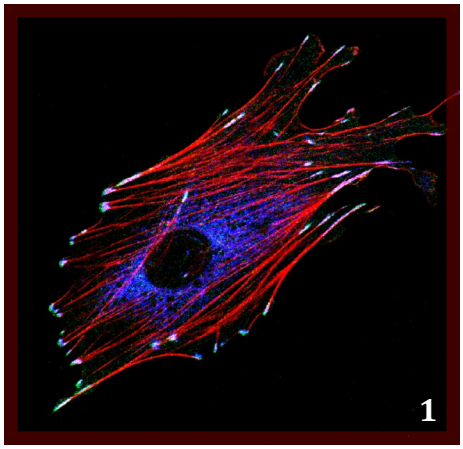
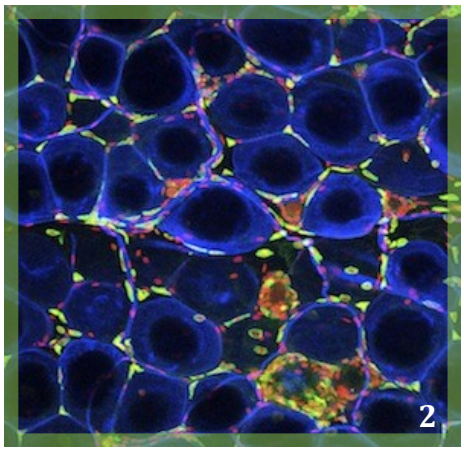
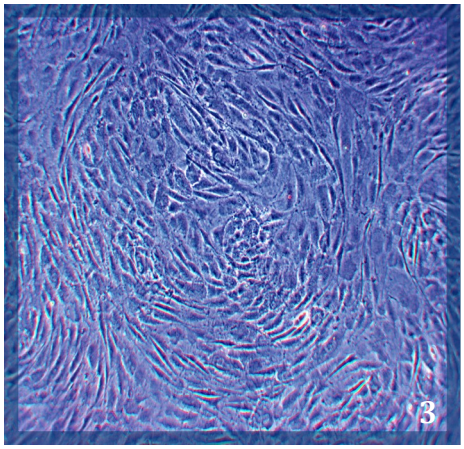
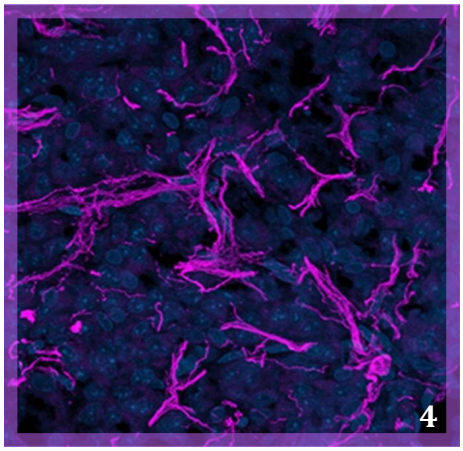
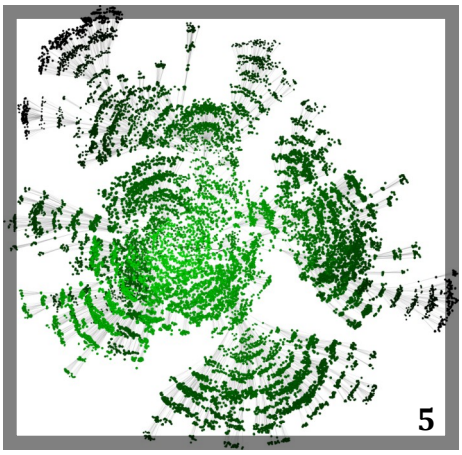
Molecular & Integrative PHYSIOLOGY

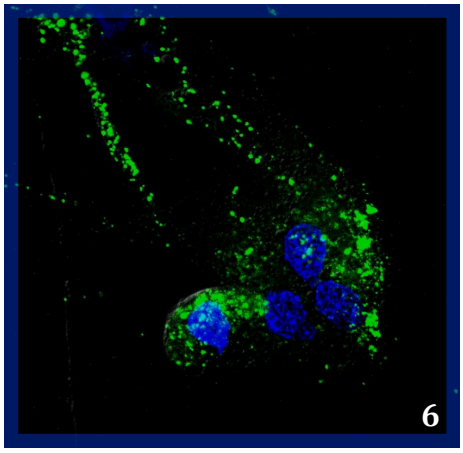


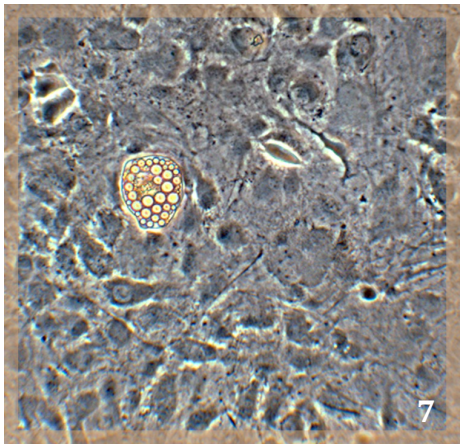


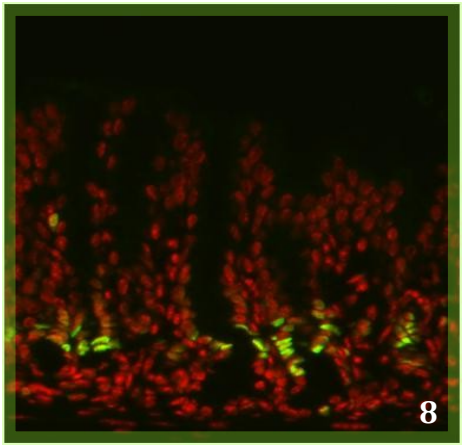


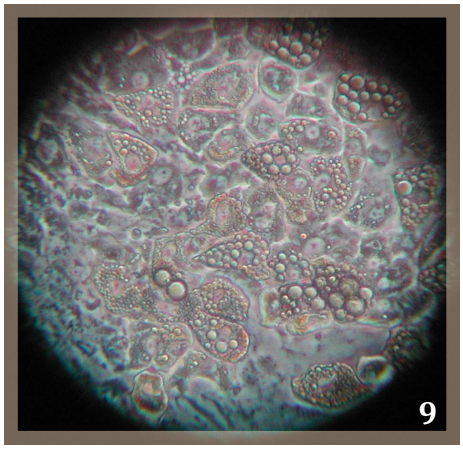












Newsletter | October 2011

A Message From Our Chair

Dear Friends: The legacy of our Physiology Department continues with 129 years and counting. Writing this annual column gives me the opportunity to reflect on the various recruitment, educational and celebratory activities and milestones that have taken place during the past year. In terms of recruitment, Jun Hee Lee joined us in July as an assistant professor with a primary appointment in Physiology and a joint appointment in Internal Medicine. Jun Hee came to Michigan from the University of California, San Diego where he was a postdoctoral fellow in the laboratory of Michael Karin. Of note, Jeff Halter and Rich Miller, who lead the Geriatrics Center at the U-M, were instrumental in helping recruit Jun Hee, who in turn was selected as a Biological Scholar which speaks to his outstanding accomplishments during graduate school and postdoctoral training. Another faculty member who joined us in February is Michael Ferrari who was an associate professor in the School of Biological Sciences at the University of Missouri—Kansas City. Mike hit the ground running and has been instrumental (together with Beth Rust) in initiating our new M.S. program in Physiology that started its first class of 17 students in September, 2011. In addition, Natasha Snider (a physiology postdoctoral fellow since 2009) was appointed beginning September as a Research Investigator and is a recent recipient of an NIH K01 award. An important part of our mission is to promote the careers of talented trainees, like Natasha, be it to pursue research and/or teaching positions in academia, or positions in industry. Collectively, this brings us to a total of 35 primary, 36 joint, 7 adjunct and 10 active and inactive emeritus faculty members. Our plans are to continue to grow in a strategic manner and to recruit in the areas of cardiovascular physiology, reproductive sciences, and systems biology. Thanks to our students, post docs, faculty and staff, our national stature in terms of NIH funding continues to be high, having been ranked 5th nationally for 2010 based on the Blue Ridge Institute for Medical Research numbers.

