In the Spotlight:

**David Chen**

Contributed by Rebekah Neal

David Chen may be the Program Director for the Wallace H. Coulter Foundation Translational Research Partnership in Biomedical Engineering, but what does that really mean? And why should you care?

To answer those questions, we'll start at the beginning and follow David's trail to this position here at UVa. David Chen grew up in Bergen County, New Jersey. His parents are first generation Chinese Americans, and David and his older sister and younger brother were all born in the Garden State. Growing up, David actually intended to go to college for religious studies or youth ministry, but after reading The Hot Zone (Richard Preston) in high school and volunteering as an EMT, he wanted to pursue the sciences and possibly even medicine. At Liberty University in Lynchburg Virginia, he studied biology and participated in research projects involving cold-activation enzymes, and population studies of the Peaks of Otter salamander. Deciding to stay in academia for awhile longer, he finished college early with the intention of returning to school for a graduate degree. After a short stint doing quality control at a diagnostics company, he applied to Rutgers for his master’s degree in developmental biology. While there, he worked with two different research groups, studying both signaling cascades and MAPK signaling scaffolds under Dr. Joe Ramos (who actually studied at UVa under Doug DeSimone in Cell Biology) and *Leishmania mexicana* under Dr. Dunne Fong.

Instead of pursuing his Ph.D, David chose to take a job offer from ImClone in New York. As a part of the protein chemistry and methods development group, his daily routine included protein characterizations and analytic methodology development; in short, he quickly immersed himself in the life of a biotechnologist. During his tenure at ImClone, he became “acutely appreciative of the scientific method.” While he enjoyed graduate school and found it edifying, it didn’t quite prepare him for the big, scary world of commercializing science. Working in the biotech industry, he soon discovered, he had lots left to learn. After settling into his routine at ImClone, David faced a decision: should he remain a research scientist, laboring over the benchtop for the rest of his life, or pursue other options? As he faced this dilemma, he discovered a new problem—outside the lab—that he wanted to solve. Watching the poorly orchestrated interplay between his boss and the company execs, he resolved to bring science and big business together. He could see the lack of cross-talk between the research scientists and the business executives hurting both sides of the endeavor, so David...
BTP Minority Day a Success
Contributed by Michael Stadnisky

THE BIOTECHNOLOGY TRAINING PROGRAM hosted its annual Minority Day on September 23rd. The program hosted 10 students from Norfolk State University for a full afternoon and evening of talks and shadowing. Visiting students learned about the graduate school application and interview process, spoke with current BTP students about their experiences, and had an opportunity to shadow current students one-on-one to see what graduate school is like. In addition, Dr. Gordon Laurie, head of the Biotechnology Training Program, and David Chen, Director of the U.Va.-Coulter Research Partnership, spoke with students about opportunities in the biotechnology industry. The day was planned and organized by first-year BTP student Mike Stadnisky. Special thanks go out to the Director for Graduate Student Diversity Programs Cheryl Apprey who co-hosted the event with the BTP and local artist and graphic designer Michael Shveima for designing the logo (http://web.mac.com/mshveima/). The day concluded with the annual new student dinner organized by Matthew Oberhardt.

BTP Students Give Back
Contributed by Sarah Johnson and Rebekah Neal

THIS YEAR, BTP PARTICIPATED in the community-wide Day of Caring. The Day of Caring was established in 1992 by the United Way-Thomas Jefferson Area to promote the spirit and value of volunteerism, increase the awareness of local human service agencies and schools, and demonstrate what people working together for the community’s good can accomplish (www.dayofcaring.info). 2700 Charlottesvillians participated, including 500 volunteers from the UVA Health System—seven of which came from our very own Biotechnology Training Program. Sarah Johnson organized the project, and with the help of Paul Bonthuis, Annika Hedin, Rebekah Neal, Matthew Oberhardt, Michael Stadnisky, and Gordon Laurie, the BTP team beautified the area around the Enterprise Learning Center.

