Harold Hamm Diabetes Center Quarterly Newsletter

Jed Friedman, Ph.D.
Director, Harold Hamm Diabetes Center
Chickasaw Nation Endowed Chair

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Director's Corner. Resilience, agility, flexibility – These are words I've heard used to describe the characteristics for the HHDC faculty, staff, and researchers in 2020 and the impact of COVID-19 on the research environment.

COVID-19 has challenged the HHDC. However, it is my humble opinion that we, in the HHDC, with support from the Hamm Foundation, have managed to adapt to the new reality. Together, we managed to convert our planned face-to-face meetings and seminars into meaningful online activities. Both adult and Pediatric clinics have adopted telehealth. We welcomed Dr. Emma Punni to the adult Endocrine Division in 2020 this fall.

In this issue, we also feature Dr. Marianna Wetherill, PhD, M.P.H., RDN Associate Professor and George Kaiser Family Foundation Chair of Population Healthcare at OU-Tulsa. Dr. Wetherill is a co-founder of the OU Culinary Medicine Program, and is designing a healthy menu and an online First 1,000 Days curriculum for HHDC. Her expertise in Nutritional Epidemiology is a welcome addition to the HHDC.

Dr. Jolyn Fernandes, PhD recently joined the department of Pediatrics-section of Neonatology from Emory University as Assistant Professor and Associate Director of Metabolomics for the Laboratory for Molecular Biology and Cytometry Research. She will be running her Mass-Spectometry program in redox biology and metabolomics at University Park and the Biomedical Research Center core laboratories. Dr. Fernandes brings a welcome background in systems biology and informatics to the HHDC.

Congratulations to HHDC members Dr. Rudolph, Dr. Unnikrishnan, and Dr. Wang for their research awards from The Oklahoma Center for Adult Stem Cell Research. Dr. Rudolph is studying how maternal diets pattern the development of newborn adipocytes, while Dr. Unnikrishnan will focus on stem cells from gut organoids and the benefits of caloric restriction. Dr. Wang focuses on a novel drug that changes white to brown adipocyte conversion. We are fortunate to have such talented faculty in the HHDC working on the cutting edge of these exciting research areas.

The significance for 2021 awaits. With educational and networking activities planned, we will await the vaccine program and work in close collaboration to help bring national researchers to campus from academia. Some of these events will be online, but we really hope that we can meet our ambitious recruitment goals this year. We are launching our 2021 Pilot grants, Team Science, and equipment grants this month. The HHDC collaborated with the Presbyterian Health Foundation for matching funds, and with the Stevenson Cancer Center for targeted awards for diabetes/obesity and Cancer. Letter of Intent due by January 21, 2021. Good luck to everyone.

OU Health | Harold Hamm Diabetes Center

The HHDC Newsletter is a quarterly newsletter that offers articles on HHDC events, funding opportunities, publications, research news, and training opportunities. Sign up below to receive our quarterly newsletter as well as periodic updates on the HHDC.
To submit an item for the newsletter, please send your announcement to: Katie-Hoefling@ouhsc.edu

Marianna Wetherill
Ph.D., MPH, RDN-AP/LD
Assistant Professor
George Kaiser Family Foundation Chair of Population Healthcare Research

Research Spotlight: Meet Dr. Marianna Wetherill

OU Health Harold Hamm Diabetes Center member Marianna Wetherill, Ph.D., MPH, RDN-AP/LD, is an Associate Professor of Health Promotion Sciences at the OU Hudson College of Public Health and Family and Community Medicine at the OU-TU School of Community Medicine, Tulsa. She also holds the George Kaiser Family Foundation Chair of Population Healthcare.

Wetherill obtained her Master of Public Health degree and Ph.D. in Health Promotion Sciences at OU Health Sciences Center. She also completed a graduate certificate in dietetics and integrative medicine from the University of Kansas Medical Center, Kansas City, and received additional training in nutritional epidemiology at Imperial College of London. Primary research interests include the development of evidence-based interventions for optimizing nutrition and health outcomes for people affected by food insecurity. Her interest in this area was sparked by an early professional experience as a volunteer dietitian for Tulsa CARES, northeastern Oklahoma's largest HIV social services organization.

With colleagues Lori Whelan, M.D., and Chef Valarie Carter, MPH, Wetherill is a co-founder of the OU Culinary Medicine Program, and a founding course director for the four lifestyle medicine courses now taught at the OU-Tulsa campus. These courses are offered to students pursing degrees in medicine, public health, and physician assistant programs. In this work, she advances her personal mission to connect vulnerable populations with self-care skills and resources that reduce health inequities. Other initiatives with community partners include work toward the development of an adaptive cooking curriculum, an assessment of nutrition needs for individuals experiencing homelessness, healthy menu redesigns and development of an online First 1,000 Days curriculum for Harold Hamm Diabetes Center.