Our educational activities were highlighted by the welcoming this September of 5 new first year PhD graduate students. Ormond MacDougald completed his 3 year term as Grad Program Chair in September and passed on the baton to Scott Pletcher who has taken over for a 3-year term. I wish to thank Ormond for his tremendous service during his three years, with many accomplishments including restructuring of the curriculum to provide a broader menu of courses for our PhD students, serving as an outstanding mentor, bringing us to the modern era by giving us presence on Facebook, helping raise awareness and excitement regarding the Graduate Education Fund by personally participating in the Dexter-Ann Arbor run and other fund-raising initiatives. Ormond, together with Dan Michele and Santiago Schnell, completed oversight of the third highly successful summer undergraduate research program. This program includes students with computational and engineering backgrounds who were supported by an NIH R25 grant overseen by Santiago. Moreover, Jimo Borjigin was recently awarded an NIH R25 from NHLBI to establish a summer undergraduate research program for underrepresented minorities that will work closely with our existing summer program. This latter program will begin recruiting students during Feb/March of 2012 for a summer 2012 research experience. Other educational activities included: (i) a joint symposium held with the Physiology department at Wayne State University (details on page 8); (ii) an international symposium with Trinity College of Dublin, Ireland (details on page 5).

Additional recent highlights include the naming of Dr. Linda Samuelson as the first recipient of the John A. Williams Collegiate Professor of Gastrointestinal Physiology (installment ceremony to be held on November 1, 2011). As you may recall, we began an effort to raise funds for this endowment in late 2008 and it is gratifying to have completed this effort. We are indebted to John and Christa Williams who have made this Chair a reality by contributing $100,000 towards its establishment. These endowed chairs help cement the legacy of our department and its distinguished faculty, and now also include the Horace Davenport Chair (held by John Williams) and the John Faulkner Chair (held by Ormond MacDougald). Additional active efforts are ongoing to establish the Fred Karsch Chair and the David Bohr Chair. Regarding the Karsch Chair, our entire department is eternally thankful to Fred and Nora Karsch for their recent pledge of $60,000 towards the Chair fund-raising effort. This means that we need to raise an additional $190,000 which, coupled with the available matching funds, will allow us to establish the Fred Karsch Chair in Physiology. Details regarding gift opportunities and a listing of our generous donors, are included on pages 11 and 12.

An important goal of our department is to work closely with fellow departments and units in the Medical School and University to advance our collective educational and research missions. Examples of such joint ventures include: (i) The University of Michigan Interdisciplinary Junior Faculty Cluster-hire Reproductive Sciences Program (RSP) Initiative that involves collaborative efforts of six Departments (Physiology, Obstetrics & Gynecology, Pediatrics, Urology, Cell and Developmental Biology, Biomedical Engineering) to recruit 5 new faculty into the RSP that is co-directed by Mike Lehman and Gary Smith; (ii) Working closely with Tim Johnson (Chair of Obstetrics & Gynecology) on building the RSP. Through these efforts, the RSP will have newly assigned space at the North Campus Research Complex during the coming year; (iii) Working with Chief of Gastroenterology, Chung Owyang, in the Department of Medicine, to apply for a joint T32 NIH training grant, and (iv) Working with the Department of Surgery Development team to assist us in philanthropy efforts.

To our alumni and former co-workers, I hope you will stay in touch and visit us or browse our website, www.physiology.med.umich.edu. More information pertaining to the activities briefly described above are further highlighted in other sections of the Newsletter. It is an honor and a privilege for me to be part of the Physiology Department at the U-M.

With very best wishes,
Bishr Omary

In This Issue:

2011 PHYSIOLOGY FACULTY

Front Row (L to R): Lei Yin, Tony Tong, Dolors Sans-Gili, Christin Carter-Su, Bishr Omary, Susan Shore, Lou D'Alecy, Jimo Borjigin, Carey Lumeng **Second Row:** David Antonetti, Ormond MacDougald, Susan Brooks, Gary Hammer, Suzanne Moenter, Jessica Schwartz, Gina Poe, Lisa Larkin, Elizabeth Rust, Yatrik Shah **Third Row:** Linda Samuelson, Larry Artgetsinger, Richard Mortensen, Ao-Lin Hsu, Martin Myers, David Pinsky, Michael Lehman **Fourth Row:** Anatoli Lopatin, Daniel Michele, Malcolm Low, Michael Ferrari, Xian-Zhong Xu, John Williams, Santiago Schnell, Jun Hee Lee, Liqua Coolen

Primary Faculty (30)
Jimo Borjigin
Susan Brooks
Christin Carter-Su
Lique Coolen
Louis D'Alecy
Michael Ferrari
Ken Inoki
Lisa Larkin
Jun Hee Lee
Michael Lehman
Anatoli Lopatin
Malcolm Low
Ormond MacDougald
Daniel Michele
Suzanne Moenter
Richard Mortensen
Geoffrey Murphy
Bishr Omary
Scott Pletcher
Liangyou Rui
Elizabeth Rust
Linda Samuelson
Santiago Schnell
Jessica Schwartz
Yatrik Shah
Edward Stuenkel
Michael Sutton
John Williams
Xian-Zhong (Shawn) Xu
Lei Yin

Research Faculty (6)
Lawrence Argetsinger
Zhiguo Chu
Nancy Linford
Dolors Sans Gili
Xin (Tony) Tong
Natasha Snider

Joint Faculty (35)
(Our Joint Faculty come from 14 departments/units)
David Antonetti
Justus Anumonwo
Peter Arvan
Robert Bradley
Steven Britton
Frank Brosius
Charles Burant
Gregory Cartee
Peter Dempsey
Gary Hammer
Todd Herron
Mark Hershenson
Bret Hughes
Ao-Lin (Allen) Hsu
Lori Isom
José Jalife
Richard Keep
Carey Lumeng
Ralph Lydic
Ram Menon
Juanita Merchant
Martin Myers
Chung Owyang
Vasantha Padmanabhan
David Pinsky
Gina Poe
Donald Puro
Alan Saltiel
Susan Shore
Diane Simeone
Gary Smith
Michael Wang
Margaret Westfall

Adjunct Faculty (8)
Xuequen Chen
Mario Delmar
Joan Keiser
Tatiana Kostrominova
Nam-On Ku
Warren Lockette
Joseph Metzger
Tadataka Yamada

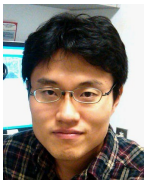
Emeritus Faculty (10)
John Faulkner
Stevo Julius
Fred Karsch
Landis Keyes
Richard Malvin
John McReynolds
Lester Rutledge
Jurgen Schnermann
James Sherman
Arthur Vander

2010-2011 NEW FACULTY

Michael Ferrari, Ph.D. |Lecturer

Dr. Ferrari, a new lecturer and Co-Director of the M.S. program in physiology, is developing new graduate courses and facilitating the growth of this new program.

