The mission of the UW Stem Cell and Regenerative Medicine Center is to advance the science of stem cell biology and foster breakthroughs in regenerative medicine through faculty interactions, research support and education.

Fall 2013

SCRMC Notes



Sean Palecek (center), Stem Cell Bioengineering Focus Group chair, reflects with student Adriana Rodriguez at the SCRMC Fall Conference.

Inside this issue

From the Directors	1
Featured Researcher: Amish Raval	2
WiCell Highlights	5
Research Highlights	6
SCRMC Executive Committee Election	7
In the News	8
Undergraduate Certificate of Excellence	8
New Home for SCRMC in WIMR II	9
Visiting Speakers	9
Welcoming New Members	9
Fall Conference Recap	10
Training Award Deadline	11
Focus Group Updates	12
The SCRMC in the Community	14
WiSCR Update	15
Outreach Highlights	16
ICTR Pilot Grants	18

From the Directors

It has been another exciting semester for the SCRMC. Our faculty members continue to push the boundaries of scientific discovery with an eye toward translating discoveries into new treatments for patients. The prominence of stem cell and regenerative medicine research at Wisconsin continues to grow, as demonstrated by the many faculty accomplishments featured in this newsletter. In addition, we are working diligently to train the next generation of leaders in this interdisciplinary field.

We are pleased to report that **Sean Palecek**, Ph.D., Milton J. and A. Maude Shoemaker Professor of Chemical and Biological Engineering, has taken over as leader of the SCRMC Stem Cell Bioengineering Focus Group this summer. Sean is among the foremost leaders in this area worldwide and brings a great deal of experience, creativity and new initiatives to the group.

In the wake of our very successful SCRMC Fall Conference (see Page 10), we now look forward to two exciting meetings coming up in Spring 2014. Our annual Stem Cell Symposium will take place April 30th at the BioPharmaceutical Technology Center Institute, and will focus on "From Stem Cells to Blood." As always, an outstanding list of speakers will be featured at the spring symposium. In addition, we are pleased to announce that for the first time the UW SCRMC will partner with Georgia Tech, Emory University, and the University of Pittsburgh to co-organize the **2014 Regenerative Medicine Workshop** at Hilton Head. This conference brings together an interdisciplinary audience to build collaborations and feature the most exciting work in regenerative medicine worldwide. Stay tuned for more announcements related to these exciting events.

As always, we need your help to enable SCRMC initiatives to reach their full potential. Whether you can provide intellectual, pedagogic, or financial contributions, there has never been a more important time to support these important initiatives. Let's work together to change the future of human health!

Sincerely,
Tim Kamp & Bill Murphy, SCRMC Co-Directors

Number 9

Amish Raval

by Jordana Lenon



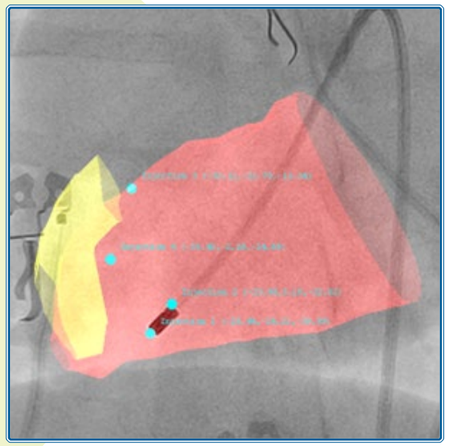
Without hesitation, **Amish Raval**, M.D. will explain what he does quite simply and matter of fact: "I am a translational researcher," he says. "I develop and test promising treatments for advanced heart and blood vessel disease in the laboratory. If they pass muster, I propose these innovations to the FDA, to get approval to design and conduct clinical trials."

Of course, there's a lot more to it than that. Raval, an assistant professor of medicine and head of Clinical Cardiovascular Regenerative Medicine at UW Health, is an interventional cardiologist. More specifically, his background and skills are in developing tools to improve interventional imaging and minimally invasive "targeted" treatment delivery for heart and vascular disease.

At this time, he is focusing on delivery aspects involving stem cells. "We are primarily using adult progenitor cells extracted from a patient's own bone marrow stem cells, then processed into viable cells for transplant," Raval says. "There are a number of ways to approach this: Mostly, I worry about cell retention in the heart — so we are seeking novel approaches to boost cell retention. For example, we ask how should we best inject cells and where? We want to make sure the cells aren't going into an inhospitable environment."

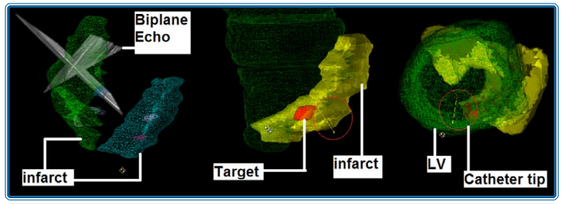
One delivery site may be the peri-infarct zone, Raval says. This is where there is still a vascular system present – mostly intact, but deficient. From there, he and his colleagues can administer stem cells in different ways. One is to inject cells directly into the heart muscle. They've found that retention is highest in the muscle when compared to intravenous injection. They use a needle-tipped steerable catheter that is placed inside the heart to inject stem cells into infarct border zone. This seems to work better at preserving acute cell retention than infusing cells in the arteries or veins.