"When I began this work, most of my patients were affected by HIV wasting. As HIV treatment options improved, I saw more and more patients with chronic disease co-morbidities, including diabetes and poorly-managed hypertension."

Through dialogue with clients, Wetherill understood how the rigors of daily living, with stressors including financial hardship and its consequent trade-offs, made traditional approaches to disease management ineffective. Research confirms the adverse effects of food insecurity and food-choice behaviors in households where diabetes is present. However, for a population lacking the means to obtain healthy food and the knowledge to prepare it, simply providing healthy food with the intent to promote dietary change is an ineffective response, Wetherill said. She believes practical help resides in a focused realignment of social systems of care for client-centered solutions, including operations within food assistance programs.

Food-systems reform isn't likely to eliminate pervasive health inequities affecting vulnerable populations, however, creating access to healthy food is a critical and immediate place to start. From extensive work with regional food banks across the state, Wetherill has explored ways these agencies can more effectively support healthy behaviors among their clients. Wetherill noted a great deal of interest among food bank staff and volunteers in helping clients learn how to eat healthier. However, these individuals often have limited knowledge, confidence and/or mechanisms to implement solutions.

Recently, Tulsa CARES became the lead community partner with the Hudson College of Public Health to develop the NOURISH-OK study, (Nutrition to Optimize, Understand and Restore Insulin Sensitivity in HIV for Oklahoma), a community based participatory research project. Wetherill is the principal investigator of the study, funded by a five-year $2.46 million R01 grant awarded by The National Institute of Diabetes and Digestive and Kidney Diseases of the National Institutes of Health. Academic research collaborators include investigators form OU-TU School of Community Medicine, Harold Hamm Diabetes Center, Oklahoma State University Center for Health Sciences, University of California San Francisco and Connecting Health Innovations, LLC.

One aspect of the NOURISH-OK study explores how early life trauma and built-environment may influence food insecurity, and how these factors then influence nutrition and other health behaviors associated with chronic inflammation and insulin resistance. Structural equation modeling is used to explore these hypothesized relationships, followed by a more in-depth examination to see how an individual's food security status may influence the microbiome as a possible modifier of downstream relationships.

"This funding will allow our community-academic research team to investigate more broadly the reasons why food insecurity occurs at such high rates among people with HIV in Oklahoma, how it is harming health, and with community input, develop a holistic, data-driven solution to address it."

Wetherill acknowledged the public health necessity to recognize the unique nutritional needs of individuals and the multiple factors that influence those needs, as well as the need to develop strategies to shift populations toward healthier eating. "It is impractical, if not impossible, to design a study that can operate in both paradigms. Nevertheless, I strive to use an integrative lens in research questions in order to advance our micro- and macro-level perspectives of a problem."

Wetherill said the scientific perspective and design of the NOURISH-OK study is quite exciting. "It will open many learning opportunities for graduate students who might be particularly interested in taking a deeper dive into any one of our study variables," Wetherill said. "This study will generate a significant amount of secondary data that intersects with nutrition epidemiology, immunology, lifestyle medicine, and social determinants of health."

Emma Punni, M.D.
Assistant Professor

Harold Hamm Diabetes Center Welcomes New Endocrinology Provider, Dr. Emma Punni

Emma Punni, M.D., recently joined Harold Hamm Diabetes Center to enhance our mission primarily through her patient-centered practice. Her expertise is in general endocrinology with emphasis on diabetes and metabolism.

"As a clinical endocrinologist and part of a team at a leading institution in the treatment of diabetes, my goal is to apply the latest and most efficacious principals of treatment of diabetes and other endocrine disorders, to improve patient outcomes and ultimately, quality of life and health," said Dr. Punni. "While doing so, I hope to contribute to the organization's robust research program and provide the highest level of education to those who are seeking a rewarding path in the discipline of endocrinology."

Dr. Punni completed her fellowship training at Harold Hamm Diabetes Center and looks forward to further professional development. "I'm excited to be part of this premier institution, well-known for its innovation in the field of diabetes."

Dr. Punni completed her internal medicine residency at St. Joseph Regional Medical Center in Paterson, New Jersey. She earned her medical degree at St. George's University School of Medicine, Grenada, West Indies. Dr. Punni has a number of publications and papers to her credit as well as poster presentations, made at important national meetings and symposiums.