Jun Hee Lee, Ph.D. |Assistant Professor



"I am working on the molecular mechanism of the age-associated obesity-prompted diseases and the protective role of Sestrins against those pathological progressions."

Natasha Snider, Ph.D. |Research Investigator

"My research addresses the post-translational regulation of cyto-skeletal intermediate filament proteins and its relevance to normal physiology and liver disease."

Faculty Awards, Honors & Promotions

David Antonetti:
2011 Awarded the Jules and Doris Stein Professorship in Ophthalomology from Research to Prevent Blindness

Jimo Borjigin:
2011-2016 Awarded NHLBI R25 Grant as PI

Gregory Cartee:
2011 Selected by the *American College of Sports Medicine* to receive an *ACSM Citation Award*

Christin Carter-Su:
2011 Received Rackham Distinguished Faculty Achievement Award

Gary Hammer:
2011 Promoted to Professor with Tenure

Lori Isom:
2011 Elected to American Association for the Advancement of Science

Malcolm Low:
2011 Elected to the Association of American Physicians
2011-2016 Associate Editor for *Gastroenterology*

Carey Lumeng:
2011 Named Program Chair for the 2012 Annual Meeting of The Obesity Society (Co-Chair for the 2011 meeting)

Ralph Lydic:
2011 Founding Board Member, Society for Anesthesia and Sleep Medicine; Chair, External Advisory Panel, Canadian Institutes of Health Research (CIHR)

Ormond MacDougald:
2011 Rackham Distinguished Graduate Mentoring Award

John McReynolds:
2011 Endowment for the Basic Sciences (EBS) Teaching Award in Physiology

Daniel Michele:
2011 Promoted to Associate Professor with Tenure

Martin Myers:
2011 Ernst Oppenheimer Award, The Endocrine Society

Bishr Omary:
2011-2016 Editor of *Gastroenterology*

Chung Owyang:
2011-2016 Senior Associate Editor for *Gastroenterology*
2011 Distinguished Mentor Award, American Gastroenterological Association

Elizabeth Rust:
2011 Awarded Gilbert Whitaker Award for the Improvement of Teaching

Linda Samuelson:
2011 Named the John A. Williams Collegiate Professor of Gastrointestinal Physiology
2011-2016 Associate Editor for *Gastroenterology*
2011-2016 Gastrointestinal Section Editor of Annual Review of Physiology

Santiago Schnell:
2011 Member of the Editorial Board of Mathematical Biosciences; Awarded Gilbert Whitaker Award for the Improvement of Teaching

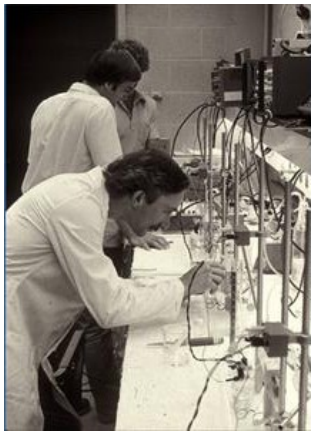
Susan Shore:
2011 Scientific Review Board of the American Tinnitus Association

Diane Simeone:
2011 President of the American Pancreatic Association

Natasha Snider:
2011 Received K01 Award from NIDDK

John Williams:
2011-2016 Associate Editor for *Gastroenterology*

Shawn Xu:
2011 Basic Science Research Award, University of Michigan



Memorial Gathering for William J. Germann

Physiology Department alumni, faculty, students, and friends and family of William Germann gathered in the Department on July 30, 2011 to recognize the accomplishments and honor the memory of one of our PhD alumni, who passed away last November in Dallas, Texas. Bill received his PhD in 1984 under the mentorship of David Dawson. After graduation, he received postdoctoral training with Alan Finkelstein at Albert Einstein College of Medicine. Bill later became Professor and Chair of the Biology Department at the University of Dallas. During that time, he also wrote a highly-regarded college- and graduate-level physiology textbook, *Principles of Human Physiology*.

Bill is fondly remembered for his passion for science education, for debate on any intellectual problem, for his incisive, quirky sense of humor, and for his professional-caliber musicianship. At the gathering, reminiscences of Bill as a graduate student were presented by fellow Physiology alumni: Jeff Tatro, currently Associate Professor of Medicine at Tufts Medical School and creator of the *GrantRescue* research grant and manuscript writing service; by Deborah Olster, currently Deputy Director of the NIH Office of Behavioral and Social Sciences Research; and by David Shier, faculty member and former Chairman of Biology at Washtenaw Community College. Another graduate school classmate, Joseph Cannon, who is Professor of Physiology in Georgia Allied Health Sciences (affiliated faculty with Physiology), also spoke about Bill, especially his professionalism as a musician, and played a selection from a recording of Bill playing trombone with the Dallas Jazz Orchestra. Reminiscences sent by Dave Dawson, who was unable to attend, were read by Jessica Schwartz, representing the Department faculty. The gathering closed with a musical performance by Fred and Nora Karsch of Ashokan Farewell.

Linda Samuelson:
First Recipient of the John A. Williams Collegiate Professorship

Dr. Linda C. Samuelson was named as the first recipient of the *John A. Williams Collegiate Professorship in Gastrointestinal Physiology* effective April 1, 2011. The chair installment celebration will take place on November 1, 2011. Establishment of the *Williams Chair* could not have happened without the incredibly generous gift of $100,000 that John and his wife Christa Williams gave, and additional funds by Dean Woolliscroft. In addition, all our faculty and John's former and current trainees, colleagues and Physiology Department alumni contributed towards this effort together with several Medical School divisions and departments (who have joint faculty mentored by John during his 21-year tenure as Department Chair). The Williams Chair is extra special because it is unusual to have an endowed chair in the medical school named after an active faculty member (in John's case, everyone would say vigorously and incredibly active). John and his wife Christa were delighted to learn of Dr. Samuelson's selection for this honor. Linda is a Professor of Physiology and Internal Medicine and is co-director of the Center for Organogenesis, Director of the Embryonic Stem Cell Transgenic Animal Model Core, a member of the MSTP Operating Committee and former Chair of MIP's Graduate Program (2000 to 2003). She is an internationally renowned investigator in gastric biology as evidenced, in part, by her selection as Associate Editor for the journals *Annual Review of Physiology* and *Gastroenterology*. In addition, Linda is a member of the NIH Study Section *Clinical, Integrative and Molecular Gastroenterology*, and has held numerous leadership positions in the American Physiological Society including her current elected position as Councilor (2008-2011). The selection of Linda Samuelson as the first recipient of the *Williams Chair* is a reflection of Linda's stature in the field of gastrointestinal physiology and her scholarly and educational contributions to our department and to the University of Michigan.

Congratulations Linda!!

