

# Science for Life Fall 2006 HHMI Distinguished Mentors

HHMI Distinguished Mentor awards recognize excellence in undergraduate mentoring. Six awardees were selected in the fall 2006 competition. These came from 34 nominees and applicants from seven different colleges at the University of Florida representing ranks from junior faculty to distinguished professors.



**Dr. Mavis Agbandje-McKenna** is an associate professor of Biochemistry and Molecular Biology in the College of Medicine with an appointment through the McKnight Brain Institute. Using X-ray crystallography and cryo-electron microscopy, her main research focus is the study members of the ssDNA virus families, which are the *Microviridae*, *Geminiviridae*, *Circoviridae* and *Parvoviridae*, infecting bacteria, plants and mammals. The aim is to elucidate the role(s) of viral capsid and capsid protein structures in the dynamic array of biological processes occurring in the viral life cycle. The ultimate goal is to aid the development of disease treatments, in the form of virus assembly disrupters, viral vaccines, foreign antigen delivery vehicles and gene therapy vectors. Mavis enjoys strong research support from 2 simultaneous NIH and 3 NSF grants and she has published some 63 papers with two notable recent reports in *J. Virology* and *J. Biological Chem.* She serves on the NSF MCB panel and has been invited to serve as one of 11 mentors in Florida's Beckman Scholar Program. Mavis' research has involved some 26 undergraduates since 2000, each with their own project. Already 10 undergraduates are primary or co-authors of peer-reviewed papers. Research involving undergraduate students has been highlighted in the March 2006 *NIGMS Findings* magazine. Undergraduates in the lab are regularly awarded prestigious research fellowships, and awards at national conferences, including travel and poster awards. [mckenna@ufl.edu](mailto:mckenna@ufl.edu)

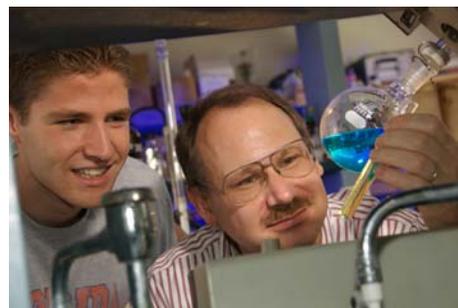
**Dr. Michael Bubb**, an Associate Professor of Medicine, is a practicing rheumatologist who performs clinical investigations in rheumatoid and degenerative arthritis, but also studies molecules and proteins at the level of atomic structure. In his laboratory, studies of crawling, amoeboid-like behavior of cells have been related to the diagnosis and treatment of arthritis and other human diseases. Novel biophysical methods have been developed in his laboratory that provide a good understanding of the mechanism by which proteins regulate cell movement. Dr. Bubb is also an editor of *FEBS Letters*, an international journal of the molecular biosciences. He has a joint appointment with the Malcom Randall VA Medical Center, where he is Director of Graduate Studies. Equally comfortable with a set of differential equations or a prescription pad, Dr. Bubb attempts to demonstrate to his students the sometimes tortuous, but always present, link between investigation in basic science and medical advance. Some 52 undergraduates have already been mentored in his group and he has secured funding for undergraduates by NSF REU supplements and NIH training grants. By his example, he hopes to inspire students to explore career paths in science that cross traditional disciplines, a path that he has found to be satisfying, challenging and productive. Dr. Bubb has led the interaction of the Science for Life program with ENS-Cachan. [bubbmr@medicine.ufl.edu](mailto:bubbmr@medicine.ufl.edu)



**Dr. Jeffrey Hughes** received his doctorate in pharmacy (PharmD) and his PhD from the University of Kentucky. He was always intrigued by the numerous mechanisms that chemistry can play in the improvement of human health. After joining UF's College of Pharmacy faculty in 1994, his research is focused on synthesizing novel chemicals that could be used for the delivery of genes. His research activities span organic synthesis to animal evaluations. During this 12 year period Dr. Hughes' work has been facilitated by over 50 undergraduate researchers and the majority of these have gone on to pursue advanced degrees. His current research is funded by NIH and focuses on the use of gene delivery for treatment of Alzheimer's disease as well as other disorders (e.g. asthma). Specifically, the lab is currently in the process of identifying therapeutic genes and synthesizing nanoparticles for the delivery of these genes. Jeff was also invited to serve as one of 11 mentors in Florida's Beckman Scholar Program. [hughes@cop.ufl.edu](mailto:hughes@cop.ufl.edu)

