCTCCCTCGGACCTGCTGGCAGTAGCTCCCCTATTTAAGAACACC
      RAT TGFB1 NCBI    (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3112) TACACTGAATGAGTTGCATTCTGATAATGTCTTATCTCTTATACGTAGAATAAATTTGAAA
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3112)
                                                                             Section 53
                     (3173) 3173   3180      3190      3200      3210      3220      3233
    MOUSE TGFB1 NCBI  (625) CACTTTTGGATCTCAGAGAGCGCTCATCTCGATTTTTACCCTGGTGGTATACTGAGACACC
      RAT TGFB1 NCBI    (1) -------------------------------------------------------------
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3173) GACTATTTGATCTTAAAACCAAAGTAATTTTAGAATGAGTGACATATTACATAGGAATTTA
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3173)
                                                                             Section 54
                     (3234) 3234  3240      3250      3260      3270      3280       3294
    MOUSE TGFB1 NCBI  (686) TTGGTGTCAGAGCCTCACCGCGACTCCTGCTGCTTTCTCCCTCAACCTCAAATTATTCAGG
      RAT TGFB1 NCBI    (1) ------------------------------------------CAACCTCAAATTATTCAGG
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3234) GTGTCAATTTCATGTGTTTAAAAACATCATGGGAAAAATGCTTAGAGGTTACTATTTTGAC
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3234)                                            A      A T  TT
                                                                             Section 55
                     (3295) 3295 3300      3310      3320      3330      3340        3355
    MOUSE TGFB1 NCBI  (747) ACTATCACCTACCTTTCCTTGGGAGACCCCACCCCAC-----AAGCCCTGCAGGGGCGGGG
      RAT TGFB1 NCBI   (20) ACTATCACCTACCTTTCCTTGGGAGACCCCACCCCACCCCACAAGCCCTGCAGGGGCGGGG
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3295) TACAAAGTTGAGTTTTTTTCTGTAGTTACCATAATTTCA---TTGAAGCAAATGAATGAGT
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3295)    A      A  TTT  T  G AG   CCA             G      A G   G G
                                                                             Section 56
                     (3356) 3356          3370      3380      3390      3400         3416
    MOUSE TGFB1 NCBI  (803) CCTCCGCATCCCACCTTTGCCGAGGGTTCCCGCTCTCCGAAGTGCCGTGGGGCGCCGCCTC
      RAT TGFB1 NCBI   (81) CCTCCGCATCCCACCTTTGCCCGGGGTTCGCGCTCTCCGAAGTTCCGTGGGGCGCCGCCTC
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3353) TTGAGAGGTTTGTTTTTATAGTTGTGTTGTATTACTTGTTTAATAATAATCTCTAATTCTG
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3356)         T      TT      G GTT      CT                C     CT
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TGFB1 alignment

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                                                                               Section 57
                     (3417) 3417         3430      3440      3450      3460          3477
    MOUSE TGFB1 NCBI  (864) CCCCATGCCGCCCTCGGGGCTGCGGCTACTGCCGCTTCTGCTCCCACTCCCGTGGCTTCTA
      RAT TGFB1 NCBI  (142) CCCCATGCCGCCCTCGGGGCTGCGGCTGCTGCCGCTTCTGCTCCCACTCCCGTGGCTTCTA
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3414) TGATCAGGTACTTTTTTTGTGGGGGTTTTTTTTTTTGTTTTTTTTTTTTTGTTGTTGTTTTT
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3417)       G   C  T    G  G GG T  T      T T  T     T        TT T
                                                                               Section 58
                     (3478) 3478        3490      3500      3510      3520          3538
    MOUSE TGFB1 NCBI  (925) GTGCTGACGCCCGGGAGGCCAGCCGCGGGACTCTCCACCTGCAAGACCATCGACATGGAGC
      RAT TGFB1 NCBI  (203) GTGCTGACGCCCGGGAGGCCAGCCGCGGGACTCTCCACCTGCAAGACCATCGACATGGAGC
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3475) GGGCCATTTCTAAGCCTACCAGATCTGCTTTATGAAATCCAGGGGACCAATGCATTTTATC
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3478) G GC     C   G    CCAG    G         A C     GACCA  G   T  A C
                                                                               Section 59
                     (3539) 3539       3550      3560      3570      3580            3599
    MOUSE TGFB1 NCBI  (986) TGGTGAAACGGAAGCGCATCGAAGCCATCCGTGGCCAGATCCTGTCCAAACTAAGGCTCGC
      RAT TGFB1 NCBI  (264) TGGTGAAACGGAAGCGCATCGAAGCCATCCGTGGCCAGATCCTGTCCAAACTAAGGCTCGC
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3536) ACTAAAACTATTTTTATATAATTTTAAGAATATACCAAAAGTTGTCTGATTTAAAGTTGTA
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3539)      AA          AT       A       CCA A   TGTC  A  TAA G T
                                                                               Section 60
                     (3600) 3600      3610      3620      3630      3640      3650   3660
    MOUSE TGFB1 NCBI (1047) CAGTCCCCCAAGCCAGGGGGAGGTACCGCCCGGCCCGCTGCCCGAGGCGGTGCTCGCTTTG
      RAT TGFB1 NCBI  (325) CAGTCCCCCGAGCCAGGGGGAGGTACCGCCGGGCCCGCTGCCCGAGGCGGTGCTCGCTTTG
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3597) ATACATGATTTCTCACTTTCATGTAAGGTTATCCACTTTTGCTGAAGATATTTTTTATTGA
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3600)              CA     A GTA  G     C C  T  C GA G   T  T   TT
                                                                               Section 61
                     (3661) 3661     3670      3680      3690      3700      3710    3721
    MOUSE TGFB1 NCBI (1108) TACAACAGCACC----CGCGACCGGGTGGCAGGCGAGAGCGCCGACCCAGAGCCGGAGCCC
      RAT TGFB1 NCBI  (386) TACAACAGCACC----CGCGACCGGGTGGCAGGCGAGAGCGCTGACCCGGAGCCCGAGCCC
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3658) ATCAAAGATTGAGTTACAATTATACTTTTCTTACCTAAGTGGATAAAATGTACTTTTGATG
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3661)   CAA           C         T  C   C   AG G   A    G  C    G
                                                                               Section 62
                     (3722) 3722    3730      3740      3750      3760      3770     3782
    MOUSE TGFB1 NCBI (1165) GAAGCGGACTACTATGCTAAAGAGGTCACCCGCGTGCTAATGGTGGACCGCAACAACGCCA
      RAT TGFB1 NCBI  (443) GAGGCGGACTACTACGCCAAAGAAGTCACCCGCGTGCTAATGGTGGACCGCAACAACGCAA
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3719) AATCAGGGAATTTTTTTAAAGTTGGAGTTTAGTTCTAAATTGACTTTACGTATTACTGCAG
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3722)  A   GG     T     AA    G      G      A TG      CG A  A  GC
                                                                               Section 63
                     (3783) 3783   3790      3800      3810      3820      3830      3843
    MOUSE TGFB1 NCBI (1226) TCTATGAGAAAACCAAAGACATCTCACACAGTATATATATGTTCTTCAATACGTCAGACAT
      RAT TGFB1 NCBI  (504) TCTATGACAAAACCAAAGACATCACACACAGTATATATATGTTCTTCAATACGTCAGACAT
RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
    HUMAN TGFB1 NCBI (3780) TTAATTCCTTTTTTGGCTAGGGATGGTTTGATAAACCACAATTGGCTGATATTGAAAATGA
   RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
           Consensus (3783) T  AT             A            TA A      TT     ATA    A A
```

TGFB1 alignment

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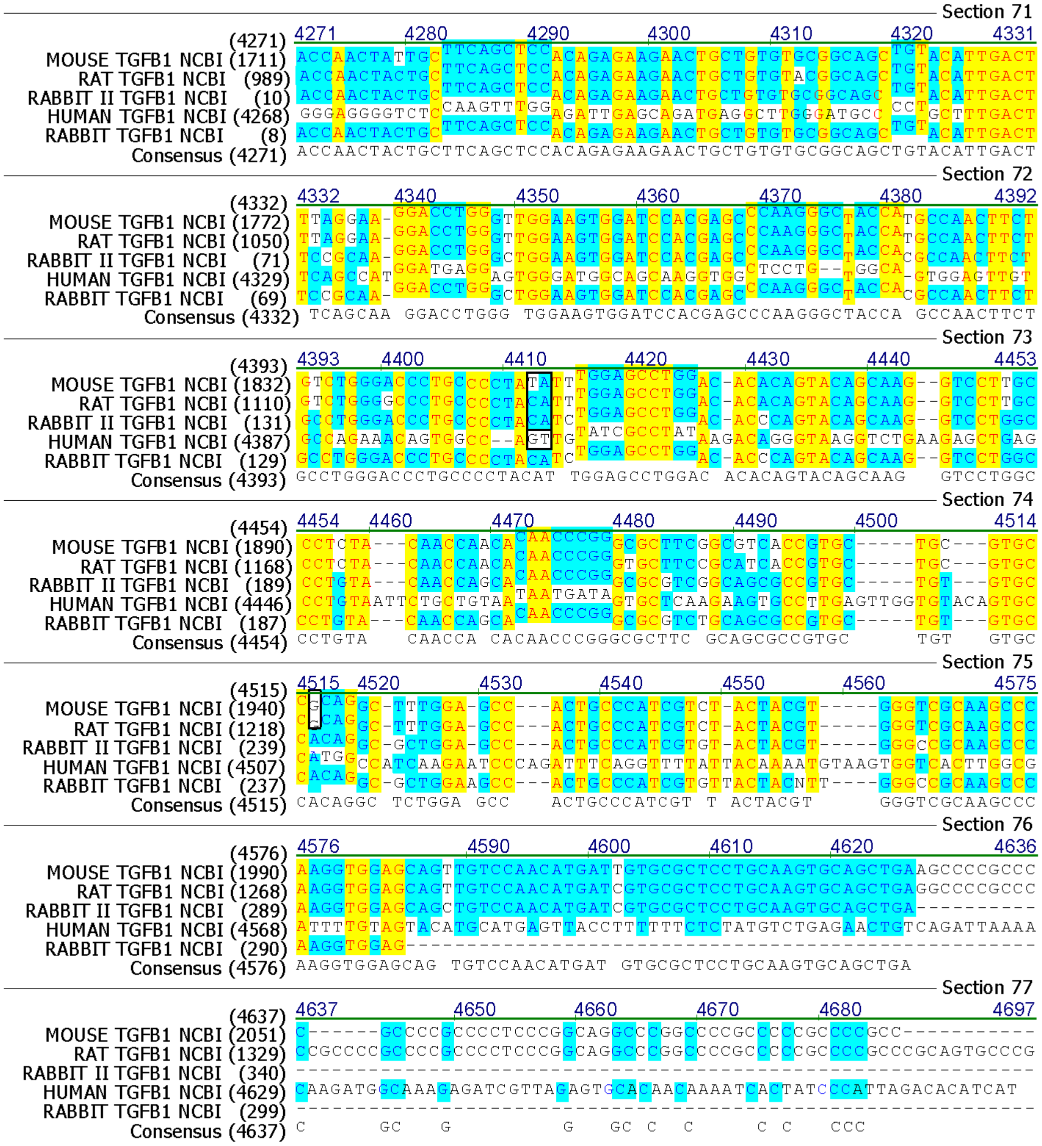
                                                                              Section 64
                         (3844) 3844  3850        3860       3870        3880       3890       3904
      MOUSE TGFB1 NCBI (1287) TCGGGAAGCAGTGCCCGAACCCCCATTGCTGTCCCGTGCAGAGCTGCGCTTGCAGAGATTA
        RAT TGFB1 NCBI  (565) TCGGGAAGCAGTGCCAGAACCCCCATTGCTGTCCCGTGCAGAGCTGCGCCTGCAGAGATTC
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (3841) AAGAAACTTAAAAGGTGGGATGGATCATGATTACTGTCGATAACTGCAGATAAATTTGATT
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (3844)   G  A   A      G              T C GT  A A CTGC   T  A     T
                                                                              Section 65
                         (3905) 3905 3910         3920       3930        3940       3950       3965
      MOUSE TGFB1 NCBI (1348) AAATCAAGTGTGGAGCAACATGTGGAACTCTACCAGAAATATAGCAACAATTCCTGGCGTT
        RAT TGFB1 NCBI  (626) AAGTCAACTGTGGAGCAACACGTAGAACTCTACCAGAAATATAGCAACAATTCCTGGCGTT
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (3902) AGAGTAATAATTTTGTCATTTAAAAACACAGTTGTTTATACTGCCCATCCTAGGATGCTCA
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (3905) A    AA   T   G  A       A           A   T  C A   T     GC
                                                                              Section 66
                         (3966) 3966              3980       3990        4000       4010       4026
      MOUSE TGFB1 NCBI (1409) ACCTTGGTAACCGGCTGCTGACCCCCACTGATACGCCTGAGTGGCTGTCTTTTGACGTCAC
        RAT TGFB1 NCBI  (687) ACCTTGGTAACCGGCTGCTGACCCCCACTGATACGCCTGAGTGGCTGTCTTTTGACGTCAC
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (3963) CCTTCCAAGATTCAACGTGGCTAAAACATCTTCTGGTAAATTGTGCGTCCATATTCATTTT
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (3966)  C T     A      G  G        T  T  G    A TG   GTC  T   C T
                                                                              Section 67
                         (4027) 4027              4040       4050        4060       4070       4087
      MOUSE TGFB1 NCBI (1470) TGGAGTTGTACGGCAGTGGCTGAACCAAGGAGACGGAATACAG---GGCTTTCGATTCAGC
        RAT TGFB1 NCBI  (748) TGGAGTTGTCCGGCAGTGGCTGAACCAAGGAGACGGAATACAG---GGCTTTCGCTTCAGT
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (4024) GTCAGTAGCCAGGAGAAATGGGGATGGGGGAAATACGACTTAGTGAGGCATAGACATCCCT
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (4027)    AGT G   GG        G A    GGA A    A   AG   GGC T     TC
                                                                              Section 68
                         (4088) 4088              4100       4110        4120       4130       4148
      MOUSE TGFB1 NCBI (1528) GCTCACTGCTCTTGTGACAGCAAAGATAACAAACTCCACGTGGAAATCAACGGGATCAGCC
        RAT TGFB1 NCBI  (806) GCTCACTGCTCTTGTGACAGCAAAGATAATGTACTCCACGTGGAAATCAATGGGATCAGTC
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (4085) GGTCCATCCTTTCTGTCTCCAGCTGTTTCTTGGAACCTGCTCTCCTGCTTGCTGGTCCCTG
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (4088) G TC  T CT T            G T        CC   T      C     G TC
                                                                              Section 69
                         (4149) 4149              4160       4170        4180       4190       4209
      MOUSE TGFB1 NCBI (1589) CCAAACGTCGGGGCGACCTGGGCACCATCCATGACATGAACCGGCCCTTCCTGCTCCTCAT
        RAT TGFB1 NCBI  (867) CCAAACGTCGAGGTGACCTGGGCACCATCCATGACATGAACCGACCCTTCCTGCTCCTCAT
  RABBIT II TGFB1 NCBI    (1) -------------------------------------------------------------
      HUMAN TGFB1 NCBI (4146) ACGCAGAGACCGTTGCCTCCCCCACAGCCGTTTGACTGAAGGCTGCTCTGGAGACCTAGAG
     RABBIT TGFB1 NCBI    (1) -------------------------------------------------------------
             Consensus (4149)  C  A      G  G C     CAC   C  T    TGAA     C  T   G  C   A
                                                                              Section 70
                         (4210) 4210        4220        4230       4240        4250       4260  4270
      MOUSE TGFB1 NCBI (1650) GGCCACCCCCCTGGAAAGGGCCCAGCACCTGCACAGCTCACGGCACCGGAGAGCCCTGGAT
        RAT TGFB1 NCBI  (928) GGCCACCCCCCTGGAAAGGGCTCAACACCTGCACAGCTCCAGGCACCGGAGAGCCCTGGAT
  RABBIT II TGFB1 NCBI    (1) ----------------------------------------------------GCCCTGGAC
      HUMAN TGFB1 NCBI (4207) TAAAACGGCTGATGGAAGTTGTGGGACCCACTTCCATTTCCTTCAGTCATTAGAGGTGGAA
     RABBIT TGFB1 NCBI    (1) ------------------------------------------------------CTTCTCC
             Consensus (4210)     AC  C    G AAG         CC    C   T     CA      AGCCCTGGA
```

TGFB1 alignment



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                                                                          Section 71
                           4271     4280        4290        4300        4310        4320   4331
                  (4271)
MOUSE TGFB1 NCBI  (1711) ACCAACTATTGCTTCAGCTCCACAGAGAAGAACTGCTGTGTGCGGCAGCTGTACATTGACT
RAT TGFB1 NCBI     (989) ACCAACTACTGCTTCAGCTCCACAGAGAAGAACTGCTGTGTACGGCAGCTGTACATTGACT
RABBIT II TGFB1 NCBI (10) ACCAACTACTGCTTCAGCTCCACAGAGAAGAACTGCTGTGTGCGGCAGCTGTACATTGACT
HUMAN TGFB1 NCBI  (4268) GGGAGGGGTCTCCAAGTTTGGAGATTGAGCAGATGAGGCTTGGGATGCCCCTGCTTTGACT
RABBIT TGFB1 NCBI    (8) ACCAACTACTGCTTCAGCTCCACAGAGAAGAACTGCTGTGTGCGGCAGCTGTACATTGACT
Consensus         (4271) ACCAACTACTGCTTCAGCTCCACAGAGAAGAACTGCTGTGTGCGGCAGCTGTACATTGACT

                                                                          Section 72
                           4332     4340        4350        4360        4370        4380   4392
                  (4332)
MOUSE TGFB1 NCBI   (1772) TTAGGAA-GGACCTGGGTTGGAAGTGGATCCACGAGCCCAAGGGCTACCATGCCAACTTCT
RAT TGFB1 NCBI    (1050) TTAGGAA-GGACCTGGGTTGGAAGTGGATCCACGAGCCCAAGGGCTACCATGCCAACTTCT
RABBIT II TGFB1 NCBI (71) TCCGCAA-GGACCTGGGCTGGAAGTGGATCCACGAGCCCAAGGGCTACCACGCCAACTTCT
HUMAN TGFB1 NCBI  (4329) TCAGCCATGGATGAGGAGTGGGATGGCAGCAAGGTGGCTCCTG--TGGCA-GTGGAGTTGT
RABBIT TGFB1 NCBI   (69) TCCGCAA-GGACCTGGGCTGGAAGTGGATCCACGAGCCCAAGGGCTACCACGCCAACTTCT
Consensus         (4332) TCAGCAA GGACCTGGG TGGAAGTGGATCCACGAGCCCAAGGGCTACCA GCCAACTTCT

                                                                          Section 73
                           4393    4400        4410        4420        4430        4440    4453
                  (4393)
MOUSE TGFB1 NCBI  (1832) GTCTGGGACCCTGCCCCTATATTTGGAGCCTGGAC-ACACAGTACAGCAAG--GTCCTTGC
RAT TGFB1 NCBI   (1110) GTCTGGGGCCCTGCCCCTACATTTGGAGCCTGGAC-ACACAGTACAGCAAG--GTCCTTGC
RABBIT II TGFB1 NCBI (131) GCCTGGGACCCTGCCCCTACATCTGGAGCCTGGAC-ACCCAGTACAGCAAG--GTCCTGGC
HUMAN TGFB1 NCBI (4387) GCCAGAAACAGTGGCC--AGTTGTATCGCCTATAAGACAGGGTAAGGTCTGAAGAGCTGAG
RABBIT TGFB1 NCBI (129) GCCTGGGACCCTGCCCCTACATCTGGAGCCTGGAC-ACCCAGTACAGCAAG--GTCCTGGC
Consensus        (4393) GCCTGGGACCCTGCCCCTACAT TGGAGCCTGGAC ACACAGTACAGCAAG  GTCCTGGC

                                                                          Section 74
                           4454  4460        4470        4480        4490        4500      4514
                  (4454)
MOUSE TGFB1 NCBI  (1890) CCTCTA---CAACCAACACAACCCGGGCGCTTCGGCGTCACCGTGC-----TGC---GTGC
RAT TGFB1 NCBI    (1168) CCTCTA---CAACCAACACAACCCGGGTGCTTCCGCATCACCGTGC-----TGC---GTGC
RABBIT II TGFB1 NCBI (189) CCTGTA---CAACCAGCACAACCCGGGCGCGTCGGCAGCGCCGTGC-----TGT---GTGC
HUMAN TGFB1 NCBI  (4446) CCTGTAATTCTGCTGTAATAATGATAGTGCTCAAGAAGTGCCTTGAGTTGGTGTACAGTGC
RABBIT TGFB1 NCBI  (187) CCTGTA---CAACCAGCACAACCCGGGCGCGTCTGCAGCGCCGTGC-----TGT---GTGC
Consensus         (4454) CCTGTA   CAACCA CACAACCCGGGCGCTTC GCAGCGCCGTGC     TGT   GTGC

                                                                          Section 75
                           4515  4520        4530        4540        4550        4560      4575
                  (4515)
MOUSE TGFB1 NCBI  (1940) CGCAGGC-TTTGGA-GCC---ACTGCCCATCGTCT-ACTACGT-----GGGTCGCAAGCCC
RAT TGFB1 NCBI    (1218) CGCAGGC-TTTGGA-GCC---ACTGCCCATCGTCT-ACTACGT-----GGGTCGCAAGCCC
RABBIT II TGFB1 NCBI (239) CACAGGC-GCTGGA-GCC---ACTGCCCATCGTGT-ACTACGT-----GGGCCGCAAGCCC
HUMAN TGFB1 NCBI  (4507) CATGGCCATCAAGAATCCCAGATTTCAGGTTTTATTACAAAATGTAAGTGGTCACTTGGCG
RABBIT TGFB1 NCBI  (237) CACAGGC-GCTGGAAGCC---ACTGCCCATCGTGTTACTACNTT----GGGCCGCAAGCCC
Consensus         (4515) CACAGGC TCTGGA GCC   ACTGCCCATCGT T ACTACGT     GGGTCGCAAGCCC

                                                                          Section 76
                           4576          4590        4600        4610        4620          4636
                  (4576)
MOUSE TGFB1 NCBI  (1990) AAGGTGGAGCAGTTGTCCAACATGATTGTGCGCTCCTGCAAGTGCAGCTGAAGCCCCGCCC
RAT TGFB1 NCBI    (1268) AAGGTGGAGCAGTTGTCCAACATGATCGTGCGCTCCTGCAAGTGCAGCTGAGGCCCCGCCC
RABBIT II TGFB1 NCBI (289) AAGGTGGAGCAGCTGTCCAACATGATCGTGCGCTCCTGCAAGTGCAGCTGA----------
HUMAN TGFB1 NCBI  (4568) ATTTTGTAGTACATGCATGAGTTACCTTTTTTCTCTATGTCTGAGAACTGTCAGATTAAAA
RABBIT TGFB1 NCBI  (290) AAGGTGGAG----------------------------------------------------
Consensus         (4576) AAGGTGGAGCAG TGTCCAACATGAT GTGCGCTCCTGCAAGTGCAGCTGA

                                                                          Section 77
                           4637          4650        4660        4670        4680          4697
                  (4637)
MOUSE TGFB1 NCBI  (2051) C------GCCCCGCCCCTCCCGGCAGGCCCGGCCCCGCCCCCGCCCGCC-----------
RAT TGFB1 NCBI    (1329) CCGCCCCGCCCCGCCCCTCCCGGCAGGCCCGGCCCCGCCCCCGCCCGCCCGCAGTGCCCG
RABBIT II TGFB1 NCBI (340) -------------------------------------------------------------
HUMAN TGFB1 NCBI  (4629) CAAGATGGCAAAGAGATCGTTAGAGTGCACAACAAAATCACTATCCCATTAGACACATCAT
RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
Consensus         (4637) C      GC   G         G   GC C  C     C C   CCC
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TGFB1 alignment

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                                                                               Section 78
                   (4698) 4698        4710      4720      4730      4740            4758
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1390) GGGCTGTATTTAAGGACACCTGCACCCCCCCCAAGCCCATCTGGGGGCCCATTAAAGGTGA
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4690) CAAAAGCTTATTTTTATTCTTGCACTGGAAGAATCGTAAGTCAACTGTTTCTTGACCATGG
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (4698)
                                                                               Section 79
                   (4759) 4759       4770      4780      4790      4800                4819
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1451) CAGAGGAAAAAAAAAAAAAAAAAAAAAAAAAA-----------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4751) CAGTGTTCTGGCTCCAAATGGTAGTGATTCCAAATAATGGTTCTGTTAACACTTTGGCAGA
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (4759)
                                                                               Section 80
                   (4820) 4820      4830      4840      4850      4860      4870      4880
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1483) -------------------------------------------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4812) AAATGCCAGCTCAGATATTTTGAGATACTAAGGATTATCTTTGGACATGTACTGCAGCTTC
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (4820)
                                                                               Section 81
                   (4881) 4881     4890      4900      4910      4920      4930      4941
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1483) -------------------------------------------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4873) TTGTCTCTGTTTTGGATTACTGGAATACCCATGGGCCCTCTCAAGAGTGCTGGACTTCTAG
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (4881)
                                                                               Section 82
                   (4942) 4942    4950      4960      4970      4980      4990       5002
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1483) -------------------------------------------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4934) GACATTAAGATGATTGTCAGTACATTAAACTTTTCAATCCCATTATGCAATCTTGTTTGTA
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (4942)
                                                                               Section 83
                   (5003) 5003   5010      5020      5030      5040      5050         5063
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1483) -------------------------------------------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (4995) AATGTAAACTTCTAAAAATATGGTTAATAACATTCAACCTGTTTATTACAACTTAAAAGGA
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (5003)
                                                                               Section 84
                   (5064) 5064  5070      5080      5090      5100      5110          5124
       MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
         RAT TGFB1 NCBI (1483) -------------------------------------------------------------
    RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
       HUMAN TGFB1 NCBI (5056) ACTTCAGTGAATTTGTTTTTATTTTTTAACAAGATTTGTGAACTGAATATCATGAACCATG
      RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
              Consensus (5064)
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TGFB1 alignment

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                                                                                     Section 85
                     (5125) 5125 5130      5140      5150      5160      5170          5185
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5117) TTTTGATACCCCTTTTTCACGTTGTGCCAACGGAATAGGGTGTTTGATATTTCTTCATATG
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5125)
                                                                                     Section 86
                     (5186) 5186          5200      5210      5220      5230          5246
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5178) TTAAGGAGATGCTTCAAAATGTCAATTGCTTTAAACTTAAATTACCTCTCAAGAGACCAAG
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5186)
                                                                                     Section 87
                     (5247) 5247         5260      5270      5280      5290           5307
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5239) GTACATTTACCTCATTGTGTATATAATGTTTAATATTTGTCAGAGCATTCTCCAGGTTTGC
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5247)
                                                                                     Section 88
                     (5308) 5308        5320      5330      5340      5350            5368
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5300) AGTTTTATTTCTATAAAGTATGGGTATTATGTTGCTCAGTTACTCAAATGGTACTGTATTG
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5308)
                                                                                     Section 89
                     (5369) 5369       5380      5390      5400      5410             5429
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5361) TTTATATTTGTACCCCAAATAACATCGTCTGTACTTTCTGTTTTCTGTATTGTATTTGTGC
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5369)
                                                                                     Section 90
                     (5430) 5430      5440      5450      5460      5470      5480    5490
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5422) AGGATTCTTTAGGCTTTATCAGTGTAATCTCTGCCTTTTAAGATATGTACAGAAAATGTCC
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5430)
                                                                                     Section 91
                     (5491) 5491     5500      5510      5520      5530      5540     5551
     MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
       RAT TGFB1 NCBI (1483) -------------------------------------------------------------
 RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
     HUMAN TGFB1 NCBI (5483) ATATAAATTTCCATTGAAGTCGAATGATACTGAGAAGCCTGTAAAGAGGAGAAAAAAACAT
    RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
            Consensus (5491)
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Section 92
                    (5552) 5552      5560      5570      5580      5590      5600      5612
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5544) AAGCTGTGTTTCCCCATAAGTTTTTTTAAATTGTATATTGTATTTGTAGTAATATTCCAAA
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5552)

Section 93
                    (5613) 5613      5620      5630      5640      5650      5660      5673
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5605) AGAATGTAAATAGGAAATAGAAGAGTGATGCTTATGTTAAGTCCTAACACTACAGTAGAAG
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5613)

Section 94
                    (5674) 5674      5680      5690      5700      5710      5720      5734
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5666) AATGGAAGCAGTGCAAATAAATTACATTTTTCCCAAGTGCCAGTGGCATATTTTAAAATAA
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5674)

Section 95
                    (5735) 5735      5740      5750      5760      5770      5780      5795
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5727) AGTGTATACGTTGGAATGAGTCATGCCATATGTAGTTGCTGTAGATGGCAACTAGAACCTT
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5735)

Section 96
                    (5796) 5796      5810      5820      5830      5840      5856
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5788) TGAGTTACAAGAGTCTTTAGAAGTTTTCTAACCCTGCCTAGTGCAAGTTACAATATTATAG
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5796)

Section 97
                    (5857) 5857      5870      5880      5890      5900      5917
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5849) CGTGTTCGGGGAGTGCCCTCCTGTCTGCAGGTGTGTCTCTGTGCCTGGGGGCTTTTCTCCA
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5857)

