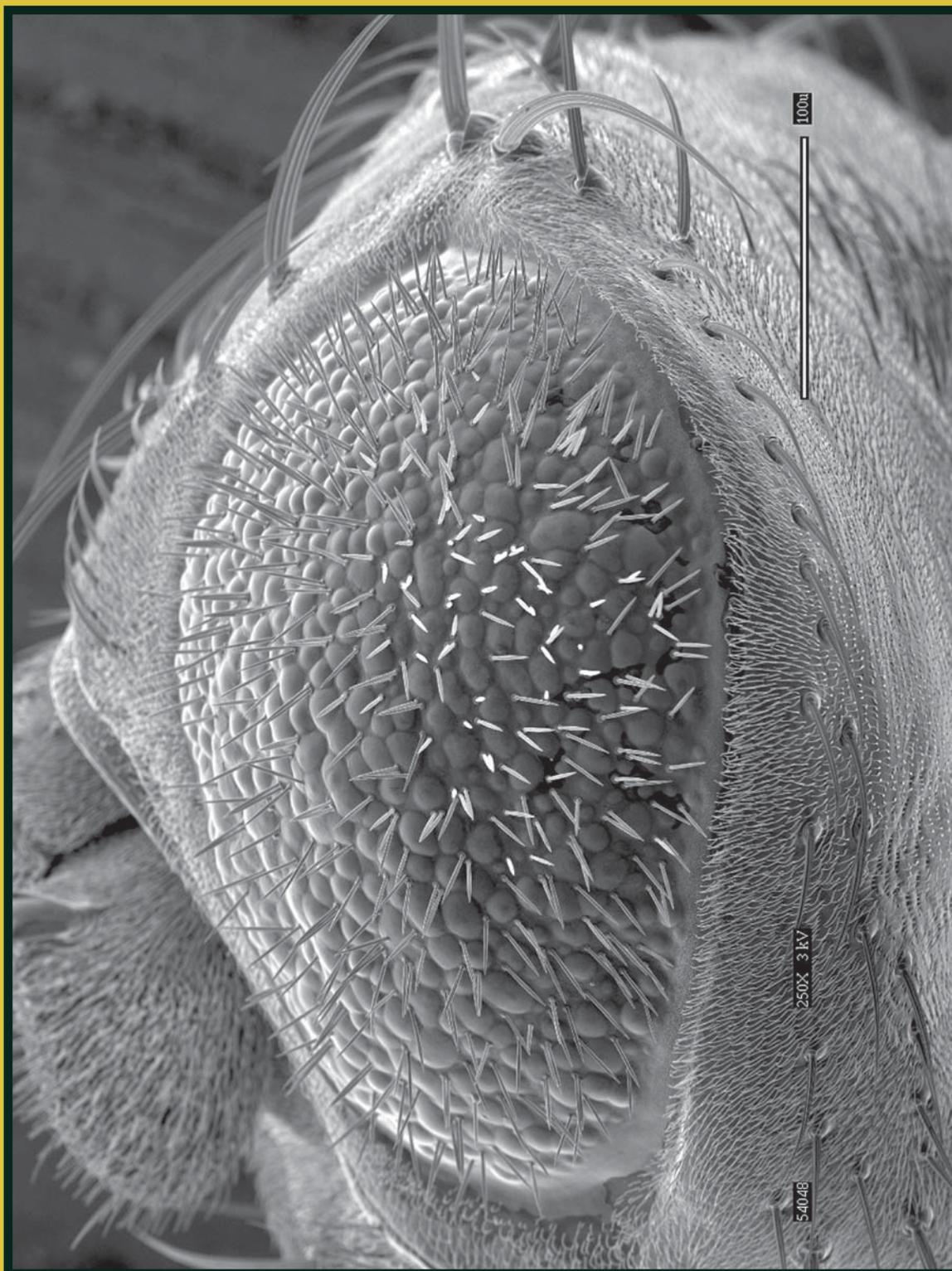


Department of

Biochemistry

PURDUE
UNIVERSITY



2007 - 2008
Annual Report

Undergraduate Michelle Wyreter working on her undergraduate research project in Dr. Ann Kirchmaier's lab.



*Department
Head Message...*



As I'm sure it has been for many of you, it has been busy year in the Department of Biochemistry. Considering that this is the first Annual Report in which my photograph and signature are associated with this preamble, I should begin by explaining that I have had the pleasure of serving as Head of the Department of Biochemistry since May 1, 2008. At that time, Jim Forney, department head since February 2001, returned to full-time teaching and research. During his tenure, the department experienced significant growth. He hired seven faculty, doubled our undergraduate enrollment, facilitated the renovation of facilities, and nurtured our relations with colleagues across campus, as well as with students and alumni. Jim will continue playing a vital role in our department as he devotes more time to mentoring students and continuing his research. We all owe Jim a debt of gratitude for his service over the past seven years and I speak for all of the faculty when I wish him every success in the future.

We launched a number of new initiatives in 2008. We have begun a comprehensive curricular review, involving our current undergraduates as well as our alumni. We thank everyone for the tremendous response we had to our surveys... they have provided us with invaluable information on how our curriculum should be restructured.

Another exciting undertaking, and one that you'll be hearing a lot more about in the next few months, is a celebration of the 75th anniversary of the Department of Biochemistry. In 1934 the Department of Agricultural Chemistry as it was then called became independent from the Department of Agronomy. There have been many changes in those 75 years and we have graduated many successful students since then. It is these milestones that we will be celebrating with seminars, poster sessions, and most importantly, lots of socializing on October 9 and 10, 2009. We do hope you'll be able to come!

Sincerely,

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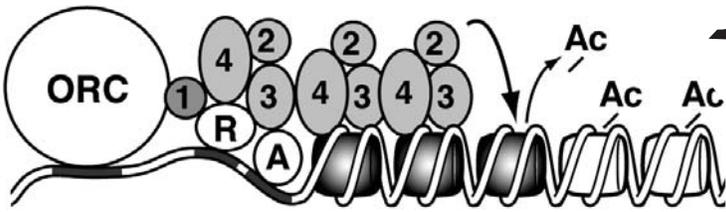
On the Cover

Jim Clemens' lab studies the role of the protein known as Ack, which has an anti-apoptotic role during the development of the Drosophila eye. The work in the Clemens' lab is of particular relevance to human health because in humans, Ack activity is essential for the survival of activated Ras cells which occur in a third of human cancers. Below, graduate student Jessica Schoenherr examines Drosophila neuronal development using an epifluorescence dissecting microscope.



Learning A

Active Sir2p



Condensed from an article written by Susan A. Steeves for *Purdue Agriculture Magazine*, Spring 2008

Chemically modifying the proteins that bind to DNA can change plants' and animals' characteristics much as an author can change literary meaning by adding or subtracting punctuation.

Like a comma makes a reader pause or a period makes a reader stop, certain proteins can bind to a gene and modulate the gene's expression level. These molecules create biochemical changes that act as on/off switches to activate or silence particular genes. A gene's status dictates the orders sent to a cell that control its function and ultimately may contribute to disease risk and other traits in people, animals, plants and other living organisms. Even some expected physical and psychological similarities, or phenotypes, between brothers and sisters may not hold true because a gene has been turned on or off as a result of epigenetic changes.

Researchers, including faculty in the Department of Biochemistry, increasingly are

actively investigating the how, why and what that flips genetic switches. This mode of gene regulation is known as "epigenetics," from the Greek and Latin meaning "on top of genes."

"Epigenetic alteration can lead to differences in appearance or physical condition between so-called identical siblings," says Perry Kirkham, program coordinator in the Purdue Office of the

"Some forms of cancer develop because histone-methylation shuts off a gene that normally would stop cancer."

Vice President of Research. "There are no differences in the gene sequence between the siblings, but changes in the regulation of gene expression lead to very obvious differences in the phenotype of the siblings."

The sequence of a gene isn't changed when epigenetic modifications occur. It's the architecture that is altered by addition or subtraction of functional groups attached to DNA-based proteins called histones that activate or silence the gene.

Histones are proteins around which DNA is wrapped like thread on a spool so that an entire genome fits into a cell's nucleus.

