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- One Trans-NORC P&F study awarded to Damaris Lornezo, Asst. Prof. at UNC NORC collaborating with Anastasia Kralli, Associate Prof at John Hopkins Univ. (Mid-Atlantic NORC) for “Regulation of systemic energy metabolism through ankyrin-B function in brown adipose tissue”;
- A successful Trans-NORC training course in nutrition and obesity research methods. Attendance included 20 NORC members from most of the NORC centers as well as four early-career investigators from Louisiana Tech, LSU-HSC and Tulane. Furthermore, most of our postdocs attended the course for a total of approximately 50 participants. Description of the program and attendees is presented in this newsletter.

## NEWS FROM THE NORC DIRECTOR



**Eric Ravussin, PhD**  
*Boyd Professor  
AED of Clinical Science  
Pennington Biomedical  
Research Center*

So far, 2019 has been a very successful year for the Pennington / Louisiana NORC. Thanks to a supplemental grant from NIDDK we were able to fund:

- A competitive Trans-NORC visiting scholar program to Brandon Kayser from Washington University who spent time at the University of Michigan NORC - “Hands-on training in untargeted metabolomics to study human metabolism”;

Two calls for NORC P&F applications were also issued. One was awarded last spring and the winner(s) of the second call will be awarded early next year.

Another major achievement from the NORC has been the development of a Diabetes Research Center lead by Dr. Franck Mauvais-Jarvis with a submitted application to be reviewed this fall. The DRC now includes a full human Clinical Trial Unit Core at Pennington Biomedical.

Within the next few months we are chasing some important deadlines.

- First of all, our 4<sup>th</sup> cycle renewal submission is due for June 2, 2020. There is indeed a lot of work to be included in such competitive renewal especially with more and more academic institutions chasing such center grants. We have an upcoming SWOT analyses, EAB meetings



and an IAB meeting in preparation of this submission.

- Second we will organize an Obesity Day on January 24, 2020 to have presentations from most of our NORC members from institutions across Louisiana. This day will be held at the University Medical Center in New Orleans.
- Finally, in the spirit of the Center renewal we have now established scientific teams working in a translational way with: a) review of recently published papers; b) presentation of data from our NORC and; c) developing potential new translational grants application. The 3 science teams are *Physical activity & energy expenditure*, *Nutrition & metabolic health*, and *Neuronal & molecular regulation of energy balance & metabolic health*.

Overall, 2019 has been a very successful year for our Pennington / Louisiana NORC. Now it is time to develop a very competitive renewal for a fourth 5-year cycle.

## NEWS ON ENRICHMENT AND TRAINING

On June 1, 2019, NIDDK awarded Pennington Biomedical a third five-year renewal on its T-32 postdoctoral training grant entitled "Training in Obesity Research". Drs. Phil Brantley and Leanne Redman direct the program and enjoy the support of 27 other faculty who serve as mentors; all are NORC members. The program supports five training positions. Thus far, we have recruited two new trainees.

### **Christoph Hochsmann**

received his PhD in Sports Science from the University of Basel, Switzerland. Dr.

Hochsmann was appointed to the T32 in June of 2019 and will pursue research with

mentor, Corby Martin, PhD on new and emerging technologies to promote healthy lifestyles.



### **Chelsea L Kracht**

received her PhD in Nutritional Sciences from the University of Oklahoma Health Science Center. Dr. Kracht was appointed to the T32 in June of 2019 and will conduct research with Amanda Staiano, PhD and Peter Katzmarzyk, PhD in the area of pediatric obesity and its related metabolic processes.



We are actively recruiting three more trainees and we encourage NORC members to help us identify highly promising candidates. Interested applicants should visit: <https://www.pbrc.edu/training-and-education/postdocs/obesity-from-genes-to-man/>.

Pennington Biomedical and the Cleveland Clinic co-hosted the 14<sup>th</sup> Annual Diabetes, Obesity and Cardiovascular Disease Summit September 26-27, 2019. The event was held simultaneously (live broadcast from two locations) from the InterContinental & Bank of America in Cleveland Ohio and the Pennington Biomedical Research Center. This Summit featured diverse sessions that highlight the causes of obesity and diabetes, preventive strategies and therapeutic management. NORC members served as speakers and organizers for an audience of health providers, scientists, and hospital and corporate administrators. This activity was approved for AMA PRA Category 1 Credit.