Section 98
                    (5918) 5918      5930      5940      5950      5960      5978
MOUSE TGFB1 NCBI (2095) ------------------------------------------------------------
RAT TGFB1 NCBI (1483) ------------------------------------------------------------
RABBIT II TGFB1 NCBI (340) ------------------------------------------------------------
HUMAN TGFB1 NCBI (5910) CATGCTTAGGGGTGTGGGTCTTCCATTGGGGCATGATGGACCTGTCTACAGGTGATCTCTG
RABBIT TGFB1 NCBI (299) ------------------------------------------------------------
Consensus (5918)
```

TGFB1 alignment

```
                                                                        Section 99
                          (5979) 5979      5990      6000      6010      6020            6039
          MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
            RAT TGFB1 NCBI (1483) -------------------------------------------------------------
      RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
          HUMAN TGFB1 NCBI (5971) TTGCCTTTGGGTCAGCACATTTGTTAGTCTCCTGGGGGTGAAAACTTGGCTTACAAGAGAA
         RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
                 Consensus (5979)
                                                                       Section 100
                          (6040) 6040      6050      6060      6070      6080      6090    6100
          MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
            RAT TGFB1 NCBI (1483) -------------------------------------------------------------
      RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
          HUMAN TGFB1 NCBI (6032) CTGGAAAAATGATGAGATGTGGTCCCCAAACCCTTGATTGACTCTGGGGAGGGGCTTTGTG
         RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
                 Consensus (6040)
                                                                       Section 101
                          (6101) 6101     6110      6120      6130      6140      6150     6161
          MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
            RAT TGFB1 NCBI (1483) -------------------------------------------------------------
      RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
          HUMAN TGFB1 NCBI (6093) AATAGGATTGCTCTCACATTAAAGATAGTTACTTCAATTTGAAGGCTGGATTTAGGGATTT
         RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
                 Consensus (6101)
                                                                       Section 102
                          (6162) 6162    6170      6180      6190      6200      6210      6222
          MOUSE TGFB1 NCBI (2095) -------------------------------------------------------------
            RAT TGFB1 NCBI (1483) -------------------------------------------------------------
      RABBIT II TGFB1 NCBI  (340) -------------------------------------------------------------
          HUMAN TGFB1 NCBI (6154) TTTTTTTTCCTTATAACAAAGACATCACCAGGATATGAAGCTTTTGTTGAAAGTTGGAAAA
         RABBIT TGFB1 NCBI  (299) -------------------------------------------------------------
                 Consensus (6162)
                                                                       Section 103
                          (6223) 6223  6230      6240     6252
          MOUSE TGFB1 NCBI (2095) ------------------------------
            RAT TGFB1 NCBI (1483) ------------------------------
      RABBIT II TGFB1 NCBI  (340) ------------------------------
          HUMAN TGFB1 NCBI (6215) AAAGTGAAATTAAAGACATTCCCAGACAAA
         RABBIT TGFB1 NCBI  (299) ------------------------------
                 Consensus (6223)
```

APPENDIX B
TGFBR2 ALIGNMENT SEQUENCES

```
                                   TGFBR2 alignment

--------------------------------------------------------------------------- Section 1
                            (1) 1        10        20        30        40             56
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI   (1) GAATTCGAGCTTGCATGCCTGCAGGTCGTTACATAACTTACGGTAAATGGCCCGCC
                   Consensus   (1)
--------------------------------------------------------------------------- Section 2
                           (57) 57           70        80        90        100       112
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI  (57) TGGCTGACCGCCCAACGACCCCCGCCCATTGACGTCAATAATGACGTATGTTCCCA
                   Consensus  (57)
--------------------------------------------------------------------------- Section 3
                          (113) 113    120       130       140       150             168
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI (113) TAGTAACGCCAATAGGGACTTTCCATTGACGTCAATGGGTGGAGTATTTACGGTAA
                   Consensus (113)
--------------------------------------------------------------------------- Section 4
                          (169) 169        180       190       200       210         224
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI (169) ACTGCCCACTTGGCAGTACATCAAGTGTATCATATGCCAAGTACGCCCCCTATTGA
                   Consensus (169)
--------------------------------------------------------------------------- Section 5
                          (225) 225  230       240       250       260       270     280
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI (225) CGTCAATGACGGTAAATGGCCCGCCTGGCATTATGCCCAGTACATGACCTTATGGG
                   Consensus (225)
--------------------------------------------------------------------------- Section 6
                          (281) 281      290       300       310       320           336
  MOUSE TYPEII TGFB1 NCBI B   (1) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A   (1) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-B   (1) --------------------------------------------------------
 HUMAN TYPEII TGFB1 NCBI-A   (1) --------------------------------------------------------
    RABBIT TYPEII TGFB1 NCBI (281) ACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATCGCTATTACCATGGTGATG
                   Consensus (281)

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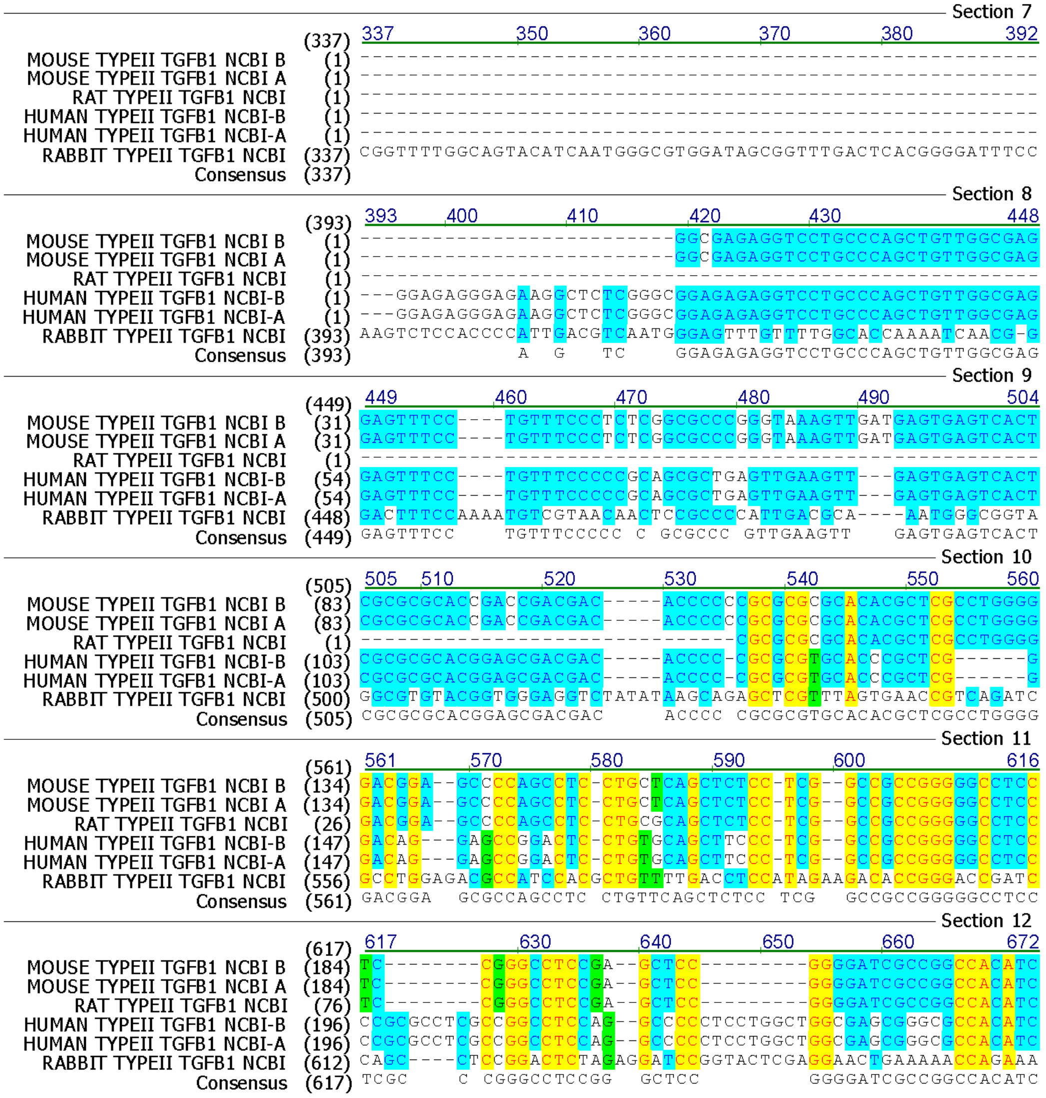
TGFBR2 alignment



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                                                                                     Section 7
                                   (337) 337         350       360       370       380          392
        MOUSE TYPEII TGFB1 NCBI B    (1) --------------------------------------------------------
        MOUSE TYPEII TGFB1 NCBI A    (1) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI    (1) --------------------------------------------------------
        HUMAN TYPEII TGFB1 NCBI-B    (1) --------------------------------------------------------
        HUMAN TYPEII TGFB1 NCBI-A    (1) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI  (337) CGGTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGACTCACGGGGATTTCC
                        Consensus  (337)
                                                                                     Section 8
                                   (393) 393    400       410       420       430             448
        MOUSE TYPEII TGFB1 NCBI B    (1) --------------------------GGCGAGAGGTCCTGCCCAGCTGTTGGCGAG
        MOUSE TYPEII TGFB1 NCBI A    (1) --------------------------GGCGAGAGGTCCTGCCCAGCTGTTGGCGAG
            RAT TYPEII TGFB1 NCBI    (1) --------------------------------------------------------
        HUMAN TYPEII TGFB1 NCBI-B    (1) ---GGAGAGGGAGAAGGCTCTCGGGCGGAGAGAGGTCCTGCCCAGCTGTTGGCGAG
        HUMAN TYPEII TGFB1 NCBI-A    (1) ---GGAGAGGGAGAAGGCTCTCGGGCGGAGAGAGGTCCTGCCCAGCTGTTGGCGAG
         RABBIT TYPEII TGFB1 NCBI  (393) AAGTCTCCACCCCATTGACGTCAATGGGAGTTTGTTTTGGCACCAAAATCAACG-G
                        Consensus  (393)              A  G   TC    GGAGAGAGGTCCTGCCCAGCTGTTGGCGAG
                                                                                     Section 9
                                   (449) 449        460       470       480       490         504
        MOUSE TYPEII TGFB1 NCBI B   (31) GAGTTTCC----TGTTTCCCTCTCGGCGCCCGGGTAAAGTTGATGAGTGAGTCACT
        MOUSE TYPEII TGFB1 NCBI A   (31) GAGTTTCC----TGTTTCCCTCTCGGCGCCCGGGTAAAGTTGATGAGTGAGTCACT
            RAT TYPEII TGFB1 NCBI    (1) --------------------------------------------------------
        HUMAN TYPEII TGFB1 NCBI-B   (54) GAGTTTCC----TGTTTCCCCCGCAGCGCTGAGTTGAAGTT---GAGTGAGTCACT
        HUMAN TYPEII TGFB1 NCBI-A   (54) GAGTTTCC----TGTTTCCCCCGCAGCGCTGAGTTGAAGTT---GAGTGAGTCACT
         RABBIT TYPEII TGFB1 NCBI  (448) GACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCA----AATGGGCGGTA
                        Consensus  (449) GAGTTTCC    TGTTTCCCCC C GCGCCC GTTGAAGTT   GAGTGAGTCACT
                                                                                    Section 10
                                   (505) 505 510       520       530       540       550       560
        MOUSE TYPEII TGFB1 NCBI B   (83) CGCGCGCACCGACCGACGAC-----ACCCCCCGCGCGCGCACACGCTCGCCTGGGG
        MOUSE TYPEII TGFB1 NCBI A   (83) CGCGCGCACCGACCGACGAC-----ACCCCCCGCGCGCGCACACGCTCGCCTGGGG
            RAT TYPEII TGFB1 NCBI    (1) -------------------------------CGCGCGCGCACACGCTCGCCTGGGG
        HUMAN TYPEII TGFB1 NCBI-B  (103) CGCGCGCACGGAGCGACGAC-----ACCCC-CGCGCGTGCACCCGCTCG------G
        HUMAN TYPEII TGFB1 NCBI-A  (103) CGCGCGCACGGAGCGACGAC-----ACCCC-CGCGCGTGCACCCGCTCG------G
         RABBIT TYPEII TGFB1 NCBI  (500) GGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCGTTTAGTGAACCGTCAGATC
                        Consensus  (505) CGCGCGCACGGAGCGACGAC     ACCCC CGCGCGTGCACACGCTCGCCTGGGG
                                                                                    Section 11
                                   (561) 561      570       580       590       600           616
        MOUSE TYPEII TGFB1 NCBI B  (134) GACGGA--GCCCCAGCCTC-CTGCTCAGCTCTCC-TCG--GCCGCCGGGGGCCTCC
        MOUSE TYPEII TGFB1 NCBI A  (134) GACGGA--GCCCCAGCCTC-CTGCTCAGCTCTCC-TCG--GCCGCCGGGGGCCTCC
            RAT TYPEII TGFB1 NCBI   (26) GACGGA--GCCCCAGCCTC-CTGCGCAGCTCTCC-TCG--GCCGCCGGGGGCCTCC
        HUMAN TYPEII TGFB1 NCBI-B  (147) GACAG---GAGCCGGACTC-CTGTGCAGCTTCCC-TCG--GCCGCCGGGGGCCTCC
        HUMAN TYPEII TGFB1 NCBI-A  (147) GACAG---GAGCCGGACTC-CTGTGCAGCTTCCC-TCG--GCCGCCGGGGGCCTCC
         RABBIT TYPEII TGFB1 NCBI  (556) GCCTGGAGACGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATC
                        Consensus  (561) GACGGA  GCGCCAGCCTC CTGTTCAGCTCTCC TCG  GCCGCCGGGGGCCTCC
                                                                                    Section 12
                                   (617) 617          630       640       650       660       672
        MOUSE TYPEII TGFB1 NCBI B  (184) TC--------CGGGCCTCCGA--GCTCC---------GGGGATCGCCGGCCACATC
        MOUSE TYPEII TGFB1 NCBI A  (184) TC--------CGGGCCTCCGA--GCTCC---------GGGGATCGCCGGCCACATC
            RAT TYPEII TGFB1 NCBI   (76) TC--------CGGGCCTCCGA--GCTCC---------GGGGATCGCCGGCCACATC
        HUMAN TYPEII TGFB1 NCBI-B  (196) CCGCGCCTCGCCGGCCTCCAG--GCCCCCTCCTGGCTGGCGAGCGGGCGCCACATC
        HUMAN TYPEII TGFB1 NCBI-A  (196) CCGCGCCTCGCCGGCCTCCAG--GCCCCCTCCTGGCTGGCGAGCGGGCGCCACATC
         RABBIT TYPEII TGFB1 NCBI  (612) CAGC----CTCCGGACTCTAGAGGATCCGGTACTCGAGGAACTGAAAAACCAGAAA
                        Consensus  (617) TCGC    C CGGGCCTCCGG  GCTCC         GGGGATCGCCGGCCACATC
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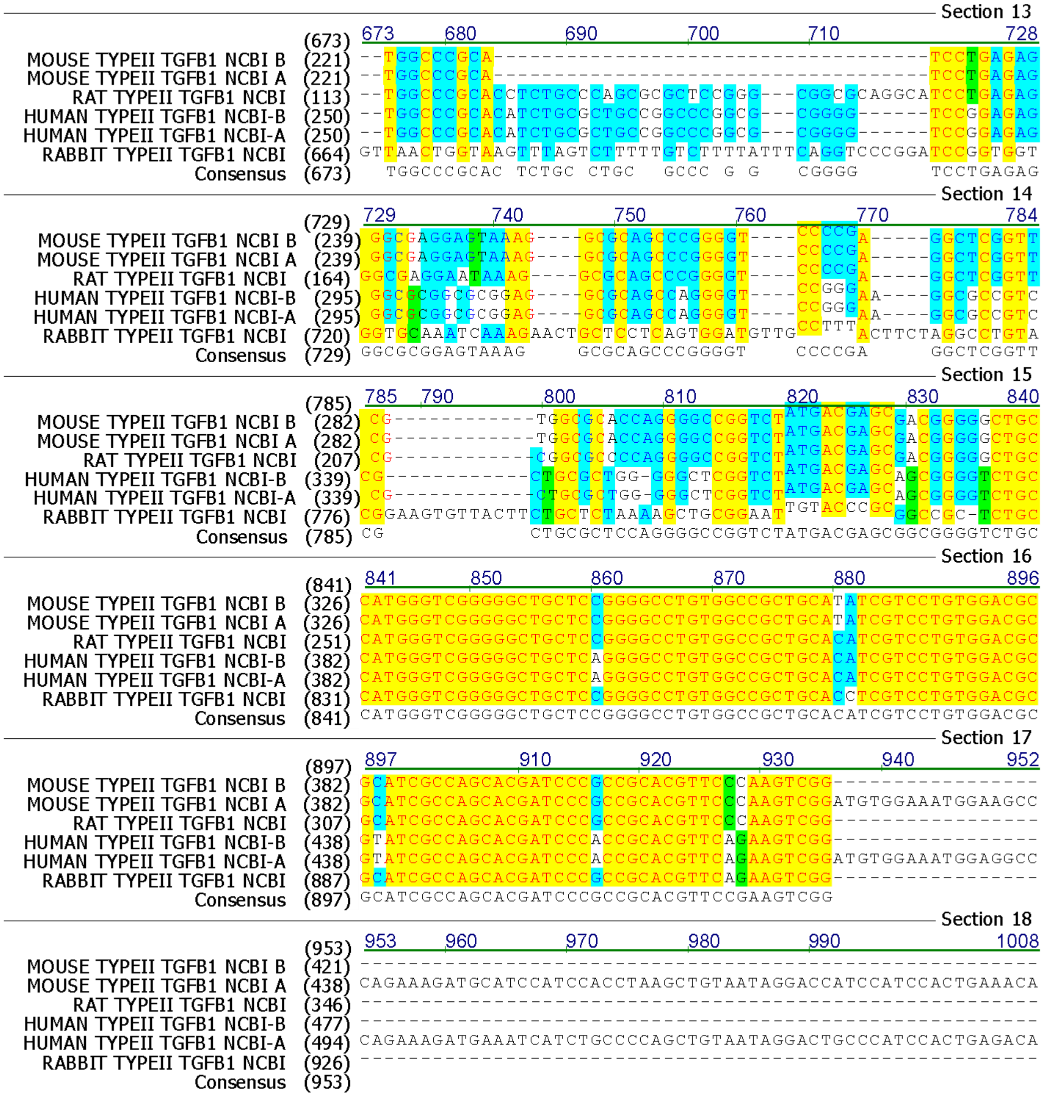
TGFBR2 alignment



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                                                                                Section 13
                          (673)  673    680        690       700       710            728
MOUSE TYPEII TGFB1 NCBI B (221)  --TGGCCCGCA------------------------------------TCCTGAGAG
MOUSE TYPEII TGFB1 NCBI A (221)  --TGGCCCGCA------------------------------------TCCTGAGAG
   RAT TYPEII TGFB1 NCBI  (113)  --TGGCCCGCACCTCTGCCCAGCGCGCTCCGGG---CGGCGCAGGCATCCTGAGAG
HUMAN TYPEII TGFB1 NCBI-B (250)  --TGGCCCGCACATCTGCGCTGCCGGCCCGGCG---CGGGG------TCCGGAGAG
HUMAN TYPEII TGFB1 NCBI-A (250)  --TGGCCCGCACATCTGCGCTGCCGGCCCGGCG---CGGGG------TCCGGAGAG
  RABBIT TYPEII TGFB1 NCBI (664)  GTTAACTGGTAAGTTTAGTCTTTTTGTCTTTTATTTCAGGTCCCGGATCCGGTGGT
                Consensus (673)    TGGCCCGCAC TCTGC CTGC  GCCC G G    CGGGG     TCCTGAGAG
                                                                                Section 14
                          (729)  729        740       750       760       770          784
MOUSE TYPEII TGFB1 NCBI B (239)  GGCGAGGAGTAAAG----GCGCAGCCCGGGGT----CCCCGA-----GGCTCGGTT
MOUSE TYPEII TGFB1 NCBI A (239)  GGCGAGGAGTAAAG----GCGCAGCCCGGGGT----CCCCGA-----GGCTCGGTT
   RAT TYPEII TGFB1 NCBI  (164)  GGCGAGGAATAAAG----GCGCAGCCCGGGGT----CCCCGA-----GGCTCGGTT
HUMAN TYPEII TGFB1 NCBI-B (295)  GGCGCGGCGCGGAG----GCGCAGCCAGGGGT----CCGGGAA----GGCGCCGTC
HUMAN TYPEII TGFB1 NCBI-A (295)  GGCGCGGCGCGGAG----GCGCAGCCAGGGGT----CCGGGAA----GGCGCCGTC
  RABBIT TYPEII TGFB1 NCBI (720)  GGTGCAAATCAAAGAACTGCTCCTCAGTGGATGTTGCCTTTACTTCTAGGCCTGTA
                Consensus (729)  GGCGCGGAGTAAAG    GCGCAGCCCGGGGT    CCCCGA     GGCTCGGTT
                                                                                Section 15
                          (785)  785  790         800       810       820       830     840
MOUSE TYPEII TGFB1 NCBI B (282)  CG------------TGGCGCACCAGGGGCCGGTCTATGACGAGCGACGGGGGCTGC
MOUSE TYPEII TGFB1 NCBI A (282)  CG------------TGGCGCACCAGGGGCCGGTCTATGACGAGCGACGGGGGCTGC
   RAT TYPEII TGFB1 NCBI  (207)  CG------------CGGCGCCCAGGGGCCGGTCTATGACGAGCGACGGGGGCTGC
HUMAN TYPEII TGFB1 NCBI-B (339)  CG------------CTGCGCTGG-GGGCTCGGTCTATGACGAGCAGCGGGGTCTGC
HUMAN TYPEII TGFB1 NCBI-A (339)  CG------------CTGCGCTGG-GGGCTCGGTCTATGACGAGCAGCGGGGTCTGC
  RABBIT TYPEII TGFB1 NCBI (776)  CGGAAGTGTTACTTCTGCTCTAAAAGCTGCGGAATTGTACCCGCGGCCGC-TCTGC
                Consensus (785)  CG            CTGCGCTCCAGGGGCCGGTCTATGACGAGCGGCGGGGTCTGC
                                                                                Section 16
                          (841)  841      850       860       870       880             896
MOUSE TYPEII TGFB1 NCBI B (326)  CATGGGTCGGGGGCTGCTCCGGGGCCTGTGGCCGCTGCATATCGTCCTGTGGACGC
MOUSE TYPEII TGFB1 NCBI A (326)  CATGGGTCGGGGGCTGCTCCGGGGCCTGTGGCCGCTGCATATCGTCCTGTGGACGC
   RAT TYPEII TGFB1 NCBI  (251)  CATGGGTCGGGGGCTGCTCCGGGGCCTGTGGCCGCTGCACATCGTCCTGTGGACGC
HUMAN TYPEII TGFB1 NCBI-B (382)  CATGGGTCGGGGGCTGCTCAGGGGCCTGTGGCCGCTGCACATCGTCCTGTGGACGC
HUMAN TYPEII TGFB1 NCBI-A (382)  CATGGGTCGGGGGCTGCTCAGGGGCCTGTGGCCGCTGCACATCGTCCTGTGGACGC
  RABBIT TYPEII TGFB1 NCBI (831)  CATGGGTCGGGGGCTGCTCCGGGGCCTGTGGCCGCTGCACCTCGTCCTGTGGACGC
                Consensus (841)  CATGGGTCGGGGGCTGCTCCGGGGCCTGTGGCCGCTGCACATCGTCCTGTGGACGC
                                                                                Section 17
                          (897)  897          910       920       930       940         952
MOUSE TYPEII TGFB1 NCBI B (382)  GCATCGCCAGCACGATCCCGCCGCACGTTCCCAAGTCGG-----------------
MOUSE TYPEII TGFB1 NCBI A (382)  GCATCGCCAGCACGATCCCGCCGCACGTTCCCAAGTCGGATGTGGAAATGGAAGCC
   RAT TYPEII TGFB1 NCBI  (307)  GCATCGCCAGCACGATCCCGCCGCACGTTCCCAAGTCGG-----------------
HUMAN TYPEII TGFB1 NCBI-B (438)  GTATCGCCAGCACGATCCCACCGCACGTTCAGAAGTCGG-----------------
HUMAN TYPEII TGFB1 NCBI-A (438)  GTATCGCCAGCACGATCCCACCGCACGTTCAGAAGTCGGATGTGGAAATGGAGGCC
  RABBIT TYPEII TGFB1 NCBI (887)  GCATCGCCAGCACGATCCCGCCGCACGTTCAGAAGTCGG-----------------
                Consensus (897)  GCATCGCCAGCACGATCCCGCCGCACGTTCCGAAGTCGG
                                                                                Section 18
                          (953)  953   960       970       980       990             1008
MOUSE TYPEII TGFB1 NCBI B (421)  --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (438)  CAGAAAGATGCATCCATCCACCTAAGCTGTAATAGGACCATCCATCCACTGAAACA
   RAT TYPEII TGFB1 NCBI  (346)  --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (477)  --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (494)  CAGAAAGATGAAATCATCTGCCCCAGCTGTAATAGGACTGCCCATCCACTGAGACA
  RABBIT TYPEII TGFB1 NCBI (926)  --------------------------------------------------------
                Consensus (953)
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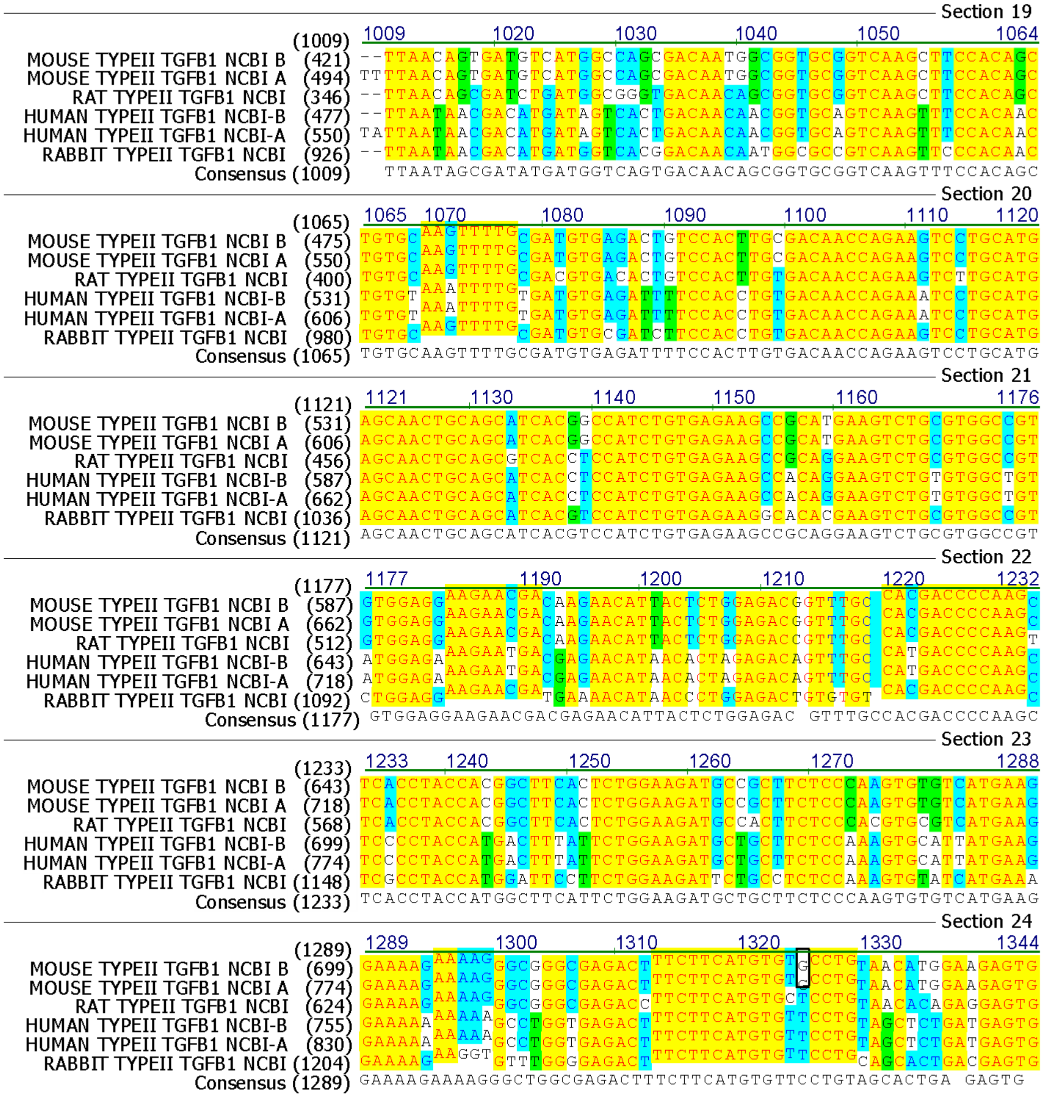
TGFBR2 alignment



