Florida Tomorrow | Whitney Laboratory for Marine Bioscience

UF | FLORIDA TOMORROW

THE CAMPAIGN FOR THE UNIVERSITY OF FLORIDA

From the Director

I love it when people ask what we do at the Whitney Laboratory for Marine Bioscience. They're usually astounded when I tell them how much we can learn about ourselves by studying simple sea creatures. Lobsters, sea slugs, horseshoe crabs and even the lowly jellyfish can teach us a great deal about our own biology.

Since its founding in 1974, the Whitney Laboratory for Marine Bioscience, a research institute of the University of Florida, has earned international acclaim for marine biomedical research in important fields such as vision, sense of smell, neurobiology, parasitology, developmental and vector biology. We are now embarking on an exciting new academic venture that will complement and enhance our existing expertise.

Marine animals, be they wild or in captivity, are increasingly vulnerable to disease. We can witness this through the many strandings of marine mammals and from the increasing burden and costs that disease places on marine farming. To address this growing problem, the Whitney Laboratory is seeking to create The Center for Marine Animal Health. This will be a marine veterinary school that will conduct research into the biology of marine animals and their diseases, develop diagnostics and treatments for those diseases, and train veterinarians and technicians to apply those treatments. The University of Florida's College of Veterinary Medicine and others around the world can treat most diseases of domestic pets and farm animals. The goal of The Center for Marine Animal Health is to afford marine animals the same level of care.

This program will build on the existing strengths of the Whitney Laboratory in the cell and molecular biology of marine animals, and will gain the credibility needed for good marketing from our reputation in this area. At the same time, the marine animal health program will highlight the importance of our existing marine biomedical programs and give them a very public face — a win-win situation.

I invite you to join us in the campaign to create The Center for Marine Animal Health and to help make *Florida Tomorrow* a place where marine animals can live disease free.

Sincerely,
Peter Anderson, director
Whitney Laboratory for Marine Bioscience

Florida Tomorrow

... and the Whitney Laboratory for Marine Bioscience

The Promise of Tomorrow

The University of Florida holds the promise of the future: *Florida Tomorrow* — a place, a belief, a day. *Florida Tomorrow* is filled with possibilities. *Florida Tomorrow* is for dreamers and doers, for optimists and pragmatists, for scholars and entrepreneurs, all of whom are nurtured at Florida's flagship university: the University of Florida, the foundation of the Gator Nation.

What is *Florida Tomorrow*? Here at the Whitney Laboratory for Marine Bioscience, we believe it's an opportunity, one filled with promise and hope. It's that belief that feeds the university's capital campaign to raise more than $1 billion.

The *Florida Tomorrow* campaign will shape the university, certainly. But its ripple effect will also touch the state of Florida, the nation and the entire world. *Florida Tomorrow* is pioneering research and spirited academic programs. It's a fertile environment for inquiry, teaching and learning. It's being at the forefront to address the challenges facing all of us, both today and tomorrow.

Whitney Laboratory for Marine Bioscience

Florida Tomorrow Campaign Goals

Faculty Support	**$250,000**
Programs & Research	**$250,000**
Campus Enhancements	**$3.5 million**
TOTAL	**$4 million**

Florida Tomorrow is a day …

when whales and dolphins are no longer compelled to strand themselves and die on the beach.

For Future Scientists

At first, the elementary schoolchildren who visit UF's Whitney Lab are hesitant to approach the wriggling horseshoe crab in the touch tank. But once a few children work up the nerve, the rest dive right in.

It's that transformation from fear to curiosity that education coordinator Jessica Roberts-Misterly says is the best part of her job.

"It's amazing to see these kids, who often haven't seen these animals before, overcome their fear," she says. "They learn how these animals survive, how they breathe, how they eat, what adaptations they have for their environment. Our hope is that knowing about these animals and having a positive experience will, in the future, help them be more aware of the environment and protect the places where these animals live."

In addition to raising environmental consciousness, the Whitney Lab's education programs let kids do hands-on experiments to show them that science is about more than textbooks.

"We want them to see that this is something fun and get them thinking about a career in science," Roberts-Misterly says.

The lab's outreach efforts got a major boost in 2007, when the 17,000-square-foot Center for Marine Studies opened on the Whitney's eight-acre campus with labs, classrooms, conference rooms and a 270-seat auditorium. In addition to the grade-school Day at the Whitney programs, the center houses middle- and high-school classes, public lectures and research programs for undergraduate, graduate and post-doctoral students. Ideally situated on a peninsula in the Intracoastal Waterway, the Whitney offers a limitless supply of pure seawater — critical to keeping research animals healthy — and a wealth of specimens available for collection right outside the lab's door.