"The caliber of clinicians and researchers associated with Harold Hamm Diabetes Center continues to expand and distinguish our exceptional work and reputation," said Jed Friedman, Ph.D., Director. "I look forward to working with Dr. Punni to achieve the center's goals for improved patient care, disease management and innovations in treatment."

Jolyn Fernandes, Ph.D., M.S.
Assistant Professor of Pediatrics

Associate Director of Metabolomics, Laboratory for Molecular Biology and Cytometry Research

Adjunct Assistant Professor, Biochemistry and Molecular Biology

Harold Hamm Diabetes Center Welcomes New OUHSC Faculty Member, Dr. Jolyn Fernandes

We are happy to announce Jolyn Fernandes, MS, Ph.D., recently joined the Section of Neonatology in the Department of Pediatrics as Assistant Professor at the OU College of Medicine at the University of Oklahoma Health Sciences Center. Her research program focuses on determining molecular mechanisms of neurodevelopmental and metabolic diseases through exposure science, using systems biology approach with a particular focus on metallomics and metabolomics. Her background in systems biology, bioinformatics and redox biology will be a valuable addition to the Harold Hamm Diabetes Center.

As Associate Director of Metabolomics for the Laboratory for Molecular Biology and Cytometry Research and member of the Diabetes center, Dr. Fernandes is working to build Metabolomics infrastructure on OU campus. Metabolomics platform is an emerging but powerful tool for studying metabolic diseases including Diabetes. "I look forward to building both Metabolomics and Metallomics Infrastructure on campus to expand our research capabilities and augment our collaborative opportunities through high-resolution high-throughput strategies to detect small molecule signatures and networks in metabolic health and disease. This platform combined with bioinformatics approach is instrumental in discovery of diagnostic and therapeutic biomarkers and prediction of health trajectories. I am currently working closely with the diabetes group on the HHDC/PHF application and with other programs on campus to make metabolomics platform and this cutting-edge technology a thriving resource at OU and across the state."

Most recently, Dr. Fernandes was a Postdoctoral Fellow at Emory University, Atlanta, Georgia in the Department of Medicine. She is returning to the OU College of Medicine, where she earned her doctorate in Biochemistry and Molecular Biology through the Free Radical Biology and Aging program at Oklahoma Medical Research Foundation. She earned her Master of Science degree in Biochemistry and undergraduate degree with honors in Microbiology and Biochemistry from University of Mumbai, India. Dr. Fernandes is currently a member of the Society of Toxicology and Society for Redox Biology and Medicine.

Request for applications: HHDC-PHF Diabetes Grant Program

Harold Hamm Diabetes Center researchers planning on submitting a diabetes-related grant for a Presbyterian Health Foundation Team Science, Seed, or Equipment Grant Program should submit their grant using this HHDC-PHF Diabetes Grant Program mechanism. Diabetes projects aimed specifically at collaboration between researchers in diabetes and cancer should apply for the HHDC-SCC Cancer-Related Diabetes Grant Program.

The Harold Hamm Diabetes Center (HHDC) is pleased to announce funding opportunities for diabetes grants for 2021. The HHDC-PHF Diabetes Grant Program will consider funding three types of proposals including Team Science Grants, Seed Grants, and Equipment Grants. Through matching funds from HHDC and PHF this program will award up to $1.6M to researchers to launch investigations for diabetes research.

Team Science Grant:	$100,000 per year up to 3 years
Seed Grant:	$50,000 for 1 year
Equipment Grant:	Up to $250,000

PROCESS:

1. Letter of Intent to **HHDCGrants@ouhsc.edu** DUE by **5PM January 15, 2021**.
2. Full Application candidates will be notified by February 1, 2021 if selected for full application to this program. Selected applicants will need to submit a complete routed and signed application on the appropriate PHF Grant Program application form to **HHDCGrants@ouhsc.edu** for review by an HHDC review panel; **DUE BY 5PM MARCH 15, 2021**.
3. Applicants not selected to be part of the HHDC-PHF Diabetes Grant Program may submit their applications through the regular PHF grant submission process.

Information and guidelines for submitting the Letter of Intent can be found at the HHDC Grant Opportunities website: <**HERE**>

Request for applications: HHDC-SCC Diabetes/ Cancer Grant Program

The Harold Hamm Diabetes Center (HHDC) is pleased to announce funding opportunities specifically aimed at collaboration between researchers in diabetes/ obesity and cancer for 2021. Through matching funds from HHDC and the Stephenson Cancer Center this program will award up to $1.0M to researchers to launch investigations targeted at uncovering the biology at the intersection of Cancer and Diabetes/Obesity. The HHDC- Diabetes/Cancer Grant Program will consider funding Team Science Grants and Pre-Team Science Grants to foster collaborations aimed at understanding the link between Diabetes/Obesity and Cancer; Treatment/prevention of Diabetes/Obesity and Cancer, and interventions that address the developmental origins of Cancer and metabolic complications associated with obesity.