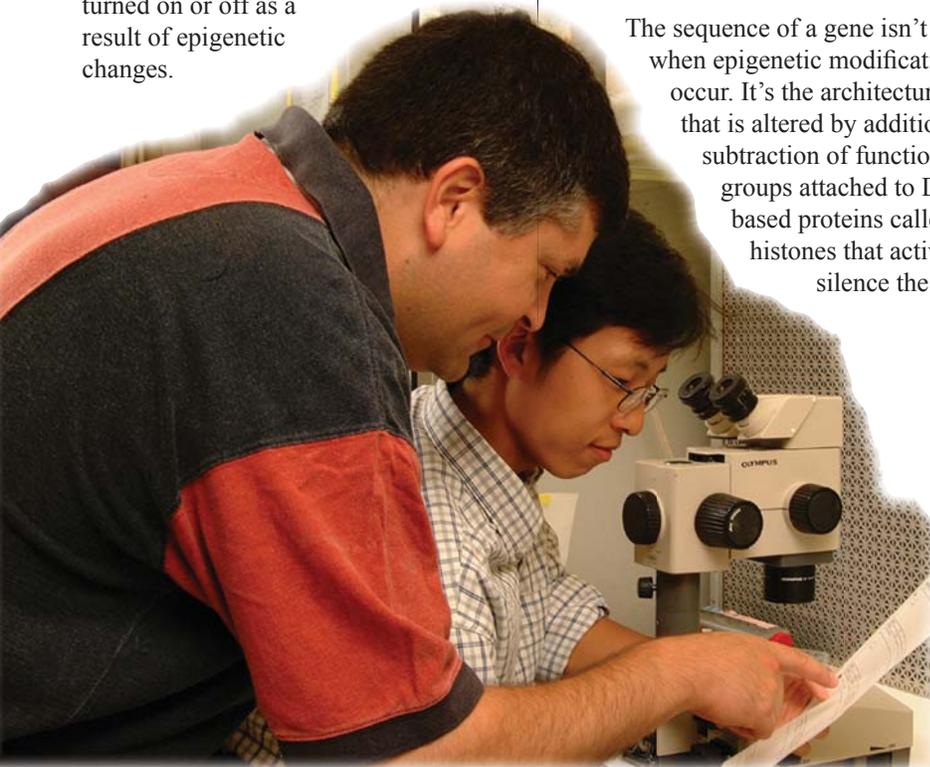
Methyl groups are the most common of the functional groups that can act as switches to activate or silence a gene. Addition of methyl groups is called "methylation"; removal is called "demethylation." During growth and development, the timing of a methylation and/or demethylation change can determine the epigenetic effect on plants and animals.

"There are certain genes that you don't want turned on at certain stages in the life cycle," says Scott Briggs. Briggs studies histone methyltransferases, a type of enzyme that has been implicated in cancers. Some forms of cancer develop because histone-methylation shuts off a gene that normally would stop cancer. When expressed normally, these suppressor genes prevent the cell proliferation that characterizes cancers.

"If you can modulate these enzymes in cancer or other diseases, you could possibly change the outcome," Briggs says. "That's a nice thing about epigenetic modifications: they alter gene expression without changing the DNA sequence. Since the genetic code is maintained, we may be able to develop drugs that would alter or reverse the gene expression, or epigenetic profile, of a cancer cell."

In conventional genetic mutations the gene's sequence is disrupted, and this altered gene is heritable. Epigenetic changes also can be inherited, so in some cases, cancers, obesity, diabetes, behavior and even hair color can be affected in future generations, depending on when and where histone methylation occurs.

Studies on epigenetics have shown that a gene being turned on or off can change the phenotype of both plants and animals for generations without harming their DNA. If the DNA isn't



▶ Dr. Joe Ogas with graduate student, King Chuang, analyzing a sample using a dissection microscope.

New Language Of Life

altered, then future generations may be able to adapt to changing situations.

“A plant wants as much potential success for its progeny as possible,” says Joe Ogas, who works with *Arabidopsis*, a cousin of the mustard plant and a model organism for studies of plant biochemistry. “Imagine that over the course of evolution a plant has experienced a certain environment and that its offspring are likely to experience that environment as well. Epigenetics regulation offers the potential to turn off or turn on certain sets of genes if it will help the offspring be successful in that environment.”

Ogas studies a gene called “PKL” involved in rearranging histones so that the enzymes similar to those Briggs works with can modify the histones. Methylation isn’t the only biochemical mechanism that causes epigenetic changes. Acetylation and ubiquitination are also biochemical mechanisms that can turn genes on or off. Interest by national and international research

groups and funding sources is gaining momentum in the quest to determine how these processes work.

The National Institutes of Health (NIH) and the National Science Foundation (NSF) have earmarked federal funding specifically for studying the epigenome. Purdue biochemist Ann Kirchmaier recently received a nearly \$500,000 NSF grant to probe the mystery of how deacetylation silences—permanently turns off—genes in cells and how epigenetic change is inherited.

“The heritable feature of epigenetic gene regulation necessitates that cells tightly control if, when and where silencing will occur,” Kirchmaier says. “If the wrong genes are permanently turned on or off, it can lead to developmental defects, cancer and other catastrophic disorders.”

Finding ways to stop improper flicking of genetic switches is spawning a new class of drugs, and scientists are

striving for even more. Researchers now are experimenting with epigenetics to program cell function for use in repairing specific injuries and diseases.

Understanding how to trigger the on/off genetic switch may allow scientists to remove some of the genetic programming that tells a cell to change from an undifferentiated embryonic cell to a cell designed for a specific function, such as bone or muscle. “If we can understand epigenetics, then we can understand how to reverse gene expression from on to off or vice versa. We already know that as a cell progresses from a stem cell to a differentiated state there are a large number of epigenetic changes,” Ogas says. “The more we understand the changes, the more we’ll be able to direct cells to particular outcomes.”

Dr. Ann Kirchmaier and senior Rebecca Funk during her undergraduate research experience.



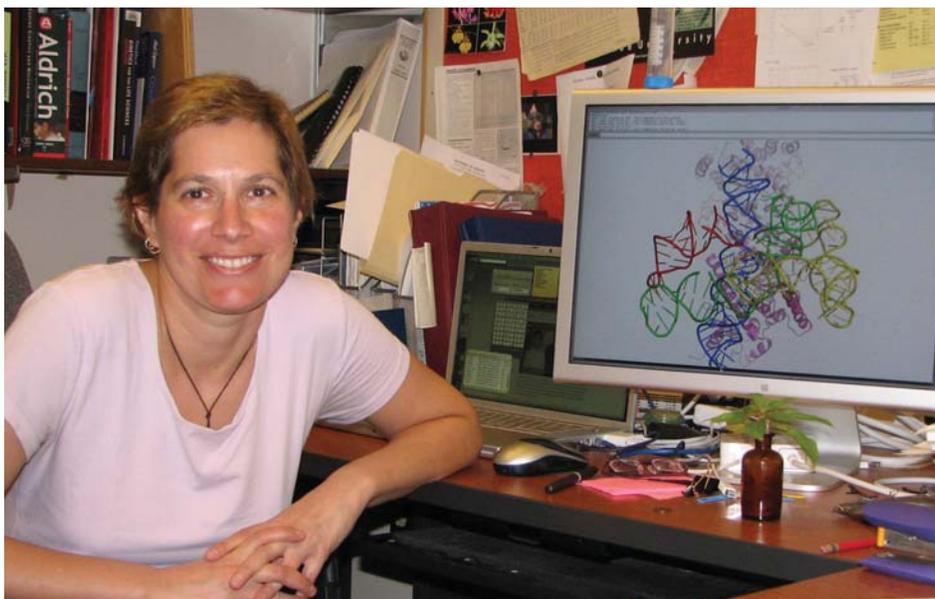
Faculty Focus

Condensed from an article written by Susan A. Steeves for *Purdue Agriculture Magazine*, Spring 2008

A team led by Purdue structural biologist Barbara Golden crystallized a molecule from a common fungus that has allowed researchers to gain insight into evolution. Researchers from Purdue and the University of Texas at Austin collaborated to study the change from a world of RNA to one of RNA and proteins and DNA. “Obviously, we can’t see the process of moving from RNA to RNA and proteins and then to DNA, without a time machine,” Golden said. “But by using this complex, we can see this process occurring in modern life.”

The ‘RNA world’ hypothesis holds that the first self-replicating molecules may have been RNA or a chemically related molecule. Over time, the structural and

enzymatic functions initially served by RNA were assumed by proteins, leading to the latter’s domination of biological catalysis. Hints of this progression can still be seen in modern biology, where RNAs, such as those found in the ribosome and



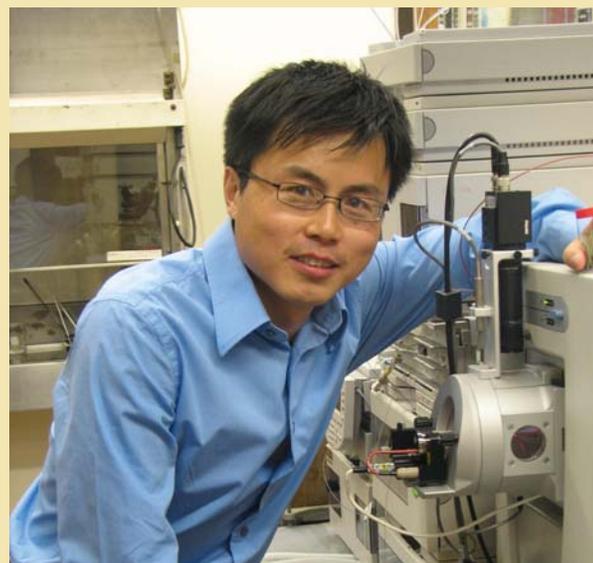
RNase P, retain their ability to catalyze biological reactions, but have evolved into protein-dependent RNA catalysts called RNPzymes. Similarly, group I introns use RNA-catalyzed splicing reactions, but many have evolved to function as

RNPzymes bound to proteins that stabilize their catalytically active RNA structure. In collaboration with Paul Paukstelis and Alan Lambowitz at the University of Texas at Austin, the Golden laboratory has determined a crystal structure of a group I

intron bound to a chaperone protein called CYT-18. This protein is bifunctional and can both aminoacylate tRNA^{Tyr} and stabilize the structure of group I intron RNAs. The co-crystal structure provides insight into how CYT-18 promotes group I intron splicing, how it evolved to have this function, and how proteins

could have incrementally replaced RNA structures during the transition from an RNA world to an RNP world.