Raval indicates that safety and accuracy of his catheter delivery methods are critically important. His team has developed a novel imaging system that can fuse a previously acquired MRI scan



Picture 1: Previously acquired MRI scan shows the inner surface of the heart (red) and an area of infarction (yellow), superimposed on an X-ray background. The needle tip injection catheter has made a number of injections which are tracked. (*Tomkowiak et al. 2011*)

of the heart onto the X-ray system that he uses to inject the stem cells (See Picture 1, *Tomkowiak et al.*) A problem that can arise is misregistration of images, because the heart can move considerably while the patient is breathing. In collaboration with Philips Healthcare, his team has developed a method built on a clinical platform that can track heart motion using ultrasound (See

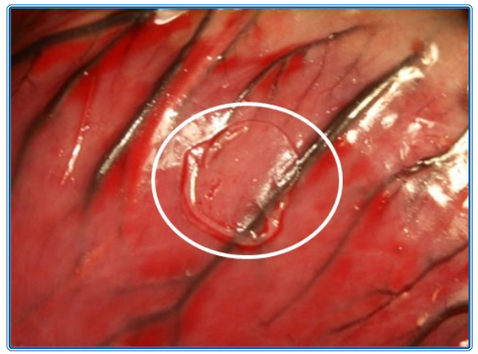


Picture 2: Images showing a previously acquired MRI road map with ultrasound used to compensate for breathing motion. The catheter is tracked using as specialized sensor. This provides all of the elements the physician needs to make very safe and accurate injections. In the center image and right image, the infarct is yellow, and the inner surface of the heart is represented in green. Red is a site of injection. The yellow arrow is the catheter tip. (*Hatt et al. 2013*)

Picture 2, *Hatt et al.*). He envisions this being the future of imaging for transcatheter intramuscular cell delivery.

"The stem cell therapies we are working on right now range from preclinical work with animals to clinical trials," Raval says. "We have promising therapies that are ready to go into patients for clinical trials."

On the preclinical front, Raval and colleagues expect to publish this fall in the *Journal of Cardiovascular Engineering and Technology (in press)* on the use of an extracellular matrix acting as a delivery platform, or raft, to carry stem cells. "Our raft is smaller and more pliable than a contact lens," he says. "It's made from cardiac fibroblast cells to simulate the heart environment and it can carry stem cells. The cells are the passengers and the matrix is the raft, and this can be directly placed on the injured tissue. (See Picture 3.) The goal is for the passengers to exit off the raft slowly and eventually the raft will dissolve away. Our early findings suggest the raft itself may have some treatment benefits also, which is an exciting discovery."



Picture 3: Cardiac fibroblasted derived extracellular matrix "raft" placed on the surface of the heart and appearing somewhat like a contact lens.

On the patient front, Raval has clinical-quality stem cells now available from **Waisman Biomanufacturing**. These are lab-grown stem cells deemed safe for use in human patients thanks in large part to research at UW-Madison over the past decade and vigorous testing by clinical standards.

Crossing over from preclinical to clinical right now is Raval's goal. He is principal investigator of a project involving a novel "prime and boost" therapy using allogeneic mesenchymal stem cells to safely and effectively treat a swine model of acute myocardial infarction. The procedure, involving the **Cardiovascular Physiology Core**, is poised to launch a Phase I clinical trial mid next year, pending funding. Through the procedure, an initial infusion of stem cells is injected into a vein and circulates up to the heart. This primes it for a second injection of stem cells infused directly into the peri-infarct zone, which acts to boost the effectiveness of the first injection.

Another exciting new treatment entering Phase III clinical trials at UW-Madison and other medical centers this November is the "**RENEW**" study, now recruiting human subjects at 50 sites throughout the U.S. and abroad. The trial involves the harvesting, condensing and infusion of autologous CD34+ stem cells to treat heart disease. Described in the UW-Madison 2007 news release, "**UW launches study testing adult stem cells for heart damage repair**", this treatment was safe and effective in earlier trials.

"What's exciting about this stem cell trial is that it is ahead of the pack," Raval says. "If all goes well in Phase III, in a few years this will lead to FDA approval of the first cellular therapy for cardiovascular disease." This is a relatively fast-moving breakthrough in the world of bench-to-bedside treatments, he points out. The seminal basic research paper that led researchers on the path to this new therapy involved research with rabbits at Tufts University School of Medicine in Boston, Raval notes. (***Asahara et al, 1997, Science.***)

"We need to get away from conventional open-

sternum surgeries to treat acute heart conditions," Raval says. "They carry too many risks for the patient. Cellular therapies involving improved interventional imaging and careful catheter-based procedures are the way we are heading."

Because there are so many new clinical trials involving stem cells coming down the pipeline these days, Raval opened a new clinic in 2009, the **Options Clinic** to offer hope for patients with the worst heart and vascular diseases who may have exhausted conventional treatments. "The idea is that patients receive a 360 degree evaluation of what treatments they have received to date, what may be missing which is part of standard of care, and what they may be eligible for in terms of an investigational treatment. Cathlyn Leitzke, RN, is a highly experienced senior research nurse specialist who runs the day to day clinic operations, and ensures an informative and comfortable experience for the patients that come through."

"We finally have all the components that can lead us to FDA submissions after reaching Phase I clinical trials in humans," Raval says. "We just need more people to enroll in these trials. We need to spread the word about this clinic."