Team Science Grant:	$100,000 per year up to 3 years
Pre-Team Science Grant:	$25,000 for 1 year

PROCESS:

1. Letter of Intent to HHDCGrants@ouhsc.edu DUE by 5PM January 15, 2021.
2. Full Application candidates will be notified by February 1, 2021 if invited to submit a full application for this program. Selected applicants will need to submit a complete signed and routed application to HHDCGrants@ouhsc.edu for review by an HHDC review panel; DUE BY 5PM MARCH 15, 2021.

Information and guidelines for submitting the Letter of Intent can be found at the HHDC Grant Opportunities website: <**HERE**>

Now We're Cooking

Since the completion of the Chickasaw Nation teaching kitchen at the Harold Hamm Diabetes Center in 2017, the center's dietitians and diabetes educators Christy Olson and Dianne Brown have been providing group cooking demos for patients with pre-diabetes and diabetes monthly. The Chickasaw Nation's Get Fresh! Cooking team have also provided cooking demos every other month after diabetes support groups. Since the start of the pandemic we've had to move our support groups over to a virtual platform. To reach a larger audience with diabetes while proving healthy recipes for our patient population, we decided to record a series of cooking demo videos entitled, "Now We're Cooking" with the help of Windswept Media. Grant dollars used to build the teaching kitchen were also used for this effort. The videos are about one minute long each and provide the recipes ingredients, nutrition information and simple instructions on preparation. Starting in January 2021 these will be broadcasted on our different social media platforms with the help of our OU Health marketing team.

Congratulations to our 2020 Research Symposium Winners!

GROUP A:

First place, The Steven Chernausek Award: **Tamas Csipo**

Longer Reaction Time Is Associated With Neurovascular Dysfunction In Obese, Older Adults

Second place: **Ru Wang**

Derivation And Validation Of Essential Predictors And Risk Index For Early Detection Of Diabetic Retinopathy Using Electronic Health Records

GROUP B:

First place, The Jian-Xing Ma Award: **David Mayte**

Tfeb Regulation Of Hepatic Cysteine And Coenzyme A Supports Metabolic Flexibility

Second Place: **Maria Newhardt**

Increasing Glycolysis Protects Cardiac Function Against High Fat Diet- Induced Cardiomyopathy

Clinic Updates

Pediatric Diabetes & Endocrinology Clinic

David Sparling, M.D., Ph.D.
Assistant Professor
CHF Paul and Ann Milburn Chair in Pediatric Diabetes

The pediatric clinic continues to see patients both in person (with appropriate precautions, including masking and limited family members in clinic) and virtually. We continue to monitor all of our patients and their incidence of COVID-19, which is of course a significant worry for our entire group. We continue to provide remote home sick day support as needed; it's definitely the season for increased illnesses of any type to occur with type 1 diabetes, not just COVID-19. We also continue to see an uptick of patients in the hospital, and so, as we always say, everyone needs to keep a close watch on their blood sugars, mask, socially distance, and take care of each other!

Adult Diabetes & Endocrinology Clinic

Mary Zoe Baker, M.D.
David Ross Boyd Professor of Medicine

We are very pleased to welcome Dr. Emma Punni to the Endocrine faculty at OU. Dr. Punni joined us in November. Dr. Punni completed her endocrine fellowship with us here in Oklahoma City. She will be involved in the education of our students, residents and fellows and is already seeing patients in the Harold Hamm Adult Endocrine clinic.

As the Covid pandemic surges, we are once again seeing most of our patients in the HHDC Adult Endocrine clinic by telehealth visits.

We had a very successful endocrine fellowship match and will welcome 2 new fellows to campus in July to begin their 2 year endocrine fellowships.

In November, our section lost Dr. David Kem, a long-time member of the section and previous section chief. He was an outstanding scientist, inspiring teacher and gifted physician. His passing leaves a gaping hole in our section, which will be hard to fill.

New Grants to HHDC Members:

PI: Barbara Carlson

Other Team Members: D. Sturdevant (Nursing), J. Myers (Nursing), R. Koszalinski (Nursing), S. Kovats (OMRF), D. Zhao (Public Health), D. Drevets (Dept. of Infectious Disease, Medicine), and T. VanWagoner (OCTSI).