Dr. Andy Tao traveled to China in October 2007 where he presented talks entitled, “Functional Proteomics by Mass Spectrometry” at the Department of Chemistry, Peking University; “Functionalizing Soluble Nanopolymers for Proteomic Research” at the Department of Chemistry, Beijing University of Chemistry and Chemical Engineering; and “Functional Proteomics by Mass Spectrometry and Soluble Nanopolymers” at the Department of Chemistry, Nankai University. In March 2008, Andy returned to Beijing, China, where he presented a talk at the Institute of Chemistry, Chinese Academy of Science (CAS) and one entitled, “Applications of Soluble Nanopolymers in Proteomics” at The 2nd Life Science Analytical Chemistry Conference.

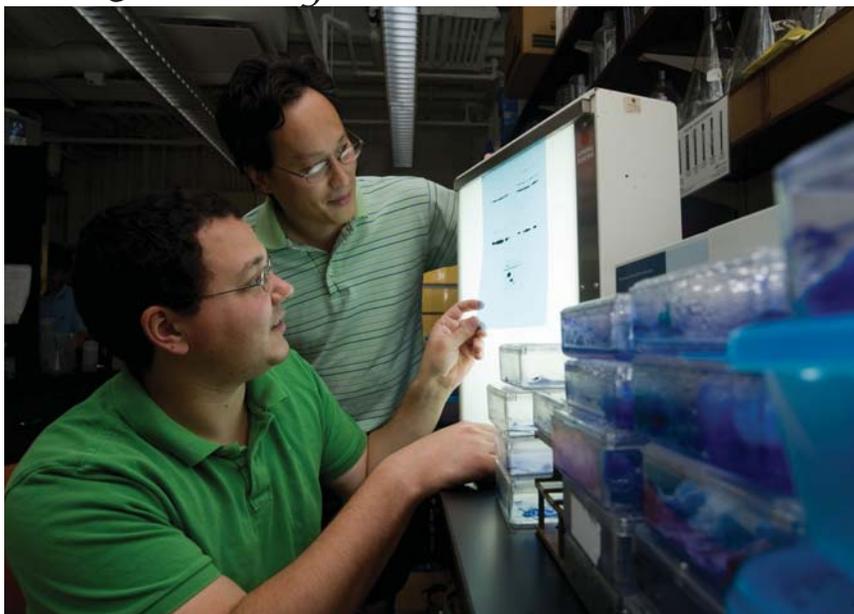


Introducing....

T. Joseph Kappock joined the department in July 2008 as an Assistant Professor of Biochemistry. Dr. Kappock received his Ph.D. from Yale University and did his postdoctoral work at Massachusetts Institute of Technology. Before moving to Purdue, he was an assistant professor in the Department of Chemistry at Washington University (St. Louis, MO). His research interests are the mechanisms of microbial enzymes, particularly those from the acidophilic bacterium *Acetobacter aceti*.



Faculty Promotion



▲ Dr. Scott Briggs and graduate student Paul South reading an autoradiogram.

Scott Briggs was promoted to Associate Professor of Biochemistry, effective August 2008. Dr. Briggs' research focuses on the regulation and function of histone methyltransferases in gene expression and oncogenesis. After receiving his B.S. in Biology from the University of Northern Iowa, Dr. Briggs worked as a research technician at the Eppley Cancer Institute in Omaha, Nebraska. He received his Ph.D. in Pathology and Microbiology from the University of Nebraska Medical Center in 1999. Dr. Briggs joined Purdue's Department of Biochemistry in 2003 and is a member of the Purdue Cancer Center. In 2004 he was awarded the Kimmel Scholar Award and was recognized in 2007 in the Seed for Success Program for receiving a sponsored research grant of one million dollars or more. In January 2008, Dr. Briggs began serving a 2-year term as board member of the New Epigenetics Society, an international scientific society open to those interested in any aspects that can influence the epigenome. Members of the society share their views on numerous topics including DNA methylation, chromatin structure, histone modifications and non-coding RNAs.

On the Move

Dr. Sandra Rossie was named a Fulbright Scholar in May 2008. She received her B.S. from The Johns Hopkins University and a Ph.D. in pharmacology from The University of Chicago. She was a postdoctoral fellow, then research associate in the Department of Pharmacology at the University of Washington. She then joined the faculty of the College of Pharmacy, The University of Arizona as an assistant professor before moving to Purdue.

Dr. Rossie teaches biochemistry and conducts research focused on signal transduction. She studies the changes in the biochemical responses of cells when they receive input from hormones and neurotransmitters. Her research has been published in a variety of peer-reviewed journals and has been funded primarily by the National Institutes of Health and the American Heart Association. She is

a member of the American Society for Biochemistry and Molecular Biology and the Society for Neuroscience.

Dr. Rossie traveled to Russia in the fall of 2008. She had visited Russia several times as a tourist and a scientist. As a Fulbright Scholar, she was affiliated with the Institute of Chemical Biology and Fundamental Medicine and the Institute of Chemical Kinetics and Combustion in Novosibirsk. Located in southwestern Siberia, Novosibirsk is the third largest city in the Russian Federation. It is home to the Siberian branch of the Russian Academy of Sciences and a large scientific community called Akademgorodok, a collection of research institutes together



with Novosibirsk State University. (Академгородок literally translated means “academic station (or small city)”). She taught a class on scientific communication in English and collaborated on a biochemistry research project.



LeAnn (on the left) with some friends on the Whitesunday Islands off the eastern coast of Queensland. ▲

LeAnn Hall (undergraduate) studied abroad in Australia during the fall 2007 semester. During her stay, she took in several classes in political science and world politics. LeAnn states, “It was a very interesting perspective to evaluate politics. I was viewing the U.S. from the outside.” She also took an introduction to marine biology class at James Cook University. Aussie lingo was just the first of many lessons LeAnn had to learn. She also found she had a lot to learn about Australian football and rugby, not to mention learning to drive manual-shift transmission cars on the “wrong” side of the road. She, along with some friends went sailing for 3 days, snorkeling and diving, looking at fish and turtles, and enjoying the southern stars at night. She described the country as a land where half the animals want to attack you and the other half are deadly poisonous. “It wasn’t so bad, though, as the Australians have a great sense of humor, a sense of adventure, and are always ready to have a good time. My study-abroad experience in Australia was an absolute blast. Without the pictures and the adventures, it would hardly seem real. If anyone gets a chance to visit Australia, they will have the time of their lives!” LeAnn traveled again during the summer 2008 to India, Cambodia and Thailand. This trip was centered on public health where she took tours of hospitals, ambulances, visited humanitarian hospitals and toured a sanitation plant.



During the summer of 2007, Erin Kischuk (sophomore) worked for the Bureau of Water Quality of the Muncie Sanitary District (Indiana). She spent nearly six hours each day in chest waders walking upstream in electrified water catching fish and recording data. The fish are a very good indicator of the overall health of a stream as some species are more tolerant of stressors (like pollutants or poor habitat) than others.

Dr. David Krogmann traveled to Cuernavaca, Mexico in February 2008 to teach his course entitled, "How to Write a Scientific Paper in English." Cuernavaca is approximately 35 miles south of Mexico City and is home to a branch campus of the Universidad Nacional Mexico Autonomics. In the past, students commuted from the outpost to the high central campus, but this time the commuting was reversed. The branch campus has been converted to a center for genomics and has made substantial progress.



Emily Sturm (undergraduate) spent the summer of 2007 working as a research assistant in Dr. Forney's lab. Emily was highlighted in Destination Purdue (a newspaper published for high school students to help broaden the awareness of agriculture and promote interest in Purdue's College of Agriculture). Emily was quoted as saying, "Working in a lab and conducting simple, but significant research has truly been a surprising and incredible experience." She acknowledged that students have the privilege of learning masses of information, but often take for granted the years of work and research that was put into finding the fundamentals of science.



Jacob Adler (senior) spent his summer 2007 as an intern for Cargill Corn Sweeteners North America in Dayton, Ohio, where he worked as a Quality Assurance Chemist. Cargill is an international provider of food, agricultural and risk management products with 149,000 employees in 63 countries. Jacob's projects focused on corn milling and the production of high fructose corn syrup.

Graduate students Ayesha Elias (Rossie lab) and Heng Zhang (Ogas lab) were both recipients of a Beach Travel Grant. Ayesha used her award to help defray costs of her trip to the Molecular Chaperones and Stress Responses meeting at Cold Spring Harbor Laboratory in New York in April 2008. She presented a poster about her studies with protein phosphatase 5 and the lab's newest research involving heat shock protein 90 and other chaperones. Heng's award provided support for him to attend a meeting called Biological Methylation:

From DNA to Histones in Carefree, Arizona in June 2008. The conference was Heng's first national meeting. He presented a poster about his research with PKL and the newest observation that PKL promotes trimethylation of histone H3 lysine 27 mediated gene repression.

