About seven years ago, at the request of Dr. M.J. Soileau, vice president for Research and Commercialization, I formulated a plan to build a biomedical science research and education enterprise at UCF. On September 30, 2003, I shared the plan with the greater Orlando community and expressed my dream that this enterprise should lead to building a medical school at UCF within a five-year period. I was pleased to hear that President Hitt, on October 27 of that year, told the Orlando City Council that UCF could start a medical school in five to 15 years.

On February 26, 2004, I suggested to President Hitt that UCF should form a College of Biomedical Sciences to establish credibility for an application for a new medical school. President Hitt made it happen by obtaining a generous gift of 10 million dollars from Al and Nancy Burnett and launched the Burnett College of Biomedical Sciences on July 24, 2004, thus making a good beginning towards seeking a medical school. It is gratifying to see the realization of our dream, shared by the entire Central Florida community and President Hitt's long-held dreams, with the first class of our medical school already at work this fall.

The biomedical science education and research enterprise is thriving thanks to the dedicated efforts of our faculty and staff. As per my suggestion, Burnett College of Biomedical Sciences merged with the College of Medicine under a memorandum of understanding that recognizes our primary mission is undergraduate and graduate education. By joining forces within the college, as well as other partners within and outside UCF, we will help build a research-intensive medical school where cutting-edge medical research will span the entire spectrum, from the laboratory bench to patients’ bedsides.

The Burnett Biomedical Sciences building at Lake Nona is ready for occupancy as we just received the certificate of occupancy. With the availability of new space, we are able to resume recruiting new faculty to build the planned biomedical science research enterprise. Also, our undergraduate education has been growing in quality and quantity. We have over 2,300 majors. Total annual enrollment in our courses exceeded 14,000, and more than 90 undergraduate students are currently conducting research in our laboratories.

Further, 10 of our undergraduates are listed as coauthors on journal articles, and 25 contributed to 20 different abstracts/presentations. Of the 14 presentations given at the Showcase of Undergraduate Research (SURE), our students received first and second places, and one honorable mention.
Our new B.S. degree program in biotechnology, spearheaded by Dr. Henry Daniell, started in Fall 2008 and has already graduated the first 10 students in Spring 2009. The program provides hands-on experience so that the graduates will be ready to work in the emerging biotechnology industry. The new, highly competitive Program for Undergraduate Research (PURE) was initiated under the leadership of Dr. Kenneth Teter in Spring 2007. This year the program graduated 11 students. The program is designed to further enhance our undergraduate research experience.

Our graduate programs continue to grow, as well. The M.S. program coordinated by Dr. Saleh Naser currently has 27 Molecular Biology and Microbiology students and eight non-thesis majors. In 2008-2009, five M.S. students defended their thesis. The M.S. in biotechnology and M.S./M.B.A. programs, spearheaded by Dr. Daniell, received Graduate Council approval. We now have 16 students in the M.S. in biotechnology program.

The new Ph.D./M.B.A. program started in Fall 2008. Collaboration with the College of Business Administration, under the leadership of Dean Tom Keon, allowed us to launch the M.S./M.B.A. and Ph.D./M.B.A. programs that are rare in U.S. universities. Our Ph.D. program, coordinated by Dr. Steven Ebert, has grown from seven to 73 students in a few short years. Our graduate students were coauthors on 17 journal articles, 11 as first author last year and made 36 presentations at scientific conferences. The Ph.D. program is comprised of 46 faculty members from our school, the chemistry and biology departments, the NanoScience Technology Center, Burnham Institute for Medical Research and M.D. Anderson Cancer Center Orlando Cancer Research Institute.

The Medical Laboratory Sciences (MLS) program, under the leadership of Dorielyn Hitchcock, had a 100 percent pass rate on the ASCP national certification exam for 2009. Most of our graduates work in hospitals or clinical diagnostic laboratories in Central Florida, and have an average starting salary of $45,000.

Under the leadership of Dr. Genaro Lopez, our Pre-health Professions Advising Program experienced a great increase in activity with 186 students seeking pre-application packages in 2008. Last year, 29 of our students were admitted into allopathic medical schools.