## NEW AWARDS FOR PILOT & FEASIBILITY STUDIES

*The objective of the NORC P&F program is to encourage young investigators by providing research support to test innovative hypotheses involving nutritional programming-related research and other pilot studies related to the function of NORC. Below are the most recent P&F winners.*

## Does inhibition of Cpt1 activity in pancreatic $\beta$ -cells enhance insulin secretion?



### **Susan Burke PhD**

Assistant Professor,  
Laboratory of  
Immunogenetics,  
Pennington Biomedical  
Research Center

Obesity, insulin  
resistance, and  
pancreatic  $\beta$ -cell  
dysfunction are

fundamental contributors to the development of type 2 diabetes mellitus (T2DM). During obesity, the number of pancreatic islet  $\beta$ -cells increases in response to peripheral demand for insulin (i.e., insulin resistance), with compensatory insulin hypersecretion. The mechanisms associated with these adaptive changes are not completely understood. We propose that mitochondrial lipid overload may be a key contributor to these phenotypes.

In this NORC Pilot and Feasibility study, we propose that as the lipid burden increases such as occurs during obesity, islet  $\beta$ -cells adapt to rely on increased oxidation of fatty acids. As obesity worsens, tissue lipid storage results when lipid supply exceeds oxidative capacity of the mitochondria. This can lead to incomplete fatty acid oxidation products produced within the mitochondria that reduce insulin secretion.

To date, no *in vivo* studies have elucidated a direct link between altered lipid oxidation and pancreatic  $\beta$ -cell function. The current project will therefore employ a novel *in vivo* model of reduced fatty acid oxidation in pancreatic  $\beta$ -cells to directly test the hypothesis that reducing fatty acid oxidation enhances insulin secretion by increasing the reliance on glucose metabolism. Thus, we are generating a mouse with a  $\beta$ -cell specific deletion of carnitine

palmitoyltransferase 1a (Cpt1a), the rate-limiting enzyme controlling mitochondrial lipid entry, to directly assess whether limiting mitochondrial fatty acid oxidation enhances insulin secretion, reduces incomplete fatty acid oxidation species, and prevents onset of inflammation and de-differentiation of  $\beta$ -cells, that typically occur during the progression to T2DM.

## Dietary protein restriction impacts metabolic health in middle-aged mice



### **Cristal M. Hill PhD**

NIDDK Ruth L. Kirschstein-  
National Research Service  
Award F32 Fellow,  
Pennington Biomedical  
Research Center

Aging, particularly during  
middle-age, is a risk  
factor for obesity and is  
often associated with the

development of insulin resistance. Biological aging is moderately regulated by endocrine systems that impact health, which may be explained by the interaction of hormones including hepatokine Fibroblast Growth Factor 21 (FGF21) and nutrient intake among other factors. Regimens such as dietary or caloric restriction are well established to improve metabolic health and protect against age-related metabolic decline. Recently, our lab reported compelling evidence that dietary protein restriction exerts a series of beneficial metabolic health effects in young rodents, and specifically that these advantageous effects require the induction of FGF21.

Therefore, protein restriction appears to engage unique mechanisms that benefit health-span. This Pennington/Louisiana Nutritional Obesity Research Center Nutrition (NORC)-Obesity and Metabolic Health throughout the Lifespan 2019 Pilot and Feasibility project will use an established model of dietary protein restriction to directly test the impact of



diets low in protein on improvements in insulin sensitivity in both aged lean and diet-induced obese mice. Chronological aging is an inevitable process; however, it is not expected to occur with metabolic dysfunction. For this reason, our work will significantly advance the field by delineating the contribution of dietary protein restriction on the metabolic profiles that occur during aging, specifically when age-related risks are increased

### TRAINING IN NUTRITION AND OBESITY RESEARCH METHODS

On September 8-10, 2019, we hosted the inaugural Pennington/Louisiana Training in Obesity and Nutrition methods course. After extending an invitation to the postdocs and junior faculty from other NORC's to attend, 20 excited participants accepted and made the trek to Baton Rouge. In addition, we hosted two graduate students from LA Technology University and two of our NORC members from Tulane and LSUHSC along with Mary Evans from NIH.

provided an overview of methods in human phenotyping, animal phenotyping and molecular phenotyping. The feedback of the attendees was outstanding and by far the most sought after aspect were the practical labs that were conducted by the Pennington Postdocs and Junior Faculty.