Jing-Ke Weng (Chapple lab) traveled to Chicago, IL to present a poster at the ASPB meeting in July 2007 and Juan Martinez (Hall lab) traveled to Cold Spring Harbor in New York to present a poster at the Yeast Cell Biology meeting in August 2007.

Mentionables

Biochemistry Research Retreat

The 2007 research retreat was held on Saturday, October 13, at the Wright Forestry Center. The event offered graduate students and postdoctoral researchers the opportunity to share research in the form of 23 posters and 8 talks. Top poster winners were Haining Du (Briggs lab), Juan Martinez (Hall lab) and Paul South (Briggs lab). The event featured a keynote lecture presented by a biochemistry alumnus, Dr. Phil Andrews (Ph.D. 1978, Butler) from the Department of Biological Chemistry, University of Michigan Medical School.



We gratefully acknowledge the financial support of the following sponsors for our annual retreat:

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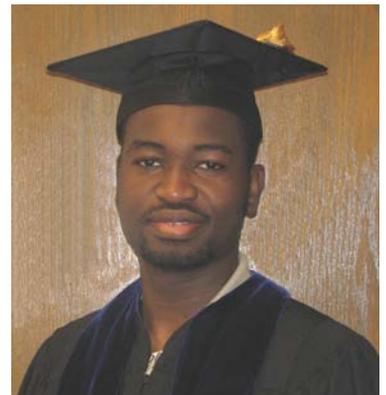
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Biochemistry Club Officers



Kara Levell (vice-president)
Emily Sturm (president)
Erin Kischuk (outreach coordinator)
Sydney Lambert (treasurer)
Korbin Davis (secretary)

Bella Siangonya, a May 2007 graduate from the Department of Biochemistry, is co-author of a paper recently accepted by the journal *Managed Care Interface* (Avery G., Okoror T. and Siangonya B., Disparities in the Quality of Hospital Care: Assessment of Processes of Care.) Bella was admitted to Purdue's Master of Public Health Program and began his studies in fall of 2008. The authors presented the study in June as a poster at the Academy of Health 2007 Annual Research Meeting in Orlando, Florida.



Tiaunn Foster (Jackson State University) worked in Dr. Ann Kirchmaier's lab for 8 weeks in the summer of 2007 as part of the Summer Research Opportunities Program (SROP). Tiaunn analyzed how modifications in chromatin affect DNA damage repair and epigenetic processes in budding yeast. She presented a talk for SROP on campus entitled, "Chromatin Modifications and Their Effects on DNA Damage and Silencing in *Saccharomyces cerevisiae*." She also presented a poster with co-authors Andy Miller and Dr. Kirchmaier at the 21st Annual SROP Conference held at Purdue University.



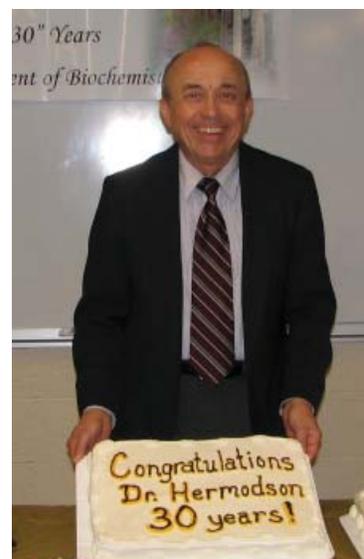
30 Years of Service

Fond Farewell

Dr. Mark Hermodson was honored at a retirement party on December 11, 2007. Dr. Hermodson started his career at Purdue in 1977 as Associate Professor of Biochemistry and was promoted to Professor of Biochemistry in 1980. For the next 20 years, Mark served as head of the department (1981-2001). From November 2004 through December 2005 he served as Interim Associate Dean for Research for the College of Agriculture. Mark also served as Deputy Director (2002-2005) and Interim Co-Director (July 2005 through October 2007) of the Bindley Biosciences Center, Discovery Park.

Dr. Hermodson's principal interests have been in protein structure, protein chemistry, protein sequence analysis, and chemical modification studies with primary interests in enzymology, instrumentation (particularly HPLC), and membrane transport proteins. These interests led him to a 20-year commitment to The Protein Society, which he helped organize in 1985. During his term as the third elected President of the Society (1991-93), the Society launched a journal, *Protein Science*, which began publication in 1992. Mark served as Editor-in-Chief from 1998-2006 and remained Associate Editor through 2008. Mark Hermodson will be remembered for his dedication to the

Department of Biochemistry and the students as well as his warm personality and great sense of humor. He is now spending more time with his family and continuing his service to the community.



“To all my many friends and colleagues, thanks for the memories, the exciting times, and the friendships. May you all retire in good time with the warm feelings that I have for all of you.”



Feature Seminars

The Beach Family Biochemistry Lectureship

Dr. David Allis, Joy and Jack Fishman Professor and Head of the Laboratory of Chromatin Biology at The Rockefeller University in New York City, presented the Beach Lecture Series in September 2007. Dr. Allis delivered two seminars, "Beyond the Double Helix: Reading and Writing the 'Histone Code'" and "The 'Marriage' of Covalent and Non-Covalent Mechanisms of Chromatin Remodeling: Until Gene Activation Do Us Part."

Dr. David Allis' laboratory focuses on the DNA-histone protein complex, chromatin, which is part of a sophisticated system that allows for extremely selective gene activation or inactivation in a given cell. Dr. Allis received his B.S. from the University of Cincinnati and his Ph.D. from Indiana University. A member of the American Academy of Arts and Sciences since 2001, Dr. Allis is a past recipient of the DeWitt Stetten Jr. Award (2001), The Dickson Prize in Medicine (2002), the Massry Prize (2003), and is the 2004 recipient of the Wiley Prize. He was elected to the National Academy of Sciences in 2005 and is a 2007 recipient of the Gairdner International Award.



The Beach Family Biochemistry Lectureship was established in 1990 by David W. Beach. Inspired by his son's enthusiasm for science, he chose to share his good fortune by supporting this biochemistry graduate program. This long-term support is intended to promote intellectual curiosity, and an appreciation of science in all those involved.

Bernard Axelrod Lectureship

Dr. Jasper Rine, Professor of Genetics in the Department of Molecular and Cell Biology at the University of California, Berkeley, presented the Bernard Axelrod Lecture Series in March 2007. Dr. Rine delivered two seminars, "Looking for Good News in the Human Genome" and "Epigenetic Inheritance of Transcriptional States."

The Axelrod Lectureship was established by colleagues and friends of Dr. Bernard Axelrod to honor his many contributions to the field of biochemistry and its community of scientists. Dr. Axelrod served as Head of the Department of Biochemistry from 1964 to 1975. During that time, he hired 12 faculty members, created a vibrant intellectual atmosphere and was instrumental in elevating the reputation of basic biochemistry research at Purdue.



Dr. Jasper Rine is a dynamic geneticist whose insatiable scientific curiosity has led his laboratory's research down many paths ranging from epigenetic mechanisms of gene regulation in

budding yeast to dog genomics to isoprenoid metabolism and, more recently, to human genetic variations in folate metabolism.

Jasper obtained a B.S. in Biological Sciences from The State University of New York and received his Ph.D. in Molecular Genetics at the University of

Oregon with Professor Ira Herskowitz. He conducted his postdoctoral research at Stanford University with Professor Ron Davis until 1982, when he became an assistant professor in the Department of Biochemistry at the University of California, Berkeley. There, Jasper was rapidly promoted to Professor of Genetics in the Department of Molecular and Cell Biology. Jasper has also served as the Director of the Human Genome Center at Lawrence Berkeley Labs and is currently the Director of the Center of Computational Biology at UC Berkeley.

Jasper has been honored by election as an AAM fellow and an AAAS Fellow and was a recipient of an NIH-Merit Award. He received a Distinguished Teaching Award from the University of California and in 2006 was awarded a Howard Hughes Medical Institute Professorship to support excellence in teaching.