Four new faculty members are joining us this fall: Dr. Deborah Altomare from Fox Chase Cancer Center, Philadelphia, Dr. Shadab Siddiqi, from the University of Tennessee Health Science Center, and Dr. Mollie Jewett and Dr. Travis Jewett from Rocky Mountain Laboratories of the National Institutes of Health. With the availability of laboratory space in the new Burnett Biomedical Sciences building, we are accelerating our faculty hiring plans to meet our original objective of building critical mass in each of the four chosen areas in the biomedical sciences: cancer, cardiovascular, neurodegenerative and infectious diseases.

Faculty members are supported by more than $10.5 million a year from organizations such as the National Institutes of Health and the Department of Defense—a rare achievement in these times. They also continue to publish in high-impact journals such as Nature Cell Biology, Federation of American Societies for Experimental Biology Journal, and Journal of Immunology. Last year, 14 invention disclosures and 18 patent applications were filed—two new patents were issued.

Our faculty members also gave more than 90 presentations at professional meetings, and were on 74 national review panels last year. They have made major advances by discovering novel ways of treating diabetes, Alzheimer’s disease, and HIV/AIDS, and in understanding cancer, cardiovascular diseases, strokes and tuberculosis. These discoveries garnered national attention.

The Luminary Series, initiated several years ago by Ms. Bernadine Douglas, Director of Development of the Burnett School, continued under the sponsorship of Dean Mead and Fifth Third Bank, showcases our cutting-edge research. This year, presentations organized under the leadership of Charles Roberts, the assistant vice president of development, include “Green Technology for Health Care” by Dr. Henry Daniell, and “Killing Cells Killing Cancer” by Dr. Annette Khaled. Dr. Eila Bossy-Wetzel presented “Aging and Neurodegeneration” in September.

Thanks to the dedicated efforts of our administrative team, the Associate Director for Academic Affairs, Dr. Roseann White, the Associate Director for Facilities and Research Infrastructure, Dr. Robert Gennaro, and our often-overworked staff, headed by Greg Norris and Sheryl Seaman, our school has made great progress in undergraduate and graduate education, biomedical research and our school’s service functions.
The office helped place 61 percent of UCF applicants who used our services into medical schools for the entering class of 2008, while the national acceptance rate was only 45.6 percent. In total, we placed over 100 of our applicants into several health professions (medicine, dentistry, pharmacy, etc) for the 2008 entering classes.

The SLS 2311C (“Overview of Select Medical Careers”) taught by Dr. Genaro Lopez in 2008 Spring semester, had the highest number of enrolled students ever, including over 380 freshman, sophomore, transfer, and upper division students from all majors, who are interested in careers in the health professions.

Our Pre-Health Professions Advisement Office received the highest number of Composite Evaluation Application Packages (214) ever submitted by UCF applicants to nine major health careers, who chose to use this special supplemental application service provided on behalf of our students each year.

Collaboration with VaxDesign

A great example of our partnership with the community is our collaboration with a local biotechnology company, VaxDesign. Under the leadership of Dr. William Warren, chief executive officer of VaxDesign, this partnership includes federally funded collaborative research on tissue-engineered alveolar construct to study human reactions to infections and vaccines. Dr. Warren and Dr. Higbee teach in a very popular Burnett School of Biomedical Sciences course in Tissue Engineering, thus exposing our students to cutting-edge technology.

WELCOME TO THE NEW M.S. BIOTECHNOLOGY, M.S. MOLECULAR & MICROBIOLOGY AND PH.D. STUDENTS
NEW FACULTY

Mollie W. Jewett, Ph.D.

DR. JEWETT will join our faculty as an assistant professor in December 2009. She received her Ph.D. from the Department of Molecular Microbiology at Washington University, St. Louis, in the laboratory of Dr. Eduardo Groisman. Dr. Jewett was a postdoctoral fellow in the laboratory of Zoonotic Pathogens at Rocky Mountain Laboratories under the mentorship of Dr. Patricia Rosa. Her research interests are focused on identifying and understanding the molecular mechanisms critical for the pathogenesis of the Lyme disease spirochete Borrelia burgdorferi. She is joining UCF with independent NIH funding.