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**Dr. Jon Stewart** is currently Professor of Chemistry at the University of Florida. He started his independent career at the University of Florida in 1994 as a Camille and Henry Dreyfus New Faculty Fellow. Since that time, his research group has included 19 graduate and 22 undergraduate coworkers. Several have subsequently received major awards including a Churchill Scholarship (the first ever awarded at Florida), a Goldwater Scholarship and an NSF Predoctoral Fellowship. Dr. Stewart was recently invited to be one of eleven mentors for the Beckman Scholar program for University of Florida undergraduates. Dr. Stewart's research has focused on biocatalysis – the use of enzymes to carry out stereoselective organic synthesis and on developing “smart” nanostructures as drug delivery vehicles. He has published more than 65 peer-reviewed papers and was recently honored with the 2006 International Biocat Award in the academic category for his research accomplishments in this area. He also received a fellowship from the Japan Society for the Promotion of Science in 2006. [jds2@chem.ufl.edu](mailto:jds2@chem.ufl.edu)



Lego is a toy. It has attributes that differentiate it from most toys that are designed for only one purpose; in contrast, Lego pieces can be used in a variety of ways. Ideas, techniques, instruments, and assays can be used just like Lego building blocks to assemble a variety of projects in life science research. In preparation for the study of biological systems, **Dr. Yiider Tseng** switched his research direction from theoretical physics to experimental biology to gain a broad spectrum of “research building blocks”. He received his Ph.D. in Biophysics and pursued his postdoctoral training in Chemical Engineering in the cell bioengineering field, both from the Johns Hopkins University. His research has combined cell biology and polymer physics to make the first direct measurements of intracellular mechanics in live cells, leading to 13 undergraduate-authored papers in quality journals, several as first authors. His group is supported by simultaneous NSF, NASA, and NIH grants. Tseng believes that undergraduate research is more than just an educational experience; rather it should help shape the future career path of students. A majority of his 20 undergraduates in recent years have moved on to top programs around the US. As an associate professor of Chemical Engineering, joint with Biomedical Engineering, he is also currently engaged in efforts to enhance undergraduate bioengineering research training. He is formulating a series of bioengineering courses across the engineering departments at University of Florida to systematically modernize the curriculum and integrate undergraduate research. He is working closely with the Science for Life program to promote engineering undergraduate research. [ytseng@che.ufl.edu](mailto:ytseng@che.ufl.edu)

**Dr. Chang-Yu Wu** received his B.S. in mechanical engineering from the National Taiwan University. However, the desire to seek the balance between technology and the environment led him to pursue a M.S. and Ph.D. in environmental engineering sciences at University of Cincinnati. He started at the University of Florida in 1998 and is now Associate Professor of Environmental Engineering Sciences. In the past 8 years, 28 undergraduate students have joined his group with the passion to develop better technology for protecting the environment and human health and this has led to undergraduate participation in 11 publications, 2 patents, and 35 meeting presentations. Many of these undergraduate researchers have won awards, and most have continued to pursue advanced degrees across the US. Dr. Wu is also the PI of two grants from NSF-DUE, leading a team to develop a dynamic and interactive web environment aimed at enhancing undergraduate education and research. His research focuses on harvesting the benefits of aerosols (e.g. drug delivery through the respiratory system) and protecting humans from undesired aerosols (e.g. SARS and anthrax). [cywu@ufl.edu](mailto:cywu@ufl.edu)



The University of Florida will award at least 27 HHMI-DM awards in six university-wide competitions over the next four years through the Science for Life program. A rotating seven-member selection committee reviews applications. Contact: K. Berns [kberns@ufl.edu](mailto:kberns@ufl.edu), R. Duran [duan@chem.ufl.edu](mailto:duan@chem.ufl.edu), L. Guillette [lguillette@zoo.ufl.edu](mailto:lguillette@zoo.ufl.edu)