

# DIABETES & METABOLISM RESEARCH CENTER



HEALTH  
UNIVERSITY OF UTAH

Friday, September 9, 2022

## DMRC QUARTERLY UPDATE

Colleagues,

It has been great to see many of you again as the new academic year has begun! We look forward to seeing all of you next Thursday at the [2022 Diabetes and Metabolism Retreat](#). We have a great line up this year with exceptional keynote speakers and internal speakers, and an exciting program of lightning talks and posters. Be sure to [register](#) to hear from:

- [Bethany M. Kwan, PhD, MSPH](#) is Associate Professor and Associate Vice Chair for Research in the Department of Emergency Medicine, and Director of Dissemination & Implementation for the Colorado Clinical & Translational Sciences Institute at the University of Colorado School of Medicine. Dr. Kwan explores behavior change and dissemination and implementation (D&I) science in the context of diabetes and chronic disease management. Her talk will be on *“Enhancing the impact of diabetes research through dissemination and implementation science.”*
- [Jean E. Schaffer, MD](#) is Senior Investigator and Associate Research Director, Joslin Diabetes Center, Professor of Medicine, Harvard Medical School. Dr. Schaffer uses genetic, biochemical, cell biological, and physiological approaches to study mechanisms through which metabolic stress leads to cell dysfunction and cell death. She will present on *“mRNA Translation as a Regulator of the Response to Nutrient Excess.”*



In addition, many of you may have heard that we were unsuccessful on our latest application to become an NIDDK-funded Diabetes Research Center. While this is disappointing, we want to share two things with all of you:

1. The reviewers recognized and commended us on the **growing**, and well-funded base of researchers that make up this center. They also complimented us on the **high quality**

**research** performed by our investigators. We are incredibly proud of the strength of this research community, and we are pleased reviewers recognized this as well.

2. For this submission, reviewers thought that our focus on a variety of **metabolic diseases** was a weakness. In the past, our breadth has been viewed as a strength. No matter the reviewers' comments, we believe that focusing on metabolism broadly – as it relates to many diseases – is right for the University of Utah. We remain steadfast in our commitment to supporting all aspects of this research in our community.

While the NIDDK Diabetes Research Center grant is one goal for the DMRC, it is not the only goal. We look forward to continuing to recruit and retain excellent faculty, supporting large extramural grant proposals, and championing research excellence across a variety of programs. The future is bright! And we look forward to celebrating our bright future with all of you next Thursday!

**Scott Summers, Jared Rutter, and Angie Fagerlin, DMRC Leadership Team**

## GOOD NEWS

### The Larry H. & Gail Miller Family Foundation gives \$3 million to support Driving Out Diabetes

The Larry H. & Gail Miller Family Foundation has given a \$3 million dollar gift to the Driving Out Diabetes Initiative, for a total of \$8.29M in the last five years. This gift supports Driving Out Diabetes' efforts to reduce the burden of diabetes across the state of Utah through community health and wellness programs, innovations in clinical care, and discovery research. In addition, the Foundation challenged the University of Utah and the local community to raise \$2.7 million to supplement Foundation funding over the next three years, which the U has successfully done.



### Helena Safavi-Hemami returns to the U!

Welcome back, [Dr. Safavi-Hemami](#)! Dr. Safavi-Hemami is rejoining the Department of Biochemistry as an Associate Professor. She studies the biology and therapeutic properties of marine venom, including fast-acting insulin. Learn more about her work [here](#).



## Keke Fairfax receives funding from NIAID to support BRIDGE UP-HBCU

Dr. Keke Fairfax has received R25 funding to support the Biomedical Research Inclusion & Diversity to Grow Excellence in Science – Undergraduate Program for Historically Black Colleges and Universities (BRIDGE UP-HBCU) at the University. Dr. Fairfax has run BRIDGE UP-HBCU for the last two summers, and hosted exceptional undergraduate trainees from HBCUs in a variety of labs across campus with support from the Department of Pathology, the DMRC, and others. Congratulations, Dr. Fairfax!