External Speakers

David Allis

Chromatin Biology and Epigenetics
The Rockefeller University
(see **Beach Family Biochemistry Lectureship article**)

Robert Brosh

National Institute of Aging
New Insights to the Roles of Rec-Q-like Helicases in the Maintenance of Genomic Stability

James Bruce

Department of Chemistry
Washington State University
Chemistry and Mass Spectrometry: New Tools for in Vivo Protein Interaction Identification

Or Gozani

Department of Biological Sciences
Stanford University
Modulation of DNA Damage Signaling Pathways by Lysine Methylation

Paul Kaufman

Department of Gene Function and Expression & Molecular Medicine
University of Massachusetts Medical School
Chromosome Assembly and Genome Stability

Jasper Rine

Department of Molecular and Cell Biology
University of California, Berkeley
(see **Bernard Axelrod Lectureship article**)

David Shapiro (BCHM Ph.D. 1972)

Department of Biochemistry
University of Illinois
Estrogen Receptor: From Mechanisms of Action to Immune Surveillance in Cancer and Drug Discovery

Weinian Shou

Department of Pediatrics
Indiana University School of Medicine
The Role of FKBP and BMP Signaling in Cardiogenesis and Heart Function

David Skalnik

Department of Pediatrics
Indiana University School of Medicine
SETting the Stage for Epigenetics Regulation

Bill Sullivan

Department of Pharmacology and Toxicology
Indiana University School of Medicine
Connecting the Stress Response to Histone Modifications and Gene Expression in a Protozoan Parasite

Andrew Vershon

Department of Molecular Biology and Biochemistry
Waksman Institute, Rutgers University
Mechanisms of Transcriptional Regulation of Meiotic Genes in Yeast

Nancy Walworth

Department of Pharmacology
Rutgers University
Checkpoints and Chromosome Instability: Stories from Fission Yeast Chk1

Xiang S. Ye

Eli Lilly
Indianapolis
Targeting Cell Division for Cancer Therapy

Purdue Speakers

Erik Barton

Department of Biological Sciences
Immune Physiology During Latent Herpesvirus Infection

Clint Chapple

Department of Biochemistry
Biochemical and Genetic Opportunities for Biomass Crop Improvement

Chang-Du Hu

Department of Medicinal Chemistry and Molecular Pharmacology
Functional Analysis of AP-1 Dimerization Using BiFC-Based Technologies

Kee-Hong Kim

Department of Food Sciences
Modulation of Endoplasmic Reticulum Stress by Selenoprotein S

Ann Kirchmaier

Department of Biochemistry
*Epigenetic Gene Regulation in *Saccharomyces cerevisiae*: How to Build to Last Forever*

Joe Ogas

Department of Biochemistry
*Role of a CHD3 Chromatin Remodeler in Transcriptional Repression in *Arabidopsis**

Sandra Rossie

Department of Biochemistry
Examining the Regulation and Role of Protein Phosphatase 5 in Signal Transduction

Chris Staiger

Department of Biological Sciences
Regulation of Actin Dynamics

Henry Weiner

Department of Biochemistry
New Discoveries with Aldehyde Dehydrogenase and Mitochondrial Protein Import

Awards & Recognitions

Distinguished Ag Alumna

On March 21 the Department welcomed back Tuajuanda Jordan (Ph.D. 1989, Rodwell) as the 2008 Distinguished Agricultural Alumna for Biochemistry. Dr. Jordan, who is currently Senior Program Officer for the Howard Hughes Medical Institute presented a talk, "Targeting the Future of Science Education."

The Howard Hughes Medical Institute has established a new division of its Grants and Special Programs known as the Science Education Alliance (SEA).

The mission of SEA is to transform science education by providing a national resource of vetted materials and methods. The first initiative of SEA, under Dr. Jordan's charge, is the

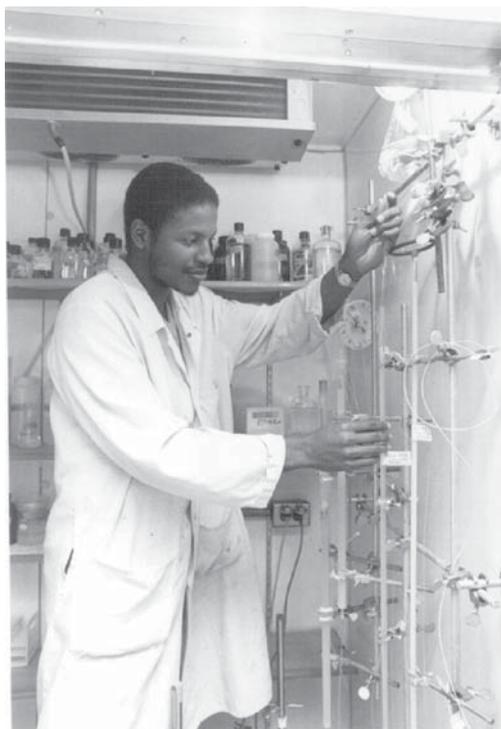
National Genomics Research Initiative (NGRI), a program targeting college freshmen. The NGRI is designed to expose students to the process of doing science via engagement in an authentic research experience that is



implemented as part of the curriculum. During Fall 2008, classrooms at twelve institutions will become innovative research laboratories, where students can isolate organisms, characterize them, and realize true discoveries. It is believed that this initiative will positively impact students' scientific experience and help faculty realize innovative ways to bring research into the classroom without sacrificing scholarship and student learning.

Dr. Jordan frequently returns to Purdue in the roles of advisor and speaker.

Honorary Doctorate Recipient



▲ Brad Sheares during his graduate studies in the early 1980's.

The department welcomed back Brad Sheares (Ph.D. 1982, Carlson) who received an honorary doctorate during Purdue's commencement ceremony May 10, 2008. The honorary degree is the highest award Purdue can offer. It signifies both distinguished service to the university and great achievements in career and life. During his visit, Dr. Sheares presented a seminar, "The Future of the Pharmaceutical Industry." Brad has distinguished himself over a 25-year career in biochemical research and the pharmaceutical industry. He spent much of his career with Merck and Co., Inc. where he rose through the ranks to President, U.S. Human Health Division. Most recently Brad served as chief executive officer of Reliant Pharmaceuticals, Inc. In 2002, he received the Distinguished Ag Alumni award for Biochemistry. He was featured on the cover of Fortune Magazine in 2006 as a "rising star."



Dr. Brad Sheares, 2008

Dr. Clint Chapple with undergraduates Anna Hurlock and Leslie Seals discussing Arabidopsis research.



Clint Chapple received the Richard L. Kohls Outstanding Undergraduate Teacher award for the College of Agriculture. Clint, along with Co-PI Alan Friedman, also received funding of \$1.93 million from the Stanford University Global Climate and Energy Project to develop new strategies for biofuel production. The project will be completed in cooperation with the Bindley Biosciences Center and the Energy Center at Discovery Park.

Drs. Fred Gimble and Jim Henderson received \$26,000 from the College-level Instructional Innovation Funds Awards for their proposal, "3D Visualization of Biomolecules to Enhance Learning of Major Principles of Biochemistry." Three-dimensional visualization equipment will be purchased to aid in teaching and learning in all biochemistry courses and will allow students to better understand the structures of important biomolecules such as DNA, RNA, proteins and lipids.



Kwok Ki "KK" Ho and Abhijit Mukhopadhyay, both research associates in Dr. Henry Weiner's lab, each received a College of Agriculture Administrative/Professional Advancement for excellent performance. Abhijit has been with Dr. Weiner since 1997. KK has been with the University since 1991 and in Dr. Weiner's lab since 2001.

Graduate student Jacob Galan (Tao lab) received a first place award for his poster entitled, "Development and Application of Functional Nanopolymers in Cancer Research," during the Cancer Prevention Retreat hosted by the Oncological Sciences Center at Purdue on April 11, 2008. Co-authors Anton Iliuk (Tao lab), Dr. Robert Geahlen (MCMP) and his graduate student Bethany Alicie helped to make the poster a success.

Three staff members were recognized for their years of service at Purdue: Michael Ku (Forney lab; 15 years); Huide Zhang (Hermodson lab; 15 years) and Abhijit Mukhopadhyay (Weiner lab; 10 years).

Jim Clemens' research on the prevention and treatment of disorders such as Down Syndrome, autism, Alzheimer's and Parkinson's diseases was highlighted in the January/February 2008 *Purdue Alumnus* Magazine. Jim's research has earned him two prestigious fellowships from the Alfred P. Sloan Foundation and the Esther A. and Joseph Klingenstein Fund, Inc.

Henry Weiner received the Outstanding Graduate Educator award for the Department of Biochemistry, College of Agriculture.



Dr. Henry Weiner

Dr. Mark Hall and graduate student Juan Martinez separating a complex mix of proteins using high performance liquid chromatography.

Dr. Jim Clemens scoring ectopic axon projections in Down Syndrome cell adhesion molecule mutant brains.



Awards & Recognitions

Michelle Drennan (Broyles lab) was the Hickory Stick Award winner for her work with BCHM 562 during the fall 2007 session. This award is given annually to an outstanding graduate teaching assistant. Michelle received excellent feedback from students who attended her help sessions, which brought together the materials team-taught by Scott Briggs and Xiaoqi Liu. In addition to her regular office hours, Michelle provided many one-on-one hours helping students learn and understand the materials.

Michelle also received the Celebration of Graduate Student Teaching Award sponsored by the Committee for the Education of Teaching Assistants (CETA), the Teaching Academy, and the Office of the Provost. She was recognized with other departmental winners at an April 17, 2008 banquet and received an engraved plaque.

Jing-Ke Weng (Chapple lab) received the A.K. Balls Award. This award is given annually to an outstanding graduate in research. Jing-Ke is a 5th year student in the Plant Biology Program. His research focuses on the isolation of genes encoding cytochrome P450-dependent monooxygenases involved in phenylpropanoid biosynthesis from *Selaginella moellendorffii*. Though his focus is on P450s, Jing-Ke has successfully kept projects on several other genes and enzymes moving forward simultaneously. In addition, he helped publish eight papers and served as a mentor to several undergraduate students. Jing-Ke plans to graduate during the next academic year.