International Exchange Program

A delegation of 7 faculty and 3 students from the Departments of Molecular & Integrative Physiology and Pharmacology visited Trinity College, Dublin, (TCD) Ireland in September to foster continuing development of an exciting academic and research collaboration directed at enhancing a global perspective on graduate education. TCD has a long tradition of excellence in scholarship and research (celebrating their tercentenary this year) and is an international leader in graduate education, with over 500 registered graduate students. Upon arriving in Dublin, the Michigan group was treated to a viewing of the all-Ireland Gaelic Football Championship at Croke Park Stadium. The event culminated with a spectacular win of the hometown Dubliners over the much heralded Kerry team. Over the following days, the group participated in the TCD Medical School Annual Postgraduate Symposium, comprised of an exciting day of graduate student and faculty research presentations and over 90 research posters. A celebratory dinner including Dr. Dermot Kelleher (Head, School of Medicine and VP of Medical Affairs), Veronica Campbell (Dean of Postgraduate Studies), Shane O'Mara (Director Institute of Neuroscience), Áine Kelly (Head, Department of Physiology) and other TCD dignitaries followed the symposium and was held at *1592*, a wonderful historical room on the TCD campus. The Michigan group also participated in informative and interactive presentations on the research enterprise at Trinity College led by Professor Padraic Fallon (Director of Research, School of Medicine), and international funding opportunities to support Ireland-USA student exchange/research provided by Dr. Oonagh Kinsman (Research and Development). The UM group was also led on a tour by Audrey Crosbie (Industrial Liasion Officer) of TCD's new Trinity Biomedical Sciences Institute, a beautiful building that directly links Medical and Postgraduate Science Education and industrial collaboration. Finally, the Michigan group was introduced by Professor Paul Coughlan to a highly successful new program at TCD termed the Innovation Academy. This postgraduate education program draws graduate students from across disciplines to participate in creative thinking and to develop innovative models by which to convey their research to the public sector. The program comprises a series of modules that build development of creative and innovative thinking, while establishing the value of marketing their research to the public and industrial sector. The modules include fundamentals of creative thinking and innovation, opportunity generation and recognition, protecting your idea, planning your new venture and financing your new venture. Overall, the events and individual meetings between UM faculty and Trinity faculty established an enthusiasm and clear path by which future collaborations will occur. Most notable to the trip's success, several of the UM faculty have initiated contacts for future research collaboration and each of the UM graduate student participants expressed an eagerness to establish and carry out joint research projects with colleagues at TCD.

Graduate Students

First Row (L to R): Gail Butler, Kristen Ruka, Meg Allison, Amy Sutton, Alexis Carulli, Mearan Uhm, Abbie Renoux **Second Row:** Joanne Garbincius, Kristen Brown, Katie Overmyer, Jacob Bermudez, Joel McDade, Bryan Holtz, Jun Young Hong, Adam Bree, Michael Doche **Third Row:** Jonathan Gumucio, Jon Mowers, Beverly Piggott, Matt Campbell **Last row:** Jacob Mertens, Mark Bolinger, Donel Sequea, Jim MacKrell

It is with mixed emotions that I end my term as director of the graduate program. While the chance to refocus my energies on research and other academic endeavors is welcome, I will miss my individual and group interactions with the graduate students. It has been an honor to witness and make a contribution to their development as scientists and educators. Fortunately, it is with complete confidence that I turn the reins over to Scott Pletcher, who is a talented and enthusiastic successor. As I look back on my term, the program underwent a number of changes for which I'm quite proud. First, we expanded the curriculum to create a neuroscience track, and increased the number of electives to allow MIP students with varied interests (e.g. systems biology) to choose classes specific for their educational needs. Second, we began an undergraduate summer research fellowship to increase the quality and quantity of students applying to MIP for graduate school. Third, we raised over $265,000 for the Graduate Education Fund in Physiology. This endowment will allow the graduate committee to provide research grants and other opportunities to enrich the education of our students. This was only possible because of the widespread and generous support of this effort by the medical school, our students and faculty, our loyal alumni, and other friends and supporters – MIP graduate students will thank you for all time! Fourth, an academic exchange program was formalized with Trinity College Dublin in Ireland, and a sizeable three-year grant from the Rackham School of Graduate Studies was obtained to foster travel and collaborations. Expanding the focus of our graduate program to a global stage is an important part of our future competitiveness, and I look forward to seeing the success of this exciting program. In parting, I am indebted to the members of the graduate committee, especially the seven student members, all of whom provided critical insights and worked tirelessly over the past years to accomplish these goals. Go Blue!

--Ormond MacDougald

"…on the shoulders of giants."

We are dwarfs standing on the shoulders of giants. One of the most often used metaphors in Western society. But what does it really mean? For Isaac Newton, it implied that his scientific discoveries would not have been realized were it not for those whose contributions came before[1]. For the theologian, John of Salisbury, it meant that he was empowered to discover – to see further and in more detail than his predecessors[2]. For the rock band Oasis, it signified a freeing of themselves from history – a burst of creativity – that became their musical introduction to the 21st century[3]. For Linus Torvalds, who built on existing free software to develop the open-source Linux operating system, it meant the obligation to give back and to recognize the generosity of others[4].

As I take hold of the reins of the Graduate Program from Ormond, I realize that for me it means all of these things: appreciating the tremendous history and achievements of this University and our Department; learning from those that teach and inspire; and working hard to build our research family. I am lucky. Ormond's remarkable accomplishments over the past three years have provided me a broad set of shoulders upon which to stand. I am also lucky that, considering his penchant for kilts, I am the one standing on top.

Women and men from all walks of society – great minds, leaders of nations, and popular icons – have seized the opportunity to build, create, and extend the discoveries of the past. I look forward to the privilege of working with the next generation of leaders and asking: What does it mean to you?

--Scott Pletcher

Notes

1.Isaac Newton's letter to Robert Hooke, February 5, 1676.

2. *The Metalogicon of John Salisbury.*

3. "*Standing on the Shoulder of Giants*" Oasis studio album released February 2000.

4. "I had hoisted myself up on the shoulders of giants," Linus Torvalds quoted in *Free as in Freedom: Richard Stallman's Crusade for Free Software*. Pg 138.

2010-2011 Student Awards & Honors

Asma Al Menhali (Samuelson Lab):
2005-2011 United Arab Emirates University Scholarship;
2010 Horace W. Davenport Research Award Finalist

Anuli Anyanwu (Pinsky Lab):
2011 Rackham Graduate Research Grant; Rackham Travel Grant

Jacob Bermudez (Larkin Lab):
2011 Systems and Integrative Physiology Biology Training Grant Fellow

Mark Bollinger (Antonetti Lab):
2011 Vision Research Training Grant Fellow

Adam Bree (MacDougald Lab):
2011 Systems and Integrative Physiology Biology Training Grant Fellow

Gail Butler (Samuelson Lab):
2011 Systems and Integrative Physiology Biology Training Grant Fellow

Katherine Campbell (Jalife Lab):
2011 UM-Wayne State Physiology Symposium Poster/Abstract Award

Matthew Campbell (Michele Lab):
2010 Horace W. Davenport Research Award Finalist;
2011 UM-Wayne State Physiology Symposium Poster/Abstract Finalist

Alexis Carulli (Samuelson Lab):
2011 Organogenesis Training Grant Fellow; Rackham Research Grant; Rackham Travel Grant; Organogenesis Bioartography Travel Grant

Wei-Chung (Daniel) Chiang (Hsu Lab):
2010 Horace W. Davenport Research Award Finalist;
2011 Rackham Travel Grant

Megan Greenwald-Yarnell, Neuroscience (Myers Lab):
2011 Systems and Integrative Biology Training Grant Fellow; Endocrine Society Meeting Oral Presentation

Jessica Gumerson (Michele Lab):
2010 Horace W. Davenport Research Award
2011 Rackham Predoctoral Fellowship; Rackham Travel Grant