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                                                                    Section 19
                         (1009) 1009       1020       1030       1040       1050       1064
MOUSE TYPEII TGFB1 NCBI B  (421) --TTAACAGTGATGTCATGGCCAGCGACAATGGCGGTGCGGTCAAGCTTCCACAGC
MOUSE TYPEII TGFB1 NCBI A  (494) TTTTAACAGTGATGTCATGGCCAGCGACAATGGCGGTGCGGTCAAGCTTCCACAGC
RAT TYPEII TGFB1 NCBI      (346) --TTAACAGCGATCTGATGGCGGGTGACAACAGCGGTGCGGTCAAGCTTCCACAGC
HUMAN TYPEII TGFB1 NCBI-B  (477) --TTAATAACGACATGATAGTCACTGACAACAACGGTGCAGTCAAGTTTCCACAAC
HUMAN TYPEII TGFB1 NCBI-A  (550) TATTAATAACGACATGATAGTCACTGACAACAACGGTGCAGTCAAGTTTCCACAAC
RABBIT TYPEII TGFB1 NCBI   (926) --TTAATAACGACATGATGGTCACGGACAACAATGGCGCCGTCAAGTTCCCACAAC
Consensus                 (1009)   TTAATAGCGATATGATGGTCAGTGACAACAGCGGTGCGGTCAAGTTTCCACAGC
                                                                    Section 20
                         (1065) 1065 1070      1080       1090       1100       1110     1120
MOUSE TYPEII TGFB1 NCBI B  (475) TGTGCAAGTTTTGCGATGTGAGACTGTCCACTTGCGACAACCAGAAGTCCTGCATG
MOUSE TYPEII TGFB1 NCBI A  (550) TGTGCAAGTTTTGCGATGTGAGACTGTCCACTTGCGACAACCAGAAGTCCTGCATG
RAT TYPEII TGFB1 NCBI      (400) TGTGCAAGTTTTGCGACGTGACACTGTCCACTTGTGACAACCAGAAGTCTTGCATG
HUMAN TYPEII TGFB1 NCBI-B  (531) TGTGTAAATTTTGTGATGTGAGATTTTCCACCTGTGACAACCAGAAATCCTGCATG
HUMAN TYPEII TGFB1 NCBI-A  (606) TGTGTAAATTTTGTGATGTGAGATTTTCCACCTGTGACAACCAGAAATCCTGCATG
RABBIT TYPEII TGFB1 NCBI   (980) TGTGCAAGTTTTGCGATGTGCGATCTTCCACCTGTGACAACCAGAAGTCCTGCATG
Consensus                 (1065) TGTGCAAGTTTTGCGATGTGAGATTTTCCACTTGTGACAACCAGAAGTCCTGCATG
                                                                    Section 21
                         (1121) 1121     1130       1140       1150       1160           1176
MOUSE TYPEII TGFB1 NCBI B  (531) AGCAACTGCAGCATCACGGCCATCTGTGAGAAGCCGCATGAAGTCTGCGTGGCCGT
MOUSE TYPEII TGFB1 NCBI A  (606) AGCAACTGCAGCATCACGGCCATCTGTGAGAAGCCGCATGAAGTCTGCGTGGCCGT
RAT TYPEII TGFB1 NCBI      (456) AGCAACTGCAGCGTCACCTCCATCTGTGAGAAGCCGCAGGAAGTCTGCGTGGCCGT
HUMAN TYPEII TGFB1 NCBI-B  (587) AGCAACTGCAGCATCACCTCCATCTGTGAGAAGCCACAGGAAGTCTGTGTGGCTGT
HUMAN TYPEII TGFB1 NCBI-A  (662) AGCAACTGCAGCATCACCTCCATCTGTGAGAAGCCACAGGAAGTCTGTGTGGCTGT
RABBIT TYPEII TGFB1 NCBI  (1036) AGCAACTGCAGCATCACGTCCATCTGTGAGAAGGCACACGAAGTCTGCGTGGCCGT
Consensus                 (1121) AGCAACTGCAGCATCACGTCCATCTGTGAGAAGCCGCAGGAAGTCTGCGTGGCCGT
                                                                    Section 22
                         (1177) 1177         1190       1200       1210       1220     1232
MOUSE TYPEII TGFB1 NCBI B  (587) GTGGAGGAAGAACGACAAGAACATTACTCTGGAGACGGTTTGCCACGACCCCAAGC
MOUSE TYPEII TGFB1 NCBI A  (662) GTGGAGGAAGAACGACAAGAACATTACTCTGGAGACGGTTTGCCACGACCCCAAGC
RAT TYPEII TGFB1 NCBI      (512) GTGGAGGAAGAACGACAAGAACATTACTCTGGAGACCGTTTGCCACGACCCCAAGT
HUMAN TYPEII TGFB1 NCBI-B  (643) ATGGAGAAAGAATGACGAGAACATAACACTAGAGACAGTTTGCCATGACCCCAAGC
HUMAN TYPEII TGFB1 NCBI-A  (718) ATGGAGAAAGAATGACGAGAACATAACACTAGAGACAGTTTGCCATGACCCCAAGC
RABBIT TYPEII TGFB1 NCBI  (1092) CTGGAGGAAGAACGATGAAAACATAACCCTGGAGACTGTGTGTCACGACCCCAAGC
Consensus                 (1177) GTGGAGGAAGAACGACGAGAACATTACTCTGGAGAC GTTTGCCACGACCCCAAGC
                                                                    Section 23
                         (1233) 1233   1240       1250       1260       1270           1288
MOUSE TYPEII TGFB1 NCBI B  (643) TCACCTACCACGGCTTCACTCTGGAAGATGCCGCTTCTCCCAAGTGTGTCATGAAG
MOUSE TYPEII TGFB1 NCBI A  (718) TCACCTACCACGGCTTCACTCTGGAAGATGCCGCTTCTCCCAAGTGTGTCATGAAG
RAT TYPEII TGFB1 NCBI      (568) TCACCTACCACGGCTTCACTCTGGAAGATGCCACTTCTCCCACGTGCGTCATGAAG
HUMAN TYPEII TGFB1 NCBI-B  (699) TCCCCTACCATGACTTTATTCTGGAAGATGCTGCTTCTCCAAAGTGCATTATGAAG
HUMAN TYPEII TGFB1 NCBI-A  (774) TCCCCTACCATGACTTTATTCTGGAAGATGCTGCTTCTCCAAAGTGCATTATGAAG
RABBIT TYPEII TGFB1 NCBI  (1148) TCGCCTACCATGGATTCCTTCTGGAAGATTCTGCCTCTCCAAAGTGTATCATGAAA
Consensus                 (1233) TCACCTACCATGGCTTCATTCTGGAAGATGCTGCTTCTCCCAAGTGTGTCATGAAG
                                                                    Section 24
                         (1289) 1289       1300       1310       1320       1330       1344
MOUSE TYPEII TGFB1 NCBI B  (699) GAAAAGAAAAGGGCGGGCGAGACTTTCTTCATGTGTGCCTGTAACATGGAAGAGTG
MOUSE TYPEII TGFB1 NCBI A  (774) GAAAAGAAAAGGGCGGGCGAGACTTTCTTCATGTGTCCCTGTAACATGGAAGAGTG
RAT TYPEII TGFB1 NCBI      (624) GAAAAGAAAAGGGCGGGCGAGACCTTCTTCATGTGCTCCTGTAACACAGAGGAGTG
HUMAN TYPEII TGFB1 NCBI-B  (755) GAAAAAAAAAAGCCTGGTGAGACTTTCTTCATGTGTTCCTGTAGCTCTGATGAGTG
HUMAN TYPEII TGFB1 NCBI-A  (830) GAAAAAAAAAAGCCTGGTGAGACTTTCTTCATGTGTTCCTGTAGCTCTGATGAGTG
RABBIT TYPEII TGFB1 NCBI  (1204) GAAAAGAAGGTGTTTGGGGAGACTTTCTTCATGTGTTCCTGCAGCACTGACGAGTG
Consensus                 (1289) GAAAAGAAAAGGGCTGGCGAGACTTTCTTCATGTGTTCCTGTAGCACTGA GAGTG
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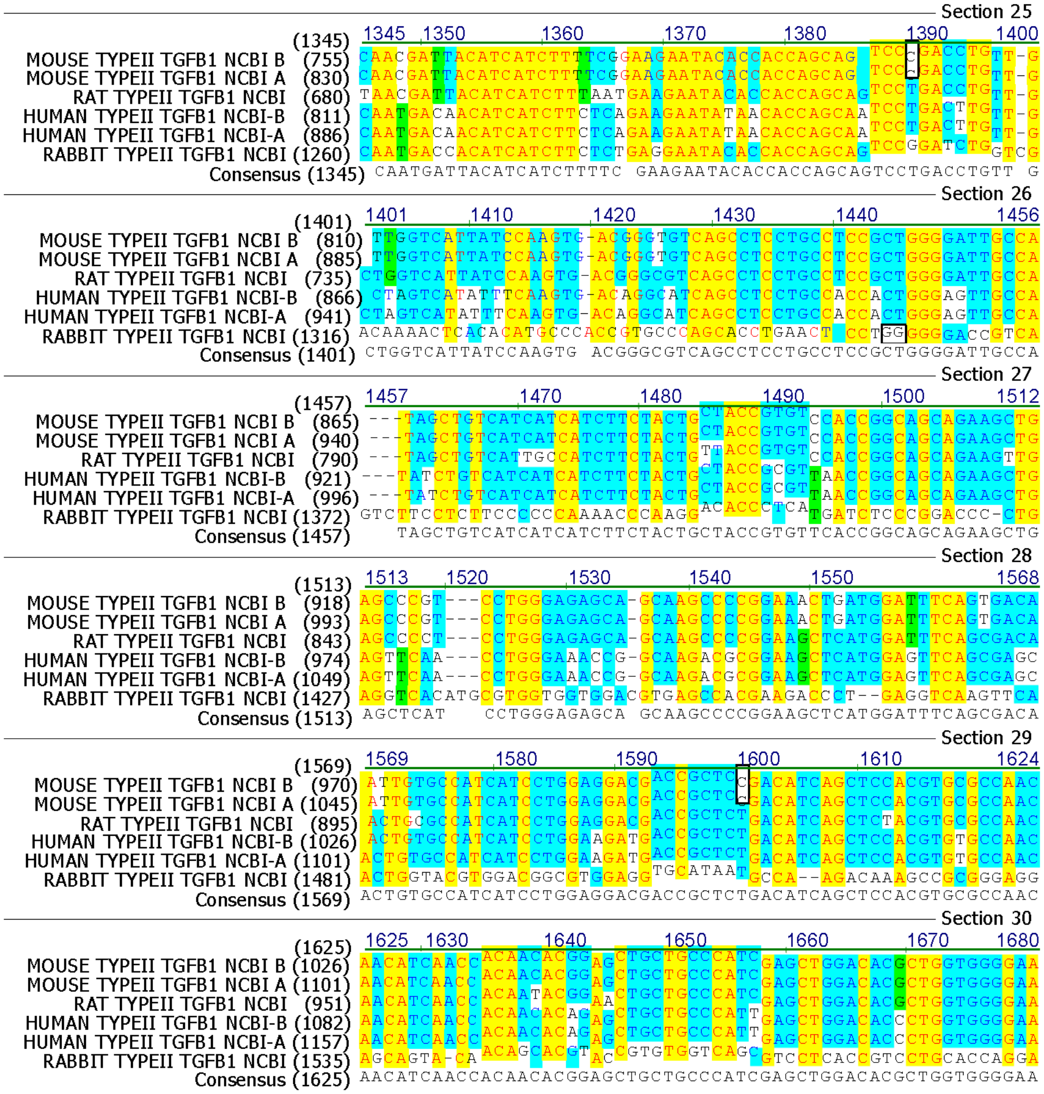
TGFBR2 alignment



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                                                          Section 25
                           (1345) 1345 1350      1360      1370      1380      1390     1400
     MOUSE TYPEII TGFB1 NCBI B  (755) CAACGATTACATCATCTTTTCGGAAGAATACACCACCAGCAGTCCCGACCTGTT-G
     MOUSE TYPEII TGFB1 NCBI A  (830) CAACGATTACATCATCTTTTCGGAAGAATACACCACCAGCAGTCCCGACCTGTT-G
       RAT TYPEII TGFB1 NCBI  (680) TAACGATTACATCATCTTTAATGAAGAATACACCACCAGCAGTCCTGACCTGTT-G
    HUMAN TYPEII TGFB1 NCBI-B  (811) CAATGACAACATCATCTTCTCAGAAGAATATAACACCAGCAATCCTGACTTGTT-G
    HUMAN TYPEII TGFB1 NCBI-A  (886) CAATGACAACATCATCTTCTCAGAAGAATATAACACCAGCAATCCTGACTTGTT-G
     RABBIT TYPEII TGFB1 NCBI (1260) CAATGACCACATCATCTTCTCTGAGGAATACACCACCAGCAGTCCGGATCTGGTCG
                  Consensus (1345) CAATGATTACATCATCTTTTC GAAGAATACACCACCAGCAGTCCTGACCTGTT G
                                                          Section 26
                           (1401) 1401      1410      1420      1430      1440          1456
     MOUSE TYPEII TGFB1 NCBI B  (810) TTGGTCATTATCCAAGTG-ACGGGTGTCAGCCTCCTGCCTCCGCTGGGGATTGCCA
     MOUSE TYPEII TGFB1 NCBI A  (885) TTGGTCATTATCCAAGTG-ACGGGTGTCAGCCTCCTGCCTCCGCTGGGGATTGCCA
       RAT TYPEII TGFB1 NCBI  (735) CTGGTCATTATCCAAGTG-ACGGGCGTCAGCCTCCTGCCTCCGCTGGGGATTGCCA
    HUMAN TYPEII TGFB1 NCBI-B  (866) CTAGTCATATTTCAAGTG-ACAGGCATCAGCCTCCTGCCACCACTGGGAGTTGCCA
    HUMAN TYPEII TGFB1 NCBI-A  (941) CTAGTCATATTTCAAGTG-ACAGGCATCAGCCTCCTGCCACCACTGGGAGTTGCCA
     RABBIT TYPEII TGFB1 NCBI (1316) ACAAAACTCACACATGCCCACCGTGCCCAGCACCTGAACTCCTGGGGGGACCGTCA
                  Consensus (1401) CTGGTCATTATCCAAGTG ACGGGCGTCAGCCTCCTGCCTCCGCTGGGGATTGCCA
                                                          Section 27
                           (1457) 1457           1470      1480      1490      1500       1512
     MOUSE TYPEII TGFB1 NCBI B  (865) ---TAGCTGTCATCATCATCTTCTACTGCTACCGTGTCCACCGGCAGCAGAAGCTG
     MOUSE TYPEII TGFB1 NCBI A  (940) ---TAGCTGTCATCATCATCTTCTACTGCTACCGTGTCCACCGGCAGCAGAAGCTG
       RAT TYPEII TGFB1 NCBI  (790) ---TAGCTGTCATTGCCATCTTCTACTGTTACCGTGTCCACCGGCAGCAGAAGTTG
    HUMAN TYPEII TGFB1 NCBI-B  (921) ---TATCTGTCATCATCATCTTCTACTGCTACCGCGTTAACCGGCAGCAGAAGCTG
    HUMAN TYPEII TGFB1 NCBI-A  (996) ---TATCTGTCATCATCATCTTCTACTGCTACCGCGTTAACCGGCAGCAGAAGCTG
     RABBIT TYPEII TGFB1 NCBI (1372) GTCTTCCTCTTCCCCCCAAAACCCAAGGACACCCTCATGATCTCCCGGACCC-CTG
                  Consensus (1457)    TAGCTGTCATCATCATCTTCTACTGCTACCGTGTTCACCGGCAGCAGAAGCTG
                                                          Section 28
                           (1513) 1513  1520      1530      1540      1550           1568
     MOUSE TYPEII TGFB1 NCBI B  (918) AGCCCGT---CCTGGGAGAGCA-GCAAGCCCCGGAAACTGATGGATTTCAGTGACA
     MOUSE TYPEII TGFB1 NCBI A  (993) AGCCCGT---CCTGGGAGAGCA-GCAAGCCCCGGAAACTGATGGATTTCAGTGACA
       RAT TYPEII TGFB1 NCBI  (843) AGCCCCT---CCTGGGAGAGCA-GCAAGCCCCGGAAGCTCATGGATTTCAGCGACA
    HUMAN TYPEII TGFB1 NCBI-B  (974) AGTTCAA---CCTGGGAAACCG-GCAAGACGCGGAAGCTCATGGAGTTCAGCGAGC
    HUMAN TYPEII TGFB1 NCBI-A (1049) AGTTCAA---CCTGGGAAACCG-GCAAGACGCGGAAGCTCATGGAGTTCAGCGAGC
     RABBIT TYPEII TGFB1 NCBI (1427) AGGTCACATGCGTGGTGGTGGACGTGAGCCACGAAGACCCT--GAGGTCAAGTTCA
                  Consensus (1513) AGCTCAT   CCTGGGAGAGCA GCAAGCCCCGGAAGCTCATGGATTTCAGCGACA
                                                          Section 29
                           (1569) 1569       1580      1590      1600      1610          1624
     MOUSE TYPEII TGFB1 NCBI B  (970) ATTGTGCCATCATCCTGGAGGACGACCGCTCCGACATCAGCTCCACGTGCGCCAAC
     MOUSE TYPEII TGFB1 NCBI A (1045) ATTGTGCCATCATCCTGGAGGACGACCGCTCCGACATCAGCTCCACGTGCGCCAAC
       RAT TYPEII TGFB1 NCBI  (895) ACTGCGCCATCATCCTGGAGGACGACCGCTCTGACATCAGCTCTACGTGCGCCAAC
    HUMAN TYPEII TGFB1 NCBI-B (1026) ACTGTGCCATCATCCTGGAAGATGACCGCTCTGACATCAGCTCCACGTGTGCCAAC
    HUMAN TYPEII TGFB1 NCBI-A (1101) ACTGTGCCATCATCCTGGAAGATGACCGCTCTGACATCAGCTCCACGTGTGCCAAC
     RABBIT TYPEII TGFB1 NCBI (1481) ACTGGTACGTGGACGGCGTGGAGGTGCATAATGCCA--AGACAAAGCCGCGGGAGG
                  Consensus (1569) ACTGTGCCATCATCCTGGAGGACGACCGCTCTGACATCAGCTCCACGTGCGCCAAC
                                                          Section 30
                           (1625) 1625 1630       1640      1650      1660      1670     1680
     MOUSE TYPEII TGFB1 NCBI B (1026) AACATCAACCACAACACGGAGCTGCTGCCCATCGAGCTGGACACGCTGGTGGGGAA
     MOUSE TYPEII TGFB1 NCBI A (1101) AACATCAACCACAACACGGAGCTGCTGCCCATCGAGCTGGACACGCTGGTGGGGAA
       RAT TYPEII TGFB1 NCBI  (951) AACATCAACCACAATACGGAACTGCTGCCCATCGAGCTGGACACGCTGGTGGGGAA
    HUMAN TYPEII TGFB1 NCBI-B (1082) AACATCAACCACAACACAGAGCTGCTGCCCATTGAGCTGGACACCCTGGTGGGGAA
    HUMAN TYPEII TGFB1 NCBI-A (1157) AACATCAACCACAACACAGAGCTGCTGCCCATTGAGCTGGACACCCTGGTGGGGAA
     RABBIT TYPEII TGFB1 NCBI (1535) AGCAGTA-CAACAGCACGTACCGTGTGGTCAGCGTCCTCACCGTCCTGCACCAGGA
                  Consensus (1625) AACATCAACCACAACACGGAGCTGCTGCCCATCGAGCTGGACACGCTGGTGGGGAA
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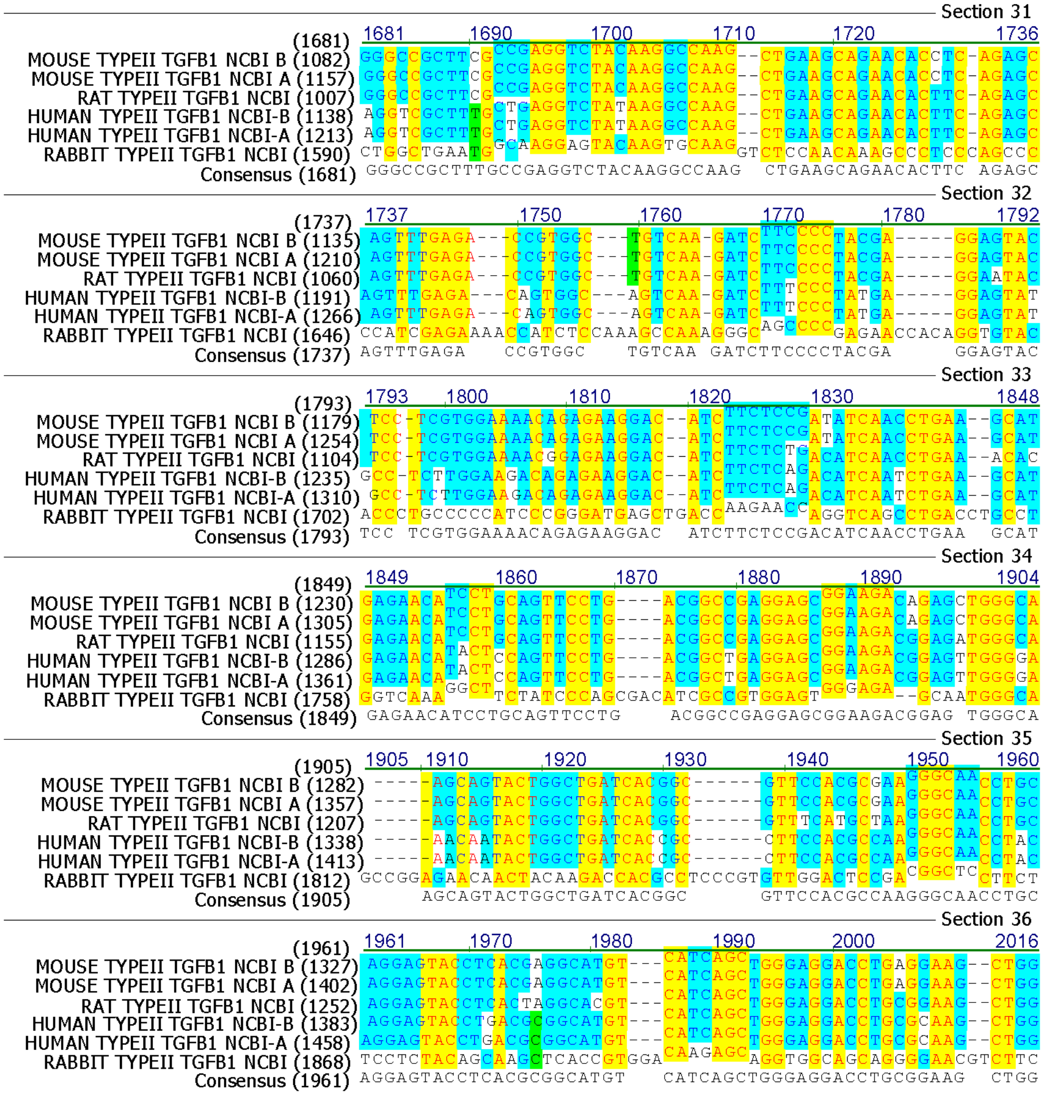
TGFBR2 alignment



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                                                                       Section 31
                            (1681) 1681     1690        1700        1710        1720            1736
  MOUSE TYPEII TGFB1 NCBI B (1082) GGGCCGCTTCGCCGAGGTCTACAAGGCCAAG--CTGAAGCAGAACACCTC-AGAGC
  MOUSE TYPEII TGFB1 NCBI A (1157) GGGCCGCTTCGCCGAGGTCTACAAGGCCAAG--CTGAAGCAGAACACCTC-AGAGC
     RAT TYPEII TGFB1 NCBI (1007) GGGCCGCTTCGCCGAGGTCTACAAGGCCAAG--CTGAAGCAGAACACTTC-AGAGC
 HUMAN TYPEII TGFB1 NCBI-B (1138) AGGTCGCTTTGCTGAGGTCTATAAGGCCAAG--CTGAAGCAGAACACTTC-AGAGC
 HUMAN TYPEII TGFB1 NCBI-A (1213) AGGTCGCTTTGCTGAGGTCTATAAGGCCAAG--CTGAAGCAGAACACTTC-AGAGC
  RABBIT TYPEII TGFB1 NCBI (1590) CTGGCTGAATGGCAAGGAGTACAAGTGCAAGGTCTCCAACAAAGCCCTCCCAGCCC
                Consensus (1681) GGGCCGCTTTGCCGAGGTCTACAAGGCCAAG  CTGAAGCAGAACACTTC AGAGC
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                                                                       Section 32
                            (1737) 1737        1750        1760        1770        1780         1792
  MOUSE TYPEII TGFB1 NCBI B (1135) AGTTTGAGA---CCGTGGC---TGTCAA-GATCTTCCCCTACGA-----GGAGTAC
  MOUSE TYPEII TGFB1 NCBI A (1210) AGTTTGAGA---CCGTGGC---TGTCAA-GATCTTCCCCTACGA-----GGAGTAC
     RAT TYPEII TGFB1 NCBI (1060) AGTTTGAGA---CCGTGGC---TGTCAA-GATCTTCCCCTACGA-----GGAATAC
 HUMAN TYPEII TGFB1 NCBI-B (1191) AGTTTGAGA---CAGTGGC---AGTCAA-GATCTTTCCCTATGA-----GGAGTAT
 HUMAN TYPEII TGFB1 NCBI-A (1266) AGTTTGAGA---CAGTGGC---AGTCAA-GATCTTTCCCTATGA-----GGAGTAT
  RABBIT TYPEII TGFB1 NCBI (1646) CCATCGAGAAAACCATCTCCAAAGCCAAAGGGCAGCCCCGAGAACCACAGGTGTAC
                Consensus (1737) AGTTTGAGA   CCGTGGC   TGTCAA GATCTTCCCCTACGA     GGAGTAC
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                                                                       Section 33
                            (1793) 1793  1800        1810        1820        1830            1848
  MOUSE TYPEII TGFB1 NCBI B (1179) TCC-TCGTGGAAAACAGAGAAGGAC--ATCTTCTCCGATATCAACCTGAA--GCAT
  MOUSE TYPEII TGFB1 NCBI A (1254) TCC-TCGTGGAAAACAGAGAAGGAC--ATCTTCTCCGATATCAACCTGAA--GCAT
     RAT TYPEII TGFB1 NCBI (1104) TCC-TCGTGGAAAACGGAGAAGGAC--ATCTTCTCTGACATCAACCTGAA--ACAC
 HUMAN TYPEII TGFB1 NCBI-B (1235) GCC-TCTTGGAAGACAGAGAAGGAC--ATCTTCTCAGACATCAATCTGAA--GCAT
 HUMAN TYPEII TGFB1 NCBI-A (1310) GCC-TCTTGGAAGACAGAGAAGGAC--ATCTTCTCAGACATCAATCTGAA--GCAT
  RABBIT TYPEII TGFB1 NCBI (1702) ACCCTGCCCCCATCCCGGGATGAGCTGACCAAGAACCAGGTCAGCCTGACCTGCCT
                Consensus (1793) TCC TCGTGGAAAACAGAGAAGGAC  ATCTTCTCCGACATCAACCTGAA  GCAT
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                                                                       Section 34
                            (1849) 1849      1860        1870        1880        1890         1904
  MOUSE TYPEII TGFB1 NCBI B (1230) GAGAACATCCTGCAGTTCCTG----ACGGCCGAGGAGCGGAAGACAGAGCTGGGCA
  MOUSE TYPEII TGFB1 NCBI A (1305) GAGAACATCCTGCAGTTCCTG----ACGGCCGAGGAGCGGAAGACAGAGCTGGGCA
     RAT TYPEII TGFB1 NCBI (1155) GAGAACATCCTGCAGTTCCTG----ACGGCCGAGGAGCGGAAGACGGAGATGGGCA
 HUMAN TYPEII TGFB1 NCBI-B (1286) GAGAACATACTCCAGTTCCTG----ACGGCTGAGGAGCGGAAGACGGAGTTGGGGA
 HUMAN TYPEII TGFB1 NCBI-A (1361) GAGAACATACTCCAGTTCCTG----ACGGCTGAGGAGCGGAAGACGGAGTTGGGGA
  RABBIT TYPEII TGFB1 NCBI (1758) GGTCAAAGGCTTCTATCCCAGCGACATCGCCGTGGAGTGGGAGA--GCAATGGGCA
                Consensus (1849) GAGAACATCCTGCAGTTCCTG    ACGGCCGAGGAGCGGAAGACGGAG TGGGCA
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                                                                       Section 35
                            (1905) 1905 1910       1920        1930        1940        1950  1960
  MOUSE TYPEII TGFB1 NCBI B (1282) -----AGCAGTACTGGCTGATCACGGC------GTTCCACGCGAAGGGCAACCTGC
  MOUSE TYPEII TGFB1 NCBI A (1357) -----AGCAGTACTGGCTGATCACGGC------GTTCCACGCGAAGGGCAACCTGC
     RAT TYPEII TGFB1 NCBI (1207) -----AGCAGTACTGGCTGATCACGGC------GTTTCATGCTAAGGGCAACCTGC
 HUMAN TYPEII TGFB1 NCBI-B (1338) -----AACAATACTGGCTGATCACCGC------CTTCCACGCCAAGGGCAACCTAC
 HUMAN TYPEII TGFB1 NCBI-A (1413) -----AACAATACTGGCTGATCACCGC------CTTCCACGCCAAGGGCAACCTAC
  RABBIT TYPEII TGFB1 NCBI (1812) GCCGGAGAACAACTACAAGACCACGCCTCCCGTGTTGGACTCCGACGGCTCCTTCT
                Consensus (1905)      AGCAGTACTGGCTGATCACGGC      GTTCCACGCCAAGGGCAACCTGC
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                                                                       Section 36
                            (1961) 1961    1970        1980        1990        2000            2016
  MOUSE TYPEII TGFB1 NCBI B (1327) AGGAGTACCTCACGAGGCATGT---CATCAGCTGGGAGGACCTGAGGAAG--CTGG
  MOUSE TYPEII TGFB1 NCBI A (1402) AGGAGTACCTCACGAGGCATGT---CATCAGCTGGGAGGACCTGAGGAAG--CTGG
     RAT TYPEII TGFB1 NCBI (1252) AGGAGTACCTCACTAGGCACGT---CATCAGCTGGGAGGACCTGCGGAAG--CTGG
 HUMAN TYPEII TGFB1 NCBI-B (1383) AGGAGTACCTGACGCGGCATGT---CATCAGCTGGGAGGACCTGCGCAAG--CTGG
 HUMAN TYPEII TGFB1 NCBI-A (1458) AGGAGTACCTGACGCGGCATGT---CATCAGCTGGGAGGACCTGCGCAAG--CTGG
  RABBIT TYPEII TGFB1 NCBI (1868) TCCTCTACAGCAAGCTCACCGTGGACAAGAGCAGGTGGCAGCAGGGGAACGTCTTC
                Consensus (1961) AGGAGTACCTCACGCGGCATGT   CATCAGCTGGGAGGACCTGCGGAAG  CTGG
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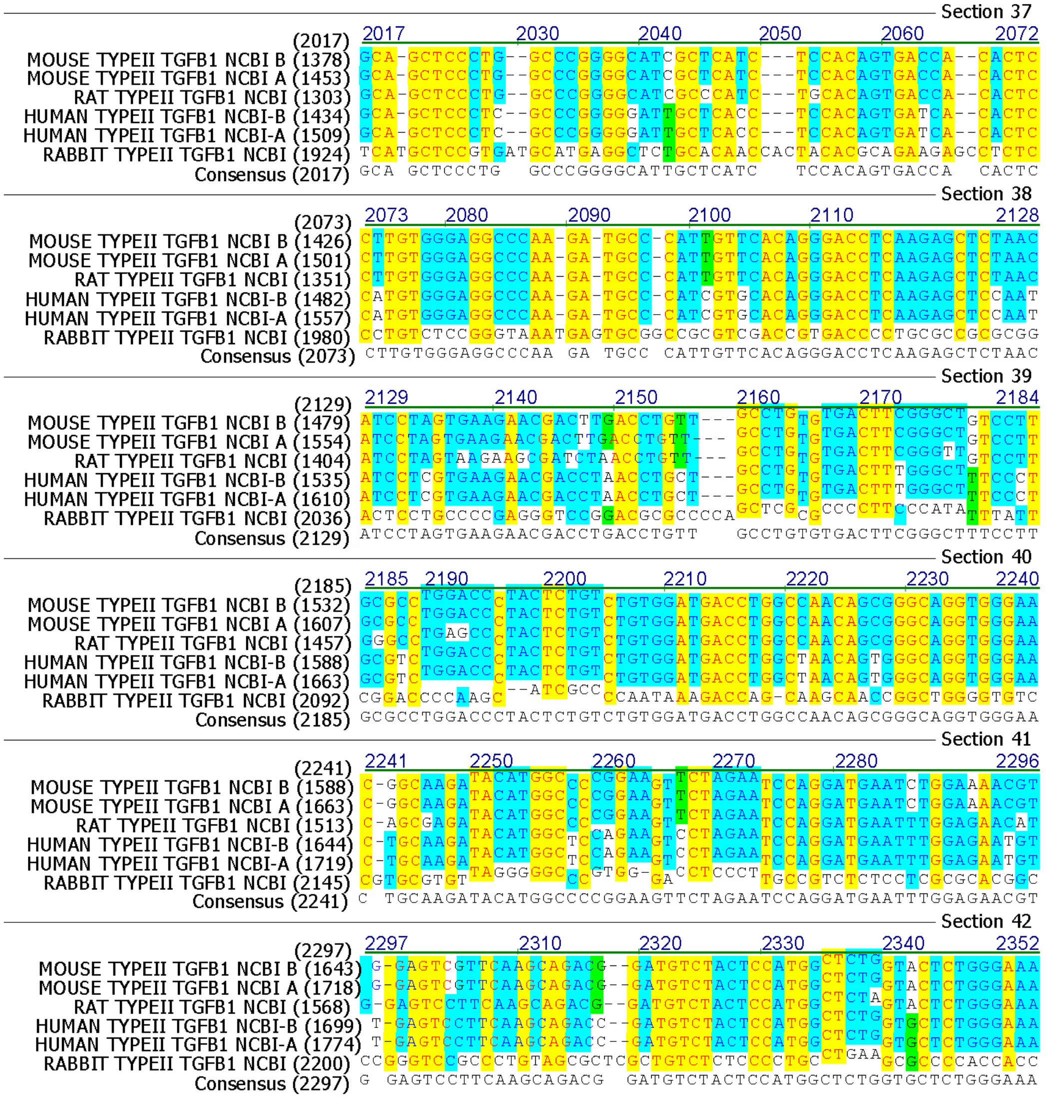
TGFBR2 alignment