Raval is also head of the SCRMC's Cardiovascular Regeneration Focus Group. To hear more about this group's goals and exciting advances, watch his **brief video introduction**.

Selected references:

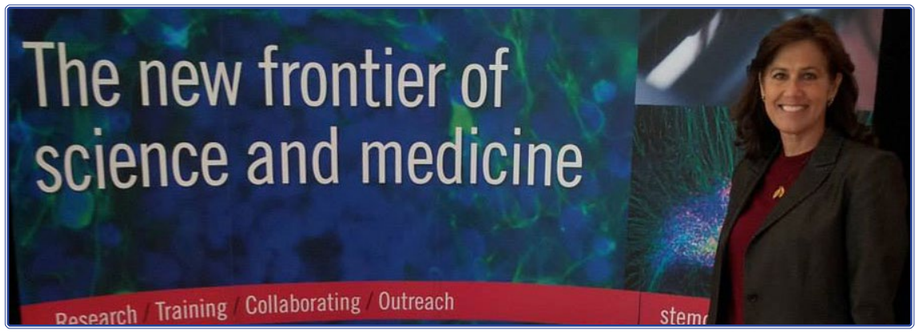
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The images within this article, courtesy of Amish Raval, depict preclinical progress in swine models of myocardial infarction



Jordana Lenon with the SCRMC display.

New reporter cell lines from Life Technologies now available via the WiCell Core

Neural Reporter Cell Line

In this newly available cell line (LT1e-OLIG2GFP), an enhanced GFP (EGFP) cassette was inserted to the Olig2 locus of hESC line BG01 via homologous recombination, which allows the expression of GFP when the neural marker Olig2 is expressed. Originally published in Stem Cells and Development, the authors report that this line can be used "to study motoneuron and oligodendrocyte lineage development in human, which will also facilitate research on cell based therapy for the treatment of several neurological conditions, including spinal cord injury, multiple sclerosis and amyotrophic lateral sclerosis." (*Xue et al., Stem Cells. 2009 August; 27(8): 1836–1846.*) For details on the modifications, look for "LT1e" at **www.wicell.org/cell-lines** and for more information regarding WiCell offerings to support SCRMC members, click **here**.

WA09(H9) GFP Cell Line

The modifications made to this cell line (LT2e-H9CAGGFP) result in constitutive GFP expression at the chromosome 13 locus that is maintained in prolonged culture. This cell line "is a valuable tool for lineage development study, gain- and loss-of-function experiments, and human disease modeling using hESCs." (*Macarthur et al., Stem Cell Dev 2012, 21 (2) 191-205.*) FFor details on the modifications, look for "LT2e" at **www.wicell.org/cell-lines** and for more information regarding WiCell offerings to support SCRMC members, click **here**.

Have a sample for Cytogenetic testing? Save time, have your Cytogenetics test samples picked up at your UW-Madison lab!

To schedule a free pick-up of live cells for g-banded karyotyping, fastFISH, SKY or CGH/SNP analysis please follow the 'UW Courier Instructions' and complete one 'Testing Request Form' on the **SCRMC** site for each sample.

What can we do for you?

Are there other cell lines, cytogenetic tests, and Core products/services would you like WiCell to offer? We welcome suggestions for additional items we can provide to SCRMC members. Let us know by emailing **rdrape@wicell.org**.

Safeguard your cell lines with WiCell

Having cell lines stored in multiple locations is one of the best ways to protect your research from the potential disaster associated with power outages, equipment failures, or other catastrophic events. By depositing your lines with WiCell you are not only ensuring their safety through having an additional storage site, but you'll sleep better knowing that WiCell's 24/7/365 equipment monitoring and response team is on the job even during those nasty winter storms. With immediate notification, back-up battery, and emergency relocation plans in place, you can rest easy all season. Additionally, WiCell can distribute your cell lines to the stem cell research community, while returning a portion of the revenue to your laboratory to fund additional research! For more information, email **deposits@wicell.org**.



One more reason to deposit your cell lines with WiCell: Our equipment monitoring and response team is on call 24/7/365 – even during the worst of Wisconsin's winter storms. *(Photo courtesy of UW-Madison University Communications and Jeff Miller.)*

Research Highlights



October 17, 2103
Biomanufacturing center takes central role in developing stem-cell therapies
Developing a new drug takes enormous amounts of time, money and skill, but the bar is even higher for a promising stem-cell therapy. Many types of cells derived from these ultra-flexible parent cells are moving toward the market, but the very quality that makes stem cells so valuable also makes them a difficult source of therapeutics, **Derek Hei**, Ph.D., director of Waisman Biomanufacturing.

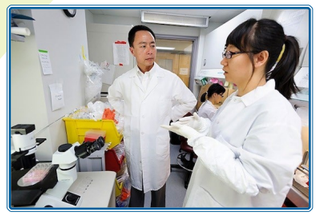
August 12, 2013
New gene repair technique promises advances in regenerative medicine
Using human pluripotent stem cells and DNA-cutting protein from meningitis bacteria, researchers from the Morgridge Institute for Research and Northwestern University have created an efficient way to target and repair defective genes. **James Thomson**, V.M.D., Ph.D., Diplomate A.C.V.P., director of regenerative biology at the Morgridge Institute, was one of the principal investigators on the research.





