



## RESEARCH FROM MCDB FACULTY

### Laura Buttitta Lab



Laura Buttitta joined MCDB in January 2011. The Buttitta lab is interested in how the cell cycle is regulated to speed up, slow down or stop at the right places and times during development. This is an important question, as mistakes in cell cycle control can lead to developmental defects and cancer. Most of the studies in the Buttitta lab are performed by manipulating cell cycle genes in the fruit fly *Drosophila melanogaster*.

Since opening, the Buttitta lab has identified two complexes that seem to play an important role in shutting off cell division in adults. The lab is now interested in applying what they have learned in flies to human cancer cells, to find new ways to stop or slow cancer cell proliferation.

### Ann Miller Lab



Assistant Professor Ann Miller joined MCDB in June 2011. Her lab studies cytokinesis, the final step of cell division where one cell separates into two. The importance of cytokinesis is evident throughout life: it drives development and helps maintain adult tissues, whereas failures in cytokinesis can promote tumor formation. Despite the biological and clinical importance of cytokinesis, many aspects of its regulation remain poorly understood. Therefore, the Miller lab is focused on studying the molecular mechanisms that regulate cytokinesis normally and how cytokinesis failure may contribute to tumor formation.

The lab is particularly interested in the role that the small GTPase Rho and its associated GEFs (Rho activators), GAPs (Rho inactivators), and other regulatory proteins play in orchestrating cytokinesis. Further, they aim to examine how Rho signaling during cytokinesis can become misregulated, which may promote tumor formation. The approaches used to study these questions include cell biology, molecular biology, and biochemistry with an emphasis on live confocal microscopy. The lab's model system of choice is the embryos of the African clawed frog, *Xenopus laevis*. This system allows them to study the dynamic process of cytokinesis at high resolution via live confocal microscopy in the context of an intact vertebrate epithelium. Because the proteins that regulate cytokinesis in *Xenopus* are highly conserved with those in human cells, the insights gained from these studies should improve the understanding of how cells divide and how misregulation of cytokinesis may contribute to cancer in humans.

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### MESSAGE FROM THE CHAIR



Pamela Raymond

The Department of MCDB has thrived and grown over the past year. We were delighted to recruit two outstanding new assistant professors, whose research interests are profiled in this issue. Several of our faculty and students won prestigious internal and national awards, and sponsored research funding levels have continued to increase. In collaboration with our sister department (Ecology & Evolutionary Biology) we launched the undergraduate Michigan Biological Scholars Academy. Given the financial constraints faced by the University, in partnership with the College we have reduced our operating budget by 6% over a three-year period, while preserving our core missions of research and education. While the future for MCDB is bright, the times are challenging for all of us. We thank the many donors whose support has made such a difference.

# FACULTY NEWS

**Marc Ammerlaan** traveled to Boston as a faculty adviser with the Michigan Synthetic Biology Team for the annual International Genetically Engineered Machine competition.

**James Bardwell** and his research team were featured in the U-M News Services article “Quest for designer bacteria uncovers a Spy.” Bardwell and his research team developed a way to coerce bacteria into making large quantities of stable, functional proteins. In exploring why these designer bacteria were so successful, the scientists discovered a molecular helper they called Spy.

**Matthew Chapman** was featured in the U-M News Service article “Bacteria make thrift a habit, U-M researchers find.” Chapman and researchers performed protein economy calculations for a wide range of bacteria, as well as for yeast, and found the same trend: proteins secreted to the extracellular environment are made up of cheaper-to-produce parts than are proteins found inside the cell.

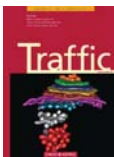


**Robert Denver** founded the North American Society for Comparative Endocrinology (NASCE). Denver took the leading role in organizing the inaugural meeting at U-M in July 2011.

**Cunming Duan** was featured in the U-M News Service article “‘Catch-up’ growth signals revealed.” Duan and researchers uncovered molecular signals that regulate catch-up growth—the growth spurt that occurs when

normal conditions are restored after a fetus, young animal or child has been ill, under stress or deprived of enough food or oxygen to grow properly.

