This year marks the 20th anniversary of the Office for Research on Women’s Health (ORWH). A congressional briefing, “Unveiling of the Ten-Year Strategic Plan for Women’s Health Research at the National Institutes of Health”, was held on September 30th to celebrate the research achievements of the past 20 years and to discuss the strategic agenda for the next decade. Several women’s health advocacy groups in cooperation with the Congressional Caucus for Women’s Issues sponsored the briefing. Cindy Hall, President of Women’s Policy, Inc., a leading organization that helps ensure the most informed decisions on key women’s issues are made by policymakers, was instrumental in pulling together the event.

The CRS Associate Director, Teresa Woodruff, PhD, was invited as a distinguished panel member to participate in the dissemination of a visionary plan for improving women’s health in the United States by 2020. The panel consisted of Vivian Pinn, MD, Director of ORWH, Alan Guttmacher, MD, Director of NICHD and Eugene Orringer, MD from UNC-Chapel Hill. Each speaker presented testimony on the future of women’s health research and advocated for continued support of the NIH and biomedical research. Specifically, Dr. Woodruff focused on the technology and biology that underlies sex difference research and how Congress and the public can advocate for more research in this area of work. She discussed the importance of ensuring that both males and females are studied all along the pathway of discovery; this begins at the most basic cellular level and up through the clinical trial process. Dr. Woodruff stated three take home messages in addition to providing several recommendations.

» The biology of sex matters to the health of our nation.
» Sex-based biomedical research ultimately saves money.
» Innovative, interdisciplinary work that embraces new technology creates the pathway to success in this field.

Recommendations:
• Fund and support the emerging area of research called genderomics – a field that is intentionally aware of the differences associated with chromosomal sex and aims to understand fundamental sex-based biological phenomena from the molecular level through the whole organism.
• Mandate the use of male and female models in basic research as well as clinical investigation.
• Value sex and gender variables in the pipeline of discovery at the governmental level.

Ultimately Dr. Woodruff stressed that in order to increase the pace and quality of women’s health research, and improve the health of the nation as a whole, we need increased awareness that sex-based research is necessary in addition to the allocation of funds to conduct the research.
I hope this late fall issue of Reproduction Matters finds you all well, and I wish you a wonderful end to 2010 and a joyous 2011. There is much news to share in this issue regarding the accomplishments and recognition of our students and faculty, and I hope you find it informative. I do want to highlight the administrative reorganization within CRS, and welcome Dr. Sarah Bristol-Gould as our new Assistant Director for Operations and congratulate Ms. Ingrid Cox-Miller on her promotion to Administrative Assistant 4. The recently completed 2nd Illinois Symposium on Reproductive Science held at the University of Illinois-Chicago was terrific, and we are already looking forward to the 3rd Symposium to be held at the University of Illinois-Urbana/Champaign next fall. It is great to see the success of this event that highlights the strengths in reproductive science within The Prairie State. I do want to remind you that Northwestern’s Minisymposium in Reproductive Biology is moving to the Spring; the 31st Minisymposium will be held on April 12, 2011, so please save the date.

Finally, remember-with growing concern about an increasing world population and a deteriorating environment-reproduction matters!

From the Director...

A Farewell to CRS Faculty

J. Larry Jameson, MD, PhD has announced that he will step down as Dean of the Northwestern University Feinberg School of Medicine to become Executive Vice President and Dean of the University of Pennsylvania School of Medicine. Jon Levine, PhD, has recently retired from Northwestern University to become Director of the Wisconsin National Primate Research Center at the University of Wisconsin – Madison. Both Drs. Jameson and Levine have been members of CRS for many years in addition to being investigators on the program project (P01), and the reproductive biology training (T32), grants that are administered through the center. We thank Dr. Jameson for his University-wide leadership as Dean, and we thank Dr. Levine for his mentorship and excellence in teaching both undergraduate and graduate students. Both of you have made considerable contributions to science and have provided widespread support of those studying reproductive science here at Northwestern.

We wish you all the best!

Highlights

Dr. Serdar Bulun
• In October 2010, Dr. Bulun gave the Plenary Herbert H. Thomas Lecture at the American Society of Reproductive Medicine meeting in Denver, Colorado.