Modeling the Whitney after the famed Woods Hole Marine Biological Laboratory, director Peter Anderson hopes to expand the lab's educational offerings to the international level, attracting eminent scientists from around the world to work on their research and teach graduate courses and summer seminars.

From opening young minds to the possibilities of science to fostering research on the cutting edge of marine science, the Center for Marine Studies is bringing the Whitney Lab one step closer to becoming the Woods Hole of the South.

Florida Tomorrow is a place …

where the world's seafood supply is plentiful and always safe for human consumption.

Clues in Unlikely Places

The spotted, slimy creature curled around Peter Anderson's hand doesn't look like a medical marvel, but this lowly sea slug could hold the key to diseases from Parkinson's to Alzheimer's.

"The molecules implicated in Alzheimer's are present in sea slugs," says Anderson, director of the University of Florida's Whitney Laboratory for Marine Bioscience. "What we're trying to determine is, 'How does it learn?' 'How does it forget?' And, 'What are the genes being turned on and off when that occurs?'"

The sea slug is one of the marine animals that researchers at the Whitney Lab study to gain insight into human neurology. Research like the sea slug genome study, conducted by Dr. Leonid Moroz, may translate to improved understanding of the human brain. More so than the lab rats most people associate with medical research, marine animals' simplified neurological systems make them good models for neurological studies.

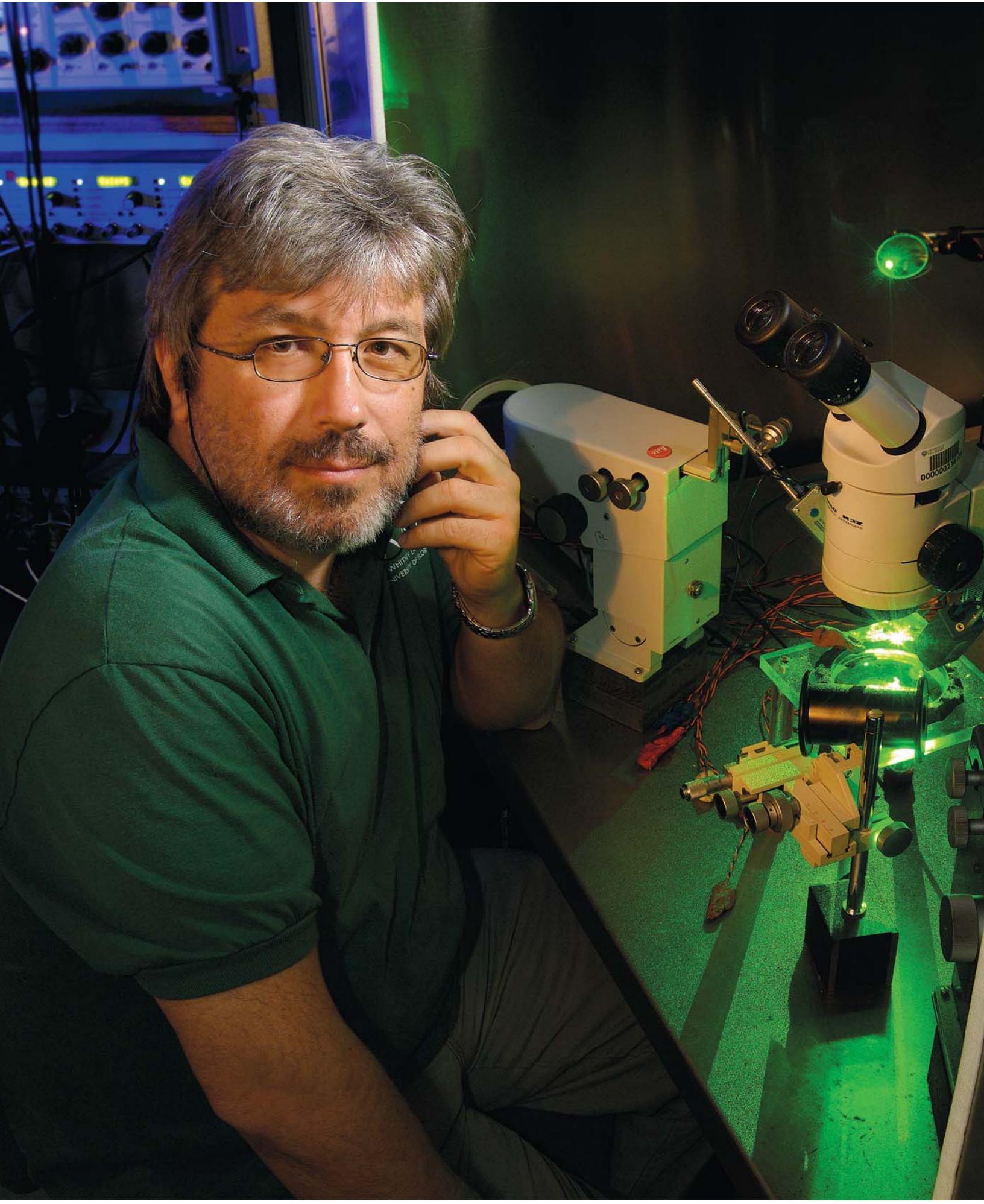
"A jellyfish nervous system works the same way ours does, by-and-large, it's just a lot simpler," Anderson says. "It's kind of humbling."