The Enterprise Learning Center is a partnership between Albemarle County Public Schools and a local nonprofit organization, Teens Give, to provide leadership and community-service experience to high-risk middle or high school students who have been expelled or suspended. The program, which began with a State Department of Education grant in 2003, hopes to encourage students to resolve the reasons for their suspensions or expulsions, and teach life skills to avoid negative behaviors at school, home, and in the community.

After 3 hours of weeding, raking, and mulching, the Enterprise Learning Center received a face lift much appreciated by its staff and students, several of whom came to thank the group for their efforts. Hopefully an newly mulched and beautified exterior will help raise spirits and values inside the Center!
New Students Enjoy Good Food and Great Company

Contributed by Matthew Oberhardt

OUR ANNUAL BTP NEW STUDENT DINNER was a great success this year, with approximately 25 attendees and ample enthusiasm throughout. The dinner coincided with the conclusion of our minority day, so minority day participants enjoyed good catered food along with the BTP members and mentors. The speaker this year was Dr. Milton Brown, director of the Georgetown drug discovery center and past UVA professor. Dr. Brown gave an exciting talk about the future of drug discovery, and he laid out his vision for the drug discovery center at Georgetown. Instead of the current paradigm, with a clear disconnect between the academic drug development stage and the clinical trials/drug testing stage in the pharmaceutical industry’s pipeline, Dr. Brown described a new approach, where academic institutions stay involved in drug development through early clinical trials and thus maintain a much larger stake in their intellectual property. The drug discovery center at Georgetown is what Dr. Brown calls an ‘accelerator’, which can push drugs through the development pipeline without them ever leaving the academic halls of Georgetown Medical Center.

After Dr. Brown’s talk, we heard an engaging story from Dr. Ed Botchwey, assistant professor of Biomedical Engineering at UVA, about his own personal path to becoming a professor of science and engineering. This was an inspiring speech for BTPers and also for the minority day students, to whom Dr. Botchwey and Dr. Brown both can serve as valuable role models.

We also heard about BTP externships from Dr. Caren Petrie Aronin at Luna innovations in Charlottesville VA, Dr. Alex Bailey at Tissue Genesis Inc. in Honolulu HI, and Kristina Little at Biosite, Inc. in San Diego CA.

2009 BTP Symposium Planning Underway; Translational Medicine to Be Featured

Contributed by Erwin Gianchandani

PREPARATIONS FOR THE UNIVERSITY OF VIRGINIA’S 2009 Biotechnology Training Program (BTP) Symposium are currently underway. The symposium committee, chaired by BTP chemistry faculty James P. Landers and comprised of faculty and students from various BTP departments, has settled on a theme of “Translational medicine: from bench to bedside” and plans to hold the symposium at the University on May 5–6, 2009. Attendance by UVA faculty and students from the biomedical sciences community is highly encouraged.

The BTP Symposium, which has been held approximately every two years since the University was awarded the NIH-sponsored training program, is an opportunity for UVA to host world-renowned scientists. In 2006, for example, the BTP recruited Jay Keasling and Andrew McCulloch, leading experts in metabolic engineering and cardiovascular systems, respectively.

Expanding on previous successes, this year’s symposium will be the first to span multiple days. On the afternoon of May 5, BTP students will present posters summarizing their research activities, and invited speakers will serve as judges of a first-ever BTP poster competition. Presenters of top-ranked posters will receive special prizes. That evening, BTP students and faculty will have an opportunity to interact with the invited speakers at a cocktail hour. The second day, May 6, will feature eight 40-minute talks by academic and industrial researchers spanning key areas of translational medicine, including clinical informatics, diagnostics, prognostics, and therapeutics. Current invitees include science colleagues at Microsoft and Genentech as well as members of the UVA faculty.
Two BTP Alum Accept Assistant Professorships

MICHAEL SMITH, graduate of Klaus Ley’s laboratory, joins the faculty of Boston University in the Department of Biomedical Engineering. His laboratory focuses on mechanotransduction via the extracellular matrix, in particular on fibronectin and engineering of cell culture platforms for the regulation of cell behavior in vitro. Additionally, he was recently awarded the Innovation Career Development Professorship at BU.