We are eager to learn from this maiden workshop and the positive feedback suggests we should consider making this an annual occurrence.



The twenty-seven visitors enjoyed 14 lectures from our NORC faculty highlighting our expertise and

### TRAINING COURSE PARTICIPANTS

Institution	Participant	Title
Boston University	Justin English	Graduate Student
Harvard Med School	Vibha Singhal	Assistant Professor
Mass. General Hosp	Rachel Millstein	Assistant Professor
Mass. General Hosp	Stephanie Harshman	Postdoctoral Researcher
Mass. General Hosp	Liya Kerem	2nd year Fellow
Columbia University	Maxine Ashby-Thompson	Research Associate
Columbia University	Kathryn Whyte	Research Associate
Univ. Of Illinois at U-C	Bridget Ann Hannon	Graduate Research Assistant
LSU - HSC	Marcella Houser	Academic General Pediatrician
Tulane	Mary Younger-Rossi	Assistant Professor
LA Tech	Mengcheng (Scott) Liu	Graduate Research Assistant
LA Tech	Haley Barnett	Graduate Research Assistant
Univ. Alabama Birm.	Sarah Deemer	Postdoctoral Fellow
Univ. Alabama Birm.	Christian Behrens	Pre-Doctoral Trainee
Univ. Of Denver	Nathan (Nate) Dejong	Graduate Student
Univ. Of Denver	Dori Miller	Postdoctoral Fellow
Univ. Of Denver	Paula Price	Postdoctoral Fellow
Univ. Of Denver	Danielle Ostendorf	Postdoctoral Fellow
Univ. Of Denver	Jessica Hill	Graduate Student
Univ Of Michigan	Erica Jansen	Assistant Professor - Research
Univ Of Michigan	Katherine (Kate) Bauer	Assistant Professor
Univ Of Michigan	Brigid Gregg	Assistant Professor
Univ. North Carolina	Abbie Smith-Ryan	Assistant Professor
Univ. North Carolina	Ashley Aguillard	Graduate Student
Univ. North Carolina	Klara Klein	Internal Medicine Resident
Virginia Tech	Siobhan Craige	Assistant Professor
NIH	Mary Evans	Program Director

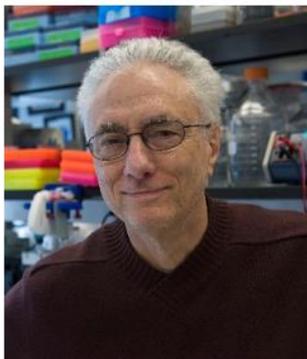


## COMING SOON – LA / PBRC NORC BIO-REPOSITORY ONLINE SEARCH PORTAL

The Pennington / Louisiana NORC was awarded a supplemental grant from NIH to develop a biorepository to provide nutrition and obesity researchers access to data and bio-specimens collected in clinical research studies performed at Pennington Biomedical Research Center. The online portal will allow NORC members around the country to independently determine the availability of clinical data from over 200 completed studies. Investigators will be able to apply for data from the Pennington/Louisiana NORC Biorepository through NORC pilot and feasibility programs. The synergism of these two initiatives will allow new and exciting hypotheses to be studied and will allow young investigator the ability to obtain preliminary data to support NIH grant applications.

## NORC EXTERNAL ADVISORY BOARD

*The Pennington/Louisiana NORC would like to express our gratitude and acknowledge the contributions of our external advisory board members. Their advice and feedback are invaluable to the operation and strategic planning of the center*



**Rudolph L. Leibel, MD**  
Professor of Medicine  
Columbia University



**Philipp Scherer, PhD**  
Professor of Cell Biology  
University of Texas Southwestern



**Holly Ingraham, PhD**  
Professor and Associate Vice-Chair  
University of California, San Francisco



**William Kraus, MD**  
Professor of Medicine  
Duke University