

Quarterly Publication

Issue 03 Spring 2017

PRC Symposium & SRI Meeting in Orlando, FL

On March 13-14, over 80 investigators and staff from the five Prematurity Research Centers (PRC) convened in Orlando, FL to showcase the latest in their research and discuss ways for continued collaboration. The symposium was organized by research topics, which included



Washington University PRC members in Orlando, FL.

Genetics & Evolution, Sociobiology & Population Studies, Maternal Fetal Signaling & Progesterone, Engineering & Anatomy, Data Coordination, and Microbiome. From the Washington University PRC, Drs. Herzog, Jungheim, Wang, Tuuli, and Cahill spoke about the progress made within each research theme. The group looks forward to the next PRC Symposium, which will be held in 2018 in San Diego, CA.

From March 15-18, PRC investigators attended the Society for Reproductive Investigation's (SRI) 64th Annual Meeting in Orlando, FL. This year's theme was "D2D: Data to Discovery," with over 1000 people in attendance. The meeting included satellite sessions,

workshops on a variety of topics, and lectures. Sarah England, PhD, PRC associate director and Theme 3 leader, was a program committee member and moderated the mini-symposium on March 16 entitled "The Influence of Circadian Rhythms on Reproductive Outcomes." Dr. England presented "The Influence of Chronodisruption on Risk of Preterm Birth" at the mini-symposium. Additionally, PRC postdoc Carmel Martin-Fairey, PhD, presented a poster entitled "Intrinsic Circadian Rhythms of Reproductive Tissues over Pregnancy" at the meeting.

The 65th Annual SRI Meeting will be held March 7-10, 2018 in San Diego, CA.

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Upcoming Events

June 16, 2017
 March of Dimes Board of Trustees meeting, Washington University School of Medicine

For more information about the March of Dimes Prematurity Research Center at Washington University in St. Louis please visit:

<https://prematurityresearch.wustl.edu>

Cahill presents at ACOG



Alison Cahill, MD

Alison Cahill, MD, gave the March of Dimes Annual Lecture at the American College of Obstetricians & Gynecologists (ACOG) Annual Clinical and Scientific Meeting on May 7. As a Theme 2 leader, Dr. Cahill shared recent findings related to her team's goal of looking at contraction patterns and understanding how they differ in women who labor at term vs. those who labor prematurely. "It was an honor to give the March of Dimes Annual Lecture at ACOG this year," said Dr. Cahill. "It's always nice to have our team recognized for the hard work that goes into this project."

New Education Core Associate Director

We welcome Gary Silverman, MD, PhD, as the associate director of the Education Core. Dr. Silverman joins the PRC as the Chair of Pediatrics and the Pediatrician-in-Chief of St. Louis Children's Hospital.

Update on 1000 Women Cohort

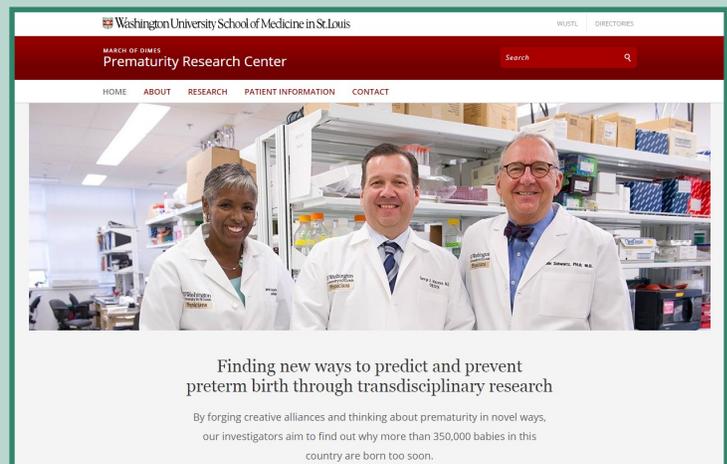


Kaytelyn Meyenberg

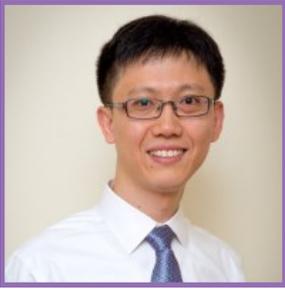
The newest addition to the recruitment staff is Kaytelyn Meyenberg, a research associate, who began work at the PRC in March. Kaytelyn is primarily focusing on recruitment and consent, however she will assist at study visits for all three themes as the 1000 Women Cohort progresses. Kaytelyn graduated in spring 2016 from Southern Illinois University of Edwardsville with a Bachelors of Science in Biology. Recruitment for the 1000 Women Cohort has progressed well this spring. Over 100 participants have been enrolled since January 2017, and the staff is busy with follow up appointments and approaching new potential subjects. The team is constantly brainstorming ways to improve compliance to study procedures and reduce no-shows for study visits. They are continuously on the move, from the lab for specimen drop-off and processing, to the Labor & Delivery floor, to private practice and clinic locations for study visits. Thank you Recruitment Core for your tireless support!