**Jianming Li** was appointed co-director of the University of Michigan - Peking University Joint Institute. Li will be serving a three-year term through June 30, 2014.



**Erik Nielsen** and his research group's figure was featured as the cover image in the March 2011 issue of *Traffic*.

**Pamela Raymond** presented “Lessons from Fish Eyes” the Stephen S. Easter Collegiate Lecture at the Rackham Amphitheater on November 11th, 2010.

**Kwoon Wong** received a Career Development Award from Research to Prevent Blindness. This award supports promising junior ophthalmology faculty working in vision eye research.

**Patricia Wittkopp** was awarded the 2011 Class of 1923 Memorial Teaching Award for outstanding teaching of undergraduates.

**Haoxing Xu** received 2009 Presidential Early Career Award for Scientists and Engineers (PECASE.) Xu was one of 85 researchers President Obama named as recipients of PECASE, the highest honor bestowed by the United States government on science and engineering professionals in the early stages of their independent research careers.



## Laura Olsen Receives the 2011 John Dewey Award

The award honors those who, in the spirit of John Dewey, have shown a consistent dedication to the education of undergraduates at the University. Modeling Dewey's own example, recipients show a parallel engagement in the following areas: scholarly productivity, provision of leadership, and engagement with and care for students.

## Ursula Jakob Receives the 2011 Faculty Recognition Award

This award recognizes faculty in the earlier phase of their careers who have demonstrated substantive contributions to the University through significant achievements in scholarly research and/or creative endeavors; excellence as a teacher, adviser and mentor; and distinguished participation in the service activities of the University.

*Research continued from page one*

### Haoxing Xu Lab



Have you ever wondered how our body and cells sense what is going on in the environment, and how they get rid of the rubbish? Recent research at the Xu laboratory has revealed that these two very different biological processes are controlled by the same set of proteins, called transient recep-

tor potential (TRP) calcium channels. Calcium is involved in regulating biological functions from life to death. Therefore, the pathways for calcium flux must be tightly regulated. The major goals of the research at the Xu lab are to understand how calcium ion channels are precisely controlled by extracellular and intracellular signals, and how this information is transduced into physiological and pathological changes at the cellular and animal levels. The Xu group has recently identified an unexpected link between TRP channels and growth

*Research continued on page three*

# POSTDOCTORAL FELLOW, GRADUATE, AND UNDERGRADUATE NEWS

**Michael Gray**, a research fellow in the Jakob Lab, was awarded a Ruth L. Kirschstein F32 postdoctoral fellowship from the National Institutes of Health.

**Lindsey Gish**, a member of the Clark Lab, and **Yidan Liu**, a member of the Li Lab, each received an Emma Cole Graduate Fellowship for research in plant biology.

**Chengzhen Dai**, a Detroit Country Day School student who worked in the Shafer Lab during the summer of 2010 and 2011. His research, “Glial Contributions to Circadian Time-keeping in the *Drosophila* Brain,” won the Zoology division at the Science and Engineering Fair of Metro Detroit, and qualified for the Michigan Science and Engineering Fair. There, he won second place featured at the International Science and Engineering Fair in the Animal Sciences category.



**Daniel Smith**, who recently received his Ph.D. in the Chapman Lab, was lead author of the paper “Economical Evolution: Microbes Reduce the Synthetic Cost of Extracellular Proteins” published online in the open access journal mBio. The paper was highlighted by the U-M News Service in the article “Bacteria make thrift a habit, U-M researchers find.”



**David Payne**, a member of the Boles lab, has been awarded the 2011 National Science Foundation Graduate Research Fellowship Program (GRFP) Fellowship.

**Molly Day**, a graduate student in the Klionsky Lab, **Danming Tang**, a graduate student in the Wang Lab, and **Xin Xiong**, a graduate student in the Collins Lab, have all been awarded the Rackham Predoctoral Fellowship.