PATRICK MARTIN, graduate of Ann Sutherland’s laboratory, joins the faculty of North Carolina A&T State University, in Greensboro, as an assistant professor in the Biology Department. His research interests include brain tumor pathogenesis and novel chemotherapeutics, as well as developmental biology.

BTP Welcomes New Students

MICHAEL STADNISKY joins us from the Microbiology Department where he studies the genetics of virus resistance and innate immune response to viral infection. His thesis title is: Natural Killer and Dendritic Cells in the Early Response to Cytomegalovirus Infection, and his mentor is Michael Brown. Michael completed his undergraduate degree at Clemson in 2005. Here at UVA he’s been a Resident of the Range for four years, as well as the organizer for the 2008 BTP Minority Day (See article, page 2). You’re likely to see Michael out running; he’s an avid distance runner, with plans to compete against UVA and other university athletes in the 5000m this spring!

ERNIE X. PEREZ ALMODOVAR comes from the laboratory of Giorgio Carta (who is organizing Journal Club for BTP this semester) in the Chemical Engineering Department. Ernie’s project deals with characterization and optimization design of novel anion, cation and protein A chromatographic medias for protein separation. He attended the University of Puerto Rico at Mayaguez for his undergraduate studies with a concentration in Industrial Biotechnology. Ernie loves to travel, and has visited South America, Central America, Europe, and Asia. He also enjoys playing softball and volleyball in the Charlottesville city leagues.

SARAH JOHNSON completed her undergraduate degree at the University of Nebraska—Lincoln, and joined the laboratory of John L. Hudson in the Chemical Engineering Department. Her project area is synchronization control in neurons with applications to epilepsy. She has been married for three and a half years, and she and her husband Rick are expecting a new bundle of joy in February! They have yet to decide on a name for her, but promised to keep us posted.

PAUL BONTHIUS is mentored by Emile Rissman in the Neuroscience Graduate Program. His project area is histone acetylation and gene regulation by estrogen receptor-beta in mood disorders. Paul joins us from the University of Washington where he completed a degree in Cell and Molecular Biology. In his free time, Paul brews his own beer with hops he grows at his parents’ lake cabin in Eatonville, WA.

BARTBARA MERK, from the department of Pathology (Molecular and Cellular Basis of Disease, is studying the role of Signal Transducer and Activator of Transcription 6 (STAT-6) in the regulation of cell growth, survival and invasive capacity in glioblastoma multiforme (GBM), in the laboratory of Isa Hussaini. She comes to UVa from Sweet Briar College where she earned her B.S. in Biochemistry and Molecular Biology. Barbara was born in Germany and lived there until she was 12, but manages to fool the rest of us since she doesn’t have a German accent. She comes from a big family and loves animals, especially horses. After finishing up at UVa, she plans to move to South Carolina and live on a farm.

BTP Introduces New Faculty Mentors

THE BIOTECHNOLOGY TRAINING PROGRAM would like to welcome the following new faculty mentors:

Michael G. Brown, Department of Medicine, Center for Inflammation and Regeneration. His research interests include Immunology, Molecular Biology and Genetics with two distinct project areas: (1) Virus Immunity Research Microbiology, Immunology and Infectious Disease, and (2) Viral Pathogenesis Research Immunity and Inflammation.

Linda Columbus, Department of Chemistry. Her research interests include Biophysical Chemistry, specifically membrane protein structure, function, and dynamics.
Patrick Concannon, Department of Biochemistry and Molecular Genetics. Research in his laboratory builds upon prior genetic studies to map and identify genes involved in genetic disorders such as breast cancer and type 1 diabetes. Additionally, he is interested in cellular DNA damage responses.

Jeffrey Holmes, Department of Biomedical Engineering. The Cardiac Biomechanics Group, led by Dr. Holmes, is interested in the interactions between mechanics, function, and growth and remodeling in the heart, with applications in prevention of myocardial infarction.