July 9, 2013
Stem cell research shows promise of memory restoration
Su-Chun Zhang, M.D., Ph.D., a professor of neuroscience and neurology at the University of Wisconsin-Madison, has been searching for a solution to the growing problem of memory loss, and he thinks our answer may lie in stem cells.

June 26, 2013
Waisman scientists model human disease in stem cells
Many scientists use animals to model human diseases. Mice can be obese or display symptoms of Parkinson's disease. Rats get Alzheimer's and diabetes. Animal models are seldom perfect, however, so **Su-Chun Zhang,** M.D., Ph.D., a neuroscientist who leads the iPS Core at Waisman, and others are looking at induced pluripotent stem cells (iPS cells), which can be grown into specialized cells that become useful models for human disease.



Questions about this newsletter? Please contact us.
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*Photography: **Jordana Lenon** (unless otherwise noted)*
*Design: **Sue Gilbert** <sggilber@wisc.edu>*

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SCRMC Executive Committee Elections

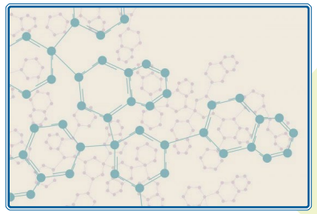
All SCRMC members contribute to and benefit from the center, but we especially receive leadership and guidance from our executive committee. It is once again time to elect two new members to succeed those whose three-year commitment is up. These faculty members have dedicated precious time to help the SCRMC thrive. The polling was sent out on November 22. If you have not seen the email with the link, please contact **Sue Gilbert**.

In addition to permanent members Tim Kamp (Medicine), Bill Murphy (Biomedical Engineering/ Orthopedics and Rehabilitation), and Robert Drape (WiCell), we have members representing the following campus schools and colleges:

- **School of Medicine & Public Health**: Su-Chun Zhang (term expiring 12/2013)
- **College of Engineering**: *vacant* (Brenda Ogle resigned August 2013)
- **College of Letters and Sciences**: Linda Hogle
- **Members-at-large**: Anita Bhattacharyya, Sean Palecek

We are currently polling the membership for the open positions in SMPH and CoE. The deadline for voting is December 9. The choices are:

- **CoE**: Randolph Ashton, Eric Shusta, and Ray Vanderby
- **SMPH**: Peiman Hematti and Igor Slukvin.



June 13, 2013
WID researcher looks to break conversion rate of stem cells
Only about 1 percent of your cells make the transition to iPS cells, while the rest stall somewhere along the process like a broken down car on the highway. That's why **Rupa Sridharan**, Ph.D., WID scientist and assistant professor of cell and regenerative medicine in the University of Wisconsin School of Medicine and Public Health (SMPH), is so interested in the mechanics of pluripotency.

May 28, 2013
Engineered stem cell advance points toward treatment for ALS
In work recently completed at the UW School of Veterinary Medicine, **Masatoshi Suzuki**, Ph.D., an assistant professor of comparative biosciences, and his colleagues used adult stem cells from human bone marrow and genetically engineered the cells to produce compounds called growth factors that can support damaged nerve cells.



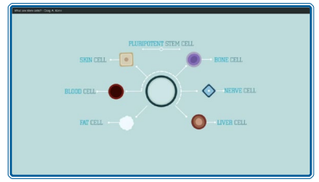


May 27, 2013
Down syndrome neurons grown from stem cells show signature problems
Anita Bhattacharyya, Ph.D., a neuroscientist at the Waisman Center at the University of Wisconsin-Madison, reports on brain cells that were grown from skin cells of individuals with Down syndrome.

Find more news in our **News Archives.**

Cell & Regenerative Biology News

Don't forget to visit the Department of Cell & Regenerative Biology **website** for upcoming seminars featuring SCRMC members and other updates.



September 11, 2013
Stem cells on Ted-Ed: Lessons worth sharing

Check out this new TED-Ed video and curriculum for high school teachers produced by educator Craig A. Kohn with the UW-Madison Stem Cell and Regenerative Medicine Center. The instructional site features multiple choice and essay questions, additional resources and on-line guided discussions for participants. *(Image: Craig Kohn.)*

August 6, 2013
Gong receives NIH Grant for cancer biology research



The National Institutes of Health awarded Biomedical Engineering Associate Professor **Shaoqin "Sarah" Gong**, Ph.D., a five-year, $993,600 mentored quantitative research development award for didactic training and research in cancer biology. Gong's project, "Targeted therapy of neuroendocrine cancers via the notch signaling pathway," focuses on developing novel nanomedicines for targeted neuroendocrine cancer therapy. Gong is a member of the BIONATES tissue engineering theme in the Wisconsin Institute for Discovery and will work under the mentorship of Surgery Professor Herb Chen. *(Image: Sarah Gong.)*



May 24, 2013
Two researchers named Shaw scientists

SCRMC faculty member **Rupa Sridharan**, Ph.D., is one of two UW-Madison scientists chosen by the Greater Milwaukee Foundation to receive a 2013 Shaw Scientist Award. *(Image: Rupa Sridharan)*

Find more news in our **News Archives.**

Undergraduate Certificate of Excellence in Stem Cell Sciences

The Stem Cell and Regenerative Medicine Center (SCRMC) is offering a "Certificate of Excellence in Stem Cell Sciences" to be awarded immediately after graduation to undergraduate students who have demonstrated academic excellence by meeting the following criteria: One semester of the Stem Cell Seminar; three additional approved courses; and two semesters of independent research with an SCRMC faculty member including a presentation at the Undergraduate Research Symposium or an abstract presentation at a scholarly meeting.
Since the launch, we have had twelve applicants, with two individuals completing the certificate program. This will not appear on their final transcript; however, they may wish to include it in their academic dossier.