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                                                                                      Section 37
                                  (2017) 2017         2030      2040      2050      2060      2072
MOUSE TYPEII TGFB1 NCBI B (1378) GCA-GCTCCCTG--GCCCGGGGCATCGCTCATC---TCCACAGTGACCA--CACTC
MOUSE TYPEII TGFB1 NCBI A (1453) GCA-GCTCCCTG--GCCCGGGGCATCGCTCATC---TCCACAGTGACCA--CACTC
     RAT TYPEII TGFB1 NCBI (1303) GCA-GCTCCCTG--GCCCGGGGCATCGCCCATC---TGCACAGTGACCA--CACTC
 HUMAN TYPEII TGFB1 NCBI-B (1434) GCA-GCTCCCTC--GCCCGGGGATTGCTCACC---TCCACAGTGATCA--CACTC
 HUMAN TYPEII TGFB1 NCBI-A (1509) GCA-GCTCCCTC--GCCCGGGGATTGCTCACC---TCCACAGTGATCA--CACTC
  RABBIT TYPEII TGFB1 NCBI (1924) TCATGCTCCGTGATGCATGAGGCTCTGCACAACCACTACACGCAGAAGAGCCTCTC
                 Consensus (2017) GCA GCTCCCTG  GCCCGGGGCATTGCTCATC   TCCACAGTGACCA  CACTC
                                                                                      Section 38
                                  (2073) 2073   2080      2090      2100      2110          2128
MOUSE TYPEII TGFB1 NCBI B (1426) CTTGTGGGAGGCCCAA-GA-TGCC-CATTGTTCACAGGGACCTCAAGAGCTCTAAC
MOUSE TYPEII TGFB1 NCBI A (1501) CTTGTGGGAGGCCCAA-GA-TGCC-CATTGTTCACAGGGACCTCAAGAGCTCTAAC
     RAT TYPEII TGFB1 NCBI (1351) CTTGTGGGAGGCCCAA-GA-TGCC-CATTGTTCACAGGGACCTCAAGAGCTCTAAC
 HUMAN TYPEII TGFB1 NCBI-B (1482) CATGTGGGAGGCCCAA-GA-TGCC-CATCGTGCACAGGGACCTCAAGAGCTCCAAT
 HUMAN TYPEII TGFB1 NCBI-A (1557) CATGTGGGAGGCCCAA-GA-TGCC-CATCGTGCACAGGGACCTCAAGAGCTCCAAT
  RABBIT TYPEII TGFB1 NCBI (1980) CCTGTCTCCGGGTAAATGAGTGCGGCCGCGTCGACCGTGACCCCTGCGCCGCGCGG
                 Consensus (2073) CTTGTGGGAGGCCCAA GA TGCC CATTGTTCACAGGGACCTCAAGAGCTCTAAC
                                                                                      Section 39
                                  (2129) 2129       2140      2150      2160      2170      2184
MOUSE TYPEII TGFB1 NCBI B (1479) ATCCTAGTGAAGAACGACTTGACCTGTT---GCCTGTGTGACTTCGGGCTGTCCTT
MOUSE TYPEII TGFB1 NCBI A (1554) ATCCTAGTGAAGAACGACTTGACCTGTT---GCCTGTGTGACTTCGGGCTGTCCTT
     RAT TYPEII TGFB1 NCBI (1404) ATCCTAGTAAGAAGCGATCTAACCTGTT---GCCTGTGTGACTTCGGGTTGTCCTT
 HUMAN TYPEII TGFB1 NCBI-B (1535) ATCCTCGTGAAGAACGACCTAACCTGCT---GCCTGTGTGACTTTGGGCTTTCCCT
 HUMAN TYPEII TGFB1 NCBI-A (1610) ATCCTCGTGAAGAACGACCTAACCTGCT---GCCTGTGTGACTTTGGGCTTTCCCT
  RABBIT TYPEII TGFB1 NCBI (2036) ACTCCTGCCCCGAGGGTCCGGACGCGCCCCAGCTCGCGCCCCTTCCCATATTTATT
                 Consensus (2129) ATCCTAGTGAAGAACGACCTGACCTGTT   GCCTGTGTGACTTCGGGCTTTCCTT
                                                                                      Section 40
                                  (2185) 2185 2190      2200      2210      2220      2230      2240
MOUSE TYPEII TGFB1 NCBI B (1532) GCGCCTGGACCCTACTCTGTCTGTGGATGACCTGGCCAACAGCGGGCAGGTGGGAA
MOUSE TYPEII TGFB1 NCBI A (1607) GCGCCTGGACCCTACTCTGTCTGTGGATGACCTGGCCAACAGCGGGCAGGTGGGAA
     RAT TYPEII TGFB1 NCBI (1457) GGGCCTGAGCCCTACTCTGTCTGTGGATGACCTGGCCAACAGCGGGCAGGTGGGAA
 HUMAN TYPEII TGFB1 NCBI-B (1588) GCGTCTGGACCCTACTCTGTCTGTGGATGACCTGGCTAACAGTGGGCAGGTGGGAA
 HUMAN TYPEII TGFB1 NCBI-A (1663) GCGTCTGGACCCTACTCTGTCTGTGGATGACCTGGCTAACAGTGGGCAGGTGGGAA
  RABBIT TYPEII TGFB1 NCBI (2092) CGGACCCCAAGC--ATCGCCCCAATAAAGACCAG-CAAGCAACCGGCTGGGGTGTC
                 Consensus (2185) GCGCCTGGACCCTACTCTGTCTGTGGATGACCTGGCCAACAGCGGGCAGGTGGGAA
                                                                                      Section 41
                                  (2241) 2241     2250      2260      2270      2280          2296
MOUSE TYPEII TGFB1 NCBI B (1588) C-GGCAAGATACATGGCCCCGGAAGTTCTAGAATCCAGGATGAATCTGGAAAACGT
MOUSE TYPEII TGFB1 NCBI A (1663) C-GGCAAGATACATGGCCCCGGAAGTTCTAGAATCCAGGATGAATCTGGAAAACGT
     RAT TYPEII TGFB1 NCBI (1513) C-AGCGAGATACATGGCCCCGGAAGTTCTAGAATCCAGGATGAATTTGGAGAACAT
 HUMAN TYPEII TGFB1 NCBI-B (1644) C-TGCAAGATACATGGCTCCAGAAGTCCTAGAATCCAGGATGAATTTGGAGAATGT
 HUMAN TYPEII TGFB1 NCBI-A (1719) C-TGCAAGATACATGGCTCCAGAAGTCCTAGAATCCAGGATGAATTTGGAGAATGT
  RABBIT TYPEII TGFB1 NCBI (2145) CGTGCGTGTTAGGGGGCCCGTGG-GACCTCCCTTGCCGTCTCTCCTCGCGCACGGC
                 Consensus (2241) C TGCAAGATACATGGCCCCGGAAGTTCTAGAATCCAGGATGAATTTGGAGAACGT
                                                                                      Section 42
                                  (2297) 2297       2310      2320      2330      2340      2352
MOUSE TYPEII TGFB1 NCBI B (1643) G-GAGTCGTTCAAGCAGACG--GATGTCTACTCCATGGCTCTGGTACTCTGGGAAA
MOUSE TYPEII TGFB1 NCBI A (1718) G-GAGTCGTTCAAGCAGACG--GATGTCTACTCCATGGCTCTGGTACTCTGGGAAA
     RAT TYPEII TGFB1 NCBI (1568) G-GAGTCCTTCAAGCAGACG--GATGTCTACTCCATGGCTCTAGTACTCTGGGAAA
 HUMAN TYPEII TGFB1 NCBI-B (1699) T-GAGTCCTTCAAGCAGACC--GATGTCTACTCCATGGCTCTGGTGCTCTGGGAAA
 HUMAN TYPEII TGFB1 NCBI-A (1774) T-GAGTCCTTCAAGCAGACC--GATGTCTACTCCATGGCTCTGGTGCTCTGGGAAA
  RABBIT TYPEII TGFB1 NCBI (2200) CCGGGTCCGCCCTGTAGCGCTCGCTGTCTCTCCCCTGCCTGAAGCGCCCCACCACC
                 Consensus (2297) G GAGTCCTTCAAGCAGACG  GATGTCTACTCCATGGCTCTGGTGCTCTGGGAAA
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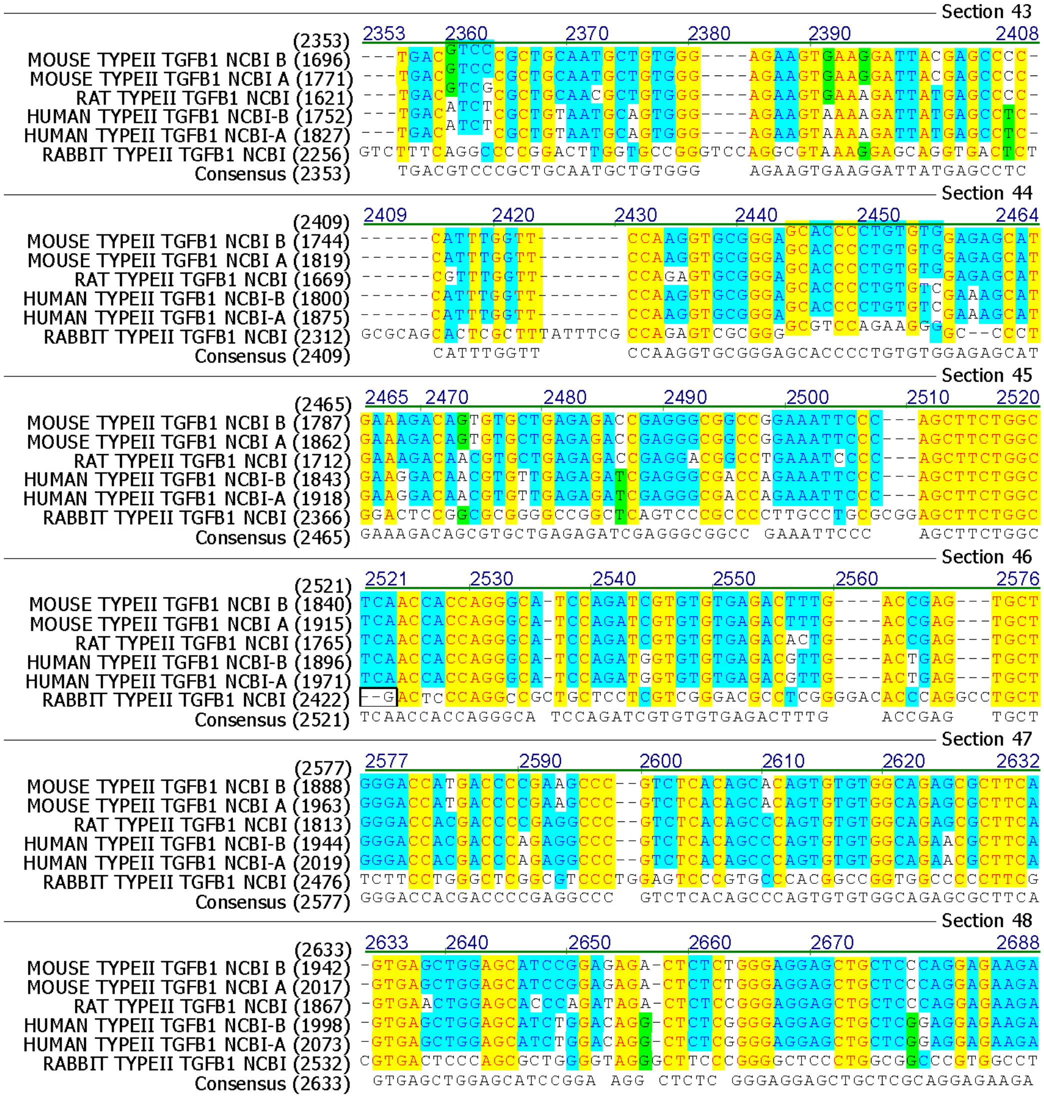

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                                                                   Section 43
                               (2353) 2353  2360       2370       2380       2390          2408
    MOUSE TYPEII TGFB1 NCBI B (1696) ---TGACGTCCCGCTGCAATGCTGTGG----AGAAGTGAAGGATTACGAGCCCC-
    MOUSE TYPEII TGFB1 NCBI A (1771) ---TGACGTCCCGCTGCAATGCTGTGG----AGAAGTGAAGGATTACGAGCCCC-
        RAT TYPEII TGFB1 NCBI (1621) ---TGACGTCGCGCTGCAACGCTGTGG----AGAAGTGAAAGATTATGAGCCCC-
  HUMAN TYPEII TGFB1 NCBI-B (1752) ---TGACATCTCGCTGTAATGCAGTGG----AGAAGTAAAAGATTATGAGCCTC-
  HUMAN TYPEII TGFB1 NCBI-A (1827) ---TGACATCTCGCTGTAATGCAGTGG----AGAAGTAAAAGATTATGAGCCTC-
     RABBIT TYPEII TGFB1 NCBI (2256) GTCTTTCAGGCCCCGGACTTGGTGCCGGGTCCAGGCGTAAAGGAGCAGGTGACTCT
                    Consensus (2353)    TGACGTCCCGCTGCAATGCTGTGG    AGAAGTGAAGGATTATGAGCCTC
                                                                   Section 44
                               (2409) 2409       2420       2430       2440       2450       2464
    MOUSE TYPEII TGFB1 NCBI B (1744) ------CATTTGGTT-------CCAAGGTGCGGGAGCACCCCTGTGTGGAGAGCAT
    MOUSE TYPEII TGFB1 NCBI A (1819) ------CATTTGGTT-------CCAAGGTGCGGGAGCACCCCTGTGTGGAGAGCAT
        RAT TYPEII TGFB1 NCBI (1669) ------CGTTTGGTT-------CCAGAGTGCGGGAGCACCCCTGTGTGGAGAGCAT
  HUMAN TYPEII TGFB1 NCBI-B (1800) ------CATTTGGTT-------CCAAGGTGCGGGAGCACCCCTGTGTCGAAAGCAT
  HUMAN TYPEII TGFB1 NCBI-A (1875) ------CATTTGGTT-------CCAAGGTGCGGGAGCACCCCTGTGTCGAAAGCAT
     RABBIT TYPEII TGFB1 NCBI (2312) GCGCAGCACTCGCTTTATTTCGCCAGAGTCGCGGGGCGTCCAGAAGGGGC--CCCT
                    Consensus (2409)       CATTTGGTT       CCAAGGTGCGGGAGCACCCCTGTGTGGAGAGCAT
                                                                   Section 45
                               (2465) 2465 2470       2480       2490       2500       2510  2520
    MOUSE TYPEII TGFB1 NCBI B (1787) GAAAGACAGTGTGCTGAGAGACCGAGGGCGGCCGGAAATTCCC---AGCTTCTGGC
    MOUSE TYPEII TGFB1 NCBI A (1862) GAAAGACAGTGTGCTGAGAGACCGAGGGCGGCCGGAAATTCCC---AGCTTCTGGC
        RAT TYPEII TGFB1 NCBI (1712) GAAAGACAACGTGCTGAGAGACCGAGGACGGCCTGAAATCCCC---AGCTTCTGGC
  HUMAN TYPEII TGFB1 NCBI-B (1843) GAAGGACAACGTGTTGAGAGATCGAGGGCGACCAGAAATTCCC---AGCTTCTGGC
  HUMAN TYPEII TGFB1 NCBI-A (1918) GAAGGACAACGTGTTGAGAGATCGAGGGCGACCAGAAATTCCC---AGCTTCTGGC
     RABBIT TYPEII TGFB1 NCBI (2366) GGACTCCGGCGCGGGGCCGGCTCAGTCCCGCCCCTTGCCTGCGCGGAGCTTCTGGC
                    Consensus (2465) GAAAGACAGCGTGCTGAGAGATCGAGGGCGGCC GAAATTCCC    AGCTTCTGGC
                                                                   Section 46
                               (2521) 2521     2530       2540       2550       2560          2576
    MOUSE TYPEII TGFB1 NCBI B (1840) TCAACCACCAGGGCA-TCCAGATCGTGTGTGAGACTTTG----ACCGAG---TGCT
    MOUSE TYPEII TGFB1 NCBI A (1915) TCAACCACCAGGGCA-TCCAGATCGTGTGTGAGACTTTG----ACCGAG---TGCT
        RAT TYPEII TGFB1 NCBI (1765) TCAACCACCAGGGCA-TCCAGATCGTGTGTGAGACACTG----ACCGAG---TGCT
  HUMAN TYPEII TGFB1 NCBI-B (1896) TCAACCACCAGGGCA-TCCAGATGGTGTGTGAGACGTTG----ACTGAG---TGCT
  HUMAN TYPEII TGFB1 NCBI-A (1971) TCAACCACCAGGGCA-TCCAGATGGTGTGTGAGACGTTG----ACTGAG---TGCT
     RABBIT TYPEII TGFB1 NCBI (2422) --GACTCCCAGGCCGCTGCTCCTCGTCGGGACGCCTCGGGGACACCCAGGCCTGCT
                    Consensus (2521) TCAACCACCAGGGCA TCCAGATCGTGTGTGAGACTTTG    ACCGAG   TGCT
                                                                   Section 47
                               (2577) 2577         2590       2600       2610       2620    2632
    MOUSE TYPEII TGFB1 NCBI B (1888) GGGACCATGACCCCGAAGCCC--GTCTCACAGCACAGTGTGTGGCAGAGCGCTTCA
    MOUSE TYPEII TGFB1 NCBI A (1963) GGGACCATGACCCCGAAGCCC--GTCTCACAGCACAGTGTGTGGCAGAGCGCTTCA
        RAT TYPEII TGFB1 NCBI (1813) GGGACCACGACCCCGAGGCCC--GTCTCACAGCCCAGTGTGTGGCAGAGCGCTTCA
  HUMAN TYPEII TGFB1 NCBI-B (1944) GGGACCACGACCCAGAGGCCC--GTCTCACAGCCCAGTGTGTGGCAGAACGCTTCA
  HUMAN TYPEII TGFB1 NCBI-A (2019) GGGACCACGACCCAGAGGCCC--GTCTCACAGCCCAGTGTGTGGCAGAACGCTTCA
     RABBIT TYPEII TGFB1 NCBI (2476) TCTTCCTGGGCTCGGCGTCCCTGGAGTCCCGTGCCCACGGCCGGTGGCCCCCTTCG
                    Consensus (2577) GGGACCACGACCCCGAGGCCC  GTCTCACAGCCCAGTGTGTGGCAGAGCGCTTCA
                                                                   Section 48
                               (2633) 2633  2640       2650       2660       2670          2688
    MOUSE TYPEII TGFB1 NCBI B (1942) -GTGAGCTGGAGCATCCGGAGAGA-CTCTCTGGGAGGAGCTGCTCCCAGGAGAAGA
    MOUSE TYPEII TGFB1 NCBI A (2017) -GTGAGCTGGAGCATCCGGAGAGA-CTCTCTGGGAGGAGCTGCTCCCAGGAGAAGA
        RAT TYPEII TGFB1 NCBI (1867) -GTGAACTGGAGCACCCAGATAGA-CTCTCCGGGAGGAGCTGCTCCCAGGAGAAGA
  HUMAN TYPEII TGFB1 NCBI-B (1998) -GTGAGCTGGAGCATCTGGACAGG-CTCTCGGGGAGGAGCTGCTCGGAGGAGAAGA
  HUMAN TYPEII TGFB1 NCBI-A (2073) -GTGAGCTGGAGCATCTGGACAGG-CTCTCGGGGAGGAGCTGCTCGGAGGAGAAGA
     RABBIT TYPEII TGFB1 NCBI (2532) CGTGACTCCCAGCGCTGGGGTAGGGCTTCCCGGGGCTCCCTGGCGGCCCGTGGCCT
                    Consensus (2633)  GTGAGCTGGAGCATCCGGA AGG CTCTC GGGAGGAGCTGCTCGCAGGAGAAGA
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                                                                                         Section 49
                                 (2689) 2689       2700       2710       2720       2730         2744
    MOUSE TYPEII TGFB1 NCBI B (1996) TTCCAGAAGATGGCTCGCTGAACACTACCAAATAGCTTTTTCTGGGCAGGCTGGGC
    MOUSE TYPEII TGFB1 NCBI A (2071) TTCCAGAAGATGGCTCGCTGAACACTACCAAATAGCTTTTTCTGGGCAGGCTGGGC
      RAT TYPEII TGFB1 NCBI (1921) TTCCAGAAGACGGCTCCCTGAACACTACCAAATAGCTTTTTCTGGGCAGGCTGGGC
   HUMAN TYPEII TGFB1 NCBI-B (2052) TTCCTGAAGACGGCTCCCTAAACACTACCAAATAGCTCTTCTGGGGCAGGCTGGGC
   HUMAN TYPEII TGFB1 NCBI-A (2127) TTCCTGAAGACGGCTCCCTAAACACTACCAAATAGCTCTTCTGGGGCAGGCTGGGC
     RABBIT TYPEII TGFB1 NCBI (2588) CTCCTCTTT-CCGCGGCCTCT-CTTTCTTAGGTCTCTCCTCCTTCCGCGGCTTCTC
                    Consensus (2689) TTCCTGAAGACGGCTCCCTGAACACTACCAAATAGCTTTTTCTGGGCAGGCTGGGC
                                                                                         Section 50
                                 (2745) 2745 2750      2760       2770       2780       2790      2800
    MOUSE TYPEII TGFB1 NCBI B (2052) CAAGCCTCCAGAAG-CCGTCCTCTAGCCAAAGAC---CAGAGG-CAGCAGGATT-C
    MOUSE TYPEII TGFB1 NCBI A (2127) CAAGCCTCCAGAAG-CCGTCCTCTAGCCAAAGAC---CAGAGG-CAGCAGGATT-C
      RAT TYPEII TGFB1 NCBI (1977) -AAGACTCCGGAAGTCCGTCCTCTAACCAAAGAC---CAGAGGTCAGCAGGATTGC
   HUMAN TYPEII TGFB1 NCBI-B (2108) CATGTCCAAAGAGGCTGCCCCTCTCACCAAAGAA---CAGAGG-CAGCAGGAAGCT
   HUMAN TYPEII TGFB1 NCBI-A (2183) CATGTCCAAAGAGGCTGCCCCTCTCACCAAAGAA---CAGAGG-CAGCAGGAAGCT
     RABBIT TYPEII TGFB1 NCBI (2642) -----CTTCCGCGGCTTCCCCTCTCTCCGAGGCCTCTCCTTGGGTCCCCGGTCTGC
                    Consensus (2745) CAAG CTCCAGAGGCTCGTCCTCTCACCAAAGAC   CAGAGG CAGCAGGATT C
                                                                                         Section 51
                                 (2801) 2801     2810       2820       2830       2840            2856
    MOUSE TYPEII TGFB1 NCBI B (2102) TCTCCTGA-CTGATGCTTC-TGGAAAACCAAGGACTTGCTCCCTTCTTCCCCAGGA
    MOUSE TYPEII TGFB1 NCBI A (2177) TCTCCTGA-CTGATGCTTC-TGGAAAACCAAGGACTTGCTCCCTTCTTCCCCAGGA
      RAT TYPEII TGFB1 NCBI (2029) TTTCCTGA-CTGATGCTTC-TGGAAAACCAAGGACTTGCTCCCTTCTTCCCTAG--
   HUMAN TYPEII TGFB1 NCBI-B (2160) GCCCCTGAACTGATGCTTCCTGGAAAACCAAGGG---GGTCACTCCCCTCCCTGTA
   HUMAN TYPEII TGFB1 NCBI-A (2235) GCCCCTGAACTGATGCTTCCTGGAAAACCAAGGG---GGTCACTCCCCTCCCTGTA
     RABBIT TYPEII TGFB1 NCBI (2693) GAGGGTCACACGGTCCTCC-CGGACGGCCTCTCCGGTGGCCTCGCCGGGCTCCTCT
                    Consensus (2801)  TCTCCTGA CTGATGCTTC TGGAAAACCAAGGACTTGGTCCCTTCTTCCCCAG A
                                                                                         Section 52
                                 (2857) 2857        2870       2880       2890       2900      2912
    MOUSE TYPEII TGFB1 NCBI B (2156) GCTGCCCCGTGTTTAGAAGCGGCAGCAGCAGCAGCAACAACCATAGCGGCGGTGGC
    MOUSE TYPEII TGFB1 NCBI A (2231) GCTGCCCCGTGTTTAGAAGCGGCAGCAGCAGCAGCAACAACCATAGCGGCGGTGGC
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (2213) --AGCTGTGGGGATA--------------AGCAGAAACAAC---------------
   HUMAN TYPEII TGFB1 NCBI-A (2288) --AGCTGTGGGGATA--------------AGCAGAAACAAC---------------
     RABBIT TYPEII TGFB1 NCBI (2748) TCGTCGTTCTCTGCAG---CCTCCCGACTCCCGGGAATCTTGGGTCTGACCTCTGC
                    Consensus (2857)  C GC  TGTGT TAG   C  C   A  AGCAG AACAAC      G C    GC
                                                                                         Section 53
                                 (2913) 2913   2920       2930       2940       2950            2968
    MOUSE TYPEII TGFB1 NCBI B (2212) AGCGGCGGGGGATGAGTGACAGAGAGCGTCCTATGCCTTGGAGACTGTCATGGCAT
    MOUSE TYPEII TGFB1 NCBI A (2287) AGCGGCGGGGGATGAGTGACAGAGAGCGTCCTATGCCTTGGAGACTGTCATGGCAT
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (2238) AGCAGCAGGGAGTGGGTGACATAGAGCATTCTATGCCTTTGACATTGTCATAGGAT
   HUMAN TYPEII TGFB1 NCBI-A (2313) AGCAGCAGGGAGTGGGTGACATAGAGCATTCTATGCCTTTGACATTGTCATAGGAT
     RABBIT TYPEII TGFB1 NCBI (2801) CTCGGCCCGGGGCGCAGGCGGCGCTGATGGAGGCGCCTGGGCCTCGAACTTAGGCT
                    Consensus (2913) AGCGGC GGGGGTG GTGACA AGAGC T CTATGCCTTGGACACTGTCATAGGAT
                                                                                         Section 54
                                 (2969) 2969       2980       2990       3000       3010         3024
    MOUSE TYPEII TGFB1 NCBI B (2268) AAGCTGTGCTAGCACCTCCTCAGGAAATGAGATTGATTTTTACAACAGCCAATAAC
    MOUSE TYPEII TGFB1 NCBI A (2343) AAGCTGTGCTAGCACCTCCTCAGGAAATGAGATTGATTTTTACAACAGCCAATAAC
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (2294) AAGCTGTGTTAGCACTTCCTCAGGAAATGAGATTGATTTTTACAATAGCCAATAAC
   HUMAN TYPEII TGFB1 NCBI-A (2369) AAGCTGTGTTAGCACTTCCTCAGGAAATGAGATTGATTTTTACAATAGCCAATAAC
     RABBIT TYPEII TGFB1 NCBI (2857) GCAAGACAGAGTGGGGTCCTGGGGTAA-GCGCCCACCTTCCCCCCGGCCCGGGCTC
                    Consensus (2969) AAGCTGTG TAGCAC TCCTCAGGAAATGAGATTGATTTTTACAA AGCCAATAAC
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TGFBR2 alignment