John L. Hudson, Department of Chemical Engineering. His research group focuses on the collective behavior of dynamic reaction systems with an emphasis on dynamic complexity and spatiotemporal patterns arising from interactions among rhythmic processes.

Inchan Kwon, Department of Chemical Engineering. His research interests include molecular and cellular engineering for biopharmaceuticals, gene delivery and stem cell research.

Kevin R. Lynch, Department of Pharmacology. His laboratory’s goal is to understand better the biology of lysophospholipid signaling, particularly in the context of pathologies, with the central strategy of small molecule development to probe lysophosphatidic acid (LPA) and sphingosine 1-phosphate (SIP) biology.

William A. Petri, Jr., Department of Medicine, Infectious Diseases. His laboratory is dedicated to research of various aspects of *Entamoeba histolytica*, the causative agent of amoebiasis, a parasite which affects up to 50 million people each year.

P. Prabhakara Reddi, Department of Pathology. His research focuses on transcriptional regulation of mammalian spermatogenesis for better understanding and prognosis for male infertility as well as the development of novel male contraceptives.

Emilie Rissman, Department of Biochemistry and Molecular Genetics. Her research focuses on the steroid receptor and epigenetic interactions affecting behavior.

Michele M. Sale, Department of Medicine, Cardiovascular Medicine. Her research interests include the genetics of vascular disease and the genetics of otitis media, two conditions which affect a significant number of Americans each year, both adults and children.

Michael Shirts, Department of Chemical Engineering. His research interests include molecular modeling, drug design, and condensed phase self-assembly and partitioning, with particular focus on computational drug design.

B. Jill Venton, Department of Chemistry. Her research interests include Analytical Neurochemistry, Electrochemical Detection of Adenosine, and Mechanisms of Drugs of Abuse using Capillary Electrophoresis.

J. Julius Zhu, Department of Pharmacology. His research interests include the study of basic molecular and cellular mechanisms underlying the synaptic plasticity and integration, in particular, signaling molecules and pathways that control receptor/channel trafficking and modulation.

Congratulations to Recent Graduates

RECENT GRADUATES from the Biotechnology Training Program have gone on to begin their lives after graduate school. Two students have begun medical school here at the University of Virginia, on their way to the illustrious life of an MD/PhD: Emily Cushnie and Rooshin Dalal. Four students have begun post-doctoral research positions: Alex Bailey was awarded funding from the Coulter Foundation to continue his study of targeting therapeutic stem cells to specific injury sites following intravenous injection here at UVa in the laboratory of Adam Katz; Caren Petrie Aronin was awarded an IRTA Postdoctoral Fellowship in the National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS) division at the National Institutes of Health, working in the laboratory of Rocky Tuan; and Gary Davis and Rosie Mott have taken positions at the University of Pennsylvania. Two students began work in industry: Jace Fogle as a research engineer with Genentech, and Tim Pabst as a Senior Scientist at Pfizer, Inc. Pfizer Global Biologics, St. Louis, MO, the same company where he completed his BTP externship. Additionally, Erwin Gianchandani successfully defended his dissertation in December, and will stay in the laboratory of his mentor, Jason Papin, until the end of February.
Tom Skalak Accepts Vice President for Research Position at UVa

THE BIOMEDICAL ENGINEERING DEPARTMENT AT UVA will miss their department head Tom Skalak as he moves into the position of Vice President for Research for the University, but at least he won’t go far. His new office is only a stone’s throw from the BME department, and his new job began there on August 1, 2008. According to the press release on June 12, “the vice president for research at UVa plays a leading role in promoting a University research culture that supports innovation and leads to discoveries that will transform society. As part of this role, Skalak will lead the development and promotion of institutional research priorities and themes, assist faculty members to develop new research areas, encourage investment in research infrastructure, and help enable faculty members to pursue creative scholarship as individuals and in small groups, as well as in major center grants. Major new fundraising efforts will be initiated in support of these goals.”