## GREAT START: M-BIO SUMMER PROGRAM

*With excerpts from the Department of Ecology and Evolutionary Biology Website*

“The M-Bio Summer Program is off to a great start,” said Joe Salvatore, assistant director, Science Learning Center and M-Bio Summer Program Coordinator. “The M-Bio scholars are thriving as they tackle four intense summer courses, attend weekly lectures from prominent University of Michigan faculty, and participate in a variety of academic, social and cultural activities.”

M-Bio is a two-year program for biology-interested students admitted to U-M. The program begins with an intensive summer residential academic program followed by two years of special programming. The program is

designed to strengthen and diversify the cohort of students who will receive their biological sciences degree from U-M.

“The M-Bio Program provides the support and structure to help students from many different backgrounds excel as they pursue degrees in the biological sciences,” said Salvatore.


Visit the M-Bio Website at: [www.lsa.umich.edu/mbio/](http://www.lsa.umich.edu/mbio/)



*Research continued from page two*

factor signaling: mice lacking the TRPV3 gene, a temperature sensor in the skin, exhibit similar skin and hair phenotypes as mice with mutations in the Epidermal Growth Factor Receptor (EGFR) gene. This study provides not only a potential mechanism to explain how environmental factors, such as temperature, regulate development, but also a novel target to control hair growth/removal and skin cancers.

The lysosome, the cell’s garbage dump and recycling center, is an essential service for the cells in our body. Calcium is important for the efficient removal of the recycled materials from the lysosome. To understand how calcium flux works in the lysosome, researchers at the Xu lab have recently developed a new and

powerful electrophysiological method to directly study the calcium channels in the tiny lysosome. With this method, the Xu group found that Mucolipin TRP channel 1 (TRPML1) is the principle calcium channel in the lysosome, and a lipid molecule that is present only in the lysosome serves as the signal to open the TRPML1 channel. Human mutations of TRPML1 cause garbage storage in the lysosome and a pediatric neurodegenerative disease called type IV Mucopolysaccharidosis. Because the ability to dispose of cellular garbage is also compromised when we age and in many common neurodegenerative diseases, TRPML1 could be a novel therapeutic target for boosting the efficiency of the cell’s recycling center and preventing and reversing neurodegeneration. 

## POSTDOCTORAL FELLOWS WHERE ARE THEY NOW?



**Sonia Bardy** is an Assistant Professor at the University of Wisconsin.  
*Mentor – Janine Maddock*



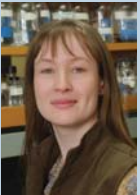
**Amy Szumlanski** is a postdoctoral fellow at the University of Oregon.  
*Mentor – Erik Nielsen*



**Xianping Dong** is an Assistant Professor at Dalhousie University in Halifax, Nova Scotia.  
*Mentor – Haoxing Xu*



**Dan Weinthal** is a postdoctoral fellow at Ben-Gurion University in Israel.  
*Mentor – Tzvi Tzifira*



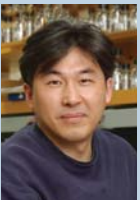
**Nicola Harrison-Lowe** is a Molecular Diagnostics Process Optimizer at Bayer Crop Science in North Carolina.  
*Mentor – Laura Olsen*



**Zhi Hong** is a Professor in the School of Life Sciences at Nanjing University in China.  
*Mentor – Jianming Li*



**Andrew Klocko** is a postdoctoral fellow at the University of Oregon.  
*Mentor – Lyle Simmons*



**Su-Hwan Kwak** is an Assistant Professor at Long Island University in New York.  
*Mentor – John Schiefelbein*

### STAFF NEWS



**Anna Cihak** joined the Program in Biology office as Student Administration Manager in April 2011. Anna provides a wide range of support to students and coordinates the administrative aspects of the undergraduate program.