PRC Launches New Website

The Prematurity Research Center recently launched a new website, <https://premaurityresearch.wustl.edu>. The website features information on the research performed at the PRC, and introduces the problem of preterm birth and how it affects the St. Louis community. With audiences as diverse as future scientific collaborators, potential donors, and community members, the site also contains information for potential and current participants of research studies and the best ways to contact the PRC. Additionally, the site showcases the PRC leadership and gives background on the March of Dimes foundation. The PRC website was launched in conjunction with the new Washington University Obstetrics & Gynecology website, which can be found at <https://obgyn.wustl.edu>.



Investigator Highlight: Yong Wang, PhD



Yong Wang, PhD

What is your background and education?

My undergraduate education is in the field of electrical and computer engineering, and I received my PhD training in the Biomedical Engineering Department at Washington University in St. Louis. During my PhD, I developed and improved a functional imaging modality, called electrocardiographic imaging (ECGI), to image cardiac disorders noninvasively. I had my postdoc training in the department of Radiology at Washington University in St. Louis, School of Medicine.

How did you become involved with the PRC, and what is your role/research?

Following my postdoc training in the field of magnetic resonance imaging (MRI), I got the opportunity to join the WashU-PRC to participate in a unique project, *3-Dimensional Electrophysiology of the Uterus: Early Electrical Maturation in the Etiology of Preterm Birth* (Theme 2 of the PRC). This project aims to develop a functional imaging system, called electromyometrial imaging (EMMI), to noninvasively image uterine contractions in a way similar to imaging heart contractions using ECGI. We are employing MRI (which is safe for pregnant moms and their babies) to obtain patient specific geometrical information for EMMI. My expertise and experience on both ECGI and MRI motivated me to join the EMMI development team here at the Washington University PRC. As a co-investigator for Theme 2, my lab and I are developing the EMMI system hardware and software, and translate the system to be easily used by medical personnel.

What research are you involved in outside of the PRC?

I am also working on translating novel MRI imaging techniques to image the uterus, cervix and placenta during normal and abnormal pregnancies. MRI has the capability to noninvasively image and quantify microstructural and functional changes during pregnancy. My long term goal is to combine EMMI and MRI to comprehensively study the physiological and pathological changes of the uterus, cervix and placenta. I also work on developing novel MRI neuroimaging biomarkers for inflammation in neurodegenerative diseases.

What are your interests outside of work?

I like to swim, play table tennis, and travel with my wife (Dr. Qing Wang in Radiology) and our two daughters (Emily and Sophia).

Theme 2 Launches Term Labor Study

In February 2017, the Theme 2 investigators kicked off their first human study to look at contraction patterns in women at term, which applies the techniques learned in an animal model to humans. Led by Drs. Alison Cahill, Phillip Cuculich, and Yong Wang, this study is recruiting pregnant women who are in their 36th week of pregnancy, and who will likely deliver at term, between weeks 37-41. The participants undergo MRI, which is safe for both mom and baby, to obtain images of the uterus. Then, they will have their contractions electrically mapped at the hospital before delivery. Tracy Burger, BSN, is the nurse coordinator leading the efforts of recruiting, consenting, scheduling MRIs, and coordinating labor mapping for these participants. Theme 2 investigators hope to gather data from this study to better understand contraction patterns in healthy women who deliver babies at term. This will serve as a baseline to compare contraction patterns in future studies of women who have premature labor.

Webinar with Herzog & Jungheim



Erik Herzog, PhD



Emily Jungheim, MD

On March 30, over 60 people logged on to learn more about the research conducted by Theme 3 investigators Erik Herzog, PhD, and Emily Jungheim, MD. Hosted by the March of Dimes, this informational research webinar is the third in a series showcasing PRC research from the five centers. Attendees included March of Dimes staff and volunteers. Drs. Herzog and Jungheim shared the work they are doing to investigate how circadian rhythms affect the timing of birth in both mice and humans, and whether disruption of these natural rhythms affect whether babies are born too soon. Audience members were invited to take the Munich Chronotype Questionnaire which measures chronotype (e.g., are you an early bird or a night owl?), and there were several questions at the end of the 45-minute presentation. Of note, folks were interested in learning how any discoveries made by Theme 3 investigators will be translated into therapies for pregnant moms. “We expect to employ low-cost methods like melatonin supplementation or bright-light therapy, or even shifting working hours to align with an individual’s chronotype, if it becomes clear that these simple interventions could lower the risk of preterm birth in some women,” explained Dr. Herzog. “It’s just the beginning,” added Dr. Jungheim. “We will learn much more over the next few years as we continue to analyze our pilot study data and enroll for our larger 1000-women study. It’s exciting to think about what we may discover.”

2017 Pilot Grant Awarded

The PRC Education Core recently announced the awardee of the Transdisciplinary Developmental Funding program. The 2017 Pilot Grant recipient is Amanda Lewis, PhD (Molecular Microbiology) with her proposal entitled “Computational and Functional studies of Yeast Microbiome Interactions and their Association with Preterm Birth,” with funding to begin on June 15, 2017. The pilot award is funded at \$25,000 for one year with matching funds from the department.

Greetings from California

Lihong Wang’s group has completed its move to California and settled into a uniquely renovated lab space at Caltech. This was one of the largest renovation efforts for a research group in Caltech’s history. PRC members are enjoying the California weather and are working towards further advancing their technology currently used in the 1000 Women Cohort study. For more information about the research and the Wang lab, please visit: <http://coilab.caltech.edu/>.



Preterm Birth Scholar and Wang lab member Utku Baran, PhD, in Santa Monica, CA.