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                                                                 Section 55
                                   3025 3030       3040       3050       3060       3070    3080
                           (3025)
 MOUSE TYPEII TGFB1 NCBI B (2324) GTTTGCACTTTATTAATGCCTGTGTGTAAATACGAATAGCTATGTTTTATATATAT
 MOUSE TYPEII TGFB1 NCBI A (2399) GTTTGCACTTTATTAATGCCTGTGTGTAAATACGAATAGCTATGTTTTATATATAT
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2350) ATTTGCACTTTATTAATGCCTGTATATAAATATGAATAGCTATGTTTTATATATAT
HUMAN TYPEII TGFB1 NCBI-A  (2425) ATTTGCACTTTATTAATGCCTGTATATAAATATGAATAGCTATGTTTTATATATAT
  RABBIT TYPEII TGFB1 NCBI (2912) CTTCTTTCCTTGGGGATGAAGGTCCCAATGCCCGC---GGTCAGTGGAAGGAAGCT
                 Consensus (3025)  TTTGCACTTTATTAATGCCTGT T TAAATACGAATAGCTATGTTTTATATATAT
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                                                                 Section 56
                                   3081     3090       3100       3110       3120       3136
                           (3081)
 MOUSE TYPEII TGFB1 NCBI B (2380) CTATATATCT----ATATGTCTATATCTCT-CTATATATAGCCATACTCTGCAAGG
 MOUSE TYPEII TGFB1 NCBI A (2455) CTATATATCT----ATATGTCTATATCTCT-CTATATATAGCCATACTCTGCAAGG
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2406) ATATATATATCTATATATGTCTATAGCTCT-ATATATATAGCCATACCTTGAAAAG
HUMAN TYPEII TGFB1 NCBI-A  (2481) ATATATATATCTATATATGTCTATAGCTCT-ATATATATAGCCATACCTTGAAAAG
  RABBIT TYPEII TGFB1 NCBI (2965) CTTACCAGGGGCGACGATGGCTCCCTCGGGGCTGAGCTTGGCGGGACCCAGGGCTC
                 Consensus (3081) CTATATAT T    ATATGTCTATATCTCT CTATATATAGCCATACCCTG AA G
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                                                                 Section 57
                                   3137         3150       3160       3170       3180    3192
                           (3137)
 MOUSE TYPEII TGFB1 NCBI B (2431) AGACA-AAGAAAATGATCAAATGTGTTCCCCGGGGAATTAGTTTTTATTGGAGAGC
 MOUSE TYPEII TGFB1 NCBI A (2506) AGACA-AAGAAAATGATCAAATGTGTTCCCCGGGGAATTAGTTTTTATTGGAGAGC
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2461) AGACA-AGGAAAAACATCAAATA--TTCCCAG--GAAATTGGTTTTATTGGAGAAC
HUMAN TYPEII TGFB1 NCBI-A  (2536) AGACA-AGGAAAAACATCAAATA--TTCCCAG--GAAATTGGTTTTATTGGAGAAC
  RABBIT TYPEII TGFB1 NCBI (3021) GGGCACACGTGCTTGGAGTGCTGCCTCCGCAGG-GACGGCGTCTGCAGCGACAGGG
                 Consensus (3137) AGACA A GAAAATGATCAAATG  TTCCCAGG GAA T GTTTTTATTGGAGAGC
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                                                                 Section 58
                                   3193  3200       3210       3220       3230          3248
                           (3193)
 MOUSE TYPEII TGFB1 NCBI B (2486) TCTAGAATGGAGCAGA------AGGGACTCGGGATAGCGTTAGCACTTGACAATCA
 MOUSE TYPEII TGFB1 NCBI A (2561) TCTAGAATGGAGCAGA------AGGGACTCGGGATAGCGTTAGCACTTGACAATCA
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2512) TCCAGAACCAAGCAGAGAAGGAAGGGACCCATGACAGCATTAGCATTTGACAATC-
HUMAN TYPEII TGFB1 NCBI-A  (2587) TCCAGAACCAAGCAGAGAAGGAAGGGACCCATGACAGCATTAGCATTTGACAATC-
  RABBIT TYPEII TGFB1 NCBI (3076) TCGGGACCCGAGTCAGCTGGGCCGAGGCACGGTCCACACTGTCCATCCCTCCCTCA
                 Consensus (3193) TC AGAACCGAGCAGA   GG AGGGAC CGGGACAGC TTAGCATTTGACAATCA
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                                                                 Section 59
                                   3249       3260       3270       3280       3290      3304
                           (3249)
 MOUSE TYPEII TGFB1 NCBI B (2536) GTCACACAAGCAACGATCCCCTGACAGCAGGGTTGGGGGCACAATTGTATGAGA-A
 MOUSE TYPEII TGFB1 NCBI A (2611) GTCACACAAGCAACGATCCCCTGACAGCAGGGTTGGGGGCACAATTGTATGAGA-A
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2567) ---ACACATGCAGTGGTTCTCTGACTGTAAAACAGTGAACTTTGCATGAGGAAAGA
HUMAN TYPEII TGFB1 NCBI-A  (2642) ---ACACATGCAGTGGTTCTCTGACTGTAAAACAGTGAACTTTGCATGAGGAAAGA
  RABBIT TYPEII TGFB1 NCBI (3132) C-CCCTAGAGCCCCCCTCCCTGGACAGTTGGAGTGGGGCTCCCCCGGTACGGCTGA
                 Consensus (3249)   CACACAAGCA CG TCCCCTGACAGTAGGA TGGGG C C  C GTA GA AGA
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                                                                 Section 60
                                   3305 3310       3320       3330       3340       3350    3360
                           (3305)
 MOUSE TYPEII TGFB1 NCBI B (2591) GGATCCATGCCTTGCAGCCTGCTTTGGCCACAAAACACTTTGTTTTGCAA--TAAT
 MOUSE TYPEII TGFB1 NCBI A (2666) GGATCCATGCCTTGCAGCCTGCTTTGGCCACAAAACACTTTGTTTTGCAA--TAAT
    RAT TYPEII TGFB1 NCBI  (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B  (2620) GGCTCCATGTCTCACAGCCAGCTATGACCACATTGCACTTGCTTTTGCAAAATAAT
HUMAN TYPEII TGFB1 NCBI-A  (2695) GGCTCCATGTCTCACAGCCAGCTATGACCACATTGCACTTGCTTTTGCAAAATAAT
  RABBIT TYPEII TGFB1 NCBI (3187) GACT--AAGGATGCCCCCGAGCCGTGGGAAGGGACTCCGGGACTCCGCTGC-CGCG
                 Consensus (3305) GGCTCCATG CT  CAGCCAGCT TGGCCACA A CACTTG TTTTGCAA  TAAT
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                                                                               Section 61
                          (3361) 3361     3370      3380      3390      3400         3416
MOUSE TYPEII TGFB1 NCBI B (2645) GACCCTCTACAGTAGGGTGCTTTATGGACCAGGGAGCTGAG--------CTCCAGT
MOUSE TYPEII TGFB1 NCBI A (2720) GACCCTCTACAGTAGGGTGCTTTATGGACCAGGGAGCTGAG--------CTCCAGT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2676) CATTCCCTGCCTAGCACTTCTCTTCTGGCCATGGAACTAAGTACAGTGGCACTGTT
HUMAN TYPEII TGFB1 NCBI-A (2751) CATTCCCTGCCTAGCACTTCTCTTCTGGCCATGGAACTAAGTACAGTGGCACTGTT
 RABBIT TYPEII TGFB1 NCBI (3240) GCGCCCCTTCTCCGAACCTCGCTCTTTCAATTGGTCATTCTTCCCCCCGACCACGG
                Consensus (3361) GA CCCCT C   G ACTTCTCT TTG CCATGGA CT AGT C    GC C  GT
                                                                               Section 62
                          (3417) 3417         3430      3440      3450      3460     3472
MOUSE TYPEII TGFB1 NCBI B (2693) CCAGCACT-GAGTCCCAGGATCTCCCATGTGTCTTTGCTTCTCTTGGTTGTTATCT
MOUSE TYPEII TGFB1 NCBI A (2768) CCAGCACT-GAGTCCCAGGATCTCCCATGTGTCTTTGCTTCTCTTGGTTGTTATCT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2732) TGAGGACCAGTGTTCCCGGGGTTCCTGTGTGCCCTTATTTCTCCTGGACTTTTCAT
HUMAN TYPEII TGFB1 NCBI-A (2807) TGAGGACCAGTGTTCCCGGGGTTCCTGTGTGCCCTTATTTCTCCTGGACTTTTCAT
 RABBIT TYPEII TGFB1 NCBI (3296) GCTGTAGGAGGCCCCTAGCAAGGGAGGGGTCGCAGGAGTGCCCCCGGGGGGCGCTC
                Consensus (3417)  CAG AC AG GTCCCAGGA  TCC GTGTG C TTA TTCTCCTGG  GTT C T
                                                                               Section 63
                          (3473) 3473   3480      3490      3500      3510           3528
MOUSE TYPEII TGFB1 NCBI B (2748) TTGACATTCAAGCCCCAC-TCTG-------ACTTGTGAACCT-TCTG----ACTTA
MOUSE TYPEII TGFB1 NCBI A (2823) TTGACATTCAAGCCCCAC-TCTG-------ACTTGTGAACCT-TCTG----ACTTA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2788) TTAAGCTCCAAGCCCCAAATCTGGGGGGCTAGTTTAGAAACTCTCCCTCA-ACCTA
HUMAN TYPEII TGFB1 NCBI-A (2863) TTAAGCTCCAAGCCCCAAATCTGGGGGGCTAGTTTAGAAACTCTCCCTCA-ACCTA
 RABBIT TYPEII TGFB1 NCBI (3352) ACGAGCTGAGCGGTCCCC-AGAGAGGGCGCAGGGGAAAGGCGGCAGAACGCTACGA
                Consensus (3473) TTGAGCT CAAGCCCCAC TCTG GGG   AGTTGAGAA CT TC   C  ACCTA
                                                                               Section 64
                          (3529) 3529       3540      3550      3560      3570       3584
MOUSE TYPEII TGFB1 NCBI B (2791) GCCTTGAAACTTGGCCCCATTTTT-----------------------CTGCTTTTA
MOUSE TYPEII TGFB1 NCBI A (2866) GCCTTGAAACTTGGCCCCATTTTT-----------------------CTGCTTTTA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2843) GTTTAGAAACTCTACCCCATCTTTAATACCTTGAATGTTTTGAACCCCACTTTTTA
HUMAN TYPEII TGFB1 NCBI-A (2918) GTTTAGAAACTCTACCCCATCTTTAATACCTTGAATGTTTTGAACCCCACTTTTTA
 RABBIT TYPEII TGFB1 NCBI (3407) GGCAGGAGGGGTTGCACAAGGTTCATC----CGGAAGCCAGAACCTACTCGCGGCG
                Consensus (3529) G CT GAAACTTTGCCCCAT TTTA       G A G     A C  CTC TTTTA
                                                                               Section 65
                          (3585) 3585 3590      3600      3610      3620      3630   3640
MOUSE TYPEII TGFB1 NCBI B (2824) CG-----GGCTACCAAAAATCAAAGAAGACCGTTCCCCACCCATGAAATTGGCCTA
MOUSE TYPEII TGFB1 NCBI A (2899) CG-----GGCTACCAAAAATCAAAGAAGACCGTTCCCCACCCATGAAATTGGCCTA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2899) CCTTCATGGGTTGCAGAAAAATCAGAACAGATGTCCCCATCCATGCGATTGCCCCA
HUMAN TYPEII TGFB1 NCBI-A (2974) CCTTCATGGGTTGCAGAAAAATCAGAACAGATGTCCCCATCCATGCGATTGCCCCA
 RABBIT TYPEII TGFB1 NCBI (3459) AGGGGAATGGGCCCCGCAAAAGGTCCACACCGGGTGAGAGGGGCGCGCAAGGCCCG
                Consensus (3585) CG   A GGGT CCAGAAAAA  AGAACACCGGTCCCCA CCATGCGATTGGCCCA
                                                                               Section 66
                          (3641) 3641     3650      3660      3670      3680         3696
MOUSE TYPEII TGFB1 NCBI B (2875) CCATCTACTAATAAGATTGAGTTCTTTGATCC---TTTCCTGTGCA--TAAGTAAC
MOUSE TYPEII TGFB1 NCBI A (2950) CCATCTACTAATAAGATTGAGTTCTTTGATCC---TTTCCTGTGCA--TAAGTAAC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (2955) CCATCTACTAATGAAAAATTGTTCTTTTTTTCATCTTTCCCCTGCACTTATGTTAC
HUMAN TYPEII TGFB1 NCBI-A (3030) CCATCTACTAATGAAAAATTGTTCTTTTTTTCATCTTTCCCCTGCACTTATGTTAC
 RABBIT TYPEII TGFB1 NCBI (3515) TCACTTAAGGGACATATGACGTGAGCTCAGATCTTTGTGAAGGAACCTTACTTCTG
                Consensus (3641) CCATCTACTAAT A AT   GTTCTTT AT C T TTTCC GTGCACTTA GT AC
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                                                                                 Section 67
                          (3697) 3697         3710      3720      3730      3740     3752
MOUSE TYPEII TGFB1 NCBI B (2926) TGTTATTTGTTCCCTGCCATTATCCTTTGTTGATTTTTTTAAAACAAGGCACACCC
MOUSE TYPEII TGFB1 NCBI A (3001) TGTTATTTGTTCCCTGCCATTATCCTTTGTTGATTTTTTTAAAACAAGGCACACCC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3011) TATTCTCTGCTCCCAGCCTTCATCC---------TTTTCTAAAAAGGAGCAAATTC
HUMAN TYPEII TGFB1 NCBI-A (3086) TATTCTCTGCTCCCAGCCTTCATCC---------TTTTCTAAAAAGGAGCAAATTC
 RABBIT TYPEII TGFB1 NCBI (3571) TGGTGTGACATAATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATA
                Consensus (3697) TGTT T TG TCCCTGCC T ATCC  T   GA TTTT TAAAAC AAGCAAA TC
                                                                                 Section 68
                          (3753) 3753   3760      3770      3780      3790           3808
MOUSE TYPEII TGFB1 NCBI B (2982) TACACTCAGCCCCTCAGCCTCACTGTGTTTAATTTTTGTCGCTCTGCTGCTGGGTC
MOUSE TYPEII TGFB1 NCBI A (3057) TACACTCAGCCCCTCAGCCTCACTGTGTTTAATTTTTGTCGCTCTGCTGCTGGGTC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3058) T-CACTC------TAGGCTTTATCGTGTTTACTTTTTCATTACACTTGACTTGATT
HUMAN TYPEII TGFB1 NCBI-A (3133) T-CACTC------TAGGCTTTATCGTGTTTACTTTTTCATTACACTTGACTTGATT
 RABBIT TYPEII TGFB1 NCBI (3627) TAAAATTTT---TAAGTGTATAATGTGTTAAACTACTGATTCTAATTGTTTGTGTA
                Consensus (3753) TACACTC      TAGGCTTTA TGTGTTTAATTTTTGATTCTA TTG CTGGGT
                                                                                 Section 69
                          (3809) 3809       3820      3830      3840      3850       3864
MOUSE TYPEII TGFB1 NCBI B (3038) TTCCAGCTTGC----CATGGCAAC-ACCAGTGGGTTCCATTATCCCAGCCTCCCAA
MOUSE TYPEII TGFB1 NCBI A (3113) TTCCAGCTTGC----CATGGCAAC-ACCAGTGGGTTCCATTATCCCAGCCTCCCAA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3107) TTCTAGTTTTC----TATACAAAC-ACCAATGGGTTCCATCTTTCTGGGCTCCTGA
HUMAN TYPEII TGFB1 NCBI-A (3182) TTCTAGTTTTC----TATACAAAC-ACCAATGGGTTCCATCTTTCTGGGCTCCTGA
 RABBIT TYPEII TGFB1 NCBI (3680) TTTTAGATTCCAACCTATGGAACTGATGAATGGGAGCAGTGGTGGAATGCCTTTAA
                Consensus (3809) TTCTAG TT C    TATGGAAAC ACCAATGGGTTCCAT  T C AGGCTCCTAA
                                                                                 Section 70
                          (3865) 3865 3870      3880      3890      3900      3910   3920
MOUSE TYPEII TGFB1 NCBI B (3089) AT-----AGC---------------GGACAGGATTTGAATGGCGCACGCTGCCCAT
MOUSE TYPEII TGFB1 NCBI A (3164) AT-----AGC---------------GGACAGGATTTGAATGGCGCACGCTGCCCAT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3158) TTGCTCAAGCACAGTTTGGCCTGATGAAGAGGATTTCAACTACACAATACTATCAT
HUMAN TYPEII TGFB1 NCBI-A (3233) TTGCTCAAGCACAGTTTGGCCTGATGAAGAGGATTTCAACTACACAATACTATCAT
 RABBIT TYPEII TGFB1 NCBI (3736) TGAGGAAAACCTGTTTTGCTCAGAAGAA-ATGCCATCTAGTGATGATGAGGCTACT
                Consensus (3865) TT    AAGC    TTTG  C GA GAA AGGATTTCAA TGC CA GA GCTCAT
                                                                                 Section 71
                          (3921) 3921     3930      3940      3950      3960         3976
MOUSE TYPEII TGFB1 NCBI B (3125) ACTGTACAGCTGTGTCCGGGGACTCTTTGAACCCTCCTTTTCCTCGATCAACACAC
MOUSE TYPEII TGFB1 NCBI A (3200) ACTGTACAGCTGTGTCCGGGGACTCTTTGAACCCTCCTTTTCCTCGATCAACACAC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3214) TGTC-AGGACTATGACCTCAGGCACTCTAAACATATGTTTTGTTTGGTCAGCACAG
HUMAN TYPEII TGFB1 NCBI-A (3289) TGTC-AGGACTATGACCTCAGGCACTCTAAACATATGTTTTGTTTGGTCAGCACAG
 RABBIT TYPEII TGFB1 NCBI (3791) GCTGACTCTCAACATTCTACTCCTCCAAAAAAGAAGAGAAAGGTAGAAGACCCCAA
                Consensus (3921)  CTG A   CTATGTCCT  G CTCT TAAAC  A  TTTTG T GATCA CACA
                                                                                 Section 72
                          (3977) 3977         3990      4000      4010      4020     4032
MOUSE TYPEII TGFB1 NCBI B (3181) TG--TCGAAAAAGTTAGTTGAGCTTCTTTAGAACTATTTGG-GAGGTTGCAGAGAA
MOUSE TYPEII TGFB1 NCBI A (3256) TG--TCGAAAAAGTTAGTTGAGCTTCTTTAGAACTATTTGG-GAGGTTGCAGAGAA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3269) CG--TTTCAAAA---AGTGAAGCCACTTTATAAATATTTGGAGATTTTGCAGGAAA
HUMAN TYPEII TGFB1 NCBI-A (3344) CG--TTTCAAAA---AGTGAAGCCACTTTATAAATATTTGGAGATTTTGCAGGAAA
 RABBIT TYPEII TGFB1 NCBI (3847) GGACTTTCCTTCAGAATTGCTAAGTTTTTTGAGTCATGCTGTGTTTAGTAATAGAA
                Consensus (3977)  G  TTTCAAAA   AGTG AGC TCTTTAGAA TATTTGG GATTTTGCAGAGAA
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TGFBR2 alignment

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                                                                      Section 73
                               (4033) 4033   4040       4050       4060       4070           4088
     MOUSE TYPEII TGFB1 NCBI B (3234) GCTTAGATTCCCCAA-TAAGCAGAGGAGGTGGTTCCTAG----CTCCGCCCCCAGG
     MOUSE TYPEII TGFB1 NCBI A (3309) GCTTAGATTCCCCAA-TAAGCAGAGGAGGTGGTTCCTAG----CTCCGCCCCCAGG
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3320) ATCTGGATCCCCAGG-TAAGGATAGCAGATGGTTTTCAGTTATCTCCAGTCCACGT
   HUMAN TYPEII TGFB1 NCBI-A (3395) ATCTGGATCCCCAGG-TAAGGATAGCAGATGGTTTTCAGTTATCTCCAGTCCACGT
     RABBIT TYPEII TGFB1 NCBI (3903) CTCTTGCTTGCTTTGCTATTTACACCACAAAGGAAAAAGCTG-CACTGCTATACAA
                    Consensus (4033)  TCT GATTCCC  G TAAG A AGCAGATGGTT   AG T  CTCCGCTCCACG
                                                                      Section 74
                               (4089) 4089       4100       4110       4120       4130      4144
     MOUSE TYPEII TGFB1 NCBI B (3285) GGGCATCATTTCCAGCAAGAAGG--GCATGGCTGCAGCTGCCTCACTGCTCACTCC
     MOUSE TYPEII TGFB1 NCBI A (3360) GGGCATCATTTCCAGCAAGAAGG--GCATGGCTGCAGCTGCCTCACTGCTCACTCC
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3375) TCACAAAATGTGAAGGTGTGGAG--ACACTTACAAAGCTGCCTCACTTCTCACTG-
   HUMAN TYPEII TGFB1 NCBI-A (3450) TCACAAAATGTGAAGGTGTGGAG--ACACTTACAAAGCTGCCTCACTTCTCACTG-
     RABBIT TYPEII TGFB1 NCBI (3958) GAAAATTATGGAAAAATATTCTGTAACCTTTATAAGTAGGCATAACAGTTATAATC
                    Consensus (4089) G ACAT ATGT AAG TAT   G  ACATTTATAAAGCTGCCTCACTGCTCACT C
                                                                      Section 75
                               (4145) 4145 4150         4160       4170       4180       4190      4200
     MOUSE TYPEII TGFB1 NCBI B (3339) TAAGCCTCCAGACTTCCC--ATTACTCACACCCACCCCA-GTCTGGAAATGAAAGC
     MOUSE TYPEII TGFB1 NCBI A (3414) TAAGCCTCCAGACTTCCC--ATTACTCACACCCACCCCA-GTCTGGAAATGAAAGC
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3428) TAAACATTAGCTCTTTCC--ACTGCCTACCTGGACCCCA-GTCTAGGAATTAAATC
   HUMAN TYPEII TGFB1 NCBI-A (3503) TAAACATTAGCTCTTTCC--ACTGCCTACCTGGACCCCA-GTCTAGGAATTAAATC
     RABBIT TYPEII TGFB1 NCBI (4014) ATAACATACTGTTTTTTCTTACTCCACACAGGCATAGAGTGTCTGCTATTAATAAC
                    Consensus (4145) TAAACAT C GTCTTTCC  ACT C CACA GCACCCCA GTCTGG AAT AAA C
                                                                      Section 76
                               (4201) 4201     4210       4220       4230       4240          4256
     MOUSE TYPEII TGFB1 NCBI B (3392) TGCTTCCAGTCAGGATCCATTGTAAGAAAAGTGCGTTCGTGAGC----ATGGAGAG
     MOUSE TYPEII TGFB1 NCBI A (3467) TGCTTCCAGTCAGGATCCATTGTAAGAAAAGTGCGTTCGTGAGC----ATGGAGAG
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3481) TGCACCTAACCAAGGTCCCTTGTAAGAAATGTCCATTC----------AAGCAGTC
   HUMAN TYPEII TGFB1 NCBI-A (3556) TGCACCTAACCAAGGTCCCTTGTAAGAAATGTCCATTC----------AAGCAGTC
     RABBIT TYPEII TGFB1 NCBI (4070) TATGCTCAAAAATTGTGTACCTTTAGCTTTTTAATTTGTAAAGGGGTTAATAAGGA
                    Consensus (4201) TGC CCCAA CA GGTCCATTGTAAGAAATGT C TTC   AG     AAG AG
                                                                      Section 77
                               (4257) 4257         4270       4280       4290       4300      4312
     MOUSE TYPEII TGFB1 NCBI B (3444) ATAGCAAGTAAAAATGGTTGCACCACAAGCAAGACGACCTGAGTT-CAACCCCTCC
     MOUSE TYPEII TGFB1 NCBI A (3519) ATAGCAAGTAAAAATGGTTGCACCACAAGCAAGACGACCTGAGTT-CAACCCCTCC
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3527) ATTCTCTGGGTATATAATATGATTTTGA-CTACCTTATCTGGTGT-TAAGATTTGA
   HUMAN TYPEII TGFB1 NCBI-A (3602) ATTCTCTGGGTATATAATATGATTTTGA-CTACCTTATCTGGTGT-TAAGATTTGA
     RABBIT TYPEII TGFB1 NCBI (4126) ATATTTGATGTATAGTGCCTTGACTAGA-GATCATAATCAGCCATACCACATTTGT
                    Consensus (4257) ATA T  GTGTATAT GT T A CT GA CAACAT ATCTG   T CAACATTTG
                                                                      Section 78
                               (4313) 4313   4320       4330       4340       4350           4368
     MOUSE TYPEII TGFB1 NCBI B (3499) AG----AACCCACGACAAAAGTCATGTTCAGTGGGGCACTCTTATCATCTCAGCCC
     MOUSE TYPEII TGFB1 NCBI A (3574) AG----AACCCACGACAAAAGTCATGTTCAGTGGGGCACTCTTATCATCTCAGCCC
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (3581) AG----TTGGCCTTTTATTGGACT-----AAAGGGGAACTCCTTTAA---------
   HUMAN TYPEII TGFB1 NCBI-A (3656) AG----TTGGCCTTTTATTGGACT-----AAAGGGGAACTCCTTTAA---------
     RABBIT TYPEII TGFB1 NCBI (4181) AGAGGTTTTACTTGCTTTAAAAAACCTCCCACACCTCCCCCTGAACCTGAAACATA
                    Consensus (4313) AG    TT  C TG TATAAGACA  T CAA GGGGCACTCTTATCAT   A
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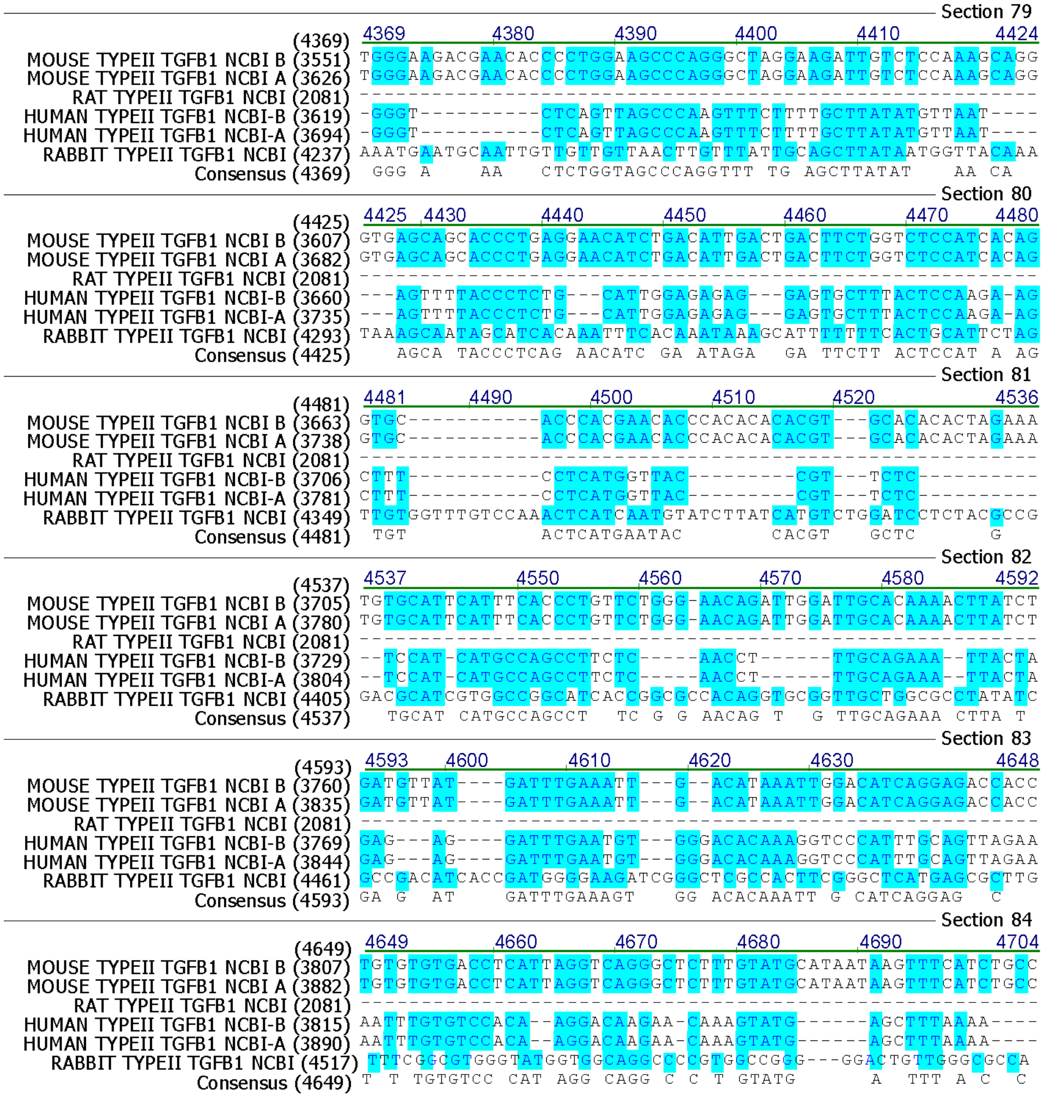
TGFBR2 alignment