Bryan Holtz (Williams Lab):
2011 Rackham Travel Award

Jun Young Hong (Hershenson Lab):
2011 John Bean Fellow for Academic Excellence

Luqia Hou (Jalife Lab):
2011 Rackham Travel Grant

James MacKrell (Cartee Lab):
2011 John A. Williams Award for Outstanding Graduate Student Service; Rackham Travel Grant

Joel McDade (Michele Lab):
2011 Invited speaker UM-Wayne State Physiology Symposium

Jonathon Mowers (Saltiel Lab):
2010-2012 NIH Ruth L. Kirschstein National Research Service Award
2011 Arthur J. Vander Outstanding Graduate Student Teaching Award

Katherine Overmyer (Burant Lab):
2011 Rackham Travel Grant Fellow

Beverly Piggott (Xu Lab):
2011 Vision Research Training Grant

Abbie Renoux (Sutton Lab):
2011 Systems and Integrative Biology Training Grant Fellow; Rackham Research Grant

Kristen Ruka (Moenter Lab):
2011 Rackham Graduate Research Grant; Rackham Travel Grant

Donel Sequea (Cartee Lab):
2011 Rackham Research Grant; NIH Research Supplement to Promote Diversity in Health Related Research

Becky Simon, CMB (MacDougald Lab):
2011 UM-Wayne State Physiology Symposium Poster/Abstract Award

Jordan Wright (Arvan Lab):
2011 Systems and Integrative Biology Training Grant; UM-Wayne State Physiology Symposium Invited Speaker; Rackham Travel Grant

Tingting Xiong (Saltiel Lab):
2011 Rackham Research Grant

2011 NIH-Funded Summer Fellowship Program

(Directed by Santiago Schnell; Co-Directed by Ormond MacDougald)

The purpose of our NIH funded R25 program, *"Interfacing computation and engineering with digestive and metabolic physiology"*, is to attract undergraduate and graduate students - who are majoring in engineering, informatics, mathematics, physics and computational disciplines - to careers in the areas of digestive disease and metabolism and their related health disorders. The program includes two components. The first is to teach the students computational applications related to NIDDK areas of research interests such as diabetes, obesity and gastrointestinal cancers. This will be done through our course Physiology 520, which will be open to graduate students and upper level undergraduates in quantitative subjects. We believe that our course will attract graduate students, who have not selected a mentor, to pursue PhD projects related to digestive disease and metabolism. The second component is to provide eight summer fellowships for engineering, mathematics, physics and computational students to gain laboratory experience in the research areas of digestive or metabolic physiology. Students will join our ongoing, successful MIP summer fellowship program, overseen by Ormond MacDougald. They will attend the noon lecture series that introduces them to multiple aspects of physiology-related research including the use of different model organisms, ethical issues in laboratory research, and career opportunities in biomedical sciences. The research experience culminates in a half-day symposium that includes oral presentations given by the students summarizing their research projects. We expect our program to encourage quantitative inclined students not only to pursue a research career but to also consider the exciting opportunities related to solving health problems involving digestive diseases and metabolic disorders.

2010-2011 Graduate

Asma Al Menhali, PhD
Mentor: Linda Samuelson, Ph.D.
Thesis: *Parathyroid Hormone-Like Hormone (PTHLH): A Novel Parietal Cell Growth Factor Regulated by Gastrin*
Current Position: Postdoc; Will return home to the United Arab Emirates to teach the undergraduate Human Physiology course at the University of the United Arab Emirates.

Post-Doc Corner

The MIP postdoctoral club continued with monthly meetings and career development activities coordinated by Natasha Snider and Yanan Hou during 2011. Although research presentations continued to be a vital part of the activities of the postdoctoral club, this year we introduced some changes to the format in order to provide more opportunities for career development activities. To that end, we participated in bi-monthly research presentations by the fellows, while the rest of our meetings involved lectures by invited speakers. The 20-min presentations given by two fellows during each meeting were accompanied by insightful discussions from the entire group. Additionally, two of our fellows, William Cawthorn (MacDougald lab) and Anil Kumar (Menon lab) successfully represented our department at the second annual UM-Wayne State Joint Physiology Symposium in August.

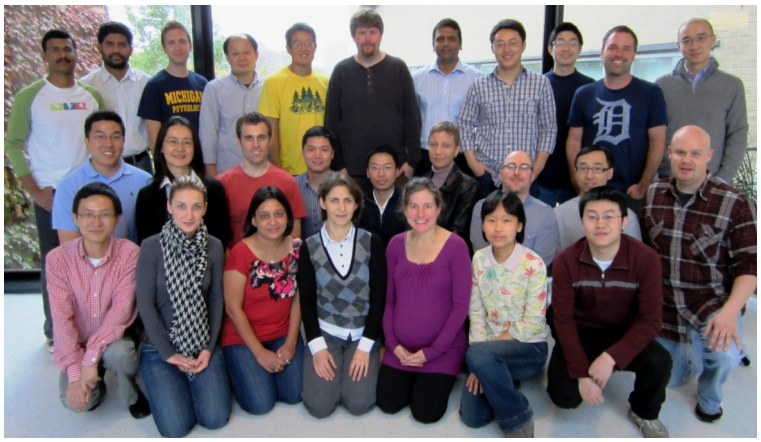
This year, the postdoctoral fellows also participated in events aimed at increasing their success of obtaining research funds. In February, we invited Julie Feldkamp, managing project representative at the Division of Research Development and Administration to speak on non-NIH funding options. Julie gave a hands-on presentation on various databases and search engines that fellows can use to identify foundations and public charities interested in funding specific areas of research, and how to efficiently apply for funding from these sources.

Our department chair, Bishr Omary, gave an insightful and highly motivating presentation at our monthly meeting in April. He offered career advice on how to succeed in academic research, such as overcoming difficulties during the postdoc years, strategies for publishing in high-impact journals, dealing efficiently with peer review, writing successful grants, and preparing for the academic job search. In terms of help with future career prospects, the majority of postdocs identified gaining some level of formal teaching experience as one goal that they would like to accomplish during their postdoctoral training. With the support of our chair and instructional faculty (Beth Rust and Mike Ferrari), interested postdocs will now have an opportunity to deliver a lecture in one of the undergraduate or masters-level physiology courses, as arranged between the fellow, his/her PI, and either Dr. Rust or Dr. Ferrari.

In June, our postdoctoral club, together with the medical school postdoc association, co-hosted a lecture by world-renowned ethicist, Nicholas Steneck, who is also the director of the Research Ethics Program and Professor Emeritus of History at the University of Michigan. In his lecture, entitled "Responsible Conduct of Research for Postdoctoral Fellows", Dr. Steneck presented several key ethical and moral responsibilities for scientists involved in biomedical research and gave specific contexts for each. His lecture, which was also attended by several of our faculty, was followed by a lively discussion with fellows engaged in research across the various basic and clinical departments at the Medical School.

Our planned activities for the rest of the year include selection of new leadership for the MIP postdoctoral club and inviting a departmental seminar speaker for 2012. We sincerely thank our department leadership and administrative staff for the support and hope that the continuation of the activities of the MIP postdoctoral club during 2012 will ensure that our valued research fellows reach their full potential during their postdoctoral training.