### PROGRAM IN BIOLOGY HAS A NEW FACULTY DIRECTOR

**Laura Olsen**, Thurnau Professor of MCDB, was appointed faculty director of the Program in Biology on July 1, 2011. The Program in Biology, jointly managed by the Departments of MCDB and EEB (Ecology and Evolutionary Biology), serves as the gateway for undergraduates interested in any of the biology concentrations and minors, as well as those with pre-health career interests. Over 12,000 undergraduate students are enrolled each year in Biology, MCDB, and EEB courses.

## THE NINTH ANNUAL PRISCILLA CONNELL MEMORIAL LECTURE



Elliot Meyerowitz

The ninth Priscilla Connell Lecture will be held March 2012 and will feature Professor Elliot Meyerowitz of the Division of Biology, California Institute of Technology.

Dr. Meyerowitz, a specialist in the genetics of flowering plants, focuses his research on genes that control the formation of flowers, and how altering these genes will affect flower develop-

ment. Meyerowitz and researchers use the plant *Arabidopsis thaliana*, which allows the parallel use of classical and molecular genetics. He has identified mutations that cause petal cells to develop into stamens instead, and another mutation that causes these same embryonic petals to become sepals. Meyerowitz's lab work concentrates in two areas: the origin of developmental patterns in flowers, and the control of cell division in meristems.

*This lecture was made possible from a generous endowment by Mr. Paul Connell, in loving memory of his wife Priscilla Harrison Connell.*

# NEW GRANTS

**Boles, Blaise** Microbial Analysis of Interior Car Surfaces, *Ford Motor Company*

**Buttitta, Laura** Mechanisms Controlling Cell Cycle Exit Upon Terminal Differentiation, Health and Human Services, *NIH*

**Csankovszki, Gyorgyi** Histone Acetylation in *C. elegans* Dosage Compensation, *NSF*

**Denver, Robert** and **Duan, Cunming** First Meeting of the North American Society for Comparative Endocrinology (NASCE), *NSF*

**Denver, Robert** Research Education for Undergraduates: Leptin Physiology throughout the Life Cycle of the Frog, *NSF*

**Duan, Cunming** Molecular, Integrative, and Functional Investigations of the Role of IGF Signaling in Aging Using a Short-lived Teleost Fish, *NSF*

**Duan, Cunming** Research Education for Undergraduates: Ligand-Dependent and -Independent Actions of Insulin-Like Growth Factor Binding Proteins in Fish, *NSF*

**Hume, Richard** NMDA Receptor Contributions to Visual Processing in the Mouse, Health and Human Services, *NIH*

**Kyono, Yasuhiro (Denver, Robert)** Thyroid Hormone-dependent DNA Methylation in the Developing Brain, *NIH*

**Pichersky, Eran** The Chemical, Biochemical, Genetic and Ecological Basis of Pollinator-driven Speciation in Australian Sexually Deceptive Orchids, *Australian National University*

**Pichersky, Eran** Scent Biosynthesis in Petunia Flowers Under Normal and Adverse Environmental Conditions, *US-Israel Binational Agricultural Research and Development Fund (BARD)*

**Pichersky, Eran** NSF Trichome Project, *Michigan State University*

**Raymond, Pamela W.K.** Kellogg Woodrow Wilson Michigan Teaching Fellows Program, *Woodrow Wilson, National Fellowship Foundation*

**Raymond, Pamela** Research Education for Undergraduates: Emergence of Geometric Order and Cell Identity in the Cone Photoreceptor Mosaic, *NSF*

**Simmons, Lyle** Coordinating Mismatch Repair with DNA Replication, *Wendy Will Case, Cancer Fund, Inc.*

**Xu, Haoxing** The Mucolipin TRP Ion Channels Health and Human Services, *NIH*

**Zhang, Xiaoli (Xu, Haoxing)** Effects of Iron Chelators and TRPML Channel Activators in Animal Models of ML4, *Mucopolidosis IV Foundation*

## WELCOME NEW FACULTY



**Assistant Professor Sara Aton** will be joining the department in 2012. Sara received her B.S. with Highest Distinction in Biopsychology and Cognitive Science from U-M in 2006 and her Ph.D. in Neuroscience from Washington University in St. Louis in 2011, after which she worked as a postdoc in the lab of Marcos Frank at the University of Pennsylvania. Sara's research program will explore how activity patterns in the sleeping brain lead to plasticity in neural circuits following waking experience.