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                                                                           Section 79
                                 4369       4380      4390      4400      4410       4424
                          (4369)
MOUSE TYPEII TGFB1 NCBI B (3551) TGGGAAGACGAACACCCCTGGAAGCCCAGGGCTAGGAAGATTGTCTCCAAAGCAGG
MOUSE TYPEII TGFB1 NCBI A (3626) TGGGAAGACGAACACCCCTGGAAGCCCAGGGCTAGGAAGATTGTCTCCAAAGCAGG
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3619) -GGGT----------CTCAGTTAGCCCAAGTTTCTTTTGCTTATATGTTAAT----
HUMAN TYPEII TGFB1 NCBI-A (3694) -GGGT----------CTCAGTTAGCCCAAGTTTCTTTTGCTTATATGTTAAT----
 RABBIT TYPEII TGFB1 NCBI (4237) AAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGGTTACAAA
                Consensus (4369)  GGG A    AA   CTCTGGTAGCCCAGGTTT TG AGCTTATAT   AA CA
                                                                           Section 80
                                 4425 4430      4440      4450      4460      4470   4480
                          (4425)
MOUSE TYPEII TGFB1 NCBI B (3607) GTGAGCAGCACCCTGAGGAACATCTGACATTGACTGACTTCTGGTCTCCATCACAG
MOUSE TYPEII TGFB1 NCBI A (3682) GTGAGCAGCACCCTGAGGAACATCTGACATTGACTGACTTCTGGTCTCCATCACAG
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3660) ---AGTTTTACCCTCTG---CATTGGAGAGAG---GAGTGCTTTACTCCAAGA-AG
HUMAN TYPEII TGFB1 NCBI-A (3735) ---AGTTTTACCCTCTG---CATTGGAGAGAG---GAGTGCTTTACTCCAAGA-AG
 RABBIT TYPEII TGFB1 NCBI (4293) TAAAGCAATAGCATCACAAATTTCACAAATAAAGCATTTTTTTCACTGCATTCTAG
                Consensus (4425)    AGCA TACCCTCAG AACATC GA ATAGA  GA TTCTT ACTCCAT A AG
                                                                           Section 81
                                 4481     4490      4500      4510      4520         4536
                          (4481)
MOUSE TYPEII TGFB1 NCBI B (3663) GTGC-----------ACCCACGAACACCCACACACACGT---GCACACACTAGAAA
MOUSE TYPEII TGFB1 NCBI A (3738) GTGC-----------ACCCACGAACACCCACACACACGT---GCACACACTAGAAA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3706) CTTT-----------CCTCATGGTTAC---------CGT---TCTC----------
HUMAN TYPEII TGFB1 NCBI-A (3781) CTTT-----------CCTCATGGTTAC---------CGT---TCTC----------
 RABBIT TYPEII TGFB1 NCBI (4349) TTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCCTCTACGCCG
                Consensus (4481)  TGT           ACTCATGAATAC       CACGT   GCTC      G
                                                                           Section 82
                                 4537         4550      4560      4570      4580     4592
                          (4537)
MOUSE TYPEII TGFB1 NCBI B (3705) TGTGCATTCATTTCACCCTGTTCTGGG-AACAGATTGGATTGCACAAAACTTATCT
MOUSE TYPEII TGFB1 NCBI A (3780) TGTGCATTCATTTCACCCTGTTCTGGG-AACAGATTGGATTGCACAAAACTTATCT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3729) --TCCAT-CATGCCAGCCTTCTC-----AACCT------TTGCAGAAA--TTACTA
HUMAN TYPEII TGFB1 NCBI-A (3804) --TCCAT-CATGCCAGCCTTCTC-----AACCT------TTGCAGAAA--TTACTA
 RABBIT TYPEII TGFB1 NCBI (4405) GACGCATCGTGGCCGGCATCACCGGCGCCACAGGTGCGGTTGCTGGCGCCTATATC
                Consensus (4537)   TGCAT CATGCCAGCCT  TC G G AACAG T  G TTGCAGAAA CTTA T
                                                                           Section 83
                                 4593   4600      4610      4620      4630           4648
                          (4593)
MOUSE TYPEII TGFB1 NCBI B (3760) GATGTTAT----GATTTGAAATT---G--ACATAAATTGGACATCAGGAGACCACC
MOUSE TYPEII TGFB1 NCBI A (3835) GATGTTAT----GATTTGAAATT---G--ACATAAATTGGACATCAGGAGACCACC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3769) GAG---AG----GATTTGAATGT---GGGACACAAAGGTCCCATTTGCAGTTAGAA
HUMAN TYPEII TGFB1 NCBI-A (3844) GAG---AG----GATTTGAATGT---GGGACACAAAGGTCCCATTTGCAGTTAGAA
 RABBIT TYPEII TGFB1 NCBI (4461) GCCGACATCACCGATGGGGAAGATCGGGCTCGCCACTTCGGGCTCATGAGCGCTTG
                Consensus (4593) GA G  AT    GATTTGAAAGT   GG ACACAAATT G CATCAGGAG  C
                                                                           Section 84
                                 4649       4660      4670      4680      4690       4704
                          (4649)
MOUSE TYPEII TGFB1 NCBI B (3807) TGTGTGTGACCTCATTAGGTCAGGGCTCTTTGTATGCATAATAAGTTTCATCTGCC
MOUSE TYPEII TGFB1 NCBI A (3882) TGTGTGTGACCTCATTAGGTCAGGGCTCTTTGTATGCATAATAAGTTTCATCTGCC
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3815) AATTTGTGTCCACA--AGGACAAGAA-CAAAGTATG------AGCTTTAAAA----
HUMAN TYPEII TGFB1 NCBI-A (3890) AATTTGTGTCCACA--AGGACAAGAA-CAAAGTATG------AGCTTTAAAA----
 RABBIT TYPEII TGFB1 NCBI (4517) TTTCGGCGTGGGTATGGTGGCAGGCCCCGTGGCCGGG---GGACTGTTGGGCGCCA
                Consensus (4649) T T TGTGTCC CAT AGG CAGG C C T GTATG      A  TTT A C  C
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TGFBR2 alignment

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                                                                            Section 85
                          (4705) 4705 4710      4720      4730      4740      4750   4760
MOUSE TYPEII TGFB1 NCBI B (3863) TCTGCAAGGGAACCTCTCTGCTCTAAGAATCTTTCTTTATGG-----------CTA
MOUSE TYPEII TGFB1 NCBI A (3938) TCTGCAAGGGAACCTCTCTGCTCTAAGAATCTTTCTTTATGG-----------CTA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3858) -CTCCATAGGAAACTTGTTAATCAACAAAGAAGTGTTAATG------------CTG
HUMAN TYPEII TGFB1 NCBI-A (3933) -CTCCATAGGAAACTTGTTAATCAACAAAGAAGTGTTAATG------------CTG
 RABBIT TYPEII TGFB1 NCBI (4570) TCTCCTTGCATGCACCATTCCTTGCGGCGGCGGTGCTCAACGGCCTCAACCTACTA
                Consensus (4705) TCTCCATGGGAACCTC TT CTC A GAAGC GTGTT ATGG           CTA
                                                                            Section 86
                          (4761) 4761     4770      4780      4790      4800         4816
MOUSE TYPEII TGFB1 NCBI B (3908) CTGGTCTCTGCATGGTCCTAACCTTGGCAGAAATTACAAGTGCATATTTGAACAGG
MOUSE TYPEII TGFB1 NCBI A (3983) CTGGTCTCTGCATGGTCCTAACCTTGGCAGAAATTACAAGTGCATATTTGAACAGG
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3901) CAAGTAATCTCTTTTTTAAAACTTT--TTGAAGCTACT------TATTTTCA---G
HUMAN TYPEII TGFB1 NCBI-A (3976) CAAGTAATCTCTTTTTTAAAACTTT--TTGAAGCTACT------TATTTTCA---G
 RABBIT TYPEII TGFB1 NCBI (4626) CTGGGCTGCTTCCTAATGCAGGAGTCGCATAAGGGAGAGCGTCGAGACTCCATCTC
                Consensus (4761) CTGGTCT CTC TT TT  AAC TT GCAGAAG TACA    C TATTT CA   G
                                                                            Section 87
                          (4817) 4817         4830      4840      4850      4860     4872
MOUSE TYPEII TGFB1 NCBI B (3964) GGTCACACAGGACTCCTG----TGTAGAGACAGGGACTCTGTGTCCACTTGGATGA
MOUSE TYPEII TGFB1 NCBI A (4039) GGTCACACAGGACTCCTG----TGTAGAGACAGGGACTCTGTGTCCACTTGGATGA
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3946) C--CAAATAGGAATATT----------AGAGAGGGACT------------GGTAGT
HUMAN TYPEII TGFB1 NCBI-A (4021) C--CAAATAGGAATATT----------AGAGAGGGACT------------GGTAGT
 RABBIT TYPEII TGFB1 NCBI (4682) AAAAATAAAATAAAATAAAAATTAAAAAAAAAGGGCCCTTGTGCAAAGCTGACAGC
                Consensus (4817)    CA A AGGAATATT     T  A AGA AGGGACT TGTG   A  TGG AG
                                                                            Section 88
                          (4873) 4873   4880      4890      4900      4910           4928
MOUSE TYPEII TGFB1 NCBI B (4016) GAGCAGGGAATGAGCTTTAAAAGGAAACTTGTTAATCCCCCAACAAATGTGGATGT
MOUSE TYPEII TGFB1 NCBI A (4091) GAGCAGGGAATGAGCTTTAAAAGGAAACTTGTTAATCCCCCAACAAATGTGGATGT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (3978) GAGAA---TATCAGCTCT------------GTT----------------TGGATGG
HUMAN TYPEII TGFB1 NCBI-A (4053) GAGAA---TATCAGCTCT------------GTT----------------TGGATGG
 RABBIT TYPEII TGFB1 NCBI (4738) TTGTATG-TTTCTGCTGTTGACATTTGTGGGCTGTTTACCAACACTTCTGGAACAC
                Consensus (4873) GAG A G TATCAGCT T  A         GTT  T  CC A       TGGATG
                                                                            Section 89
                          (4929) 4929       4940      4950      4960      4970       4984
MOUSE TYPEII TGFB1 NCBI B (4072) TGCAAACCAAAGTCTGTC----TTGTTAAGAAATTGTGTTTTGAAGCGACTTATT
MOUSE TYPEII TGFB1 NCBI A (4147) TGCAAACCAAAGTCTGTC----TTGTTAAGAAATTGTGTTTTGAAGCGACTTATT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4003) TGGA-----AGGTC--TC----ATTTT-----ATTGAGATTTTTAAGA--------
HUMAN TYPEII TGFB1 NCBI-A (4078) TGGA-----AGGTC--TC----ATTTT-----ATTGAGATTTTTAAGA--------
 RABBIT TYPEII TGFB1 NCBI (4793) AGCAGTGGAAGGGACTTCCCAGATATTTTAAAATTACCCTTAGAAAGCGGTCTGTG
                Consensus (4929) TGCA    AAGGTC  TC    AT TT   AAATTG G TTTT AAGCG   T T
                                                                            Section 90
                          (4985) 4985 4990      5000      5010      5020      5030   5040
MOUSE TYPEII TGFB1 NCBI B (4124) TTCAACC-------AAATAGGAGCATGATTGGAGAACCACCAA---GGGGGCCTTT
MOUSE TYPEII TGFB1 NCBI A (4199) TTCAACC-------AAATAGGAGCATGATTGGAGAACCACCAA---GGGGGCCTTT
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4035) TACATGC-------AAAG----GTTTGGAAATAGAACCTCTA------GGCACCCT
HUMAN TYPEII TGFB1 NCBI-A (4110) TACATGC-------AAAG----GTTTGGAAATAGAACCTCTA------GGCACCCT
 RABBIT TYPEII TGFB1 NCBI (4849) AAAAACCCCTACCCAATTTCCTTTTTGTTAAGTGACCTAATTAACAGGAGGACACA
                Consensus (4985) TACAACC       AAAT    GTTTG TAAGAGAACCACTAA   GGGGGAC CT
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TGFBR2 alignment

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                                                                                   Section 91
                            (5041)  5041        5050         5060         5070         5080           5096
     MOUSE TYPEII TGFB1 NCBI B (4170)  TGTTCTGTTTGGTCAAC--ATGGTCAAATTGGGGGTAGGA---CAAAAATCTATGT
     MOUSE TYPEII TGFB1 NCBI A (4245)  TGTTCTGTTTGGTCAAC--ATGGTCAAATTGGGGGTAGGA---CAAAAATCTATGT
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4074)  CCT-CAGTGTGGG-------TGGGC----TGAGAGTT------AAAGACAGTGTGG
    HUMAN TYPEII TGFB1 NCBI-A (4149)  CCT-CAGTGTGGG-------TGGGC----TGAGAGTT------AAAGACAGTGTGG
      RABBIT TYPEII TGFB1 NCBI (4905)  GAGGGTGGATGGGCAGCCTATGATTGGAATGTCCTCTCAAGTAGAGGAGGTTAGGG
                     Consensus (5041)    T CTGT TGGGCA C  ATGGTC  A TG G GTT  A    AAGA   TATGG
                                                                                   Section 92
                            (5097)  5097             5110         5120         5130         5140        5152
     MOUSE TYPEII TGFB1 NCBI B (4221)  GTTCTGTGG-CTTCGAACACCAT-----GGAAACCCCAAGCCCACTTGCTTCTTT
     MOUSE TYPEII TGFB1 NCBI A (4296)  GTTCTGTGG-CTTCGAACACCAT-----GGAAACCCCAAGCCCACTTGCTTCTTT
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4112)  CTGCAGTAG-CATAGAGGCGCCT-----AGAAAT-------TCCACTTGCACCGTA
    HUMAN TYPEII TGFB1 NCBI-A (4187)  CTGCAGTAG-CATAGAGGCGCCT-----AGAAAT-------TCCACTTGCACCGTA
      RABBIT TYPEII TGFB1 NCBI (4961)  TTTATGAGGACACAGAGGAGCTTCCTGGGGATCCAGACATGATAAGATACATTGAT
                     Consensus (5097)   TTCTGTGG CATAGAGGAGC T     GGAAAC   CA G CCACTTGCATCGTT
                                                                                   Section 93
                            (5153)  5153   5160          5170         5180         5190               5208
     MOUSE TYPEII TGFB1 NCBI B (4271)  TGGATTGCCAGTGCTA-ACCCAGTAGCTGTTGTTCACCGCCCTCTAGCGGGGAATT
     MOUSE TYPEII TGFB1 NCBI A (4346)  TGGATTGCCAGTGCTA-ACCCAGTAGCTGTTGTTCACCGCCCTCTAGCGGGGAATT
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4155)  GGGCATGCTGATACCA-TCCCAATAGCTGTTGCCCATTGACCTCTAGTGGTGAGTT
    HUMAN TYPEII TGFB1 NCBI-A (4230)  GGGCATGCTGATACCA-TCCCAATAGCTGTTGCCCATTGACCTCTAGTGGTGAGTT
      RABBIT TYPEII TGFB1 NCBI (5017)  GAGTTTGGACAAACCACAACTAGAATGCAGTGAAAAAAATGCTTTATTTGTGAAAT
                     Consensus (5153)  GGG TTGC  ATACCA ACCCAGTAGCTGTTG  CA  G CCTCTAGTGGTGAATT
                                                                                   Section 94
                            (5209)  5209          5220         5230         5240         5250        5264
     MOUSE TYPEII TGFB1 NCBI B (4326)  TACAGAA--TGCTGGTCCACTAGTGGGATTTCTAGGGTTCAA-AAGTGACTTCACT
     MOUSE TYPEII TGFB1 NCBI A (4401)  TACAGAA--TGCTGGTCCACTAGTGGGATTTCTAGGGTTCAA-AAGTGACTTCACT
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4210)  TCTAGAA--TACTGGTCCATTCATGAGATATTCAAGATTCAA-GAGTATTCTCACT
    HUMAN TYPEII TGFB1 NCBI-A (4285)  TCTAGAA--TACTGGTCCATTCATGAGATATTCAAGATTCAA-GAGTATTCTCACT
      RABBIT TYPEII TGFB1 NCBI (5073)  TTGTGATGCTATTGCTTTATTTGTAACCATTATAAGCTGCAATAAACAAGTTAACA
                     Consensus (5209)  T  AGAA  TACTGGTCCATT GTGAGATTT TAAG TTCAA AAGTAA TTCACT
                                                                                   Section 95
                            (5265)  5265 5270          5280         5290         5300         5310   5320
     MOUSE TYPEII TGFB1 NCBI B (4379)  TCCGGGTCATCATCAGAAACTGGAATATGGTGTCAT--GTTACTGTGGCTTGTTTT
     MOUSE TYPEII TGFB1 NCBI A (4454)  TCCGGGTCATCATCAGAAACTGGAATATGGTGTCAT--GTTACTGTGGCTTGTTTT
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4263)  TCTGGGTTATCAGCATAAACTGGAATGTAGTGTCAGAGGATACTGTGGCTTGTTTT
    HUMAN TYPEII TGFB1 NCBI-A (4338)  TCTGGGTTATCAGCATAAACTGGAATGTAGTGTCAGAGGATACTGTGGCTTGTTTT
      RABBIT TYPEII TGFB1 NCBI (5129)  ACAACAATTGCATTC-ATTTTATGTTTCAGGTTCAGGGGGAGGTGTGGGAGGTTT-
                     Consensus (5265)  TC GGGTTATCATCA AAACTGGAAT TAGTGTCAG GG TACTGTGGCTTGTTTT
                                                                                   Section 96
                            (5321)  5321         5330         5340         5350         5360        5376
     MOUSE TYPEII TGFB1 NCBI B (4433)  GTTTATGTCATTTCTTTTCTTTATTCAAGAAAAA-GACCAAGGAATAGCATCGCTG
     MOUSE TYPEII TGFB1 NCBI A (4508)  GTTTATGTCATTTCTTTTCTTTATTCAAGAAAAA-GACCAAGGAATAGCATCGCTG
       RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4319)  GTTTATGT--TTTTTTTTCTT-ATTCAAGAAAAAAGACCAAGGAATAACATT-CTG
    HUMAN TYPEII TGFB1 NCBI-A (4394)  GTTTATGT--TTTTTTTTCTT-ATTCAAGAAAAAAGACCAAGGAATAACATT-CTG
      RABBIT TYPEII TGFB1 NCBI (5183)  -TTTAAAGCAAGTAAAACCTCTACAAATGTGGTATGGCTGATTATGATCTCTAGTC
                     Consensus (5321)  GTTTATGTCATTT TTTTCTTTATTCAAGAAAAA GACCAAGGAATA CATT CTG
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TGFBR2 alignment

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Section 97
                                  5377        5390        5400        5410        5420        5432
(5377)
MOUSE TYPEII TGFB1 NCBI B (4488)  TCATTCCTCAAAGTGTTGACTC--TTGTTCACTACTCTACA---TAAAGGGAAAGT
MOUSE TYPEII TGFB1 NCBI A (4563)  TCATTCCTCAAAGTGTTGACTC--TTGTTCACTACTCTACA---TAAAGGGAAAGT
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4371)  TAGTTCCTAAAAATACTGACT---TTTTTCACTACTATACA---TAAAGGGAAAGT
HUMAN TYPEII TGFB1 NCBI-A (4446)  TAGTTCCTAAAAATACTGACT---TTTTTCACTACTATACA---TAAAGGGAAAGT
RABBIT TYPEII TGFB1 NCBI (5238)   AAGGCACTATACATCAAATATTCCTTATTAACCCCTTTACAAATTAAAAAGCTAAA
Consensus (5377)                  TAGTTCCTAAAAAT   TGACT    TT TTCACTACT TACA    TAAAGGGAAAGT
Section 98
                                  5433    5440        5450        5460        5470        5488
(5433)
MOUSE TYPEII TGFB1 NCBI B (4539)  TTTATTCTTTTATTGAACACTTCGGCCATATTCATGTATTCAAATAGGAATGTGAA
MOUSE TYPEII TGFB1 NCBI A (4614)  TTTATTCTTTTATTGAACACTTCGGCCATATTCATGTATTCAAATAGGAATGTGAA
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4421)  TTTATTCTTTTATGGAACACTTCAGCTGTACTCATGTATTAAAATAGGAATGTGAA
HUMAN TYPEII TGFB1 NCBI-A (4496)  TTTATTCTTTTATGGAACACTTCAGCTGTACTCATGTATTAAAATAGGAATGTGAA
RABBIT TYPEII TGFB1 NCBI (5294)   GGTACACAATTTTTGAGCATAGTTATTAATAGCAGACACTCTA-TGCCTGTGTGGA
Consensus (5433)                  TTTATTCTTTTATTGAACACTTC GCTATA TCATGTATTCAAATAGGAATGTGAA
Section 99
                                  5489        5500        5510        5520        5530        5544
(5489)
MOUSE TYPEII TGFB1 NCBI B (4595)  TGAATGCACAATATTCTTTTTATATCAAAAC-CTAAAGC--ACTTAT-----TTTC
MOUSE TYPEII TGFB1 NCBI A (4670)  TGAATGCACAATATTCTTTTTATATCAAAAC-CTAAAGC--ACTTAT-----TTTC
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4477)  T----GCTATATACTCTTTTTATATCAAAAGTCTCAAGC--ACTTAT-----TTTT
HUMAN TYPEII TGFB1 NCBI-A (4552)  T----GCTATATACTCTTTTTATATCAAAAGTCTCAAGC--ACTTAT-----TTTT
RABBIT TYPEII TGFB1 NCBI (5349)   GTAAGAAAAAACAGTATGTTATGATTATAACTGTTATGCCTACTTATAAAGGTTAC
Consensus (5489)                  T  AA GCAAAATA TCTTTTTATATCAAAACTCT AAGC   ACTTAT      TTTC
Section 100
                                  5545 5550        5560        5570        5580        5590 5600
(5545)
MOUSE TYPEII TGFB1 NCBI B (4643)  AATCTATG---CAGTGTTTGTCTTTTATATAAATAAAAATGTCTAGTAGATCAAAT
MOUSE TYPEII TGFB1 NCBI A (4718)  AATCTATG---CAGTGTTTGTCTTTTATATAAATAAAAATGTCTAGTAGATCAAAT
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4522)  ATTCTATG---CATTGTTTGTCTTTTACATAAATAAAA-TGTTTATTAGATTGAAT
HUMAN TYPEII TGFB1 NCBI-A (4597)  ATTCTATG---CATTGTTTGTCTTTTACATAAATAAAA-TGTTTATTAGATTGAAT
RABBIT TYPEII TGFB1 NCBI (5405)   AGAATATTTTTCCATAATTTTCTTGTATAGCAGTGCAGCTTTTTCCTTTGTGGTGT
Consensus (5545)                  A  TCTATG   CA TGTTTGTCTTTTATATAAATAAAA TGTTTA TAGAT GAAT
Section 101
                                  5601        5610        5620        5630        5640        5656
(5601)
MOUSE TYPEII TGFB1 NCBI B (4696)  AAATC-CAAAGTCCGCAGAAAAAAAAAAAAAAAA----------------------
MOUSE TYPEII TGFB1 NCBI A (4771)  AAATC-CAAAGTCCGCAGAAAAAAAAAAAAAAAA----------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4574)  AAAGC-AAAA-TACTCAGGTGAGCATCCTGCCTCCTGTTCCCATTCCTAGTAGCTA
HUMAN TYPEII TGFB1 NCBI-A (4649)  AAAGC-AAAA-TACTCAGGTGAGCATCCTGCCTCCTGTTCCCATTCCTAGTAGCTA
RABBIT TYPEII TGFB1 NCBI (5461)   AAATAGCAAAGCAAGCAAGAGTTCTATTACTAAACACAGCATGACTCAAAAACTT
Consensus (5601)                  AAATC CAAAGTACGCAGGAGA CAA   A  AAAC    C       C A  A CT
Section 102
                                  5657        5670        5680        5690        5700        5712
(5657)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4628)  AA----------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4703)  AA----------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (5517)   AGCAATTCTGAAGGAAAGTCCTTGGGGTCTTCTACCTTTCTCTTCTTTTTTGGAGG
Consensus (5657)                  A
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                                                                              Section 103
                          (5713) 5713   5720      5730      5740      5750           5768
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5573) AGTAGAATGTTGAGAGTCAGCAGTAGCCTCATCATCACTAGATGGCATTTCTTCTG
                Consensus (5713)
                                                                              Section 104
                          (5769) 5769       5780      5790      5800      5810       5824
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5629) AGCAAAACAGGTTTTCCTCATTAAAGGCATTCCACCACTGCTCCCATTCATCAGTT
                Consensus (5769)
                                                                              Section 105
                          (5825) 5825 5830      5840      5850      5860      5870   5880
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5685) CCATAGGTTGGAATCTAAAATACACAAACAATTAGAATCAGTAGTTTAACACATTA
                Consensus (5825)
                                                                              Section 106
                          (5881) 5881     5890      5900      5910      5920         5936
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5741) TACACTTAAAAATTTTATATTTACCTTAGAGCTTTAAATCTCTGTAGGTAGTTTGT
                Consensus (5881)
                                                                              Section 107
                          (5937) 5937         5950      5960      5970      5980     5992
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5797) CCAATTATGTCACACCACAGAAGTAAGGTTCCTTCACAAAGATCTAAAGCCAGCAA
                Consensus (5937)
                                                                              Section 108
                          (5993) 5993   6000      6010      6020      6030           6048
MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
    RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
 RABBIT TYPEII TGFB1 NCBI (5853) AAGTCCCATGGTCTTATAAAAATGCATAGCTTTAGGAGGGGAGCAGAGAACTTGAA
                Consensus (5993)
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                                                                                                                6049        6060        6070        6080        6090        6104
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                                                                                                                AGCATCTTCCTGTTAGTCTTTCTTCTCGTAGACTTCAAACTTATACTTGATGCCTT
                                                                                                                Section 110
                                                                                                                6105 6110        6120        6130        6140        6150 6160
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                                                                                                                TTTCCTCCTGGACCTCAGAGAGGACGCCTGGGTATTCTGGGAGAAGTTTATATTTC
                                                                                                                Section 111
                                                                                                                6161        6170        6180        6190        6200        6216
                                                                                                                ------------------------------------------------------------
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                                                                                                                ------------------------------------------------------------
                                                                                                                CCCAAATCAATTTCTGGGAAAAACGTGTCACTTTCAAATTCCTGCATGATCCTTGT
                                                                                                                Section 112
                                                                                                                6217        6230        6240        6250        6260        6272
                                                                                                                ------------------------------------------------------------
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                                                                                                                ------------------------------------------------------------
                                                                                                                CACAAAGAGTCTGAGGTGGCCTGGTTGATTCATGGCTTCCTGGTAAACAGAACTGC
                                                                                                                Section 113
                                                                                                                6273 6280        6290        6300        6310        6328
                                                                                                                ------------------------------------------------------------
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                                                                                                                CTCCGACTATCCAAACCATGTCTACTTTACTTGCCAATTCCGGTTGTTCAATAAGT
                                                                                                                Section 114
                                                                                                                6329        6340        6350        6360        6370        6384
                                                                                                                ------------------------------------------------------------
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                                                                                                                CTTAAGGCATCATCCAAACTTTTGGCAAGAAAATGAGCTCCTCGTGGTGGTTCTTT
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                                                                                   Section 115
                           (6385) 6385 6390      6400      6410      6420      6430      6440
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6245) GAGTTCTCTACTGAGAACTATATTAATTCTGTCCTTTAAAGGTCGATTCTTCTCAG
                  Consensus (6385)
                                                                                   Section 116
                           (6441) 6441     6450      6460      6470      6480            6496
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6301) GAATGGAGAACCAGGTTTTCCTACCCATAATCACCAGATTCTGTTTACCTTCCACT
                  Consensus (6441)
                                                                                   Section 117
                           (6497) 6497         6510      6520      6530      6540      6552
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6357) GAAGAGGTTGTGGTCATTCTTTGGAAGTACTTGAACTCGTTCCTGAGCGGAGGCCA
                  Consensus (6497)
                                                                                   Section 118
                           (6553) 6553  6560      6570      6580      6590            6608
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6413) GGGTAGGTCTCCGTTCTTGCCAATCCCCATATTTTGGGACACGGCGACGATGCAGT
                  Consensus (6553)
                                                                                   Section 119
                           (6609) 6609       6620      6630      6640      6650          6664
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6469) TCAATGGTCGAACCATGATGGCAGCGGGGATAAAATCCTACCAGCCTTCACGCTAG
                  Consensus (6609)
                                                                                   Section 120
                           (6665) 6665 6670      6680      6690      6700      6710      6720
  MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
  HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (6525) GATTGCCGTCAAGTTTGGCGCGAAATCGCAGCCCTGAGCTGTCCCCCCCCCCAAGC
                  Consensus (6665)
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                                                                                   Section 121
                                (6721) 6721      6730        6740        6750        6760             6776
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6581) TTTTTGCAAAAGCCTAGGCCTCCAAAAAAGCCTCCTCACTACTTCTGGAATAGCTC
                       Consensus (6721)
                                                                                   Section 122
                                (6777) 6777           6790        6800        6810        6820       6832
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6637) AGAGGCCGAGGCGGCCTCGGCCTCTGCATAAATAAAAAAAATTAGTCAGCCATGGG
                       Consensus (6777)
                                                                                   Section 123
                                (6833) 6833   6840        6850        6860        6870              6888
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6693) GCGGAGAATGGGCGGAACTGGGCGGAGTTAGGGGCGGGATGGGCGGAGTTAGGGGC
                       Consensus (6833)
                                                                                   Section 124
                                (6889) 6889       6900        6910        6920        6930          6944
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6749) GGGACTATGGTTGCTGACTAATTGAGATGCTGCCTCGCGCGTTTCGGTGATGACGG
                       Consensus (6889)
                                                                                   Section 125
                                (6945) 6945 6950        6960        6970        6980        6990    7000
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6805) TGAAAACCTCTGACACATGCAGCTCCCGGAGACGGTCACAGCTTGTCTGTAAGCGG
                       Consensus (6945)
                                                                                   Section 126
                                (7001) 7001      7010        7020        7030        7040             7056
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6861) ATGCCGGGAGCAGACAAGCCCGTCAGGGCGCGTCAGCGGGTGTTGGCGGGTGTCGG
                       Consensus (7001)
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                                                                                    Section 127
                               (7057) 7057            7070         7080         7090         7100          7112
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6917) GGCGCAGCCATGACCCAGTCACGTAGCGATAGCGGAGTGTATACTGGCTTAACTAT
                        Consensus (7057)
                                                                                    Section 128
                               (7113) 7113   7120         7130         7140         7150                7168
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (6973) GCGGCATCAGAGCAGATTGTACTGAGAGTGCACCATATGCGGTGTGAAATACCGCA
                        Consensus (7113)
                                                                                    Section 129
                               (7169) 7169         7180         7190         7200         7210          7224
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (7029) CAGATGCGTAAGGAGAAAATACCGCATCAGGCGCTCTTCCGCTTCCTCGCTCACTG
                        Consensus (7169)
                                                                                    Section 130
                               (7225) 7225 7230         7240         7250         7260         7270     7280
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (7085) ACTCGCTGCGCTCGGTCGTTCGGCTGCGGCGAGCGGTATCAGCTCACTCAAAGGCG
                        Consensus (7225)
                                                                                    Section 131
                               (7281) 7281       7290         7300         7310         7320             7336
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (7141) GTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGAAAGAACATGTGAGCAAA
                        Consensus (7281)
                                                                                    Section 132
                               (7337) 7337            7350         7360         7370         7380          7392
       MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
       MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
            RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
       HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
         RABBIT TYPEII TGFB1 NCBI (7197) AGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCGTTGCTGGCGTTTTTCCATA
                        Consensus (7337)
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                                                                                        Section 133
                           (7393) 7393   7400          7410          7420          7430                7448
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7253) GGCTCCGCCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAGAGGTGGCGA
                    Consensus (7393)
                                                                                        Section 134
                           (7449) 7449          7460          7470          7480          7490          7504
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7309) AACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTCGTGCG
                    Consensus (7449)
                                                                                        Section 135
                           (7505) 7505 7510          7520          7530          7540          7550     7560
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7365) CTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCGG
                    Consensus (7505)
                                                                                        Section 136
                           (7561) 7561       7570          7580          7590          7600             7616
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7421) GAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTC
                    Consensus (7561)
                                                                                        Section 137
                           (7617) 7617             7630          7640          7650          7660       7672
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7477) GTTCGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCGACCGCTGCGC
                    Consensus (7617)
                                                                                        Section 138
                           (7673) 7673   7680          7690          7700          7710                7728
    MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
    MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (7533) CTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCAC
                    Consensus (7673)
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TGFBR2 alignment