The Education Committee would is compiling a list, which will be updated in the middle of each semester in preparation for the following semester of classes, of SCRMC members willing to mentor undergraduates in their lab. Inclusion in this list does not commit you to take an undergraduate, simply that you are willing to consider such a mentorship. We encourage PIs to establish their own criteria for accepting undergraduates into their labs.

If you are willing to take an undergraduate as a research student in your lab for the Spring 2014 semester, please reply to Sue Gilbert.



A New Home for the SCRMC

The Wisconsin Institutes for Medical Research, Tower II, will soon be completed and ready to house the Stem Cell & Regenerative Medicine Center's new home office come February 2014. Stop by early next year to welcome our administrator, Sue Gilbert, to her new digs on the eighth floor, room 8457, overlooking scenic Lake Mendota and Picnic Point.

Visiting scholars enhance the SCRMC

In August, the SCRMC was fortunate to host a visit from Robert Nerem, Ph.D., from Georgia Tech in Atlanta. Prof. Nerem is among the foremost pioneers worldwide in Biomedical Engineering, and has recently taken on an international leadership role in the emerging stem cell engineering field. Nerem provided insights and advice to SCRMC faculty across the campus, and also spent some time advising the Wisconsin Stem Cell Roundtable (WiSCR) student and post doc group. His visit provided an important catalyst for several ongoing and envisioned initiatives in the SCRMC.

Of course, almost every month during the academic year our regular Tuesday Campus Stem Cell Lab Meetings, we also feature a visiting speaker. Visiting speakers for the Fall Semester included Linheng Li, Ph.D., professor, Stowers Institute for Medical Research, Kansas City, MO, speaking September 27 on "Niche, Signaling, Epigenetic Regulation of Stem Cells." On October 1, Thomas Diekwisch, Professor, Oral Biology, UIC College of Dentistry, spoke on "Odontogenic Lineage Specification and Stem-Cell Based Attachment of Lost Teeth." Finally, we look forward to welcoming Albert Edge, Associate Professor, Otology and Laryngology, Harvard Medical School; Eaton-Peabody Laboratory Massachusetts Eye and Ear Infirmary on December 3 when he will speak on "Regeneration of Hair Cells from Cochlear Stem Cells."

Our weekly lab meetings continue to draw a crowd, with up to 100 people typically attending to hear from their colleagues working in stem cell and regenerative medicine research across campus. Students can get one academic credit for attending the series, listed as Anatomy 675 Stem Cell Seminar, class number 32292, department 144. Juniors, seniors and graduate students may enroll in this seminar course, which is directed by Tim Kamp and coordinated by Sue Gilbert. The course is a required component of the Undergraduate Stem Cell Sciences Certificate Program (see page 8 for more information on that program.).

Welcome to New SCRMC Members
(new within the past year)

Faculty and Staff:

Anjon Audhya, Biomolecular Chemistry
Miles Epstein, Neuroscience
Timothy Hacker, Medicine
Bikash Pattnaik, Pediatrics / Ophthalmology & Visual Services
Deane Mosher, Medicine / Biomolecular Chemistry

Student:

Woojon Lee, Microbiology

Seeking New Members

We welcome faculty and academic staff, as well as undergraduates, graduate students and postdoctoral fellows who want to join in contributing to the center's mission. To find out more about membership benifits and to apply for membership, please go to: http://stemcells.wisc.edu/membership

Everyone was a winner at the SCRMC Fall Conference!

We are very pleased to announce that more than 100 people attended our third annual SCRMC Fall Conference September 13 at the Wisconsin Institutes for Discovery. The high-energy afternoon featured wonderful participation by all and a few surprises as well.

First, we must congratulate our two **Gregory F. Daniel Outstanding Poster Presentation and Travel Grant** winners: **Khoa Tran** (**Sridharan** lab) (on the left in photo below) for "Two-Step Conversion of Pre-Induced Pluripotent Stem Cells to IPSCs," and Pratik Lalit (**Kamp** lab) (on the right in the photo below) for "Lineage Reprogramming of Mouse Fibroblasts to Induced Cardiac Progenitor Cells by Defined Factors."



We thank Gregory Daniel, M.D., M.B.A., a UW-Madison alumnus, for his generous contribution to our program and our trainees. Daniel, who is president of Urgent Care and Occupational Medicine at Exigence Division of Team Health, earned his doctorate of medicine and a bachelor's degree in biochemistry from the University of Wisconsin, Madison. He earned his MBA from the University of California, Irvine, and was named "Best Leader" for his class. Many thanks to Dr. Daniel, whose gift has had a significant impact on a very talented group of trainees!