Bo Yang (Kirchmaier lab) was awarded a Bilsland Dissertation Fellowship for spring 2008 by the Purdue Graduate School and the College of Agriculture to support his studies on the role of histone modifications and the Sir2 family of deacetylases in epigenetic gene regulation in *S. cerevisiae*. The Bilsland Dissertation Fellowship provides support to outstanding Ph.D. candidates in their final year of doctoral degree completion.

Michelle Drennan, graduate student and 2008 Hickory Stick Award winner.



Why I chose Biochemistry at Purdue

Over the years, many people have spent time in the Department of Biochemistry as undergraduate or graduate students, post-doctoral fellows, faculty, or staff. For many, this time spent in our department has been life changing. Those years have launched some on careers in the private sector, while others have used their time in the department as a stepping stone to medical school and a lifetime of helping others. Some have met their lifelong partners in West Lafayette and move away, whereas others settle down here to raise their families. This year, we asked a few of our current students what brought them to Purdue University for years that will undoubtedly be transformational.

Grad Student: Xiaoxiao (Shawn) Liu (B.S. 2007) Nankai University, CHINA

“When I was an undergraduate in Nankai University of China, I was deeply attracted by the interdisciplinary research between chemistry and biology. My keen interest in biochemistry, and the dream to do some research in this field, pointed towards my pursuit of graduate study and research. Therefore, I chose Purdue University for its outstanding renown in this field. I currently work under Dr. Xiaoqi Liu who studies protein phosphorylation regulating cell cycle progression. It is now widely accepted that cancer arises at least partly due to the perturbation of normal cell cycle progression. Our lab particularly focuses on Polo-like kinase 1 which emerged as a key player in many cell-cycle related events. By using a yeast two-hybrid system and mass spectrometry we are able to find Plk1-interacting proteins and further analyze the function of phosphorylation during the cell cycle. This will definitely contribute to the whole signal pathway and help to understand the mechanism of cancer and search for potential cancer drugs. With my Ph. D., I would like to be a researcher in the signaling field. It’s fantastic for me to understand even a little about the wonderful accuracy of life.”

Grad Student: Christie Eissler (B.S. 2006) Northern Illinois University, DeKalb, IL

“While pursuing my B.S. at Northern Illinois University, I took advantage of every opportunity I could to work in a laboratory. Although I learned many things from my undergraduate research and internships, one of the most important things I learned was how to think independently. My research taught me the beginning of how to ask questions and scientifically find the answer. It is here at Purdue that I hope to home in on and further develop such skills.

There are many reasons I chose to pursue my Ph.D. here at Purdue. When I was an undergraduate taking my first biochemistry class I began thinking about what schools I would be interested in for graduate school. During a conversation with one of my professors, Dr. Gary Baker, he recommended Purdue as he was a 1983 graduate of Purdue’s Department of Biological Sciences. After taking his advice and looking into the program, it did not take me long to know that this is where I wanted to pursue my graduate studies. I was attracted to the program not only due to the size of the department but also due to the diverse areas of study. After reading all the literature I could about the program, I was left with the feeling that the department really focuses on its graduate students and that the faculty worked to ensure the

success of its students. With these thoughts in mind I applied to the program and was asked to interview. During my interview, I quickly realized the department was all that I had ever dreamed of and more. After a year of rotations through several labs I chose to study under Dr. Hall where we are focused on how the cell cycle is regulated by the Anaphase-promoting complex (APC). Our lab employs the power of mass spectrometry to investigate the APC, its protein interaction partners, post-translational modifications, etc. During my time in the lab, I hope I will become an expert in mass spectrometry and its application to a biological process so that I will be able to apply it in future endeavors as a researcher.”

Grad Student: Nickolas Anderson (B.S. 2007) University of Nebraska, Lincoln, NB

“As an undergraduate at the University of Nebraska, Lincoln, I took advantage of the opportunity to work for the United States Department of Agriculture (USDA), on a biofuels project researching a method to detect seed viability in switchgrass. My job allowed me to conduct the necessary experiments but made it clear to me that a higher degree is essential if I wanted to maximize my ability to contribute in this field. The time I spent with the USDA also brought to my attention the importance of exploring alternative fuels and the potential impact they could have towards improving modern agriculture. My interest in biofuels led me to seek graduate programs which would enable me to be an innovator in the field.

Purdue has a great reputation for agricultural research. Since it is located in the Midwest, Purdue actively pursues issues relevant to the areas with which I am concerned. I currently work under Dr. Chapple who has spent his career studying plant metabolic pathways for use in multiple aspects of agriculture, including biofuels. Dr. Chapple’s goals mirror my own with respect to advancing the technology of modern agriculture. By studying under Dr. Chapple, I believe I will be able to obtain the training needed to independently pursue my own ambitions.”

Student Scholarships

Freshmen

Jillian Borsa (Purdue Academic Success Award, Scholarship Award of Excellence)

Amber Clark (Scholarship Award of Excellence, J. Kelly O'Neall & Margaret Ritchey O'Neall Memorial Scholarship)

Korbin Davis (Scholarship Award of Excellence, Marquardt Alumni Scholarship)

Matthew Gentry (Scholarship Award of Excellence)

Monica Hoover (J. Kelly O'Neall & Margaret Ritchey O'Neall Memorial Scholarship)

Anna Hurlock (Purdue Academic Success Award, Scholarship Award of Excellence, 400 Club Recognition)

Shannon Kremer (Scholarship Award of Excellence, J. Kelly O'Neall & Margaret Ritchey O'Neall Memorial Scholarship)

Lyndsey Maxwell (Marquardt Alumni Scholarship)

Bethany Roberts (Scholarship Award of Excellence)

Rachel Schluttenhofer (Purdue Academic Success Award, Scholarship Award of Excellence, J. Kelly O'Neall & Margaret Ritchey O'Neall Memorial Scholarship, 400 Club Recognition)

Megan Schnur (Scholarship Award of Excellence, 400 Club Recognition)

Leslie Seals (Purdue Academic Success Award, Scholarship Award of Excellence, 400 Club Recognition)

Jamie Steiner (Scholarship Award of Excellence, Marquardt Alumni Scholarship)

Victoria Watkins (Scholarship Award of Excellence)

Megan West (Senior Scholarship)

Kayla Wisler (Scholarship Award of Excellence)

Zinan Zhou (400 Club Recognition)



Undergraduate Rachel Schluttenhofer (Tao lab) assembling the nanospray source for a mass spectrometer.

Sophomores

Erin Kischuk (Purdue Academic Success Award, Sophomore Scholarship, Farm Credit Services Scholarship, J. Kelly O'Neill & Margaret Ritchey O'Neill Memorial Scholarship, Walter Pugsley Scholarship, Purdue University Merit Scholarship for Agriculture, 400 Club Recognition)

Brittany Kraft (Sophomore Scholarship)

Amber Stroud (Sophomore Scholarship)

Juniors

Andrew Bandy (400 Club Recognition)

Seunghee Choi (Junior Scholarship)

LeAnn Hall (Purdue Academic Success Award, Junior Scholarship, J. Kelly O'Neill & Margaret Ritchey O'Neill Memorial Scholarship)

Kara Levell (Floyd & Nellie Elliot Scholarship, J. Kelly O'Neill & Margaret Ritchey O'Neill Memorial Scholarship, Walter Pugsley Scholarship)

Nicole Mock (Junior Scholarship, J. Kelly O'Neill & Margaret Ritchey O'Neill Memorial Scholarship)

Emily Sturm (Junior Scholarship)

Christina Velasquez (Purdue Academic Success Award, Junior Scholarship, Joseph S. Dawson-Klaus M. Herrmann Award, 400 Club Recognition)

Anna Verseman (Floyd & Nellie Elliot Scholarship, Lewis Runkle Scholarship)

Seniors

Jacob Adler (Senior Scholarship, Agriculture Research Fund Scholarship)

Sarah Batta (Pfundler Scholars Program)

Julie Chaney (400 Club Recognition)

Brent Goodman (Purdue Academic Success Award, Senior Scholarship, 400 Club Recognition)

Michael Rauscher (Purdue Academic Success Award, Senior Scholarship, Purdue University Merit Scholarship for Agriculture)

Lei Shi (Junior Scholarship, Agriculture Research Fund Scholarship)

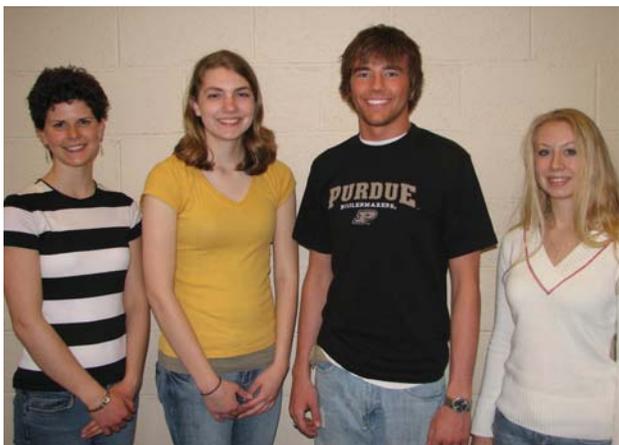
Anthony Snyder (Senior Scholarship)

Dr. Xiaoqi Liu with postdoctoral fellow Jiabin Tang and graduate student Greg Weber working in the cell culture laboratory.