We applaud the University in their choice of Tom Skalak for VP for Research. Having known him as the department chair of BME, we have seen the way he fosters young researchers and helps grow collaborations within and outside the department and the university. We expect he will be a tremendous success in his new role and wish him all the best.

BTP Bids Farewell to Two Great Mentors: Cato Laurencin and Klaus Ley

Cato Laurencin accepts position at UConn
Contributed by Olugbemisola Oredein-McCoy

DR. CATO T. LAURENCIN, M.D., PH.D., has gracefully concluded five years of innovative work in musculoskeletal tissue engineering and orthopaedics here at the University of Virginia; and with this, the University of Connecticut has gained a great leader. Dr. Laurencin has conducted pioneering work over the past 20 years in the area of biomaterials, tissue engineering, and drug delivery. His research has strongly impacted the area of orthopaedic surgery and musculoskeletal tissue engineering as he has made significant headway in applications for bone, tendon, ligament, and cartilage regeneration.

Here at the University of Virginia, Dr. Laurencin held the position of Lillian T. Pratt Distinguished Professor. He served as the chair of the Department of Orthopaedic Surgery department as well as the Orthopaedic Surgeon-in-Chief at the University of Virginia Health System. Additionally, he was named a University Professor, one of the University’s most esteemed titles, and has held additional positions in the department of Biomedical engineering and Chemical engineering.

Dr. Laurencin has powerfully impacted the area of orthopaedic surgery, in a clinical sense, and has, moreover, been heavily involved in discovering and developing novel technologies for the area of tissue engineering. He has performed ground breaking research that has lead to over 200 publications and over 20 patents. His definition of tissue engineering as the “application of biological, chemical, and engineering principles towards the repair, restoration, or regeneration of tissues using cells, scaffolds, and growth factors alone or in combination”, is derived from his strong belief in the need for interdisciplinary approaches for developing efficient and advanced medical therapies.

On top of his many accomplishments in engineering and medicine, Dr. Laurencin has made great strides to promote diversity. He has successfully mentored, developed, and encouraged other strong minority scientists, clinicians, and leaders within the UVA community. Black Enterprise named him as one of “America’s Leading Doctors” in a May 2008 issue.

It is apparent, not only based upon his monumental academic success, but also his success as a mentor and leader, that he will be greatly missed at the University of Virginia. He will move on to the University of Connecticut where he will serve as the vice president for health affairs and the dean of the School of Medicine. He has, additionally, been given the title of Distinguished Professor of Orthopaedic Surgery and Chemical, Materials and Biomolecular Engineering at the University of Connecticut, UConn’s highest academic honor, saved for those who have attained exceptional distinction in scholarship, teaching, and service. Also moving with Dr. Laurencin will be several key professors and post docs from UVA in the area of orthopaedic surgery, biomedical engineering, and chemical engineering. We are most certain that he will continue his pioneering work in orthopaedic surgery and tissue engineering research in his new position, and we all look forward to his continuing success and powerful contributions.
Klaus Ley Moves to San Diego to Join Immunology Institute
Contributed by Kristina Little

SAN DIEGO, CA – After thirteen years at the University of Virginia, and eight years as head of the Berne Cardiovascular Research Center, Dr. Klaus Ley, M.D. recently moved to San Diego to join the La Jolla Institute for Allergy and Immunology. At UVA, Dr. Ley also served as a Professor of Biomedical Engineering and Molecular Physiology, and oversaw a large lab, graduating over a dozen doctoral candidates. During his time at UVA, Dr. Ley helped to pioneer the field of vascular immunology, which looks to the immune system as a method to counteract heart disease. He focused especially on diabetes and atherosclerosis, and has sought to understand how the roles of various adhesion molecules are altered in these diseases. He continues this focus at LIAI, which is a leading center in finding cures through immunology.