We extend special thanks to our guest speakers **Thomas Zwaka**, M.D., from Mt. Sinai School of Medicine and **Rupa Sridharan**, Ph.D., from UW-Madison. Dr. Zwaka presented, "The Strange Case of Pluripotentiality: Embryonic Stem Cells, Germs Cells and Genomic Conflicts." Dr. Sridharan spoke on, "Probing the mechanism of somatic cell reprogramming." We are also grateful to Neural Regeneration Focus Group Chair **Anita Bhattacharyya**, Ph.D., for sharing her focus group's exciting highlights.

In the surprise category, our charter group of undergraduate students through the new stem cell mentor and trainee program on campus won the popular Stem Cell Jeopardy contest at the end of the day. These students answered tough questions on everything from genetics to ethics to defeat two graduate student teams as well as defending champs, The Professors. Congratulations to **Ryan Prestil**, who was mentored this summer by **Travis Cordie** in the **Saha** and **Turng** labs; **Derek Theisen**, mentored by **Gene Uenishi** in the **Slukvin** lab; **Matt Wleklinksi**, mentored by **Asuka Eguchi** in the **Ansari** lab; and **Michael Lampe**, mentored by **Cheston Hsaio** in the **Palecek** lab. Looks like your time spent in the new WiSCR Summer Undergraduate Research Training Program (SURF) really paid off!

Training Awards Deadline December 2

The SCRMC Training Award applications are now on line. This year, four awards will go to two graduate students and two post-doctoral trainees. The deadline for submission is December 2, award announcements are expected in January, and each award will provide support for one year. **Jayne Squirrell**, Ph.D., chair of the SCRMC Education Committee would like to remind everyone to check the website for updates concerning these awards *(previously known as the SCRMC Research Fellowships.)*

Conference organizing committee members, from the left: Weixiang Guo, Ethan Lippmann, Ka Yi Ling, Paul Wrighton and Ronghui Li. Advising the committee was Andrew Handorf who assisted with the jeopardy game..



Finally, a round of applause for a job well done to conference organizers and SCRMC graduate fellows **Weixiang Guo** (**Zhao** lab), **Ethan Lippmann** (**Ashton** lab), **Ka Yi Ling** (**Downs** lab), **Paul Wrighton** (**Kiessling** lab) and **Ronghui Li** (**Chang** lab). Several of the organizers and participants are also members of the Wisconsin Stem Cell Roundtable (WiSCR), a growing group of stem cell trainees who work together to foster interaction, collaboration, dialogue, and support for graduate students and post doctorate fellows at UW–Madison, as well as providing outreach to educate the public about stem cells and current research in the field.



Participants in the 3rd Annual SCRMC Fall Conference interact during the poster competition at the Wisconsin Institutes for Discovery.

Enjoy more fall conference photos here!



[Blood Research Program](#) **Update** *(Emery Bresnick, leader):*

The Blood Research Program has had a particularly productive and enjoyable year. Our new faculty member, Dr. **Lixin Rui**, has established his laboratory with a focus on mechanisms of lymphomagenesis. We have successfully developed multidisciplinary, collaborative projects, two of which recently yielded high impact publications in Cell Metabolism and Journal of Experimental Medicine. Members of the group have been appointed to important committees (Hematopoiesis Scientific Committee; Red Cell Scientific Committee; Committee on Scientific Affairs) of the major hematology society, the American Society for Hematology. Several group members attended the International Society for Hematology and Stem Cell Biology meeting in Vienna, and we are delighted that one of Igor Slukvin's trainees received an award for the second best presentation by a graduate student, and a postdoctoral fellow from one of Emery Bresnick's prior trainees, Camilla Forsberg, who is now tenured Associate Professor at UC-Santa Cruz, was honored with the best postdoctoral presentation. We are exceedingly pleased that **Jing Zhang** was honored with the highly competitive Leukemia and Lymphoma Society Scholar Award.

The group continues to meet monthly to discuss discoveries emerging from our individual and collaborative research efforts, to share technologies, and to discuss collaborative science. Efforts are underway to develop discoveries and multi-investigator extramural funding focusing on the convergence of novel signaling and transcriptional mechanisms in the context of leukemogenesis, novel mechanisms underlying anemia, epigenetic mechanisms controlling hematopoiesis, and the generation of therapeutically useful blood stem cells and differentiated blood cells from human embryonic stem and induced pluripotent cells. Please visit our new **website** to learn more about the mission of the Blood Research Program.*(Photo above used courtesy of the Blood Research Program.)*

Save the Date

"From Stem Cells to Blood"

9TH ANNUAL

WISCONSIN STEM CELL SYMPOSIUM

April 30, 2014

BTCI (BioPharmaceutical Technology Center, Fitchburg)
Find the schedule, speakers, poster contest and more at:
http://www.btci.org/stemcell/default.html



[Cardiovascular Regeneration Group](#) **Update** *(Amish Raval, leader):*

The Cardiovascular Regeneration Focus group hosted this year's 8th Annual Wisconsin Stem Cell Symposium at the BioPharmaceutical Technology Center Institute in Madison, WI. This event was a resounding success with key lectures from an array of internationally renowned scientists and key participation from major cardiovascular stem cell industry sponsors. The theme of the meeting was **Cell-Based Therapy for Heart and Vascular Disease: Pathways to Clinic**. This clinical-translational topic was a natural transition from the highly successful NHLBI Production Assistance for Cellular Therapies Workshop, which was held the day before Symposium. The Cardiovascular Regenerative Medicine focus group hosts monthly meetings to discuss regenerative medicine research innovation for cardiovascular disease. The meetings alternate between strategic planning meetings among the various lab chiefs to open meetings that engage lab chiefs, lab staff and students to discuss research innovation and collaborative opportunities. We were very excited to hold the first Cardiovascular Regeneration Focus group poster session on November 8. The session fostered discussion and showcased the recent achievements of all lab groups, serving to engage individual labs and especially students. Photo on left highlights **Eric Schmuck**, Ph.D., networking during this session (*photo by S. Gilbert.*) Dates and times of the focus group meetings will be posted on the SCRMC Cardiovascular Regenerative Focus Group **page**.