Natasha Snider, President
Yanan Hou, Vice-President



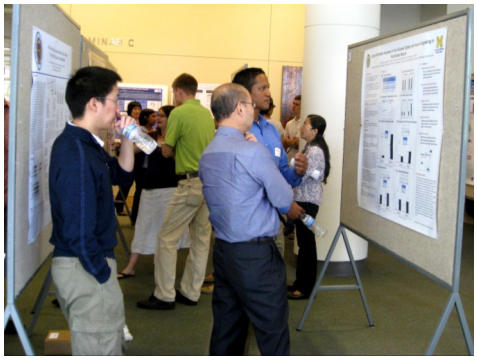
Front row (L to R): Xiang Xue, Natasha Snider, Amika Singla , Hadise Kabil, Christi Gendron, Jung-Eun Lee, Lin Jiang **2nd row:** Brian Chung , Miho Yamashita , Williams Cawthorn, Yanan Hou, Liang Sheng, Tatyana Fedina Ian Webb, Hong Shen, Ian Moench **3rd row:** Anil Kumar Pasupulati, Vithanage Sujith Weerasinghe , Aaron Mercer, Hiroyuki Mori Raymond Kwan, Doug Wacker, Saiprasad Ramnarayanan, Haoran Su, Zheng Chen, Christopher La Pensee, Yao Yao

Postdoctoral Fellow Awardees:

- **William Cawthorn** (MacDougald Lab): Royal Commission for the Exhibition of 1851 Postdoctoral Research Fellow
- **Elise Demitrack** (Samuelson Lab): NRSA Award from NIH (NIDDK)
- **Daniel Lam** (Low Lab): American Heart Association Fellowship
- **Amika Singla** (Omary Lab): NRSA Award from NIH (NIDDK)

UM-WSU Physiology Symposium II

The UM-WSU Physiology Symposium II, hosted by the Department of Molecular & Integrative Physiology at University of Michigan (UM) and the Department of Physiology at Wayne State University (WSU), was held on August 26, 2010 in BSRB, Ann Arbor. The symposium was chaired by Drs. Liangyou Rui (UM) and Javier Sala Mercado (WSU). Dr. James O. Woolliscroft, Dean of the Medical School, UM, opened the symposium and welcomed the 190 attendees. In the morning session, eight Ph.D. students and postdoctoral fellows (four from each department) presented outstanding talks, covering broad aspects of physiology at the molecular and integrative levels. In the noon poster session, researchers presented 92 abstracts/posters (58 from UM and 34 from WSU). In the afternoon section, six faculty members (three from each Department) presented their exciting findings in the areas of metabolism, neural sciences, reproductive physiology, and cardiovascular biology. Extensive audience-presenter discussion and idea exchanges greatly enhanced a scholarly atmosphere during the meeting. Four poster winners from each University were selected by Drs. Daniel Michele, Jimo Borjigin, and Yatrik Shah, together with their WSU counterparts, for a $100 award. Dr. Jian-Ping Jin, Chair of the Department of Physiology, WSU, announced the UM-WSU Physiology Symposium III next year at WSU, and presented closing remarks.



UM poster award winners:
~Katherine Campbell
~Jessica Leonard
~Becky Simon
~Xiang Xue

UM speakers:
~Jordan Wright
~Joel McDade
~Will Cawthorn
~Anil Kumar
~Liangyou Rui
~Michael Sutton
~Suzanne Moenter

Systems Biology Symposium

On April 4th 2011, the Department of Molecular & Integrative Physiology hosted the second University of Michigan Systems Biology Symposium. The symposium was co-sponsored by the Center for Computational Medicine & Bioinformatics, the Department of Biomedical Engineering and the University of Michigan Comprehensive Diabetes Center; and by Amgen Inc. Much to our delight, the symposium was a regional Great Lakes event with attendees from Indiana, Michigan, Ohio and Ontario. We had 180 registered participants, which included colleagues from Van Andel Institute, Wayne State University, Michigan State University, Western Michigan University, Oakland University, Kalamazoo College, University of Windsor, Toledo Medical Center, University of Notre Dame and Case Western Reserve University. The lively poster session had 44 contributions.

Santiago Schnell and John Williams organized the symposium on behalf of the department. The local organizing committee was also composed by Brian Athey (CCMB), Daniel Forger (Mathematics) and David Sept (Biomedical Engineering). We were privileged to have among the speakers, two extramural, major figures in the systems biology community: Drs. James Ferrell (Stanford University) and Arthur Lander (University of California, Irvine). Jeff Mackeigan (Van Andel Research Institute) was our Great Lakes Region speaker, together with three intramural speakers: Jimo Borgijin (Molecular & Integrative Physiology), Jennifer Linderman (Chemical Engineering), and Les Satin (Pharmacology).

Capitalizing on the success of this event, we are planning a third symposium next year. Meanwhile, if you are interested in learning more about systems biology, you are welcome to join the Systems Biology Journal Club, organized by Santiago Schnell and John Williams.

Graphic courtesy U.S. Department of Energy Genomic Science Program http://genomicscience.energy.gov

NIH-Supported Summer Undergraduate Research in Physiology *(SURP)*

(Directed by Jimo Borjigin)

Our SURP program, "promoting diversity of future scientists", is designed to provide summer undergraduate students with experience in biomedical research under the direct mentorship of MIP and other University of Michigan Medical School faculty. The target population of this award includes (1) students from racial and ethnic groups who are underrepresented in health-related sciences; and (2) students with disability, or from disadvantaged backgrounds (low income or inner-city environment). Students who have finished 2 or 3 years of college and who are interested in ultimately pursuing research at the Ph.D. level are encouraged to apply. The SURP program is primarily funded by a NIH-R25 award and is emerging as a product of a campus-wide collaboration with other existing programs. During the 10-week program, students work closely with their faculty on projects related to the mission of National Heart, Lung, and Blood Institute (NHLBI), which include cardiovascular biology, cerebrovascular biology, pulmonary sciences, circadian rhythms and sleep sciences. In addition to hands-on research, students will attend a weekly Physiology Seminar Series, in addition to GRE classes offered by our partner programs, and will have the opportunity to socialize with MIP graduate students. The SURP program provides a stipend, fringe benefit, housing assistance, travel assistance, and research supply fund to each eligible student. The program for 2012 starts on May 30, and ends on August 10.

SPOTLIGHT

on Alumni

Matt Kluger, one of our esteemed faculty alumni just recently recounted his first experiences as a postdoctoral fellow seeking his first faculty position. Dr. Davenport, the UM Physiology Chair in 1972, made him an offer he could not refuse as he pondered whether his professional future would be here or at Yale. He speculates that Dr. Davenport interpreted his "speechless" reaction to the first job offer as a "no" and offered more. So, perhaps the expression "silence is golden" served him well. During his years at Michigan, Matt served as Director of the graduate program for two four-year terms, and ran a research program focused on understanding the role of fever and related host-defense responses in disease, and other fundamental questions relating to the regulation of body temperature. His interactions with graduate students within the department and his own laboratory were among the fondest memories he has of his years in Ann Arbor. In 1993, he left Ann Arbor to oversee a biomedical research institute in Albuquerque, New Mexico. While there he earned an MBA from the University of New Mexico. He left New Mexico in 1999 to serve as Vice President for Research and Dean of the School of Graduate Studies at the Medical College of Georgia - now "Georgia Health Sciences University." He moved to Fairfax, Virginia in 2005 to become Vice President for Research & Economic Development at George Mason University. In 2008, he became a professor of Health Administration and Policy at Mason with an adjunct appointment in their School of Management. Matt teaches courses in strategic planning and marketing and in healthcare finance. He found that sound physiological principles work just as well in these fields (e.g., need to avoid "open-loop" systems and the importance of feedback, adaptation to changing environments).