Student Happenings

Ag Ambassadors 2008-2009



Three biochemistry students were selected to serve as Ag Ambassadors for 2008-09: Erin Kischuk (sophomore), Rachel Schluttenhofer and Korbin Davis (freshmen). Current Ambassador LeAnn Hall (junior) will continue to serve as well.



Christina Velasquez (junior) participated in the Loyola School of Medicine Summer Internship program during summer 2008. This is a six-week program in which students discuss healthcare problems in America with other program participants. The area of concentration involves community members in impoverished Chicago neighborhoods. Christina visited hospitals and clinics, performed community service work and attended a few lectures at Loyola.

Christina was also selected as a member in the Mortar Board Class of 2009 honorary. She will help plan several leadership and diversity conferences at Purdue for the 2008-09 school year. The nomination was anonymous and selection was based on scholarship, leadership and service.

Career Success Tour

Over 60 FFA (Future Farmers of America) members visited the biochemistry department as part of a “career success tour” organized by the College of Agriculture. The students were attending the 80th annual National FFA Convention which brought over 50,000 members together in Indianapolis for the week. The students spent an hour in the department isolating casein from milk and performing assays on the protein. Jim Henderson (Coordinator of Teaching Laboratories) and members of the Biochemistry Club led the workshop.





Anna Hurlock, Emily Sturm, Kara Levell, Megan Schnur, Sydney Lambert, Hana Tewoldemedhin, Erin Kischuk, Rachel Schluttenhofer and Megan West participated in Purdue's 2008 Spring Fest, an annual event intended to provide a link between Purdue and the local community. The event is a great opportunity for students of all ages to learn about animals, art, astronomy and much more in two full days of hands-on activities. The theme for the Biochemistry Club was "Enzymes." The activities in which they involved Spring Fest visitors were cheese making, fruit juice extractions, and why broccoli sprouts taste bad.

2008 Lafayette Regional Science Fair

Over 340 projects from 20 schools (grade levels 5th to 12th) were entered in 14 different categories at the 2008 Lafayette Regional Science Fair. Student projects were displayed and judged on Friday, March 7 with awards presented on Saturday, March 8. The biochemistry department was well represented. Many thanks to the following for volunteering their time as judges:

Faculty - Harry Charbonneau, Sandra Rossie and Victor Rodwell; Graduate Students - Doug Mersman, Nick Anderson, Ayesha Elias and Hemalatha Jayachandran; Undergraduate Students - LeAnn Hall, Megan West, Stephanie Cutshaw, Emily Sturm and Andrew Bandy. Anna Wilson, who retired as Coordinator of Teaching Labs in May 2007, also participated as a judge with her husband John.

Undergraduate Research & Poster Symposium

The fourth annual Undergraduate Research and Poster Symposium was held on March 31, 2008 at the Purdue Memorial Union.

Over 150 undergraduate students from the colleges of Science,

Engineering, Technology and Agriculture presented posters and abstracts explaining their current and ongoing research. Three biochemistry students participated in the symposium: Lei Shi (Rossie lab) "Potential Regulation of Protein Phosphatase 5 by Reactive Oxygen Species"; Jacob Adler (Tao lab) "Identification of Phosphorylation-dependent Proteins in B cells Using Novel Quantitative Proteomics Strategy"; and Dustin Owens (Ogas lab) "Identifying Necessity of PKL Domains in pkl-GABI."

Biochemistry faculty Fred Gimble, Mark Hall and Ann Kirchmaier helped by serving as judges.

Dr. Mark Hall (r) judging posters at symposium.



Christie Eissler (1st year graduate student) replaced Hemalatha Jayachandran (Rossie lab) as the PGSG (Purdue Graduate Student Government) Senator representing the Department of Biochemistry. Christie looks forward to the opportunity of getting more involved with graduate students in our department and the university.



“Building Your Future One Brick at a Time”

Purdue hosted more than 500 undergraduate researchers during the Committee on Institutional Cooperation Summer Research Program Conference (SROP), “Building Your Future One Brick at a Time” in July 2007. The Big Ten institutions and University of Chicago collaborate to increase minority student access to graduate education and SROP is a key component. SROP provides faculty-mentored summer research experiences and enrichment activities to help prepare students for graduate study.

Three graduate students, Jui-Hui Chen (Golden lab), Hemalatha Jayachandran (Rossie lab), and Jessica Schoenherr (Clemens lab) participated in the AMP (Applied Management Principles) Program in May 2008. The program is jointly sponsored by Purdue’s Krannert School of Management and the College of Science. The program was developed to allow doctoral students to gain business understanding while they are completing their academic programs of study and research.



Master of Science

Fall '07

Dah-Eun "Mary" Jeong
BCHM, M.S.
(Hall lab)

Matthew Fountain
BCHM, M.S.
(Ogas lab)

Ying Wang
BMB, M.S.
(Charbonneau lab)

Bachelor of Science

Summer '07

Tim Hott

Fall '07

Julie Chaney
Jung-Ah Hwang
Leonard Kim
Michael Szewczyk

Spring '08

Jacob Adler
Sarah Batta
Tara Breen
Joshua Clark
Brent Goodman
Stacey Huppenthal
Dustin Owens
Lei Shi
Noah Shields
Bella Siangonya
Anthony Snyder
Megan West

Doctorate

Fall '07

Jake Stout
PBP, Ph.D.
(Chapple lab)

*Dr. Clint Chapple and
Jake Stout at Fall
commencement.*



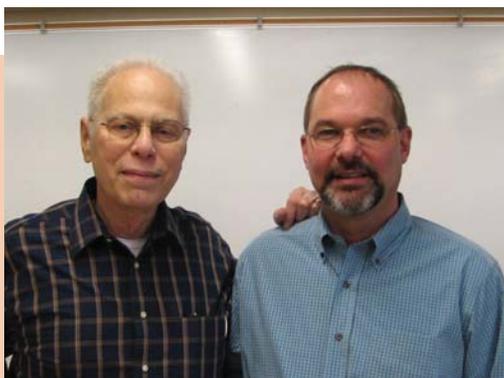
Where are they going...

Undergraduates: Tim Hott is presently enrolled at Cooley Law School in Lansing, Michigan where he is studying intellectual property law and its application to the life sciences. Jacob Adler entered Indiana University School of Medicine in Fall 2008 in the BioMedical Gateway (IBMG) Program where is working toward a Ph.D. in biomedical science. Brent Goodman plans to go to medical school. Anthony Snyder is attending graduate school at Indiana University-Bloomington in the Interdisciplinary Biochemistry Graduate Program. Lei Shi was accepted to the Biochemistry graduate program at the University of Texas-Southwestern Medical Center at Dallas. Megan West was accepted to the Agricultural & Environmental Chemistry graduate program at the University of California, Davis.

Graduates: Dah-Eun "Mary" Jeong is employed at the Gladstone Institute in San Francisco, California as a research associate. Matthew Fountain is working as a clinical oncology laboratory technician at DiagnoCure in Philadelphia, Pennsylvania. Jake Stout is a postdoctoral fellow at the National Research Council of Canada, Plant Biotechnology Institute. Ying Wang is working at Baylor College of Medicine in Houston, Texas as a research assistant.

Alumni News

The Department of Biochemistry welcomes alumni to speak in classrooms and at seminars throughout the school year. Several participants shared with students their experiences and career opportunities that are available to them after graduation. Numerous success stories in the business world and science inspire or have inspired the undergraduate and graduate students.



Drs. Henry Weiner and Tom Heard

Biochemistry alumnus, Tom Heard (Ph.D. 1999, Weiner) returned to the department on December 14, 2007 to talk with a group about career opportunities for those with a biochemistry background in non-academic environments. Tom worked as a postdoctoral fellow at Merck and The National Institutes of Health. He is currently employed at the United States Patent Office as a patent examiner.

The department welcomed back alumnus David Shapiro (Ph.D. 1972, Rodwell) who presented a seminar entitled, “Estrogen Receptor: From Mechanisms of Action, to Immune Surveillance in Cancer and Drug Discovery” as part of the biochemistry seminar series on April 8. David is a Professor of Biochemistry at the University of Illinois, Urbana-Champaign.



John Burd (B.S. 1968) was the 2008 recipient of the Edwin F. Ullman Award from the American Association of Clinical Chemistry. The award recognizes individuals for contributions to the field of clinical chemistry through creation of new technologies or analytical methods. Dr. Burd has established his career in the development of medical devices at Sabur Technologies in San Diego, CA.