[Neural Regeneration Group](#) **Update** *(Anita Bhattacharyya, leader):*

Meetings over the past year included strategic planning focused on the feasibility of developing a postdoctoral training grant. We worked to define the theme of the training grant to both take advantage of the strengths of the campus as well as distinguish it from other training grants. This fall, we continued the discussions and the major goal of this year will be to develop a training grant to submit to NINDS in May of 2014.

The group continues to meet monthly to discuss collaborative research efforts and funding opportunities. In addition, we plan to highlight and explore potential academic/industry partnerships. (*Photo at right highlights Anita Bhattacharyya at the Fall Conference in September.*)



[Stem Cell Bioengineering Group](#) **Update** *(Sean Palecek, leader):*

The Stem Cell Bioengineering Focus Group continues to work on identifying research and educational collaborations with other SCRMC focus groups and initiating multidisciplinary efforts in stem cell biology and engineering. In addition, the Stem Cell Bioengineering Focus group is in the process of establishing interactions with other stem cell engineering centers across the U.S. to help define the challenges facing the field and to pursue multi-institution grant opportunities. In fact, four SCRMC members participated in the NSF's July 10-12 workshop, "Emergence of Stem Cell Engineering" in Sonoma, California (Watch our brief "new directions" **video**.) Toward this goal, the SCRMC is co-organizing the Regenerative Medicine Workshop at Hilton Head (March 26-29, 2014) in collaboration with Georgia Tech/Emory University and the University of Pittsburgh.

Save the Date

"Discovery-Driven Transformative Research"

Regenerative Medicine Workshop at Hilton Head

March 26, 2014

Musculoskeletal Regeneration Group Update *(Ben Graf, leader)*

The Musculoskeletal Regeneration focus group has continued to develop multi-investigator research and training initiatives. In one example, Drs. Ray Vanderby, Xin Sun, Connie Chamberlain, and Bill Murphy have begun work on a NIH-funded grant on the topic of limb regeneration. In addition, the group's first major postdoctoral training grant proposal is under review by the NIH, with Dr. Vanderby as the principal investigator. The emphasis is on training postdoctoral fellows and orthopedic residents in musculoskeletal regeneration. The group continues to meet monthly, with a focus on connecting scientific discoveries with clinical needs, and featured speakers have included orthopedic surgeons, radiologists, developmental biologists, and biomedical engineers.

The SCRMC in the Community



Please send your civic presentations related to stem cells and regenerative medicine to **Jordana Lenon**. We want to know about community invitations for stem cell and regenerative medicine outreach — from business groups to schools — for our reporting efforts. Pictured above is the reception at the UW-Madison Corporate Open House August 22 at Union South. The theme this year was scientific research: Guest speakers included UW-Madison research luminaries **Hector DeLuca**, Ph.D., **Rock Mackie,** Ph.D., and **Richard Davidson,** Ph.D. Several campus schools, departments and centers, including the SCRMC, were invited to set up tables to share information with regional businesses and industry.

(Right) SCRMC co-director Bill Murphy shares stories of our recent successes during a visit to the Brown County chapter of the UW alumni association in Green Bay. *(Photo courtesy of Bill Murphy.)*



WiSCR UpDate

by Ka Yi Ling
(Karen Downs Lab / Graduate Program in Endocrinology & Reproductive Physiology)

In the last newsletter, we reported on our first round of mentors and fellows pairing up for the new Wisconsin Stem Cell Roundtable (WiSCR) **Summer Undergraduate Research Fellowship Training Program (SURF)**.

SURF Program mentees and Stem Cell Jeopardy winners, "The Undergraduates", from the left: Ryan Prestil, Derek Theisen, Matt Wleklinksi and Michael Lampe.



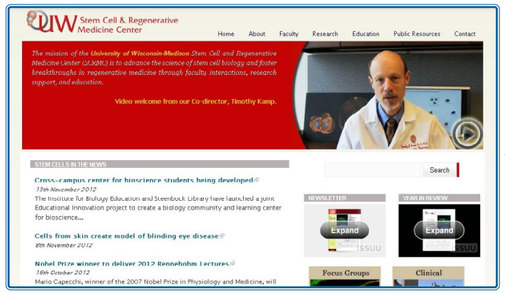
In addition to conducting research, our SURF trainees ran stem cell outreach activities for the public on campus throughout summer and fall. At the 2013 SCRMC Fall Conference at the Wisconsin Institutes for Discovery September 13, the trainees presented their summer research at the poster session and also managed to emerge as winners of the second annual Stem Cell Jeopardy game!

Current WiSCR committee members are President **Ka Yi Ling**, Treasurer **Paul Wrighton**, Secretary **Yefim Zaltsman**, and WiSCR member, **Maria Mikedis**. SURF receives financial and logistical support from the SCRMC.