Marine animals' nerve cells are also easier to locate. The sea slug's nerve cells are up to a millimeter in diameter and can be seen with the naked eye, making it much easier for scientists to pinpoint the cell they want to study.

"I liken it to the difference between a barrel of M&Ms and a box of chocolates. Marine animals are like the box of chocolates — it's easy to find the particular nerve cell you want to work with. With mammals — the M&Ms — all of the nerve cells in an area look exactly the same. You can't go back to the same one day after day."

Other biomedical projects under way at Whitney include Dr. Dirk Bucher's study of the neural circuits that control rhythmic, repetitive motions like walking, which could eventually help patients healing from spinal cord injuries, and Barbara-Anne Battelle's investigation of horseshoe crab retinas, which could lead to advances in treatment for patients with low vision.

"These studies epitomize what we're about," Anderson says. "We're here to take advantage of the opportunities these animals have to offer."

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Florida Tomorrow is a belief …

that saving our marine environment is a necessary means to saving ourselves and the planet.

To Answer Questions

From tourist attractions to aquaculture farms, the need for marine-animal veterinarians has skyrocketed, and UF's Whitney Laboratory for Marine Bioscience is poised to fill that need.

With the planned introduction of the world's first dedicated marine animal veterinarian program, an offshoot of the lab's biotechnology research, UF stands to become the leader in this burgeoning field.

"Understanding disease in marine animals requires expertise in their cell and molecular biology," says lab director Peter Anderson. "This is our bread and butter. Our reputation for solid science in this area will form the foundation of the program and give it credibility."

The Whitney Lab plans to capitalize on this expertise by training vet students to care for marine animals, not only those in captivity or aquaculture operations but also wild animals that become stranded or beached.

"The need is significant," Anderson says. "There's a big knowledge gap when animals become stranded — many of them have to be euthanized because they can't be treated."

In the aquaculture industry, disease has a marked economic impact. The Chinese shrimp industry loses $1 billion a year to disease, Anderson says, "and of course, those costs are passed on to the consumers."

UF's Center for Marine Animal Health would be a groundbreaking facility, and Anderson believes the Whitney Lab is uniquely suited to the task. Its neighbor across the street is the Marineland attraction and dolphin conservation center, where students could gain experience with marine mammals. The lab's location on the Intracoastal Waterway south of St. Augustine is another strong point. Pipes buried under the sand of the Atlantic Ocean, just a stone's throw from Whitney, provide a boundless source of fresh seawater for holding tanks. And the lab's existing partnerships with the main campus' College of Veterinary Medicine and the Department of Fisheries and Aquatic Sciences would be key resources in crafting the curriculum, Anderson says.

The future of The Center for Marine Animal Health hinges on funding for new buildings, but Anderson hopes to see the center come to fruition within five years.

"There's a huge need for this," he says. "The pieces are all in place."

Our Vision of Tomorrow

The Whitney Laboratory for Marine Bioscience is a research facility that capitalizes on the experimental advantages of marine animals to address questions in human healthcare. For instance, researchers use sea slugs to study the genes involved in learning and memory, spiny lobsters to study the sense of smell and fish to study neuromuscular disorders. The National Institutes of Health and the National Science Foundation fund research at the Whitney Lab, which is recognized as one of the premier marine biomedical research facilities in the world.