## UPCOMING EVENTS

### Fall 2022 Diabetes and Metabolism Research Retreat - Thursday, September 15

- [Register here](#) - TOMORROW (9/9) is the last day to register
- Download the [full agenda here](#)

### Rising Stars Postdoc Symposium - September 29 - 30

- Download the [full agenda here](#)

**2022 DIABETES & METABOLISM RESEARCH RETREAT**

Thursday, September 15  
8:00 AM - 6:00 PM

#DMRC2022

8:40 AM - WELCOME REMARKS

8:45 AM - MORNING KEYNOTE (moderated by Scott Summers, PhD)  
Ben Schreyer, MD, Center Investigator and Associate Research Director, Joslin Diabetes Center & Professor of Medicine, Harvard Medical School  
"Insulin Resistance as a Regulator of the Response to Nutrient Excess"

9:45 AM - DMRC INVESTIGATOR TALKS (moderated by Amanda Chiu, PhD)  
Anabella Young, PhD, Assistant Professor, Division of Microbiology and Immunology, Department of Pathology, University of Utah; Investigative, Human Cancer Institute, University of Utah  
"Developing preclinical models and interrogating clinical samples from cancer patients with immune checkpoint inhibitor-induced diabetes"

Shawel Handjar, MSc, PhD, MPH, Assistant Professor, Population Health Sciences, University of Utah  
"The role of metabolic dysfunction in cancer: Promotion, Progression, and Progress"

10:15 AM - LIGHTNING TALKS (moderated by Alfred Clurkin)  
Jason Thomas, Graduate Teaching Assistant, University of Utah  
"The Effect of an Acute Bout of Aerobic and Resistance Exercise on Non-Exercise Physical Activity"

Jennifer Hill, Postdoctoral Fellow in the Round and Murtagh Labs, Department of Pathology, University of Utah  
"Meningeal host-microbe interactions in the neonatal pancreas to prevent diabetes"

Joe Wilkerson, PhD, Postdoctoral Fellow, Holland Lab, NIDDK  
"Circadian response in the ventromedial hypothalamus in fed vs. fasted mice and the effect on glucose homeostasis"

11:00AM - BREAK

11:15AM - DMRC INVESTIGATOR TALKS (moderated by William Holland, PhD)  
Paul Lefterovska, PhD, Professor and Associate Dean of Community Engagement, Department of Kinesiology & Health, College of Health, University of Utah  
"Integrating research-practice partnerships: A strategy for improving the dissemination and implementation of evidence-based health promotional interventions"

Ademuyero Anomaharan, PhD, FRCGS, FAHA, Associate Professor of Surgery, University of Utah  
"Hepatic Fibrotic Mechanisms in Obesity"

## RESEARCH HIGHLIGHTS

**Pioneering the Future** is a series highlighting prominent health sciences discoveries made at the University of Utah. Check out these great stories featuring DMRC investigators below.



### Protecting Vision

Treatments that block VEGF, a signaling protein that promotes blood vessel growth, can reduce the severity of diabetic retinopathy, but they don't work for everyone. [Weiquan Zhu, PhD](#), and [Shannon Odelberg, PhD](#), from the Department of Internal Medicine, and colleagues discovered that in animal experiments, they can reduce fluid leakage and protect the eyes by [blocking a VEGF-regulating protein called ARF6](#).

This approach provides a potential alternative method for treating diabetic retinopathy. The researchers hope that with further development, targeting ARF6 might be an effective strategy for controlling diabetic retinopathy in patients.

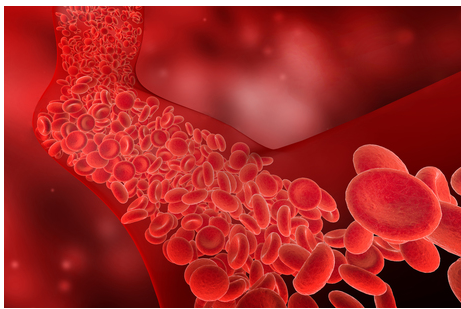
## Restoring Awareness

[Owen Chan, PhD](#), and [Candace Reno, PhD](#), researchers in the Department of Internal Medicine, and Simon Fisher, MD, PhD, traced hypoglycemia unawareness to signaling problems in the hypothalamus, a region of the brain that both senses and responds to low blood sugar. They discovered that abnormal cellular metabolism interferes with the ability of neurons in this brain region to properly sense a fall in blood sugar levels. This ultimately [impairs the release of neurotransmitters](#) that stimulate the secretion of hormones that counter the fall in blood sugars. As a result, the body cannot trigger normal hormonal responses to low blood sugars. The team's research has led to a clinical trial evaluating whether metoclopramide, a drug that dampens dopamine signaling in the brain, can improve hypoglycemia awareness in people with type 1 diabetes.