## PH.D. DEGREES GRANTED

**Zhao Qin** Molecular Mechanisms of Zebrafish Photoreceptor Regeneration. *Mentor - Pamela Raymond*

**Daniel Smith** The Application of Genetic *in silico* and *in vitro* Tools to Elucidate the Biology of a Functional Amyloid Fiber. *Mentor - Matthew Chapman*

**Shu Quan** Directed Evolution Designed to Optimize the *in vivo* Protein Folding Environment. *Mentor - James Bardwell*

**Chandan Bhambhani** Role of Protein Oligomerization in Regulation of Wnt Target Gene Transcription. *Mentor - Kenneth Cadigan*

**Nikhil Phadke** Uses of Proteomics for the Analysis of Hard-to-dissect Biological Samples. *Mentor - Janine Maddock*

**Wei Dai** Insulin-like Growth Factor Signaling in TRPV6-expressing Ionocytes in Zebrafish. *Mentor - Cunming Duan*

**Yi Xiang** Analysis of the Molecular Mechanism and Physiological Role of Golgi Stack Formation and Golgi Biogenesis. *Mentor - Yanzhuang Wang*

**Yana Wieckowski** The Role of Ribosome Biogenesis in *Arabidopsis thaliana* Root Development and Epidermal Patterning. *Mentor - John Schiefelbein*

**Adam Schmidt** Specialized Metabolites and Related Biosynthetic Enzymes are Localized to Apical Gland Cells of Tomato Glandular Trichomes: Defining Biological Functions of *Solanum* Glandular Trichome Types. *Mentor - Eran Pichersky*

**Emily Petty** The Role of Chromatin in Targeting the X for Chromosome-wide Gene Regulation. *Mentor - Gyorgyi Csankovszki*

## IN MEMORIAM

**Professor Emeritus John M. Allen**, age 84, passed away April 20, 2011. Professor Allen served as chair of the Department of Zoology from 1966-71, retiring in 1989 following 37 years of service. He received his Ph.D. degree in zoology from the University of Michigan in 1954.

Professor Allen joined the University of Michigan faculty as an instructor in 1952. He was appointed assistant professor in 1956, promoted to associate professor in 1960, and then professor in 1964.

Professor Allen brought cell biology to Michigan, ushering in a wave of change in the faculty that continues to this day. His cytochemical studies were among the very first to permit an understanding, in specific chemical terms, of the functions of several intracellular organelles: notably the Golgi systems (which had long been deemed as an artifact), and the then newly discovered lysosomes and peroxisomes.

**Christine Psujek**, who was part of the Biology Department and EEB and MCDB since 1982, died in mid-November 2010, following a long struggle with lymphoma. Chris managed the undergraduate programs for the Department of Biology since 1987, and then the interdepartmental Program in Biology after Biology split into the departments of MCDB and EEB in 2001.



Chris was responsible for the remarkably smooth operation of all aspects of our large and diverse undergraduate programs. Chris helped over 15,000 students during her time in biology with her knowledge, compassion, and patience, leaving a truly incredible legacy. In 2008, she was honored by LSA with the second annual Kay Beattie Distinguished Service Award.

In her memory, the Program in Biology established a gift fund, the Christine Psujek Memorial Undergraduate Award.

### DAVID CHAPEL RECEIVES INAUGURAL CHRISTINE PSUJEK MEMORIAL AWARD

David Chapel, B.S. in Microbiology concentration, 2011, has received the inaugural Christine Psujek Memorial Award. David's honor thesis, sponsored by Dr. Christiane Wobus, was judged to be the best thesis for this year's Program in Biology graduating class from any concentration. David graduated with a dual degree in Microbiology and German in the LSA Honors Program.