Sarah Ross was Dr. Ormond MacDougald's first graduate student. She stated in his lab in 1995 and continued as a postdoctoral fellow until December 2001. Together, they discovered that Wnt signaling acts as fate-determining switch that inhibits adipogenesis. Sarah continued her research in the lab of Dr. Mike Greenberg's lab at Harvard Medical School with the view of studying how transcription factors regulate neural cell fate. This work led to the accidental discovery that the transcription factor Bhlhb5 is required for normal itch sensation—mice lacking this factor develop abnormally elevated itch due to the loss of a specific population of inhibitory neurons within the dorsal horn of the spinal cord. This past June, Sarah began a position as an Assistant Professor at the University of Pittsburgh and is using this discovery as the foundation for studies in her lab, where she will continue to study the neural basis of itch sensation. So far she is enjoying spending her start-up money on PCR machines and microscopes. Think of her next time you have an itch. And if you ever get itchy feet, come visit her lab in Pittsburgh, only 4 hours away!

Master's Program

After two years of planning, the Department has successfully launched its new Master's Degree Program! This program was designed to attract students who plan to pursue one of the following careers: (1) employment in a research laboratory in academia or industry or other related profession, (2) application to a doctoral degree-granting program, or (3) application to a health profession program such as Medical School or Dental School. Beth Rust, Ph.D., Lecturer, chaired the committee that pulled the proposal together, along with the other committee members: Lou D'Alecy, D.M.D, Ph.D, Professor; Lisa Larkin, Ph.D., Associate Professor; and Santiago Schnell, Ph.D., Associate Professor. The program was approved by the Rackham Graduate School in December 2010 and the announcement went out in early 2011 for the first class of students. On March 1, 2011 Michael Ferrari, Ph.D., joined our faculty to serve as the Co-Director of the Program. Previously, Mike was Associate Professor in the School of Biological Sciences at the University of Missouri - Kansas City. As soon as Mike arrived, he worked closely with Sarah Lawson and Michele Boggs to develop the marketing materials, web site, application materials and set up the student files. All four deserve kudos for their excellent work under a very tight timeline. Thanks to their efforts, we received and reviewed 93 applications within just a few weeks. During the late spring/summer, the M.S. committee reviewed the applications and began extending offers to qualified individuals. Seventeen students were ultimately accepted into the program as the historic first class. We are grateful for the discussion and guidance of Peggy Zitek (LSA Pre-Health advisor), Robert Ruiz (Admissions Directory Unit, UM Medical School), Marilyn Woolfolk (Admissions Associate Director, UM School of Dentistry, Professor of Dentistry and Assistant Dean for Student Services), and Dave Engelke (Professor of Biological Chemistry, UM Med School Adm, Medical School & Associate Dean for Academic Program & Initiatives, Horace H Rackham School of Graduate Studies).

Front Row: Katherine Gasho, Arthi Krishna, Vishvanie B. Jayasundera **2nd Row:** Robert Matar, Tina Wu, Maria Tecos, Joshua Hamoud **3rd Row:** Michael Ferrari, Alexander Roussos, Maria Tocco, Joshua Rivers, Elizabeth Rust **4th Row:** David A. Kramer, Vasudevan Mahalingam, Malav Parikh, Peter Altshuler **Not Pictured:** Michael Allen, Mohamad Charara, Erica Saunders, Angela Tucker

The Master's Program offers two tracks to students: an intensive course-oriented track or an intensive research-oriented track. Students matriculate in the Fall term and complete 35 credits in 10-12 months. Coursework students take 32 credits of courses in the Fall and Winter terms followed by a Capstone Project consisting of a library research project, written thesis and oral presentation in the Spring term worth 3 credits. Research students take 18 credits of courses between the Fall and Winter terms and 17 credits of research over the Fall, Winter and Spring/Summer terms. They have at least 20 hours per week available to work in the lab during the Fall and Winter terms plus full time for research during the Spring Term to complete a project and then produce a written thesis and presentation before the end of the Summer term. The successful student demonstrates the motivation and ability to perform at a high level with a heavy workload, which we anticipate will be viewed positively by their future career target evaluators. The one year program also offers reduced overall tuition and living expenses for the student and the ability to enter the workforce or subsequent graduate program more quickly compared to a 2 year program. Dr. Ferrari is the course director for the new Translational Physiology and Pathophysiology courses. Along with Dr. Rust, he is running newly added Human Physiology laboratory course open to both M.S. and undergraduate students, the two semester Physiology seminar and coordinating with other course directors for M.S. program courses.

We are very pleased with the composition of the inaugural class of 2012. There is substantial diversity on all levels (e.g. we admitted 2 MSU students!), and yet the class has quickly gelled into a supportive group for one another. The class began the term with an orientation lunch and OSHA training, and then had the Labor Day weekend to relax before the start of coursework. The students were fortunate to have a fantastic orientation package that was put together by Angela Tucker, the newly hired Administrative Assistant for the program. Everything from transportation schedules, building maps, and most importantly, the location of coffee kiosks, was included. Fortunately for the program, Angie knows the campus and local scene, as well as the department, as she moved over to the main office from Dr. Ormond MacDougald's laboratory. The students are lucky to have Angie as a personable and responsible point of contact for the program, and we are grateful to have her on board. We are also grateful to Bishr Omary, Chair of MIP, for envisioning the program and to the MIP faculty who supported the program from inception to realization. We are looking forward to the rest of the year and the graduation of the inaugural class of 2012!

Michael Ferrari
Co-Director

Elizabeth Rust
Co-Director

Angie Tucker
Program Coordinator

2010-2011 Physiology Donors

David F. Bohr Collegiate Professorship in Physiology

Ann Bohr Benner
Margaret & John Faulkner
John Mitchell
Bishr Omary
William Hamilton Rice