Plans are under way to create The Center for Marine Animal Health at the Whitney Lab. This program will be one of the first marine vet schools in the world, and will address the critical need for research into the diseases of marine animals, effective diagnoses, development of environmentally safe treatments and the training of veterinarians and technicians to apply those technologies. Such a program is desperately needed to meet the needs of the marine aquaculture industry and the health of wild marine animals. According to a World Bank report, global losses to shrimp diseases alone total $3 billion annually, a cost that is ultimately transferred to the seafood industry and restaurants. The growing incidence of disease in wild marine species only adds to these losses and threatens supply.

In this country, there is a growing demand for domestically produced aquaculture products. Aquaculture in the United States has increased exponentially

in recent decades and will continue to grow. Currently, U.S. aquaculture accounts for about 10 percent of the seafood Americans consume. According to Florida's Department of Agriculture and Consumer Services, aquaculture is the state's most diverse agribusiness. In fact, the greatest variety of aquatic species in the nation is raised by Florida's 900-plus aquaculturists. Florida ranked third in aquaculture sales in 2005, an industry that claimed over $1.09 billion in transactions that year.

Marine life is considered by many to be the primary source of food protein for the future. The health of that life, and subsequently ours, is dependent on our learning to identify, diagnose and treat ill health, and our ability to train others to do it. The Whitney Lab's Center for Marine Animal Health will play a major role in supporting and ensuring the health of marine animals, whether for the food they provide or simply to extend their contributions to the planet.

The lab is ideally positioned to take the leadership in this initiative:

1. It is an international leader in the cell and molecular biology of marine animals, which will form a foundation for research into the diseases of marine animals, affording the CMAH strong scientific credibility.

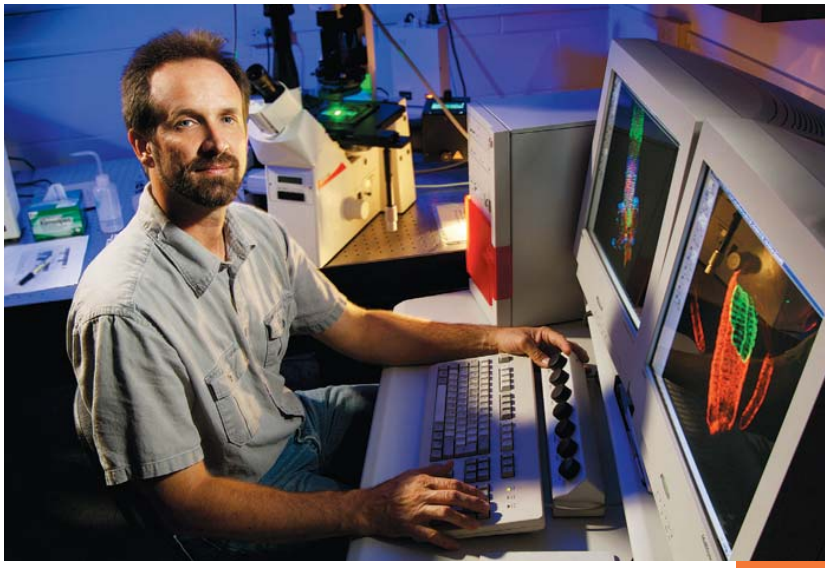
2. The program will be enhanced through its ties to other components of the University of Florida, most notably the College of Veterinary Medicine, the Department of Fisheries and Aquatic Sciences and the Archie Carr Center for Sea Turtle Research.

3. The laboratory's exceptional seawater system will facilitate necessary marine animal husbandry.

4. Our close association with the Marineland attraction will provide an array of rare opportunities to work with marine animals. The lab's Center for Marine Studies provides classrooms, teaching labs, conference space and an auditorium required for training components of the program.

As a pioneering entity, The Center for Marine Animal Health will develop research that is sought worldwide. It will:

- Move the University of Florida to the forefront of marine veterinary research, education and clinical practice;
- Bolster the state's agribusiness and economy;



- Help ensure the health and proliferation of captive marine animals living in large aquariums, zoos and tourist attractions, such as Marineland;
- Safeguard the health of wild sea animals and, hence, the oceans in which they live;
- Provide much needed marine veterinarians and technicians to identify, diagnose and treat disease in marine animals — captive or wild; and
- Secure and safeguard a primary food source for the world.

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