In memory of Christine Psujek, the Program in Biology established a gift fund, the Christine Psujek Memorial Undergraduate Award. The award is presented annually to the graduating senior with the highest ranked honors thesis in any of the biology concentrations. Gifts to the fund can be made gift online at [www.lsa.umich.edu/alumni/giveonline](http://www.lsa.umich.edu/alumni/giveonline).

## 2010 UNDERGRADUATE HONORS RECIPIENTS

### Highest Honors

#### *Microbiology*

**David Chapel**, Development of a High-Throughput Screen for Small Molecule Inhibitors of Murine Norovirus Attachment.

### High Honors

#### *EEB*

**Katelyn Zemenick**, The Indirect Effects of Ant-Hemipteran Mutualisms on Host Plant Fitness: Comparing the Cascading Effects of Two Ant Species on Coffee Production.

#### *CMB*

**Andrew Hart Smith**, Interleukin-6 Induces Expression of Bone Morphogenic Protein Receptor-1A in Articular Chondrocytes.

*Honors continued on page seven*

## Microbiology

**Matthew Stier**, The Role of Host Factors Associated with Susceptibility to Mouse Adenovirus Type 1.

**Bogdan Kindzelski**, Impact of B Cell Receptor Diversity on Thymic Output.

**Stuart Zeltzer**, The Role of TLR9 Signaling in the Activation of Pulmonary Macrophages in Response to *Cryptococcus Neoformas*.

## Biology

**Thomas Hartley**, Inhibiting Multiple Myeloma SET protein, a Histone Methyltransferase, via High Throughput Screens.

**Amanda Siuniak**, Can the Human ACD Rescue the Mouse ACD Mutant Phenotype?

## CMB

**Elizabeth Kennedy**, Mevalonate Pathway Inhibitors Reduce the Metastatic Properties of Aggressive and Invasive Breast Cancers.

**Jeremy Kratz**, Decoding the Dynamics that Guide Selection of TAR RNA Conformation.

**Cristina Pecci**, Oxidation of Ingested Phenolic Compounds Creates Oxidative Stress in the Midgut Tissues of *Lymantria Dispar* Caterpillars.

**Han Yiau She**, Small Molecule Interactions with Self-Assembling Peptides.

**Jared Spitz**, MYCN Affects DNA Repair Activity in Neuroblastoma.

**Caroline Talsma**, Expression and Function of Embryonic Stem Cell Related Genes in Gliomas.

## Neuroscience

**Ashley Anderson**, Lysosomal Phospholipase A2 and its Effects in Mouse Cells and Brain Tissue.

**David Bushart**, Neostriatal Dopamine Modulates Motivation: Incentive Salience Generation in the Neostriatum.

**Benjamin Fensterheim**, Selective Suppression of Striatal Fast Spiking Interneurons *in Vivo*.

**Kathryn Gilliam**, Prenatal Bisphenol-A Alters Response to Novelty In the Environment in Suffolk Sheep.

**Samantha Greenberg**, Effects of Social Research Methodology on Cortisol and Testosterone.

**Caely Hambro**, Interactions between the Dopamine and the Dynorphin/Kappa Opioid Receptor System Regulate both Positive and Negative Social Behavior in Prairie Voles.

## Neuroscience

**Vivian Lam**, Small Molecule Regulators of  $\Delta$ FosB Function.

**Eva Olariu**, Glial Cell Density Effect on Neuronal Network Morphology, Network Dynamics and its Relation to a Network of Resonators: An Experimental and Computational Study.

**Michelle Robinette**, Development of a Three-dimensional Collagen Gel System for Human Embryonic Stem Cells Culture that Facilitates the Isolation of Neural Crest Stem Cells.