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                                                                                    Section 139
                            (7729)  7729       7740      7750      7760      7770          7784
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7589)  TGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACA
                  Consensus (7729)
                                                                                    Section 140
                            (7785)  7785 7790      7800      7810      7820      7830      7840
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7645)  GAGTTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTAT
                  Consensus (7785)
                                                                                    Section 141
                            (7841)  7841     7850      7860      7870      7880            7896
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7701)  CTGCGCTCTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCG
                  Consensus (7841)
                                                                                    Section 142
                            (7897)  7897         7910      7920      7930      7940      7952
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7757)  GCAAACAAACCACCGCTGGTAGCGGTGGTTTTTTTGTTTGCAAGCAGCAGATTACG
                  Consensus (7897)
                                                                                    Section 143
                            (7953)  7953  7960      7970      7980      7990              8008
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7813)  CGCAGAAAAAAAGGATCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGC
                  Consensus (7953)
                                                                                    Section 144
                            (8009)  8009       8020      8030      8040      8050          8064
  MOUSE TYPEII TGFB1 NCBI B (4729)  --------------------------------------------------------
  MOUSE TYPEII TGFB1 NCBI A (4804)  --------------------------------------------------------
      RAT TYPEII TGFB1 NCBI (2081)  --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
   HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
   RABBIT TYPEII TGFB1 NCBI (7869)  TCAGTGGAACGAAAACTCACGTTAAGGGATTTTGGTCATGAGATTATCAAAAAGGA
                  Consensus (8009)
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                                                                                            Section 145
                              (8065) 8065 8070          8080          8090          8100          8110      8120
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (7925) TCTTCACCTAGATCCTTTTAAATTAAAAATGAAGTTTTAAATCAATCTAAAGTATA
                     Consensus (8065)
                                                                                            Section 146
                              (8121) 8121        8130          8140          8150          8160          8176
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (7981) TATGAGTAAACTTGGTCTGACAGTTACCAATGCTTAATCAGTGAGGCACCTATCTC
                     Consensus (8121)
                                                                                            Section 147
                              (8177) 8177             8190          8200          8210          8220      8232
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (8037) AGCGATCTGTCTATTTCGTTCATCCATAGTTGCCTGACTCCCCGTCGTGTAGATAA
                     Consensus (8177)
                                                                                            Section 148
                              (8233) 8233   8240          8250          8260          8270                8288
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (8093) CTACGATACGGGAGGGCTTACCATCTGGCCCCAGTGCTGCAATGATACCGCGAGAC
                     Consensus (8233)
                                                                                            Section 149
                              (8289) 8289          8300          8310          8320          8330          8344
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (8149) CCACGCTCACCGGCTCCAGATTTATCAGCAATAAACCAGCCAGCCGGAAGGGCCGA
                     Consensus (8289)
                                                                                            Section 150
                              (8345) 8345 8350          8360          8370          8380          8390      8400
     MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
     MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
        RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
     HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
      RABBIT TYPEII TGFB1 NCBI (8205) GCGCAGAAGTGGTCCTGCAACTTTATCCGCCTCCATCCAGTCTATTAATTGTTGCC
                     Consensus (8345)
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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    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Section 151

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                                                                                                                                       
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	8401 8410 8420 8430 8440 8456
(8401)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8261)	GGGAAGCTAGAGTAAGTAGTTCGCCAGTTAATAGTTTGCGCAACGTTGTTGCCATT
Consensus (8401)	

Section 152

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                                                                     
```

	8457 8470 8480 8490 8500 8512
(8457)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8317)	GCTGCAGGCATCGTGGTGTCACGCTCGTCGTTTGGTATGGCTTCATTCAGCTCCGG
Consensus (8457)	

Section 153

```
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
```

	8513 8520 8530 8540 8550 8568
(8513)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8373)	TTCCCAACGATCAAGGCGAGTTACATGATCCCCCATGTTGTGCAAAAAAGCGGTTA
Consensus (8513)	

Section 154

```
                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                
```

	8569 8580 8590 8600 8610 8624
(8569)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8429)	GCTCCTTCGGTCCTCCGATCGTTGTCAGAAGTAAGTTGGCCGCAGTGTTATCACTC
Consensus (8569)	

Section 155

```
                                                                                                                                                                                                                                                                                                                                                                                                                                                
```

	8625 8630 8640 8650 8660 8670 8680
(8625)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8485)	ATGGTTATGGCAGCACTGCATAATTCTCTTACTGTCATGCCATCCGTAAGATGCTT
Consensus (8625)	

Section 156

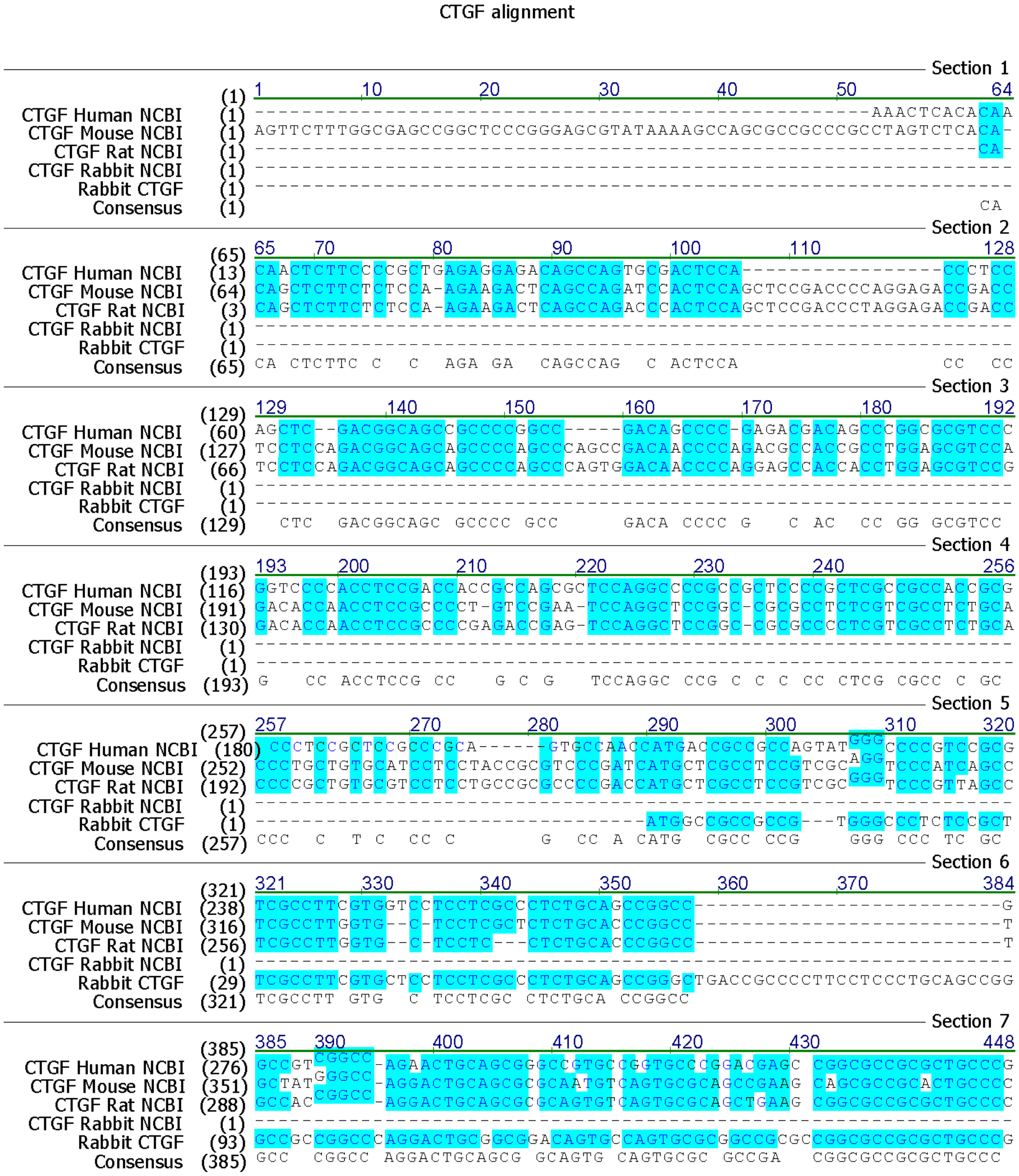
```
                                                                                                                                                                                                                                                                                                                                                
```

	8681 8690 8700 8710 8720 8736
(8681)	
MOUSE TYPEII TGFB1 NCBI B (4729)	----------
MOUSE TYPEII TGFB1 NCBI A (4804)	----------
RAT TYPEII TGFB1 NCBI (2081)	----------
HUMAN TYPEII TGFB1 NCBI-B (4630)	----------
HUMAN TYPEII TGFB1 NCBI-A (4705)	----------
RABBIT TYPEII TGFB1 NCBI (8541)	TTCTGTGACTGGTGAGTACTCAACCAAGTCATTCTGAGAATAGTGTATGCGGCGAC
Consensus (8681)	

```
                                                                                                                                Section 157
                                   8737          8750        8760        8770        8780        8792
                         (8737)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8597)   CGAGTTGCTCTTGCCCGGCGTCAACACGGGATAATACCGCGCCACATAGCAGAACT
Consensus (8737)
                                                                                                                                Section 158
                                   8793   8800        8810        8820        8830            8848
                         (8793)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8653)   TTAAAAGTGCTCATCATTGGAAAACGTTCTTCGGGGCGAAAACTCTCAAGGATCTT
Consensus (8793)
                                                                                                                                Section 159
                                   8849        8860        8870        8880        8890        8904
                         (8849)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8709)   ACCGCTGTTGAGATCCAGTTCGATGTAACCCACTCGTGCACCCAACTGATCTTCAG
Consensus (8849)
                                                                                                                                Section 160
                                   8905 8910        8920        8930        8940        8950 8960
                         (8905)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8765)   CATCTTTTACTTTCACCAGCGTTTCTGGGTGAGCAAAAACAGGAAGGCAAAATGCC
Consensus (8905)
                                                                                                                                Section 161
                                   8961      8970        8980        8990        9000            9016
                         (8961)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8821)   GCAAAAAAGGGAATAAGGGCGACACGGAAATGTTGAATACTCATACTCTTCCTTTT
Consensus (8961)
                                                                                                                                Section 162
                                   9017          9030        9040        9050        9060        9072
                         (9017)
MOUSE TYPEII TGFB1 NCBI B (4729)  ------------------------------------------------------------
MOUSE TYPEII TGFB1 NCBI A (4804)  ------------------------------------------------------------
RAT TYPEII TGFB1 NCBI (2081)      ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-B (4630)  ------------------------------------------------------------
HUMAN TYPEII TGFB1 NCBI-A (4705)  ------------------------------------------------------------
RABBIT TYPEII TGFB1 NCBI (8877)   TCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTG
Consensus (9017)
```

```
                                                                          Section 163
                          (9073) 9073   9080       9090       9100       9110                9128
   MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
   MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (8933) AATGTATTTAGAAAAATAAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTG
                   Consensus (9073)
                                                                          Section 164
                          (9129) 9129       9140       9150       9160       9170           9184
   MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------------------------------
   MOUSE TYPEII TGFB1 NCBI A (4804) --------------------------------------------------------
       RAT TYPEII TGFB1 NCBI (2081) --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4630) --------------------------------------------------------
    HUMAN TYPEII TGFB1 NCBI-A (4705) --------------------------------------------------------
     RABBIT TYPEII TGFB1 NCBI (8989) CCACCTGACGTCTAAGAAACCATTATTATCATGACATTAACCTATAAAAATAGGCG
                   Consensus (9129)
                                                                          Section 165
                          (9185) 9185 9190       9200            9217
   MOUSE TYPEII TGFB1 NCBI B (4729) --------------------------------
   MOUSE TYPEII TGFB1 NCBI A (4804) ---------------------------------
       RAT TYPEII TGFB1 NCBI (2081) ---------------------------------
    HUMAN TYPEII TGFB1 NCBI-B (4630) ---------------------------------
    HUMAN TYPEII TGFB1 NCBI-A (4705) ---------------------------------
     RABBIT TYPEII TGFB1 NCBI (9045) TATCACGAGGCCCTTTCGTCTTCAAGAATTCCG
                   Consensus (9185)
```

APPENDIX C
CTGF ALIGNMENT SEQUENCES



CTGF alignment

```
                                                                                     Section 1
                     (1) 1        10        20        30        40        50           64
  CTGF Human NCBI    (1) ----------------------------------------------------AAACTCACACAA
  CTGF Mouse NCBI    (1) AGTTCTTTGGCGAGCCGGCTCCCGGGAGCGTATAAAAGCCAGCGCCGCCCGCCTAGTCTCACA-
    CTGF Rat NCBI    (1) -------------------------------------------------------------CA-
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF    (1) ----------------------------------------------------------------
        Consensus    (1)                                                              CA
                                                                                     Section 2
                    (65) 65   70        80        90        100       110           128
  CTGF Human NCBI   (13) CAACTCTTCCCCGCTGAGAGGAGACAGCCAGTGCGACTCCA-----------------CCCTCC
  CTGF Mouse NCBI   (64) CAGCTCTTCTCTCCA-AGAAGACTCAGCCAGATCCACTCCAGCTCCGACCCCAGGAGACCGACC
    CTGF Rat NCBI    (3) CAGCTCTTCTCTCCA-AGAAGACTCAGCCAGACCCACTCCAGCTCCGACCCTAGGAGACCGACC
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF    (1) ----------------------------------------------------------------
        Consensus   (65) CA CTCTTC C  C  AGA GA  CAGCCAG  C ACTCCA                 CC  CC
                                                                                     Section 3
                   (129) 129        140       150       160       170       180       192
  CTGF Human NCBI   (60) AGCTC--GACGGCAGCCGCCCCGGCC-----GACAGCCCC-GAGACGACAGCCCGGCGCGTCCC
  CTGF Mouse NCBI  (127) TCCTCCAGACGGCAGCAGCCCCAGCCCAGCCGACAACCCCAGACGCCACCGCCTGGAGCGTCCA
    CTGF Rat NCBI   (66) TCCTCCAGACGGCAGCAGCCCCAGCCCAGTGGACAACCCCAGGAGCCACCACCTGGAGCGTCCG
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF    (1) ----------------------------------------------------------------
        Consensus  (129)   CTC  GACGGCAGC GCCCC GCC     GACA CCCC G   C AC  CC GG GCGTCC
                                                                                     Section 4
                   (193) 193    200       210       220       230       240           256
  CTGF Human NCBI  (116) GGTCCCCACCTCCGACCACCGCCAGCGCTCCAGGCCCCGCCGCTCCCCGCTCGCCGCCACCGCG
  CTGF Mouse NCBI  (191) GACACCAACCTCCGCCCCT-GTCCGAA-TCCAGGCTCCGGC-CGCGCCTCTCGTCGCCTCTGCA
    CTGF Rat NCBI  (130) GACACCAACCTCCGCCCCGAGACCGAG-TCCAGGCTCCGGC-CGCGCCCCTCGTCGCCTCTGCA
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF    (1) ----------------------------------------------------------------
        Consensus  (193) G   CC ACCTCCG CC   G C G   TCCAGGC CCG C C C CC CTCG CGCC C GC
                                                                                     Section 5
                   (257) 257          270       280       290       300       310     320
  CTGF Human NCBI  (180) CCCTCCGCTCCGCCCGCA------GTGCCAACCATGACCGCCGCCAGTATGGGCCCCGTCCGCG
  CTGF Mouse NCBI  (252) CCCTGCTGTGCATCCTCCTACCGCGTCCCGATCATGCTCGCCTCCGTCGCAGGTCCCATCAGCC
    CTGF Rat NCBI  (192) CCCCGCTGTGCGTCCTCCTGCCGCGCCCCGACCATGCTCGCCTCCGTCGCGGGTCCCGTTAGCC
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF    (1) ---------------------------------ATGGCCGCCGCCG---TGGGCCCTCTCCGCT
        Consensus  (257) CCC  C  T C  CC C       G  CC A CATG  CGCC CCG    GGG CCC TC GC
                                                                                     Section 6
                   (321) 321      330       340       350       360       370         384
  CTGF Human NCBI  (238) TCGCCTTCGTGGTCCTCCTCGCCCTCTGCAGCCGGCC--------------------------G
  CTGF Mouse NCBI  (316) TCGCCTTGGTG--C-TCCTCGCTCTCTGCACCCGGCC--------------------------T
    CTGF Rat NCBI  (256) TCGCCTTGGTG--C-TCCTC---CTCTGCACCCGGCC--------------------------T
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF   (29) TCGCCTTCGTGCTCCTCCTCGCCCTCTGCAGCCGGGCTGACCGCCCCTTCCTCCCTGCAGCCGG
        Consensus  (321) TCGCCTT GTG  C TCCTCGC CTCTGCA CCGGCC
                                                                                     Section 7
                   (385) 385  390       400       410       420       430           448
  CTGF Human NCBI  (276) GCCGTCGGCC-AGAACTGCAGCGGGCCGTGCCGGTGCCCGGACGAGC CGGCGCCGCGCTGCCCG
  CTGF Mouse NCBI  (351) GCTATGGGCC-AGGACTGCAGCGCGCAATGTCAGTGCGCAGCCGAAG CAGCGCCGCACTGCCCC
    CTGF Rat NCBI  (288) GCCACCGGCC-AGGACTGCAGCGCGCAGTGTCAGTGCGCAGCTGAAG CGGCGCCGCGCTGCCCC
 CTGF Rabbit NCBI    (1) ----------------------------------------------------------------
      Rabbit CTGF   (93) GCCGCCGGCCCAGGACTGCGGCGGACAGTGCCAGTGCGCGGCCGCGCCGGCGCCGCGCTGCCCG
        Consensus  (385) GCC  CGGCC AGGACTGCAGCG GCAGTG CAGTGCGC GCCGA  CGGCGCCGCGCTGCCC
```

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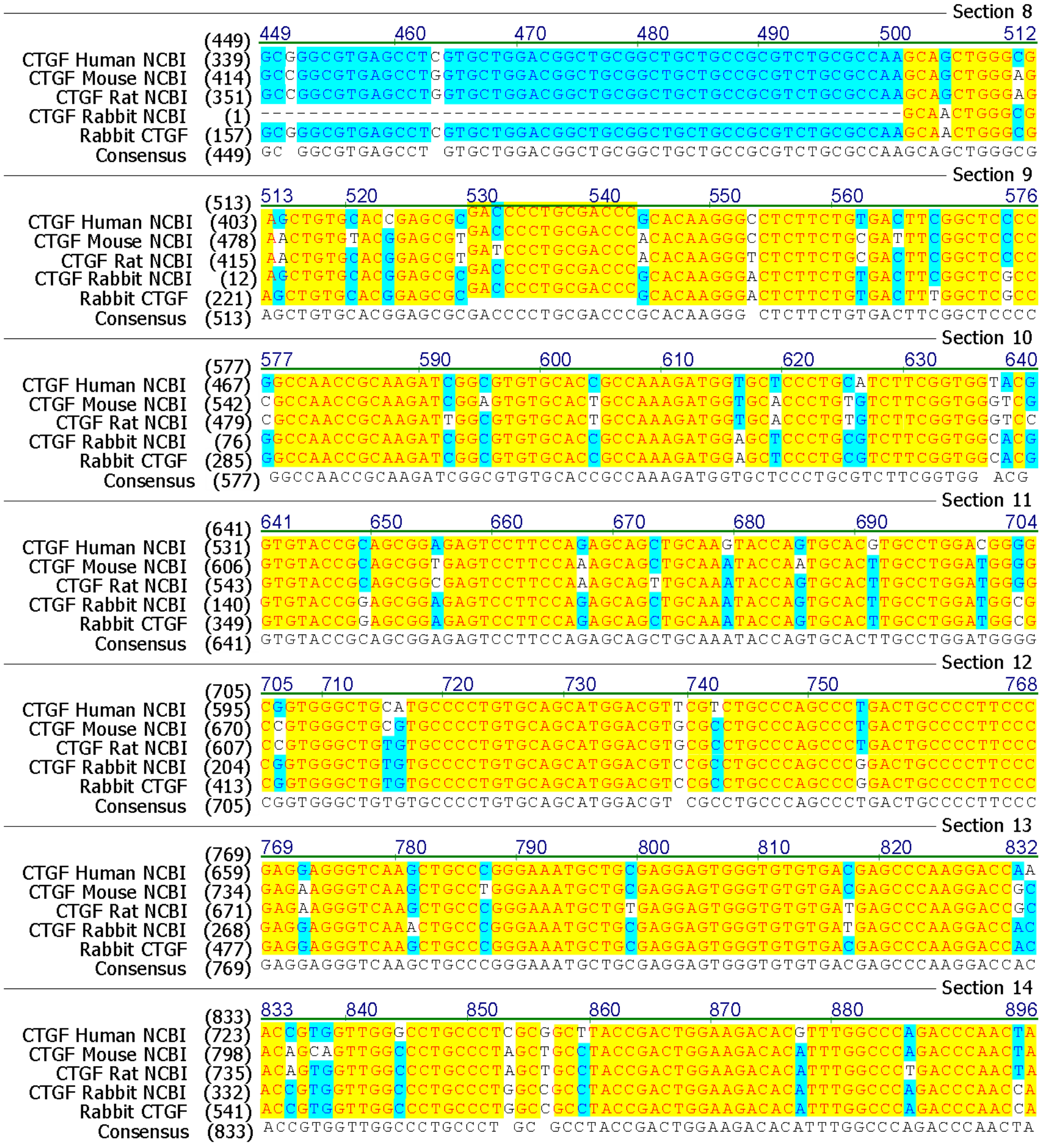

CTGF alignment