Funding Organization: OK Cares and START Foundation

Title of Grant: Training the Innate Immune System against COVID 19 using the Shingrix Vaccine in Nursing Home Residents: A Randomized, Doubled-Blinded, Comparative Group Observational Study

Total Directs: $886,934

PI: W. Shen

Other Team Members: (Robotics Laboratory, Electrical Engineering-OK State), Other CoPIs A. W. Bishop (Human Development and Family Science) and B. W. Carlson (Nursing), ***Carlson, Barbara (CoPI)****.*

Funding Organization: National Science Foundation

Title of Grant: FW-HTF-P: Robotic Health Assistants: A New Human-Machine Partnership in Home Healthcare

Oklahoma State TDC: $150,000
OUHSC Subcontract (TDC + IDC): $41,395

New Grants to HHDC Members:

PI: Michael Rudolph

Funding Organization: OCASCR

Title of Grant: Programming Adipose Stem Cells to Protect Against Diet Induced Obesity

Dates: Jan. 1, 2021 - Dec. 31, 2021 *with renewal option*

Total Directs: $167,679

PI: Archana Unnikrishnan

Funding Organization: OCASCR

Title of Grant: Short-Term Dietary Restriction Rescues The Age-Related Decline In Intestinal Stem Cell Regenerative Capacity

Dates: Jan. 1, 2021 - Dec. 31, 2021 *with renewal option*

Total Directs: $128,075

PI: Weidong Wang

Funding Organization: OCASCR

Title of Grant: White To Brown Adipocyte Conversion Via Chemical-Targeted Ppar Deacetylation

Dates: Jan. 1, 2021 - Dec. 31, 2021 *with renewal option*

Total Directs: $112,000

HHDC MEMBERS NEW PUBLICATIONS:

Brown fat-activating lipokine 12,13-diHOME in human milk is associated with infant adiposity. Wolfs D, Lynes MD, Tseng YH, Pierce S, Bussberg V, Darkwah A, Tolstikov V, Narain NR, **Rudolph MC**, Kiebish MA, Demerath EW, **Fields DA**, Isganaitis E.J Clin Endocrinol Metab. 2020 Nov 2:dgaa799. doi: 10.1210/clinem/dgaa799. Online ahead of print.PMID: 33135728

Pediatric Non-Alcoholic Fatty Liver Disease: Nutritional Origins and Potential Molecular Mechanisms. Ashok Mandala, Rachel C Janssen, Sirish Palle, Kevin R Short, **Jacob E Friedman**, Nutrients, Oct 16;12(10):3166. PMID: 33081177. PMCID: PMC7602751. DOI: 10.3390/nu12103166

Gestational Diabetes Is Uniquely Associated With Altered Early Seeding of the Infant Gut Microbiota. Taylor K. Soderborg, Charles M. Carpenter, Rachel C. Janssen, Tiffany L. Weir, Charles E. Robertson, Diana Ir, Bridget E. Young, Nancy F. Krebs, Teri L. Hernandez, Linda A. Barbour, Daniel N. Frank, Miranda Kroehl and **Jacob E. Friedman**. Frontiers in Endocrinology, 27 November 2020 | https://doi.org/10.3389/fendo.2020.603021 Gestational

Serum discrimination and phenotype assessment of coronary artery disease patents with and without type 2 diabetes prior to coronary artery bypass graft surgery. James R. Hocker, Megan Lerner, Stan A. Lightfoot, Marvin D. Peyton, Jess L. Thompson, Subrato Deb, Mathew Reinersman, R. Jane Hanas, Russel G. Postier, Barish H. Edil, Harold M. Burkhart, **Jay S. Hanas**. PLOS ONE, August 5, 2020 https://doi.org/10.1371/journal.pone.0234539

Single Cell RNA Sequencing of Human Milk-Derived Cells Reveals Sub-Populations of Mammary Epithelial Cells with Molecular Signatures of Progenitor and Mature States: a Novel, Non-invasive Framework for Investigating Human Lactation Physiology'. **Michael Rudolph**. J Mammary Gland Biol Neoplasia; 2020 Nov 20. doi: 10.1007/s10911-020-09466-z. Online ahead of print.

Macrophage-Derived microRNA-155 Increases in Obesity and Influences Adipocyte Metabolism by Targeting Peroxisome Proliferator-Activated Receptor Gamma. **Tryggestad JB**, Teague AM, Sparling DP, Jiang S, Chernausek SD. Obesity (Silver Spring). 2019 Nov;27(11):1856-1864.

Preclinical Models to Study Obesity and Breast Cancer in Females: Considerations, Caveats, and Tools. Erin D. Giles and **Elizabeth A. Wellberg**. J Mammary Gland Biol Neoplasia 2020 Nov 4. doi: 10.1007/s10911-020-09463-2.