## Honors

**Jeremy Johns**, The Role of FBW7 in Neural Stem Cell Differentiation.

**Parisa Kaviany**, The Characterization and Mapping of PITX2 with Respect to Marker Expression Patterns in Mouse Ventral r1.

**Morgan Kuhnmuensch**, Mesolimbic Dopamine and Opioid Interactions in the Regulation of Pair Bond Maintenance in the Socially Monogamous Prairie Vole.

**Mary Larijani**, Investigating the Dynamic Properties of Reward Processing: A Shift in Incentive Motivation Converts an Aversive Salt Cue into an Appetitive Motivational Magnet.

**Stephanie Lazar**, Systemic Administration of Dexmedetomidine Disrupts Sleep Architecture and Does Not Decrease Adenosine Levels in the Substantia Innominata of the Sprague-Dawley Rat.

**Dongkeun Kenneth Lee**, Mechanism of Signaling by the Wallenda Axonal Kinase in *Drosophila*.

**Jean Lee**, A Clinically Relevant Tapering Protocol for Hydrocortisone Treatment in Newborn Animals.

**Pei-Hsuan Lee**, Examination of Novelty-Seeking Behavior in Selectively-Bred Rat Lines that Differ in Addiction Liability.

**Tori Nault**, Determining the Relevance of Single Prolonged Stressors in Altering Glucocorticoid Receptor Expression in the Prefrontal Cortex and Hippocampus.

**Melanie Sottile**, Dopaminergic Effects on Temporal Processing in Parkinson's Disease: A Pharmacological and Genetics Approach.

**Ashley Stasiak**, Role of Suprachiasmatic-mediated Entrainment on Sustained Attention Performance.

**Maria Tecos**, Neurocognitive Effects of Resolving Interference for People Suffering from Bipolar Disorder.

**Arden Trickey-Glassman**, Characterization and Knockdown of Zebrafish Dynamin 2.

**Adam Weiner**, Effect of Prenatal Testosterone Treatment on Novelty-seeking Behavior in Sheep.

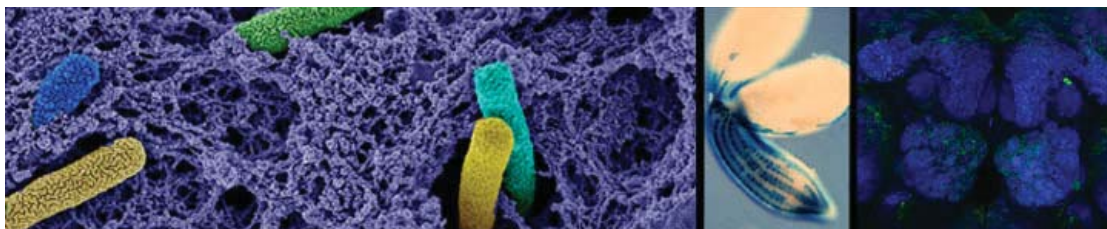
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Recent advances in the life sciences have set the stage for extraordinary new discoveries about the molecular basis of life and for the application of these discoveries to biotechnology, agriculture, and human health and disease.

The faculty in MCDB, along with the students and postdoctoral fellows they train, are leaders in the generation of new knowledge. Because of our research accomplishments and commitment to education, MCDB is responsible for educating most of the University of Michigan undergraduates who will become the next generation of physicians, biomedical and plant researchers and scientists. By providing our students with a curriculum that exposes them to the newest ideas of world class scientists, and lets them participate in the research experience to make their own discoveries, we prepare our students for positions of leadership in their professions.

We acknowledge and thank the many donors who have supported MCDB in the past. We welcome contributions at any level to support the following: scholarships and research funds for undergraduates, graduate fellowships, capital equipment for imaging and biochemical analysis, pilot funds for new research directions, endowed professorships, infrastructure upgrades for research laboratories and public spaces in the Kraus building.

You may use the enclosed gift envelope or visit our webpage for more information at: <http://www.mcdb.lsa.umich.edu/>

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