Travis J. Jewett, Ph.D.

DR. JEWETT will join our faculty as an assistant professor in December 2009. He received his Ph.D. from the Department of Molecular Microbiology at Washington University under the mentorship of Dr. David Sibley. He subsequently completed his postdoctoral research in the laboratory of Dr. Ted Hackstadt at the Rocky Mountain Laboratories. Dr. Jewett’s research interests are focused on understanding invasion mechanisms used by intracellular pathogens, such as the sexually transmitted bacterium Chlamydia trachomatis. He is joining UCF with independent NIH funding.

Shadab A. Siddiqi, Ph.D.

ASSISTANT PROFESSOR SIDDQUI joined the UCF in July 2009. After receiving his Ph.D. in Protein Chemistry from the Central Drug Research Institute, India, he conducted research on intracellular protein trafficking at the National Institute of Immunology, India. Prior to joining UCF, Dr. Siddiqi conducted research as a postdoctoral fellow and as a faculty member with Dr. Charles M. Mansbach II at the University of Tennessee. His research interests pertain to the regulation of intracellular trafficking of triacylglycerol-rich lipoproteins (very low-density lipoprotein (VLDL) and chylomicrons) from their site of synthesis, the endoplasmic reticulum (ER) to the Golgi at the molecular level. Dr. Siddiqi has identified a new vesicle, the VLDL transport vesicle (VTV), which carries VLDL from the ER to the Golgi. Currently, his NIH-supported research program focuses on the identification of proteins regulating the ER-to-Golgi transport of VLDL in hepatocytes.

Deborah A. Altomare, Ph.D.

ASSISTANT PROFESSOR ALTOMARE joined our faculty in the Fall of 2009, and is also the director of the newly emerging transgenic facility. Dr. Altomare received her Ph.D. in Microbiology and Molecular Genetics from Rutgers, the State University of New Jersey. Prior to UCF, she was an assistant research professor at the Fox Chase Cancer Center in Philadelphia, PA. Dr. Altomare has a long-standing interest in AKT signaling and its oncogenic role in ovarian and pancreatic cancer. Her research utilizes genetically engineered mice to model human tumor progression and treatment. In addition, Dr. Altomare has extensive expertise in using knockout mouse models to delineate the importance of tumor suppressor gene loss, such as that of p16ink4a, p19Arf, and Nf2, in the susceptibility to asbestos-induced malignant mesothelioma.
Debopam Chakrabarti (Full Professor)
Congratulations to Dr. Debopam Chakrabarti for his promotion to full professor. Dr. Chakrabarti’s research focuses on understanding molecular mechanisms of cell growth and differentiation during the intraerythrocytic life cycle of the malaria parasite, plasmodium falciparum. His research on the critical factors that are required for regulating cellular processes will be valuable in discovering means to disrupt parasite life cycle that will eventually contribute to finding a cure for malaria. Specifically, he is (a) defining the function of pre-replication complex components and cyclin-dependent kinases in regulating atypical cell cycle of Plasmodium, (b) delineating the SNARE protein targeting to complex network of endomembrane organelles that are unique to the malaria parasite, and (c) identifying novel antimalarials from marine natural products. Dr. Chakrabarti’s research is currently supported by grants from National Institute of Allergy and Infectious Diseases.

Annette Khaled (Tenure and Associate Professor)
Congratulations to Dr. Annette Khaled for her tenure and promotion to associate professor. Coming from National Cancer Institute-Frederick, Dr. Khaled joined the Biomolecular Science Center at UCF and in 2003 was recipient of a Career Development Award (K22) from the NCI. She has been continually funded by the NIH and is currently PI of two NIH grants. The focus of Dr. Khaled’s research is an essential cytokine, called interleukin-7 (IL-7), that supports lymphocyte survival and growth in a manner that is not well understood. IL-7 has promising use in the treatment of cancer and immunodeficiencies. Dr. Khaled identified the apoptotic protein, BAX, the cell cycle regulating protein, Cdc25A, and most recently the glycolytic enzyme, Hexokinase II, as regulatory targets of the IL-7 signaling pathway in lymphocytes, and is developing this knowledge into novel therapeutics. Also, she is examining the biologic effect of IL-7 dose and site of production upon the proliferation and differentiation of lymphocytes in terms of the specificity of the immune response generated against cancerous cells.