Dr. Mary Hendrix
• Was recognized with the Pritchett Lectureship Award from the University of Alabama at Birmingham
• Was recognized with the Sager Lectureship Award from the Dana-Farber Cancer Institute of Harvard Medical School

Dr. Takeshi Kurita
• Received two new R01 grants from the NICHD and NCI

Dr. Franck Mauvais-Jarvis
• Was elected to the American Society for Clinical Investigation in recognition of his discovery of extranuclear estrogen receptors in protecting pancreatic islet function and survival

Dr. Kelly E. Mayo
• Was elected President of The Endocrine Society for 2010-2011

Dr. Teresa Woodruff
• In an article titled “Saving for a Family,” TIME Magazine discusses new techniques in oncofertility, patient stories, and the ethical considerations for this dynamic field. It also includes interviews with multiple members of the Oncofertility Consortium.
• A new book for sale! “Oncofertility: Ethical, Legal, Social, and Medical Perspectives,” discusses the interactions among scientists, communicators, economists, historians, and religious and legal scholars in this emerging interdisciplinary field.
Microenvironments, or niches, support the maintenance of stem cells and facilitate the development of tumors through largely unknown mechanisms. Cell-autonomous genetic pathways and epigenetic networks have emerged as important determinants for the self-renewal and differentiation of stem cells in embryonic, juvenile, and adult tissues. The importance of non-cell autonomous genetic and epigenetic factors is less well established. Our goal is to identify and characterize the genetic and epigenetic mechanisms utilized by both stem cells and their surrounding niche in supporting the stem cell program. For these studies, the developing mouse testis is used to examine interactions between male germline stem cells (GSCs) and their somatic niche.

Within the testis, differentiated germ cells are continually replenished by self-renewing GSCs to ensure the continuation of spermatogenesis throughout the lifetime of the male. GSCs are adult stem cells that develop after birth, but which derive from embryonic primordial germ cells (PGCs). Under abnormal conditions, PGCs are thought to become pluripotent in vivo, develop into carcinoma in situ, and form post-pubertal testicular germ cell tumors, the most common cancer in men aged 15-40. When GSC differentiation occurs at the expense of self-renewal, depletion of germ cells and infertility can result.

Several candidate factors influencing GSC self-renewal and differentiation are being studied: chromatin remodeling gene Sin3a, Polycomb group member Ezh2, and a chemokine ligand and its receptor, Cxcl12 and Cxcr4. Current research is examining the role of Sin3a in somatic Sertoli cells, which support GSCs and nurture all differentiating germ cells. Analysis of Ezh2 in GSCs as well as in testicular germ cell tumors is being conducted to determine whether an altered ‘Polycomb repression signature’ promotes germ cell tumorigenesis. Characterization of Cxcl12, which is expressed in Sertoli cells, and Cxcr4, expressed in germ cells, is being performed to determine whether this chemokine signaling pathway is required to maintain GSCs in their niche, and whether this mechanism involves non-coding microRNAs.

To achieve these aims, distinct testicular cell populations are separated by fluorescence- and magnetic-activated cell sorting and analyzed by transcriptional profiling. Potential SIN3A and EZH2 complex-bound target genes are identified by chromatin immunoprecipitation. Loss-of-function effects are examined by one of two methods: generation of conditional knockout mice or RNAi knockdown and transplantation of cultured GSCs into recipient testes. Future studies are aimed at understanding how the niche maintains stem cells and ensures proper organogenesis, with the possibility of tissue regeneration and cancer prevention as therapeutic applications.

Christopher Payne is the newest faculty member of the Center for Reproductive Science. He is currently Assistant Professor in the Human Molecular Genetics Program with Children’s Memorial Research Center (CMRC) and the Department of Pediatrics in the Northwestern University Feinberg School of Medicine. Payne’s lab focuses on how genetic and epigenetic modulators promote the development and maintenance of adult stem cells.
On October 23-24 Miranda Bernhardt and Cathryn Smeyers from the Women’s Health Science Program went to Washington, DC to participate in the first national science expo, the USA Science and Engineering Festival Expo, which drew more than a million people to all of its events and made it one of the largest science fairs to date. Everyone from pre-schoolers to grandparents joined in this national effort to revitalize young people’s interest in pursuing careers in these fields.

Miranda and Cathryn set up a booth that involved dissecting olives and making alginate beads (the stuffing in a green olive is a mixture of pimento puree and alginate) in an attempt to describe how cancer treatment threatens fertility, and to explain what scientists within the Oncofertility Consortium are doing to help.

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New Addition To CRS

Meet Sarah Bristol-Gould, PhD, the newest addition to the CRS. Sarah joins us as Assistant Director of Operations. She completed her Ph.D. in the laboratory of Professor Teresa Woodruff investigating mechanisms of ovarian follicle endowment and persistence. For the past 2 years, she served as the Director of Research Programs and Coordinator of the Illinois Women’s Health Registry within the Institute for Women’s Health Research at Northwestern (Chicago campus). Sarah thus brings excellent research and administrative experience to this new position, and we are excited about having her with the CRS. In addition to managing the P01 program, Sarah will be searching for and creating new research initiatives for the Center.