```
                                                                              Section 8
                  (449) 449        460       470       480       490       500       512
 CTGF Human NCBI  (339) GCGGGCGTGAGCCTCGTGCTGGACGGCTGCGGCTGCTGCCGCGTCTGCGCCAAGCAGCTGGGCG
 CTGF Mouse NCBI  (414) GCCGGCGTGAGCCTGGTGCTGGACGGCTGCGGCTGCTGCCGCGTCTGCGCCAAGCAGCTGGGAG
   CTGF Rat NCBI  (351) GCCGGCGTGAGCCTGGTGCTGGACGGCTGCGGCTGCTGCCGCGTCTGCGCCAAGCAGCTGGGAG
CTGF Rabbit NCBI    (1) -----------------------------------------------------GCAACTGGGCG
     Rabbit CTGF  (157) GCGGGCGTGAGCCTCGTGCTGGACGGCTGCGGCTGCTGCCGCGTCTGCGCCAAGCAACTGGGCG
       Consensus  (449) GC GGCGTGAGCCT GTGCTGGACGGCTGCGGCTGCTGCCGCGTCTGCGCCAAGCAGCTGGGCG
                                                                              Section 9
                  (513) 513    520       530       540       550       560           576
 CTGF Human NCBI  (403) AGCTGTGCACCGAGCGCGACCCCTGCGACCCGCACAAGGGCCTCTTCTGTGACTTCGGCTCCCC
 CTGF Mouse NCBI  (478) AACTGTGTACGGAGCGTGACCCCTGCGACCCACACAAGGGCCTCTTCTGCGATTTCGGCTCCCC
   CTGF Rat NCBI  (415) AACTGTGCACGGAGCGTGATCCCTGCGACCCACACAAGGGTCTCTTCTGCGACTTCGGCTCCCC
CTGF Rabbit NCBI   (12) AGCTGTGCACGGAGCGCGACCCCTGCGACCCGCACAAGGGACTCTTCTGTGACTTCGGCTCGCC
     Rabbit CTGF  (221) AGCTGTGCACGGAGCGCGACCCCTGCGACCCGCACAAGGGACTCTTCTGTGACTTTGGCTCGCC
       Consensus  (513) AGCTGTGCACGGAGCGCGACCCCTGCGACCCGCACAAGGG CTCTTCTGTGACTTCGGCTCCCC
                                                                             Section 10
                  (577) 577          590       600       610       620       630     640
 CTGF Human NCBI  (467) GGCCAACCGCAAGATCGGCGTGTGCACCGCCAAAGATGGTGCTCCCTGCATCTTCGGTGGTACG
 CTGF Mouse NCBI  (542) CGCCAACCGCAAGATCGGAGTGTGCACTGCCAAAGATGGTGCACCCTGTGTCTTCGGTGGGTCG
   CTGF Rat NCBI  (479) CGCCAACCGCAAGATTGGCGTGTGCACTGCCAAAGATGGTGCACCCTGTGTCTTCGGTGGGTCC
CTGF Rabbit NCBI   (76) GGCCAACCGCAAGATCGGCGTGTGCACCGCCAAAGATGGAGCTCCCTGCGTCTTCGGTGGCACG
     Rabbit CTGF  (285) GGCCAACCGCAAGATCGGCGTGTGCACCGCCAAAGATGGAGCTCCCTGCGTCTTCGGTGGCACG
       Consensus  (577) GGCCAACCGCAAGATCGGCGTGTGCACCGCCAAAGATGGTGCTCCCTGCGTCTTCGGTGG ACG
                                                                             Section 11
                  (641) 641      650       660       670       680       690         704
 CTGF Human NCBI  (531) GTGTACCGCAGCGGAGAGTCCTTCCAGAGCAGCTGCAAGTACCAGTGCACGTGCCTGGACGGGG
 CTGF Mouse NCBI  (606) GTGTACCGCAGCGGTGAGTCCTTCCAAAGCAGCTGCAAATACCAATGCACTTGCCTGGATGGGG
   CTGF Rat NCBI  (543) GTGTACCGCAGCGGCGAGTCCTTCCAAAGCAGTTGCAAATACCAGTGCACTTGCCTGGATGGGG
CTGF Rabbit NCBI  (140) GTGTACCGGAGCGGAGAGTCCTTCCAGAGCAGCTGCAAATACCAGTGCACTTGCCTGGATGGCG
     Rabbit CTGF  (349) GTGTACCGGAGCGGAGAGTCCTTCCAGAGCAGCTGCAAATACCAGTGCACTTGCCTGGATGGCG
       Consensus  (641) GTGTACCGCAGCGGAGAGTCCTTCCAGAGCAGCTGCAAATACCAGTGCACTTGCCTGGATGGGG
                                                                             Section 12
                  (705) 705  710       720       730       740       750             768
 CTGF Human NCBI  (595) CGGTGGGCTGCATGCCCCTGTGCAGCATGGACGTTCGTCTGCCCAGCCCTGACTGCCCCTTCCC
 CTGF Mouse NCBI  (670) CCGTGGGCTGCGTGCCCCTGTGCAGCATGGACGTGCGCCTGCCCAGCCCTGACTGCCCCTTCCC
   CTGF Rat NCBI  (607) CCGTGGGCTGTGTGCCCCTGTGCAGCATGGACGTGCGCCTGCCCAGCCCTGACTGCCCCTTCCC
CTGF Rabbit NCBI  (204) CGGTGGGCTGTGTGCCCCTGTGCAGCATGGACGTCCGCCTGCCCAGCCCGGACTGCCCCTTCCC
     Rabbit CTGF  (413) CGGTGGGCTGTGTGCCCCTGTGCAGCATGGACGTCCGCCTGCCCAGCCCGGACTGCCCCTTCCC
       Consensus  (705) CGGTGGGCTGTGTGCCCCTGTGCAGCATGGACGT CGCCTGCCCAGCCCTGACTGCCCCTTCCC
                                                                             Section 13
                  (769) 769        780       790       800       810       820       832
 CTGF Human NCBI  (659) GAGGAGGGTCAAGCTGCCCGGGAAATGCTGCGAGGAGTGGGTGTGTGACGAGCCCAAGGACCAA
 CTGF Mouse NCBI  (734) GAGAAGGGTCAAGCTGCCTGGGAAATGCTGCGAGGAGTGGGTGTGTGACGAGCCCAAGGACCGC
   CTGF Rat NCBI  (671) GAGAAGGGTCAAGCTGCCCGGGAAATGCTGTGAGGAGTGGGTGTGTGATGAGCCCAAGGACCGC
CTGF Rabbit NCBI  (268) GAGGAGGGTCAAACTGCCCGGGAAATGCTGCGAGGAGTGGGTGTGTGATGAGCCCAAGGACCAC
     Rabbit CTGF  (477) GAGGAGGGTCAAGCTGCCCGGGAAATGCTGCGAGGAGTGGGTGTGTGACGAGCCCAAGGACCAC
       Consensus  (769) GAGGAGGGTCAAGCTGCCCGGGAAATGCTGCGAGGAGTGGGTGTGTGACGAGCCCAAGGACCAC
                                                                             Section 14
                  (833) 833    840       850       860       870       880           896
 CTGF Human NCBI  (723) ACCGTGGTTGGGCCTGCCCTCGCGGCTTACCGACTGGAAGACACGTTTGGCCCAGACCCAACTA
 CTGF Mouse NCBI  (798) ACAGCAGTTGGCCCTGCCCTAGCTGCCTACCGACTGGAAGACACATTTGGCCCAGACCCAACTA
   CTGF Rat NCBI  (735) ACAGTGGTTGGCCCTGCCCTAGCTGCCTACCGACTGGAAGACACATTTGGCCCTGACCCAACTA
CTGF Rabbit NCBI  (332) ACCGTGGTTGGCCCTGCCCTGGCCGCCTACCGACTGGAAGACACATTTGGCCCAGACCCAACCA
     Rabbit CTGF  (541) ACCGTGGTTGGCCCTGCCCTGGCCGCCTACCGACTGGAAGACACATTTGGCCCAGACCCAACCA
       Consensus  (833) ACCGTGGTTGGCCCTGCCCT GC GCCTACCGACTGGAAGACACATTTGGCCCAGACCCAACTA
```

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CTGF alignment

```
                                                                    Section 15
                   (897)  897         910       920       930       940       950       960
CTGF Human NCBI    (787)  TGATTAGAGCCAACTGCCTGGTCCAGACCACAGAGTGGAGCGCCTGTTCCAAGACCTGTGGGAT
CTGF Mouse NCBI    (862)  TGATGCGAGCCAACTGCCTGGTCCAGACCACAGAGTGGAGCGCCTGTTCTAAGACCTGTGGGAT
CTGF Rat NCBI      (799)  TGATGCGAGCCAACTGCCTGGTCCAGACCACAGAGTGGAGCGCCTGTTCTAAGACCTGTGGGAT
CTGF Rabbit NCBI   (396)  TGATGCGAGCCAACTGCCTGGTCCAGACCACA--------------------------------
Rabbit CTGF       (605)  TGATGCGAGCCAACTGCCTGGTCCAGACCACAGAGTGGAGCGCCTGTTCCAAGACCTGCGGGAT
Consensus          (897)  TGATGCGAGCCAACTGCCTGGTCCAGACCACAGAGTGGAGCGCCTGTTC AAGACCTGTGGGAT
                                                                    Section 16
                   (961)  961      970       980       990       1000      1010          1024
CTGF Human NCBI    (851)  GGGCATCTCCACCCGGGTTACCAATGACAACGCCTCCTGCAGGCTAGAGAAGCAGAGCCGCCTG
CTGF Mouse NCBI    (926)  GGGCATCTCCACCCGAGTTACCAATGACAATACCTTCTGCAGACTGGAGAAGCAGAGCCGCCTC
CTGF Rat NCBI      (863)  GGGCATCTCCACCCGGGTTACCAATGACAATACCTTCTGCAGGCTGGAGAAGCAGAGTCGTCTC
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (669)  GGGCATCTCCACCCGGGTTACCAATGACAACGCCTTCTGTCGGCTGGAGAAACAGAGCCGCCTC
Consensus          (961)  GGGCATCTCCACCCGGGTTACCAATGACAA  CCTTCTGCAGGCTGGAGAAGCAGAGCCGCCTC
                                                                    Section 17
                  (1025)  1025 1030      1040      1050      1060      1070          1088
CTGF Human NCBI    (915)  TGCATGGTCAGGCCTTGCGAAGCTGACCTGGAAGAGAACATTAAGAAGGGCAAAAAGTGCATCC
CTGF Mouse NCBI    (990)  TGCATGGTCAGGCCCTGCGAAGCTGACCTGGAGGAAAACATTAAGAAGGGCAAAAAGTGCATCC
CTGF Rat NCBI      (927)  TGCATGGTCAGGCCCTGTGAAGCTGACCTAGAGGAAAACATTAAGAAGGGCAAAAAGTGCATCC
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (733)  TGCATGGTCAGGCCTTGCGAAGCTGACCTGGAAGAGAACATTAAGAAGGGCAAGAAGTGCATCC
Consensus         (1025)  TGCATGGTCAGGCC TGCGAAGCTGACCTGGA GA AACATTAAGAAGGGCAAAAAGTGCATCC
                                                                    Section 18
                  (1089)  1089       1100      1110      1120      1130      1140     1152
CTGF Human NCBI    (979)  GTACTCCCAAAATCTCCAAGCCTATCAAGTTTGAGCTTTCTGGCTGCACCAGCATGAAGACATA
CTGF Mouse NCBI   (1054)  GGACACCTAAAATCGCCAAGCCTGTCAAGTTTGAGCTTTCTGGCTGCACCAGTGTGAAGACATA
CTGF Rat NCBI      (991)  GGACGCCTAAAATTGCCAAGCCTGTCAAGTTTGAGCTTTCTGGCTGCACCAGTGTGAAGACCTA
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (797)  GTACCCCCAAAATCTCCAAGCCGGTCAAGTTTGAGCTCTCTGGCTGCACCAGCGTGAAGACGTA
Consensus         (1089)  G AC CC AAAATC CCAAGCCTGTCAAGTTTGAGCTTTCTGGCTGCACCAG GTGAAGAC TA
                                                                    Section 19
                  (1153)  1153 1160      1170      1180      1190      1200          1216
CTGF Human NCBI   (1043)  CCGAGCTAAATTCTGTGGAGTATGTACCGACGGCCGATGCTGCACCCCCCACAGAACCACCACC
CTGF Mouse NCBI   (1118)  CAGGGCTAAGTTCTGCGGGGTGTGCACAGACGGCCGCTGCTGCACACCGCACAGAACCACCACT
CTGF Rat NCBI     (1055)  CCGGGCTAAGTTCTGTGGGGTGTGCACGGACGGCCGCTGCTGCACACCGCACAGAACCACCACA
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (861)  CCGGGCTAAGTTCTGCGGAGTATGCACCGATGGCCGATGCTGCACCCCACACCGAACCACCACC
Consensus         (1153)  CCGGGCTAAGTTCTG GG GT TGCAC GACGGCCG TGCTGCAC CC CACAGAACCACCAC
                                                                    Section 20
                  (1217)  1217         1230      1240      1250      1260      1270     1280
CTGF Human NCBI   (1107)  CTGCCGGTGGAGTTCAAGTGCCCTGACGGCGAGGTCATGAAGAAGAACATGATGTTCATCAAGA
CTGF Mouse NCBI   (1182)  CTGCCAGTGGAGTTCAAATGCCCCGATGGCGAGATCATGAAAAAGAATATGATGTTCATCAAGA
CTGF Rat NCBI     (1119)  CTGCCGGTGGAGTTCAAGTGCCCCGATGGCGAGATCATGAAAAAGAACATGATGTTCATCAAGA
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (925)  CTGCCGGTGGAGTTCAAGTGTCCTGACGGCGAGCTCATGAAGAAGAGCATGATGTTCATCAAGA
Consensus         (1217)  CTGCCGGTGGAGTTCAAGTGCCC GA GGCGAG TCATGAA AAGAACATGATGTTCATCAAGA
                                                                    Section 21
                  (1281)  1281     1290      1300      1310      1320      1330          1344
CTGF Human NCBI   (1171)  CCTGTGCCTGCCATTACAACTGTCCCGGAGACAATGACATCTTTGAATCGCTGTACTACAGGAA
CTGF Mouse NCBI   (1246)  CCTGTGCCTGCCATTACAACTGTCCTGGGGACAATGACATCTTTGAGTCCCTGTACTACAGGAA
CTGF Rat NCBI     (1183)  CCTGTGCCTGCCATTACAACTGTCCCGGGGACAATGACATCTTTGAGTCCTTGTACTACAGGAA
CTGF Rabbit NCBI   (428)  ----------------------------------------------------------------
Rabbit CTGF       (989)  CCTGTGCCTGCCATTACAACTGTCCTGGGGACAATGACATCTTTGAGTCACTGTACTACAGGAA
Consensus         (1281)  CCTGTGCCTGCCATTACAACTGTCC GGGGACAATGACATCTTTGAGTC CTGTACTACAGGAA
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CTGF alignment

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----------------------------------------------------------------------------- Section 22
                  (1345) 1345 1350      1360      1370      1380      1390           1408
  CTGF Human NCBI (1235) GATGTACGGAGACATGGCATGAAGCCAGAGAGTGAGAGACATTAACTCATT-AGACTGGAACTT
  CTGF Mouse NCBI (1310) GATGTACGGAGACATGGCGTAAAGCCAGGAAGTAAGGGACACGAACTCATT-AGACTATAACTT
    CTGF Rat NCBI (1247) GATGTATGGAGACATGGCGTAAAGCCAGGGAGTAAGGGACACGAACTCATTTAGACTATAACTT
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1053) GATGTATGGAGACATGGCATAA------------------------------------------
        Consensus (1345) GATGTA GGAGACATGGC TAAAGCCAG  AGT AG GACA  AACTCATT AGACT  AACTT
----------------------------------------------------------------------------- Section 23
                  (1409) 1409       1420      1430      1440      1450      1460     1472
  CTGF Human NCBI (1298) GAACTGATTCACATCTCATTTT--TCCGTAAAAATG--------ATTTCAGTAGCACAAGTTAT
  CTGF Mouse NCBI (1373) GAACTGAGTTGCATCTCATTTTCTTCTGTAAAAACA--------ATTACAGTAGCACAT-TAAT
    CTGF Rat NCBI (1311) GAACTGAGTTACATCTCATTTTCTTCTGTAAAAAAACAAAAAGGATTACAGTAGCACAT-TAAT
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1409) GAACTGA T  CATCTCATTTT  TC GTAAAAA          ATT CAGTAGCACA  T AT
----------------------------------------------------------------------------- Section 24
                  (1473) 1473   1480      1490      1500      1510      1520         1536
  CTGF Human NCBI (1352) TTAAATCTGTTTTTCTAACTG----GGGGAAAAGATTCCCACCCAATTCAAAACATTGTGCCAT
  CTGF Mouse NCBI (1428) TTAAATCTGTGTTTTTAACTACCGTGGGAGGAACTATCCCACCAAAGTGAGAACGTTATGTCAT
    CTGF Rat NCBI (1374) TTAAATCTGGGTTCCTAACTGCTGTGGGAGAAAACACCCCACCGAAGTGAGAACCGTGTGTCAT
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1473) TTAAATCTG  TT  TAACT     GGG   AA    CCCACC AA T A AAC  T TG CAT
----------------------------------------------------------------------------- Section 25
                  (1537) 1537         1550      1560      1570      1580      1590   1600
  CTGF Human NCBI (1412) -GTCAAACAAATAGTCTATCAACCCCAGACACTGGTTTGAAGAATGTTAAGACTTGACAGTGGA
  CTGF Mouse NCBI (1492) GGCCATACAAGTAGTCTGTCAACCTCAGACACTGGTTTCGAGACAGTTTACACTTGACAGTTG-
    CTGF Rat NCBI (1438) TGTCATGCAAATAGCCTGTCAATCTCAGACACTGGTTTCGAGACAGTTTAGACTTGACAGTTG-
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1537)  G CA  CAA TAG CT TCAA C CAGACACTGGTTT  AGA  GTT A ACTTGACAGT G
----------------------------------------------------------------------------- Section 26
                  (1601) 1601     1610      1620      1630      1640      1650       1664
  CTGF Human NCBI (1475) ACTACATTAGTACACAGCACCAGAATGTATATTAAGGTGTGGCTTTAGGAGCAGTGGGAGGGTA
  CTGF Mouse NCBI (1555) --TTCATTAGCGCACAGTGCCAGAATGCACACTGAGGTGAGTCTCCTGGAACAGTGGA--GATG
    CTGF Rat NCBI (1501) --TTCACTAGCGCACAGTGACAGAACGCACACTAAGGTGAGCCTCCTGGAAGAGTGGA--GATG
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1601)   T CA TAG  CACAG   CAGAA G A A T AGGTG G CT   GGA  AGTGG   G T
----------------------------------------------------------------------------- Section 27
                  (1665) 1665 1670      1680      1690      1700      1710           1728
  CTGF Human NCBI (1539) CCAGCAGAAA----GGTTAGTATCATCAGATAGCATCTTATACG-AGTAATATGCCTGCTATTT
  CTGF Mouse NCBI (1615) CCAGGAGAAAGAAAGACAGGTACTAGCTGAGGTTATTTTAAAAGCAGCAGTGTGCCTACTTTTT
    CTGF Rat NCBI (1561) CCAGGAGAAA----GACAGGTACTAGCTGAGGTCATTTTAAAAGCAGCGATATGCCTACTTTTT
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1665) CCAG AGAAA    G    GTA  A C GA    AT TTA A G AG   T TGCCT CT TTT
----------------------------------------------------------------------------- Section 28
                  (1729) 1729       1740      1750      1760      1770      1780     1792
  CTGF Human NCBI (1598) GAAGTGTAATTGAGAAGGAAAATTTTAGCGTGCTCACTGACCTGCCTGTAGCCCCAGTGACAGC
  CTGF Mouse NCBI (1679) GGAGTGTAACCGGGGAGGGAAATTATAGCATGCTTGCAGACAGACCTG---CTCTAGCGAGAGC
    CTGF Rat NCBI (1621) GGAGTGTGACAGGGGAGGGACATTATAGCTTGCTTGCAGACAGACCTG---CTCTAGCAAGAGC
 CTGF Rabbit NCBI  (428) ----------------------------------------------------------------
      Rabbit CTGF (1075) ----------------------------------------------------------------
        Consensus (1729) G AGTGT A  G G AGG A ATT TAGC TGCT  C GAC   CCTG   C C AG  A AGC
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Section 29
                    (1793) 1793     1800        1810        1820        1830        1840        1856
CTGF Human NCBI     (1662) TAGGATGTGCATTCTCCAGCCATCAAGAGACTGAGTCAAGTTGTTCCTTAAGTCAGAACAGCAG
CTGF Mouse NCBI     (1740) T-GAGCATGTGTCCTCCA--CTAGATGAGGCTGAGTCCAGCTGTTCTTT----AAGAACAGCAG
CTGF Rat NCBI       (1682) T-GGGTGTGTGTCCTCCA--CTCGGTGAGGCTGAAGCCAGCTATTCTTTCAGTAAGAACAGCAG
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (1793) T G    TG  T CTCCA  C     GAG CTGA  C AG T TTC TT     AGAACAGCAG
Section 30
                    (1857) 1857         1870        1880        1890        1900        1910    1920
CTGF Human NCBI     (1726) ACTCAGCTCTGAC-ATTCTGATTCGAATGACACTGTTCAGGAATCGGAATCCTGTCGATTAGAC
CTGF Mouse NCBI     (1797) TTTCAGCTCTGACCATTCTGATTCCAGTGACACTTGTCAGGAGTCAGAGCCTTGTCTGTTAGAC
CTGF Rat NCBI       (1743) TTTCAGCGCTGAC-ATTCTGATTCCAGTGACACTGGTCGGGAGTCAGAACCTTGTCTATTAGAC
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (1857)   TCAGC CTGAC ATTCTGATTC A TGACACT   TC GGA TC GA  C TGTC  TTAGAC
Section 31
                    (1921) 1921     1930        1940        1950        1960        1970        1984
CTGF Human NCBI     (1789) TGGACAGCTTGTGGCAAGTGAATTTGCCTGTAACAAGCCAGATTTTTTAAAATTTATATTGTAA
CTGF Mouse NCBI     (1861) TGGACAGCTTGTGGCAAGTAAGTTTGCCTGTAACAAGCCAGATTTTT----ATTGATATTGTAA
CTGF Rat NCBI       (1806) TGGACAGCTTGTGGCAAGTGAATTTGCCGGTAACAAGCCAGATTTTT----ATGGATCTTGTAA
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (1921) TGGACAGCTTGTGGCAAGT A TTTGCC GTAACAAGCCAGATTTTT     AT  AT TTGTAA
Section 32
                    (1985) 1985 1990        2000        2010        2020        2030        2048
CTGF Human NCBI     (1853) ATATTGTGTGTGTGTGTGTGTGTGTATATATATATATATGTACAGTTATCTAAGTTAATTTAAA
CTGF Mouse NCBI     (1921) ATATTGTGGATATATATATATATATATATATATATATTTGTACAGTTATCTAAGTTAATTTAAA
CTGF Rat NCBI       (1866) ATATTGTGGAT--------------AAATATATATATTTGTACAGTTATCTAAGTTAATTTAAA
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (1985) ATATTGTG  T              A ATATATATAT TGTACAGTTATCTAAGTTAATTTAAA
Section 33
                    (2049) 2049        2060        2070        2080        2090        2100    2112
CTGF Human NCBI     (1917) GTTGTTTGTGCCTTTTTATTTTTGTTTTTAATGCTTT-GATATTTC---AATGTTAGCCTCAAT
CTGF Mouse NCBI     (1985) GTCATTTGT----------TTTTGTTTTAAGTGCTTTTGGGATTTT-AAACTGATAGCCTCAAA
CTGF Rat NCBI       (1916) GACGTTTGTGCCTATTG-TTCTTGTTTTAAGTGCTTTTGGAATTTTTAAACTGATAGCCTCAAA
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (2049) G   TTTGT           T TTGTTTT A TGCTTT G   ATTT    A TG TAGCCTCAA
Section 34
                    (2113) 2113    2120        2130        2140        2150        2160        2176
CTGF Human NCBI     (1977) TTCTGAACACCATAGGTAGAATGTAAAGCTTGTCTGATCGTTCAAAGCATGAAATGGATACTTA
CTGF Mouse NCBI     (2038) CTCCAAACACCATAGGTAGGACACGAAGCTTATCTG-TGATTCAAAACA--AAGGAGATACTGC
CTGF Rat NCBI       (1979) CTCCAAACACCATCGATAGGACATAAAGCTTGTCTG-TGATTCAAAACA--AAGGAGATACTGC
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (2113)  TC  AACACCAT G TAG A    AAGCTT TCTG T   TTCAAA CA  AA   GATACT
Section 35
                    (2177) 2177         2190        2200        2210        2220        2230    2240
CTGF Human NCBI     (2041) TATGGAAATTCTGCTCAGATAGAATGACAGTCCGTCAAAACAGATTGTTTGCAAAGGGGAGGCA
CTGF Mouse NCBI     (2099) AGTGGGAATTGTGACCTGA----GTGACTCTCTGTCAGAACAAATGCTGTGCA--GGTGATAAA
CTGF Rat NCBI       (2040) AGTGGAAACTGTAACCTGA----GTGACTGTCTGTCAGAACATATGGTACGTA--GACGGTAAA
CTGF Rabbit NCBI    (428)  ------------------------------------------------------------
Rabbit CTGF         (1075) ------------------------------------------------------------
Consensus           (2177)   TGG AA T T   C GA     TGAC  TC GTCA AACA AT  T  G A  G  G    A
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CTGF alignment

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                                                                       Section 36
                   (2241) 2241     2250       2260       2270       2280       2290       2304
CTGF Human NCBI (2105) TCAGTGTCCTTGGCAGGCTGATTTCTAGGTAGGAAATGTGGTAGCCTCACTTTTAATGAACAAA
CTGF Mouse NCBI (2157) GCTATGTA-TTGGAAGTCAGATTTCTAG-TAGGAAATGTGGTCAAATCCCTGTTGGTGAACAAA
  CTGF Rat NCBI (2098) GCAATGGA-TCAGAAGTCAGATTTCTAG-TAGGAAATGTA---AAATCACTGTTGGCGAACAAA
CTGF Rabbit NCBI (428) ----------------------------------------------------------------
   Rabbit CTGF (1075) ----------------------------------------------------------------
      Consensus (2241)  C  TG   T  G AG C GATTTCTAG TAGGAAATGT       TC CT TT   GAACAAA
                                                                       Section 37
                   (2305) 2305 2310       2320       2330       2340       2350       2368
CTGF Human NCBI (2169) TGGCCTTTATTAAAAACTGAGTGACTCTATATAGCTGATCAGTTTTTTCACCTGGAAGCATTTG
CTGF Mouse NCBI (2219) TGGCCTTTATTAAGAAATGGCTGGCTCAGGGTAA--GGTCCGATTCCT-ACCAGGAAGTGCTTG
  CTGF Rat NCBI (2157) TGGCCTTTATTAAGAAATGGCTTGCTCAGGGTAACTGGTCAGATTTCC-ACGAGGAAGTGTTTG
CTGF Rabbit NCBI (428) ----------------------------------------------------------------
   Rabbit CTGF (1075) ----------------------------------------------------------------
      Consensus (2305) TGGCCTTTATTAA AA TG  T  CTC    TA   G TC G TT    AC  GGAAG   TTG
                                                                       Section 38
                   (2369) 2369       2380       2390       2400       2410       2420    2432
CTGF Human NCBI (2233) TTTCTACTTTGA-TATGACTGTTTTTCGGA------CAGTTTATTTGTTGAGAGTGTGACCAAA
CTGF Mouse NCBI (2280) CTGCTTCTTTGATTATGACTGGTTTGGGGTGGGGGGCAGTTTATTTGTTGAGAGTGTGACCAAA
  CTGF Rat NCBI (2220) CTGCTTCTTTGACTATGACTGGTTTGGGA-----GGCAGTTTATTTGTTGAGAGTGTGACCAAA
CTGF Rabbit NCBI (428) ----------------------------------------------------------------
   Rabbit CTGF (1075) ----------------------------------------------------------------
      Consensus (2369)  T CT CTTTGA TATGACTG TTT  G        CAGTTTATTTGTTGAGAGTGTGACCAAA
                                                                       Section 39
                   (2433) 2433   2440       2450       2460       2470       2480       2496
CTGF Human NCBI (2290) AGTTACATGTTTGCACCTTTCTAGTTGAAAATAAAGTGTATATT----TTTTCTATAAAAAAAA
CTGF Mouse NCBI (2344) AGTTACATGTTTGCACCTTTCTAGTTGAAAATAAAGTATATATATATTTTTTATATGAAAAAAA
  CTGF Rat NCBI (2279) AGTTACATGTTTGCACCTTTCTAGTTGAAAATAAAGTATATATA--TTTTTTATATGAAAAAAA
CTGF Rabbit NCBI (428) ----------------------------------------------------------------
   Rabbit CTGF (1075) ----------------------------------------------------------------
      Consensus (2433) AGTTACATGTTTGCACCTTTCTAGTTGAAAATAAAGT TATAT     TTTT TAT AAAAAAA
                                                                       Section 40
                   (2497) 2497     2507
CTGF Human NCBI (2350) AAAAAAAAA--
CTGF Mouse NCBI (2408) AAAAAAAAAAA
  CTGF Rat NCBI (2341) AAAAAAAAA--
CTGF Rabbit NCBI (428) -----------
   Rabbit CTGF (1075) -----------
      Consensus (2497) AAAAAAAAA
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BIOGRAPHICAL SKETCH

Sriniwas Sriram was born in 1987 in Chennai, India. He graduated from Sathyabama University in 2002 with a bachelor of technology in biomedical engineering. He fulfilled his lifelong ambition of studying in the United States when he was granted admission to a graduate degree in the University of Florida. An internship in the Carnegie Melon University in the summer of 2010 piqued his interest in the field of RNA interference. Subsequently in the next semester, he joined the lab of Dr. Schultz and began working on a treatment to control excessive corneal scarring. He successfully defended his thesis and completed his graduate studies in May 2011.

On a personal level, Sriniwas loves football and is a passionate fan of Chelsea football club. Watching Chelsea play live still remains one of his unfulfilled dreams.