Join WiSCR!

We are a group of graduate students and postdocs who gather monthly to discuss current stem cell literature or listen to a fellow member present their research. We also organize and participate in various science outreach events in order to engage and educate both children and adults in Wisconsin about stem cell research.

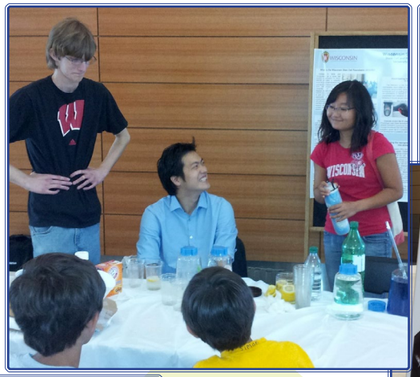
To join WiSCR, please send an email to **uwstemcellroundtable@gmail.com**



Remember: *Everyone can help keep our interactive **website** up-to-date by sending **Sue Gilbert** updates for your webpages, information on courses that would be of interest to our membership, news, milestones, job opportunities, and so much more.*

SCRMC/WiSCR Outreach Highlights













Top: Stem Cell Undergraduate Research Fellows (SURF) Program students enjoyed educating young visitors about stem cells and biochemistry at Discovery Summer Science, August 1, at the Wisconsin Institutes for Discovery. In the top row, from the left are **Gene Uenishi**, **Derek Theisen** (**Slukvin** lab), **Asuka Eguchi** (**Ansari** lab), and **Matt Wleklinski** (**Palecek** lab.)

Center left: **Sayaka Masuko** (right), postdoctoral trainee in **Laura Kiessling**'s Biochemistry lab, co-led the SCRMC's first bilingual learning lab for 20 students at the Biotechnology Center. Participants were high school students from Madison Country Day School along with their visiting students, teachers and principal from Ashikaga High School.

Bottom right: Student outreach volunteers through the Wisconsin Stem Cell Roundtable returned to WID for the Wisconsin Science Festival in September and Super Science Saturday in October. From the left are **Samantha Schmitt**, **Tyson Banh, Cat Vu**, **Jason Le** and **Sayaka Masuko** on October 5. Special thanks to WiSCR's **Fima Zaltsman** and SCRMC/WNPRC student assistant **Sara Schemel** for co-coordinating our outreach efforts.







At right: **Lily Cappelletti** (Michael J. Fox Foundation for Parkinson's Research), **Marina Emborg**, M.D., Ph.D. (SMPH and Wisconsin National Primate Research Center), and **Michelle Ciucci**, Ph.D. (SMPH and President, American Parkinson's Disease Association Wisconsin Chapter) share Parkinson's disease research highlights and discuss the critical importance of patient participation in clinical research.

Their panel was part of the opening premiere for an interactive experience on Parkinson's disease running at the Wisconsin Institutes for Discovery throughout Fall 2013. Emborg spearheaded the exhibit's production and opening premiere, assisted by outreach specialists from WARF, Morgridge Institute for Research, Wisconsin National Primate Research Center, SCRMC, and School of Medicine & Public Health, with cognitive designer **Lou Tetlan**.





UW Institute for Clinical and Translational Research
UW ICTR
UNIVERSITY OF WISCONSIN-MADISON
MARSHFIELD CLINIC

Watch for ICTR/SCRMC Pilot Grant Awards Request for Applications

The SCRMC is once again partnering with the UW-Madison Institute for Clinical and Translation Research (ICTR) on its Basic and Clinical Research Pilot Awards. These $50,000 one-year, Type 1 pilot grants support basic research, clinical trials, and research where a basic laboratory discovery may lead to the prevention, diagnosis, or treatment of a specific disease. Type 1 funding also supports a wide spectrum of patient-oriented research that embraces innovations in technology and biomedical devices. The program is targeted at new investigators or investigators taking a new direction. The program provides peer review of applications. For 2014, the SCRMC will jointly support two grants. The full RFA will be released on December 1, 2013.

Apply now for the ICTR Novel Methods Pilot Awards Program – Platforms for Advancing Therapeutic Discovery and Development

Released this year, the ICTR Novel Methods Pilot Awards Program, might be well suited for SCRMC investigators. One goal of the UW ICTR is to foster development of translational collaborations that will advance research along a trajectory leading to new therapeutic options that improve human health. Specifically, this funding mechanism will provide support for methods and technologies that advance development of therapeutic discovery platforms. Proposed methods and technologies must be more generally applicable (though not necessarily disease specific) and not directly project-specific. Demonstration of compelling proof of principle in a specific field of application is expected. The letter of intent is due December 15 and the application is due February 1.

SCRMC Member Services

The following core services are available to SCRMC members and appear on our website here:

- Cardiovascular Physiology Services
- Cellular and Molecular Imaging Services
- Immunology and Pathology Services
- Induced Pluripotent Stem Cells Service
- Nonhuman Primate Services
- Research Materials and Services
- Small Animal Imaging Services
- Training Courses
- WiCell

Google groups

Want to stay up to date about activities associated with the UW SCRMC or of interest to our members? Subscribe to Stem Cell Announcements by going to our Google group.

Stem Cell & Regenerative Medicine Center
UNIVERSITY OF WISCONSIN–MADISON

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