Dr. Ley announced that he had accepted the position of Head of LIAI’s Division of Inflammation Biology in the Spring of 2007 and began the process of moving his lab later that Fall. Because he still had five graduate students near the end of their studies, his lab at UVA remained open until May 2008, allowing all five (Elisa Ferrante, Ph.D., John Pickard, Ph.D., Dane Dunson, M.S., Sunil Unnikrishnan, M.S., Kristina Little, M.S.) to graduate. BTP member Kristina Little moved to California to complete her industry externship at Biosite, Inc., and later joined Dr. Ley at LIAI to finish her Ph.D. research in the new lab.

The cross-country transition was fluid, and over the course of the past year, Dr. Ley has built a new lab consisting of two research scientists, eight post-docs, one graduate student, and one technician. The lab operates smoothly, and everyone notes that they feel driven to work harder here than they did in previous labs so that they can better take advantage of San Diego’s fantastic weather. Unsurprisingly, weekends are usually filled by heading to the beach, going sailing, or otherwise enjoying the outdoors, as opposed to working in the lab. Dr. Ley is currently planning his lab’s first outing, which will be a ski trip to Big Bear Mountain in January.
decided to bridge that gap, and become a new breed—a scientist with an MBA.

David chose Darden for business school because it provided case-based study rather than lecture-based, affording him hands on experience he wouldn’t find elsewhere. The strong feeling of community encouraged by Darden, as well as the Jeffersonian ideal embraced by the school—a strong legacy of community service and a commitment to producing great citizens as well as great business people—attracted David and convinced him to relocate to Charlottesville.

After graduating from Darden, and beginning his job search, David realized how deep the fissures between science and business ran. Straddling the cracks, he found the striking majority of business people do not appreciate science, and many scientists ignore the business aspect. Even worse, they didn’t have an opportunity to learn from each other. For instance, according to David, in big pharma, considerable effort is made to keep science separate from business. The Coulter Program, on the other hand, envisioned research as a collaborative and cohesive enterprise—funding projects with strong basic work and promise of clinical value. Accepting this job as the ideal situation to test his newfound business acumen in the science world, he signed on for this new project.

He could see the lack of cross-talk between the research scientists and the business executives hurting both sides of the endeavor, so David decided to bridge that gap, and become a new breed—a scientist with an MBA.

Now that he's been Program Director, he still finds the Coulter Program exciting in its day to day implementation. He has the opportunity to interface with big, established companies such as Johnson & Johnson and Medtronic, and with little startup companies such as Stemgent. David finds his work with researchers and clinicians particularly rewarding, since he has the know-how to help them frame research in clinically meaningful ways.

When asked what piece of advice he wished he’d had as a burgeoning research scientist, he replied, if there is one thing his time in the MBA program at Darden taught him is that "you can’t do it alone." Business and science whether made for each other or not are now inextricably bound together. For all the scientists out there, he advises us to be open to new ideas, and to strive to communicate well on both a technical and professional level. Learning to form teams and pull in all the necessary skill sets is an essential part of managing any business, and science is no exception. Also, he reminds us to never forget the power and importance of networking: “Everybody in your life is a valuable contact. View every experience as an opportunity to meet new people and expand your network.”

This advice holds especially true as we seek our (ex) internship opportunities through the Biotechnology Training Program. David is a firm believer that the internship should be about BTPers learning how to interface with professional groups. Industry can provide life lessons for graduate students and teach skills that can’t be taught in a classroom. Indeed, his life is a testament to that very fact. With his industry and business experience, David is happy to assist with cover letters and resumés, hold practice interviews, and help with initial industry connections. But he warns us that even he doesn’t know every company out there. So, he reminds us to think about our college roommates, neighbors, parents’ friends, and consider flexing that network as we’re seeking our internships now, and again when we’re out hunting for that perfect job.

Most of all, David urges us to choose an internship that excites us, and to take it as an opportunity to meet as many people in as many different areas as possible. According to David, the relationships and connections made during our internships will become a valuable part of our networks. This is our chance to pick these brightest and best brains and take advantage of getting to know people who may one day have the opportunity to offer us our dream jobs.