Graduate Education Fund in Physiology

John Gordon Albinson
Megan Anderson
Lawrence Argetsinger & Cheryl Utiger
Peter Arvan & Amy Chang
Amy Baek
Christina N. Bennett
Ernesto Bernal-Mizrachi
Ceyda Bilgir
Mark Bolinger
Francine & Horace Bomar
Jimo Borjigin & Michael Wang
Adam J. Bree
Constance A. Bridges
Susan Brooks & John Herzog
Charles Burant & Mary Treutelaar
Katherine Campbell
Matthew D. Campbell
Sally Camper & Robert Lyons
Mr. Joseph Cannon
Nell Beatty Cant
Gregory D. Cartee
Christin Carter-Su & Eugene Su
William P. Cawthorn
Hyuk & Kelly Cha
Wei-Chung Chiang
Daniel J. Clark
Christina Consolino & Timothy Meade
Cassandra X. Constantino
Paul Cook
Elizabeth Corwin & Robert McGrath
David & E.Kay Dawson
Christiana Dellorusso
John & Margaret Faulkner
Megan Faulkner
Ekaterina Fomicheva
Gabriel & Sara Frommer
Christi Gendron
Jessica D. Gumerson
Guy E. Groblewski
Gary & Lisa Hammer
Barbara & Ian Hawkins
Karen L. Hinkle
Luqia Hou
Yanan Hou
Ao-Lin Hsu
Matthew Hyman
Ken Inoki
Geoffrey & Lauren Jacquez
Jose & Paloma Jalife
Lin Jiang
Paul & Genevieve Shanklin Johnson
Veerichetty A. Kadhiresan
Yu-Fung Lin & Chung-Kuang Ke
Jennifer Kennell & Aaron Linder
Paul & Sharon Keyes
Matthew & Susan Kluger
Marie Kohler & Brian Mani
Karen A. Lacourse
Lisa M. Larkin
Jun Hee Lee
Lisa R. Leon
Rebecca L. Leshan
Anatoli N. Lopatin
Malcolm J. Low
Ann Marie Macara
Blaine MacDougald
Clayton MacDougald
Ormond A. MacDougald
James & Linda Mackrell
Richard & Claire Malvin
William & Kathleen McArdle
Kevin K. McCully
Christopher L. Mendias
Ram K. Menon
Aaron Mercer
Jacob Mertens
Daniel E. Michele
Susan J. Mitchell
Suzanne M. Moenter
Hiroyuki Mori
Jonathan C. Mowers
John J. & Raeanne Mulcahy
Martin G. Myers
Bradley B. Nelson
Amy E. Oakley
David P. Olson
Bishr Omary
Katherine A. Overmyer
Mr. & Mrs. William J. Pearce
Subramaniam Pennathur
Mr. & Mrs. Robert D. Phair
Scott Pletcher
Gina Poe & Gary Richardson
Elizabeth M. Rust
Julie & David Ruka
Kristen A. Ruka
Ammar Salhadar
Linda Samuelson & Joel Howell
Maria Dolors Sans Gili
Gerald & Roxanne Schielke
Santiago D. Schnell
Jurgen B. Schnermann
Jessica Schwartz & Robert Brumbaugh
Catherine A. & Steven Segal
Yatrik M. Shah
Noga Shargil
Susan E. Shore
Linda S. Sorkin
Edward Stuenkel
Haoran Su
Angela R. Subauste
Ann & Mark Trax
Angela & Ronald Tucker
Maeran Uhm
Kelli VanDussen
Elizabeth R. Wagenmaker
David G. L. VanWylen
Nancy L. Wayne
Ian C. Webb
Corinne E. Weisheit
Margaret V. Westfall
Steven E. Whitesall
John & Crista Williams
Gregory N. Witbeck
Janet Wolforth
Jordan Wright
Yao Yao
Lei Yin
Anthony & Barbara Zeleznik
MacDougald Veterinary Professional Corp.
The Quatre Vents Foundation, Inc.
Denville Scientific, Inc.
Sempercor Foundation of the Greater Milwaukee Foundation
VIE
David Klein Construction, Inc.
Pfizer Foundation
Bruce W. Arden Trust

John & Margaret Faulkner Lectureship & Education Fund

John and Margaret Faulkner

John Faulkner Collegiate Professorship in Physiology

George Brooks & Rosemary Agostini
Jeffrey S. Chamberlain
John and Margaret Faulkner
William M. Kuzon
David and Margaret Mohrman
Bishr Omary
Ronald and Kathleen Zernicke
Mark F. Trax & Ann Henninger Trax Rev. Liv. Trust

John Williams Collegiate Professorship in Gastrointestinal Physiology

Sally Camper and Robert Lyons
Christin Carter-Su & Eugene Su
Matthew J. DiMagno
Malcolm J. Low
Daniel E. Michele
Yoshinori Okabayashi
Bishr Omary
Gina Poe & Gary Richardson
Donald & Debra Puro
Jessica Schwartz & Robert Brumbaugh
John and Christa Williams

Physiology SERF Fund

Joan Keiser and Arthur Tai

2011 Departmental Fall Picnic

Gift Opportunities

David F. Bohr Collegiate Professorship in Physiology

This endowment was established in honor of Dr. David Bohr and his decades of enormous contributions to our department and the field of physiology at large. The Physiology Department has set aside funds to match donations to attain the $500,000 that is needed to establish the David F. Bohr Collegiate Chair of Physiology. To date, we have raised $33,000 ($66,000 with matching).

John and Margaret Faulkner Lectureship & Education Fund

This fund will go towards supplementing the Graduate Education Fund and to establish an annual lectureship whereby a prominent invited speaker will be selected by students and faculty in honor of John and Margaret Faulkner. Currently this fund has $22,500 of the necessary $100,000 needed to endow it in perpetuity.

*Graduate Education Endowment Fund**

The Graduate Education Fund was established in the Fall of 2008. Donations will be matched at $100,000 increments by the Medical School Dean's Office up to a total of $500,000 to allow reaching our goal of $1,000,000. The income from this endowment will be used exclusively to support graduate education in the department. Your generous gifts have allowed us to raise nearly $270,000 during the first three years of this effort. With an additional $30,000, we will be able to secure the second $100,000 increment of matching funds to reach a total of $400,000.

*As a tribute to Bill Germann, an exceptional individual and educator, Bill's friends are contributing in his memory to the Graduate Education Fund in Physiology. Information can be found at www.physiology.med.umich.edu/gef/Germann.html

Fred J. Karsch Collegiate Professorship in Physiology

Established in Summer 2011 to honor Dr. Karsch's career as a preeminent scholar, scientist, teacher and beloved mentor. The campaign has just begun for this effort to raise $250,000. Of note, Fred and Nora Karsch have generously committed to donate $60,000 as a lead gift, thereby significantly reducing the goal of the campaign to $190,000.

~If you would like to make a contribution, please enclose a check in the envelope provided. Please make checks payable to the University of Michigan and place in the notes section which fund you would like to contribute to. If you would rather contribute by credit card, you may visit www.physiology.med.umich.edu, click on the "Give Online" button in the top, right hand corner and this site will allow you to choose one of these funds to donate to. If you have any questions regarding the above funds, please contact Ann Boyd-Stewart at aboydst@med.umich.edu or contact Bishr Omary at mbishr@umich.edu.

The funds constitute a gift for endowment, and distribution from the funds will be made in accordance with the University's then existing endowment distribution policy.

Front cover guide:

1 ***Christin Carter-Su:*** Identification of SH2B1 β as a novel focal adhesion protein.

2 ***Carey Lumeng:*** Inflammation in adipose tissue - Visceral fat pad from a high fat diet fed obese mouse imaged by confocal microscopy.

3 ***William Cawthorn:*** Micrographs of ear mesenchymal stem cells (eMSCs) isolated to investigate differentiation of stem cells into other cell types.

4 ***Jimo Borjigin:*** β-Tubulin staining shows that innervation of the pineal gland was greater under conditions in which SCG neurons were regularly active.

5 ***Santiago Schnell:*** Network illustrating the interactions among 13 segmentation clock genes and proteins responsible for the formation of the somites during vertebrate development.

*Image reproduced with permission of the Center for Organogensis , BioArtography.com, Regents of the University of Michigan.

6 ***Natasha Snider:*** Reactive oxygen species (green) in mouse hepatocytes lacking the energy-generating enzyme NDPK

7 ***William Cawthorn:*** Micrographs of ear mesenchymal stem cells (eMSCs) isolated to investigate differentiation of stem cells into other cell types.

8 ***Linda Samuelson:*** Proliferating cells in mouse stomach were identified by immunostaining for the proliferation marker Ki67 (green) with DAPI nuclear counter stain (red).

9 ***Ormond MacDougald:*** Cultured 3T3-L1 cells were differentiated into adipocytes and are visualized here by phase contrast microscopy.

University of Michigan, Molecular & Integrative Physiology
1137 E. Catherine St., Rm. 7744, Ann Arbor, MI 48109-5622

Molecular & Integrative Physiology