Dr. Renny Franceschi (Ph.D. 1978, Kim) Professor at the University of Michigan School of Dentistry, received the 2008 Distinguished Scientist Award for Basic Research in Biological Mineralization at the 86th General Meeting of the International Association for Dental Research in Toronto, ON, Canada on July 2, 2008. Dr. Franceschi was honored for his many discoveries related to the control of bone formation. Among his contributions, Dr Franceschi identified a fundamental mechanism that is used by the osteoblast to activate its genetic program to produce a mature mineralized matrix. This discovery may provide a target for the development of pharmaceuticals to increase bone formation and strength.

We want to hear from our alumni. Please take a moment to tell us what is going on in your life...

Comments, suggestions and updates can be sent to ross11@purdue.edu. Include your name, address, email address, degree, major and year of graduation. You can also update by using our website (www.biochem.purdue.edu)

Words from Alumni

Kyle Mohler (B.S. 2007) is at the University of Edinburgh, Scotland, School of Biological Sciences, where he is studying a unique cell wall transglycosylase. After only a year, Kyle co-authored an article published in *The Plant Journal* entitled, "Mixed-linkage β -glucan: xyloglucan endotransglucosylase, a novel wall-remodelling enzyme from *Equisetum* (horsetails) and charophytic algae." (OnlineEarly article; published May 27, 2008)

*"Hello from Edinburgh, Scotland! After graduating in spring, of 2007, I left Indiana to spend the summer backpacking through Europe. Ten weeks of travel took me to thirteen exciting countries. In September I began my postgraduate studies. Ph.D. programs are very different here in the UK. I did not take many classes my first semester, nor did I do rotations in labs through the department. Thanks to my previous research experience at Purdue University in Prof. Peter Goldsbrough's lab and summer internships, I was able to begin right away with my research. My undergraduate coursework well prepared me to hit the ground running, thanks to many professors and instructors in the Biochemistry Department. I'm now studying plant biochemistry in the Edinburgh Cell Wall Group led by Prof. Stephen Fry at the University of Edinburgh, funded with many thanks for a Darwin Trust of Edinburgh studentship award. I am very excited to be second author on a paper in *The Plant Journal* in only the first year of my Ph.D.!"*

Daniel Walker (Ph.D. 1979, Axelrod) has relocated to Sweden. He is running his own consultancy company (Ocean Consulting, LLC) providing business advice to start-up bio-pharmaceutical companies.

"Dr. Barney Axelrod was my professor during my graduate work at Purdue from September 1975 through February 1979. For me, Dr. Axelrod was the perfect person to work for. He combined just the right amount of "teaching" with ability to leave you alone and let you figure out by yourself how to proceed with your research. He was always available for consultation, and was perhaps the friendliest professor that I have ever had the opportunity to interact with. Perhaps most importantly, I considered Barney a close friend during my years at Purdue, and continue to do so today. His "teaching" for me extended outside of the laboratory. He also taught me how to play squash, a game that he was very proficient at, much to my dismay, as it was a bit embarrassing for a 20-year-old to be run around the court by a 60-year-old. His enthusiasm, work ethic and sincerity are attributes which I carry with me today.

When I left Purdue, I took the industrial route instead of the academic route, I believe much to Dr. Axelrod's dismay. I have spent my career in the pharmaceutical and medical device industries. Having started in the Quality Control area at Dow Pharmaceuticals in Indianapolis, I had the opportunity to hire two Biochemistry graduates into that department, both of which proved to be excellent hires. I eventually moved into marketing, business development, licensing and general management. I now run my own consulting company, and

relocated to Sweden during June of 2007. Life and work here is very interesting, and I would highly recommend a trip here to anyone planning a visit to Europe."

Mark Fretz (B.S. 2001) was promoted to Metal Cleaning Marketing Manager for Houghton International in Valley Forge, Pennsylvania.

"My first memory of BCHM was during freshman orientation and Dr. Herrmann was bringing me in for an interview. I had just finished the mass orientation and the qualifying math placement test and was getting ready for a chemistry placement test.

Prior to the orientation, I had made certain to stay out the whole night before at a concert. I looked and felt my best, having not slept in over 24 hours, and on the way from the concert to my house I had just received my first speeding ticket. I was stopping by my house to pick up my mother who had volunteered to come along to be my back-up driver and make sure I didn't fall asleep in the middle of it all.

Dr. Herrmann sternly instructed my mother to wait outside while I had my interview. He had a certain command that impressed me. The smell of agar and chemicals filled the air. As I looked around his laboratory I had no idea what all of the equipment was designed to do. It was quite humbling to see all of the chemicals, equipment and set-ups and to not know the first thing about what was their purpose. He escorted me into his tiny little office and I sat in his guest chair. I was surrounded by books and stacks of papers, it made the place smell a bit like a library in spite of the agar and chemicals. Dr. Herrmann folded his hands as he leaned forward to get a better look at me. He asked me why I had come to Purdue and wanted to study Biochemistry. I replied that it was to get an education, no more, no less. He leaned back and pondered my answer. We proceeded to choose the courses I would study in my first semester and what type of education I would be getting. In the end I don't think I could have received a better education for the chemical side of the metalworking industry if I had planned it out on purpose."

1950's

John Hylin (M.S. 1953, Whistler) presently edits manuscripts for *The Bulletin of Environmental Contamination and Toxicology*.

Les Hough (postdoc, 1952-53) is retired from Queen Elizabeth College in London where he was Department Chairman and inventor of "Splenda," the non-nutritive sweetener.

1960's

John E. (Ted) MacNintch (Ph.D. 1965, Quackenbush) currently resides in Old Saybrook, Connecticut. Upon his retirement as Director of Scientific Information for Bristol-Myers Squibb, Dr. MacNintch applied his scientific information-retrieval and writing skills to researching World War I over a ten-year period. This information resulted in his self-published novel entitled, "The Brother Keepers."
(www.thebrotherkeepers.com)

Joseph J. Villafranca (Ph.D. 1969, Axelrod) is Senior Vice President of Operations at Tunnel Consulting, Inc. in Pennsylvania. Dr. Villafranca has more than 30 years of experience in all phases of the development of therapeutic drugs, and extensive experience in both industry and academia. His areas of expertise include drug discovery, drug development, strategic planning, executive coaching, project management, global strategic alliances, and manufacturing operations.

1980's

Paula Ravnkar (Ph.D. 1985, Somerville) joined Invitrogen Corporation in Frederick, Maryland. She is a group leader of Molecular Biology for the PD-Direct Division.

Mary Peters (M.S. 1989, Kohlhaw) is working for the U.S. Fish and Wildlife Service as a Fish Pathologist/Microbiologist. She and her husband opened a microbrewery and pub in Hood River, Oregon.

1990's

Kirsten Nielsen (B.S., 1996) is now an assistant professor in the Department of Microbiology at the University of Minnesota School of Medicine.

2000's

Amanda Stewart (B.S. 2003) is working at Pacific Biodiesel Technologies located in Salem, Oregon. Pacific Biodiesel Technologies designs and builds community-scale biodiesel process equipment for production of biodiesel from multiple feedstocks.

Emily (Arth) Walkey (B.S. 2004) was inducted into the Gold Humanism Honor Society at Indiana University School of Medicine in September 2007. The foundation seeks to honor senior medical students, residents, role-model physician teachers and other exemplars who demonstrate excellence in clinical care, leadership, compassion and dedication to service. Emily was also inducted into Alpha Omega Alpha, a medical honorary society. She received her M.D. from the Indiana University School of Medicine in the spring of 2008.

Timothy Holzer (Ph.D. 2005, Forney) was promoted from Assistant Senior Scientist to Research Scientist with Eli Lilly in Indianapolis, IN. He works in the area of Diagnostic and Experimental Medicine where he leads projects in a group that takes "Discovery Oncology" pharmacodynamic (PD) biomarker information (mainly from *in vitro* cell lines and mouse models) and uses these to determine if they are likely predictive or prognostic biomarkers in clinical samples. The group focuses mainly on immunohistochemistry assays and works closely with similar groups using ELISA, serum-based assays, as well as mRNA abundance assessment.

Jennifer Pereira (M.S. 2005, Forney) was promoted to Scientist of Process Scale-up at Cook Pharmica in Bloomington, IN.

Holly Courtney (B.S. 2006) is living in Oklahoma City. She is working at the Oklahoma Foundation for Digestive Research as a clinical research coordinator. Holly is planning on going to the University of Oklahoma in the fall to pursue a master of public health degree.

Faculty Photo from 1957



L to R, Back to Front: Forest Quackenbush, Unknown, Unknown, Omar Ford, Roy Whistler, Bob Henze, A.K. Balls, Herb Parker, Dr. Hauge, Barney Axelrod, Paul Curtis, Horace Jackson, Elwyn Schall, Ed Mertz, Joseph Kuc, Lester Shenberger

2007

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Henry Weiner, National Institutes of Health, \$1,413,743, 06/15/2004 – 05/31/2009, “Enzymology/molecular biology of aldehyde dehydrogenase.”

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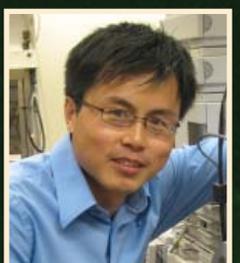
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