2010 Illinois Symposium on Reproductive Science

October 11, 2010 marked the 2nd year of this rotating annual statewide symposium. Its goals are to foster the exchange of scientific information in the reproductive sciences, to facilitate the training and career development of future reproductive scientists, and to leverage our collective institutional strengths to maintain Illinois in a preeminent nationwide position in this critical research field. This year the event featured a keynote address from Dr. Joanne Richards, PhD, Professor in the Department of Molecular and Cellular Biology at Baylor College of Medicine in Houston, TX and was held at UIC. The student organizing committee members were from three state institutions and we thank Northwestern trainees, Mike VanGompel and Christine Ackerman, for serving on the organizing committee that planned an outstanding meeting. Several other CRS trainees participated in the symposium by delivering either an oral or poster presentation or were asked to be a session moderator. Congratulations to Rebecca Harris for winning first place in the poster competition!

ISRS Participants from Northwestern:

Bulun Lab
Antonia Navarro (poster)
Mary Ellen Pavone (poster)

Jameson Lab
Rebecca Harris (poster)
Unmesh Jadhav (oral)

Kim Lab
Elizabeth Sefton (poster)
Xunqin Yin (poster)

Mayo Lab
Kristen Meldi
(postier and moderator)
Dallas Vanorny (oral)

Woodruff Lab
Eugene Galdones (moderator)
Jessica Hornick (poster)

Xu Lab
Elson Shih (poster)
Wenan Qiang (poster)

Levine Lab
Amy Flowers (poster)

Kurita Lab
Kenji Unno (poster)

Antonia Navarro (poster) Rebecca Harris (poster)

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In February 2010, the CRS and the Institute for Women’s Health Research (IWHR) ran its fourth annual Oncofertility Saturday Academy (OSA) program. This year 29 high school girls graduated from OSA. Scientists and clinicians navigated these high school girls through a total of seven Saturday modules to authentically experience the translational nature of reproductive sciences, cancer biology, and oncofertility. Through these basic science laboratory and clinical experiences, the high school girls are empowered with scientific knowledge and healthy actions thus preparing the girls to be active leaders in the field of science and medicine, specifically women’s health. Thanks to the many CRS faculty and students who helped make this event possible.


Anderson H, Fogel N, Grebe SK, Singh RJ, Taylor RL, Dunia A. Infants of women with polycystic ovary syndrome have lower cord blood androstenedione and estradiol levels. J Clin Endocrinol Metab. 2010 May;95(5):2180-6.


11/10/2010  
**John McCarrey, Ph.D.**  
The University of Texas at San Antonio  
Evanston Campus; Cook 2058  
4:00 pm

12/08/2010  
**CRS Holiday Seminar**  
**Chris Payne, Ph.D.**  
Evanston Campus; Cook 3118 A/B  
4:00 pm  
*Special reception following the CRS Holiday Seminar*

02/16/2011  
**Susan Fisher, Ph.D.**  
University of California, San Francisco  
Chicago campus  
Lurie Bldg., Gray seminar room  
4:00 pm

03/09/2011  
**Tom Thompson, Ph.D.**  
University of Cincinnati  
Evanston campus; Cook 3118 A/B  
4:15 pm

04/12/2011  
**31st Annual CRS Mini-Symposium**  
**Francesco DeMayo, Ph.D.**  
Baylor College of Medicine, Houston TX  
Chicago Campus  
Prentice – Levin Auditorium

05/05/2011  
**Richard S. Legro, M.D.**  
Penn State University College of Medicine  
M.S. Hershey Medical Center  
Chicago Campus  
Lurie Bldg., Baldwin Auditorium  
4:00 pm

05/11/2011  
**Amander Clark, Ph.D.**  
University of California, Los Angeles  
Chicago Campus  
Lurie Bldg., Gray seminar room  
4:00 pm

05/25/2011  
**Margaret McCarthy, Ph.D.**  
University of Maryland School of Medicine  
Chicago Campus  
Lurie Bldg., Gray seminar room  
4:00 pm

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**Save The Date!**

4/12/2011  
**31st Annual CRS Mini-Symposium**  

Keynote Speaker:  
**Francesco DeMayo, Ph.D.**  
Baylor College of Medicine, Houston TX  
Chicago campus  
Prentice – Levin Auditorium  
Time: to be announced

Please visit our website for updated information in the coming months.  
www.research.northwestern.edu/crs