Bill Self (Tenure and Associate Professor)
Congratulations to Dr. William T. Self for his tenure and promotion to associate professor. Dr. Self joined the Burnett School of Biomedical Sciences in August 2003 from the National Heart, Lung and Blood Institute in Bethesda, Maryland. His broad research area is the study of metal and metalloid metabolism as it relates to metalloenzymes and oxidative stress. Specifically, he is examining the mechanisms by which selenium is metabolized in bacterial and mammalian model systems. The effects of other metals and metalloids—such as tin and arsenic—on selenium metabolism, is a primary area of focus in these studies. Dr. Self’s research has recently led to studies that suggest the pathway for selenoprotein synthesis could be a valid target for development of narrow spectrum antimicrobials. He has also recently worked on cerium oxide nanomaterials, and found that these particles are capable of scavenging reactive oxygen species. Dr. Self is currently PI of two NIH grants and is co-PI on four NSF funded projects.

James Turkson (Tenure)
Congratulations to Dr. James Turkson on his tenure. Dr. Turkson joined the Burnett School of Biomedical Sciences as an associate professor in August 2005 from the H. Lee Moffitt Cancer Center and Research Institute. His research broadly covers the areas of signal transduction mechanisms in cancer with emphasis on the epidermal growth factor receptor, Src and Stat3 in breast, pancreatic and ovarian cancers, and the development of small-molecule Stat3 inhibitors as novel anti-cancer agents. He is currently the PI on two NIH R01 grants.
Faculty Accomplishments (PARTIAL LIST)

ALEXANDER COLE
2008 INVITED SPEAKER

2009 INVITED SPEAKER

DEBOPAM CHAKRABARTI
2009 INVITED SPEAKER
3rd IUBMB Symposium of Biochemistry and Molecular Biology of Malaria, 38th Annual meeting of Brazilian Society for Biochemistry and Molecular Biology, Aguas de Lindoia, Sao Paulo, Brazil, “Targeting Protein Prenylation for Malaria Therapeutics: A Piggyback Approach.”

2009 INVITED SPEAKER
Workshop on Tropical Diseases, University of Sao Paulo, Sao Paulo, Brazil, “Plasmodium falciparum CDK-like Kinases.”

STEVEN EBERT
2009 INVITED SPEAKER
Physiology and Biophysics Seminar Series, Georgetown University School of Medicine, Washington, DC, “In vivo cellular and molecular imaging of transplanted stem cells for cardiac repair/regeneration.”

2009 INVITED SPEAKER
Annual Meeting of the International Society for Heart Research (ISHR), Baltimore, MD, “In vivo molecular imaging of cardiac-differentiated stem cells in the mouse heart.”

DINENDER SINGLA
CHAIR
Scientific session, Stem Cells & Regenerative Medicine-Molecular Embryology to Tissue Engineering & Therapeutics, Seattle, WA USA-May 11-12, 2009.

University Award for Excellence in Distinguished Research

DR. ALEXANDER COLE AND DR. HENRY DANIELL were awarded the RIA (Research Incentive Award) in 2009.

DR. WILLIAM SELF was awarded the TIP (Teaching Incentive Award) in 2009.

DR. KENNETH TETER was awarded the 2008–2009 UCF College of Medicine Award for Excellence in Undergraduate Teaching.

Student Awards and Achievements

ALEXANDER COLE’S LAB
RYAN LAMERS, a new doctoral student was awarded a fellowship from NSERC (National Science and Engineering Research Council of Canada).

STEVEN EBERT’S LAB
Undergraduate Research students KATHLEEN TELUSMA, BRITTANY MOSCATO and ANGELA MARTINEZ obtained 1st place, 2nd place and honorable mention, respectively, in Life Sciences II, UCF Showcase of Undergraduate Research (SURE).

WILLIAM SELF’S LAB
SARAH JACKSON-ROSARIO obtained her Ph.D. in the summer of 2009. She is the first author on three published articles, one additional pending and a minireview submission in progress.

KENNETH TETER’S LAB
PATRICIA SCAGLIONE obtained her M.S. and was the first author in a publication in Biochemistry.

Undergraduate student LIZ HAYNES obtained 1st place in the Health and Life Sciences category, 2009 SURE poster presentation.
Dr. Aristide Dogariu of CREOL and Dr. Kiminobu Sugaya of BSBS recently discovered how light energy may be used to guide living cells, such as stem cells, to move to the areas of the body that need regenerative help. Long-term implications of the work include stimulating and controlling tissue regeneration for cleaner wound healing, and the possibility of altering the shapes of cells and preventing malignant tumors from spreading throughout the body.

“Actin rods are constantly vibrating, causing the cells to move sporadically,” Sugaya said. The researchers demonstrated that low-intensity polarized light can guide the rods’ Brownian motion to ever-so-slowly line up and move in the desired direction. “Stronger light would simply kill them,” Dogariu said. “We wanted to gently help the cells do their job the way they know how to do it.”

**RESEARCH THAT HIT NEWS MEDIA**

**Scientists Control Living Cells With Light; Advances Could Enhance Stem Cells’ Power**

This news was featured online at sciencedaily.com, photonics.com, among others

Dr. William Self’s team discovered new ways to fight bacterial pathogens that require selenium for growth. The trace mineral selenium is found in a number of selenoproteins found in both bacterial and human cells. Self’s research shows that interrupting the way selenoproteins are made can halt the growth of a super bug, clostridium difficile, that cause serious infections in hospitals and Treponema denticola, a major contributor to gum disease.

“No one has tried to block the metabolism of selenium before as a therapeutic approach,” Self said. “That’s what’s new and exciting and could lead to a whole host of other possibilities, including a better understanding of how the gold salt works for arthritis.”

**UCF Research Re-awakens Old Genes to Help in Fight Against HIV**

This news was covered in the Orlando Sentinel

Dr. Alexander Cole’s team discovered that reawakening old genes may help fight against HIV.

In collaboration with researchers at University of California at Los Angeles, the Centers for Disease Control and his team at UCF, Cole found that restoring the production of retrocyclins prevents HIV entry. He found a way to get the gene to produce the retrocyclins, and then showed that the retrocyclins appear to prevent the transmission of HIV. He applied aminoglycoside antibiotics to vaginal tissues and cervical cells in his lab, and found that the antibiotic appears to stimulate those cells and tissues to produce retrocyclins on their own.

“It could make a huge difference in the fight against HIV,” Cole said. “Much more work would be needed to demonstrate the safety and effectiveness of this approach. We would certainly have to have human trials, but these findings represent a promising step in that direction.”

**Newly Discovered Reactions From Old Drug May Lead to New Antibiotics**

This news was covered in the Orlando Sentinel

Dr. William Self’s team discovered new ways to fight bacterial pathogens that require selenium for growth.

Dr. Alexander Cole and graduate students Nitya Venkataraman and Julie Martellini
UCF gene finding may lead to new treatment for obesity, diabetes

Dr. Pappachan Kolattukudy’s team discovered a new gene that plays a critical role in obesity and Type 2 diabetes.

“A drug that can shut down its function can prevent obesity and the major inflammatory diseases resulting from obesity, including diabetes and cardiovascular diseases,” said Kolattukudy. Until now, a different protein, known as PPAR gamma, has been universally accepted as the main controller of fat-cell formation in the belly and other parts of the body. The newly discovered gene, MCPIP, can cause fat-cell formation without PPAR gamma.

“This is big,” said Dr. Steven Smith, an internationally renowned diabetes and obesity researcher who was recently appointed director of the new Florida Hospital-Burnham Clinical Research Institute. “The PPAR gamma gene has been at the center of everyone’s radar for trying to understand how fat cells develop. I think he’s on to something here that gives us a new way to see how fat cells form, and I think it will lead to exciting new drug development—especially for diabetes.”

Currently, the most common approaches to treating Type 2 diabetes are medications that tell the body to make more insulin, or simply insulin injections. Smith said the development of a drug that could prevent obesity, which can lead to Type 2 diabetes, would be “revolutionary.”