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## Iron Balance



An excess of iron in the body has long been thought to contribute to the development of diabetes. But Professor of Internal Medicine [Elizabeth Leibold, PhD](#), and colleagues found that too little iron can have a similar effect. Leibold's lab studies the causes and consequences of iron dysregulation. In their studies of mice genetically engineered to be iron deficient, they discovered that the animals developed an array of health problems, including diabetes. Taking a closer look, they determined that when iron levels are too low, cells in the pancreas [cannot produce enough insulin to control blood sugar](#). Their findings could help researchers develop new strategies to prevent or treat type 2 diabetes.

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# NEW PUBLICATIONS (abridged)

- Blanchette JE, Tran MJ, Grigorian EG, Jacob E, Edelman LS, Oser TK, Litchman ML.. **GoFundMe as a Medical Plan: Ecological Study of Crowdfunding Insulin Success.** JMIR Diabetes. 2022 Apr 15;7(2):e33205. doi: [10.2196/33205](#).
- Broxterman RM, La Salle DT, Zhao J, Reese VR, Kwon OS, Richardson RS, Trinity JD.. **Dietary nitrate supplementation and small muscle mass exercise hemodynamics in patients with essential hypertension.** J Appl Physiol (1985). 2022 Aug 1;133(2):506-516. doi: [10.1152/japplphysiol.00218.2022](#). Epub 2022 Jul 14.
- Cho JM, Park SK, Kwon OS, La Salle DT, Cerbie J, Fermoye CC, Morgan D, Nelson A, Bledsoe A, Bharath LP, Tandar M, Kunapuli SP, Richardson RS, Anandh Babu PV, Mookherjee S, Kishore BK, Wang F, Yang T, Boudina S, Trinity JD, Symons JD. **Activating P2Y1 receptors improves function in arteries with repressed autophagy.** Cardiovasc Res. 2022 Apr 14;cvac061. doi: [10.1093/cvr/cvac061](#). Online ahead of print.
- Dickinson JK, Litchman ML. **Understanding Hypoglycemia in the Real World.** Sci Diabetes Self Manag Care. 2022 Aug;48(4):270-280. doi: [10.1177/26350106221102855](#).

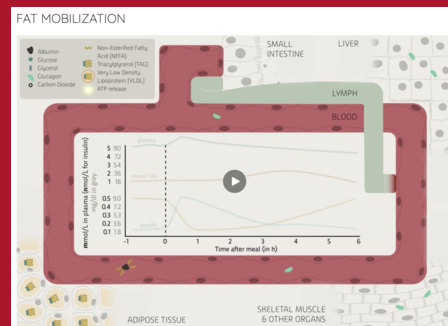
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- Karra P, Winn M, Pauleck S, Bulsiewicz-Jacobsen A, Peterson L, Coletta A, Doherty J, Ulrich CM, Summers SA, Gunter M, Hardikar S, Playdon MC. **Metabolic dysfunction and obesity-related cancer: Beyond obesity and metabolic syndrome.** *Obesity (Silver Spring).* 2022 Jul;30(7):1323-1334. doi: [10.1002/oby.23444](https://doi.org/10.1002/oby.23444).
- Koch TL, Ramiro IBL, Flórez Salcedo P, Engholm E, Jensen KJ, Chase K, Olivera BM, Bjørn-Yoshimoto WE, Safavi-Hemami H. **Reconstructing the Origins of the Somatostatin and Allatostatin-C Signaling Systems Using the Accelerated Evolution of Biodiverse Cone Snail Toxins.** *Mol Biol Evol.* 2022 Apr 10;39(4):msac075. doi: [10.1093/molbev/msac075](https://doi.org/10.1093/molbev/msac075)
- Litchman ML, Kwan BM, Zittleman L, Simonetti J, Iacob E, Curcija K, Neuberger J, Latendress G, Oser TK. **A Telehealth Diabetes Intervention for Rural Populations: Protocol for a Randomized Controlled Trial.** *JMIR Res Protoc.* 2022 Jun 14;11(6):e34255. doi: [10.2196/34255](https://doi.org/10.2196/34255).
- McKenzie AI, Mahmassani ZS, Petrocelli JJ, de Hart NMMP, Fix DK, Ferrara PJ, LaStayo PC, Marcus RL, Rondina MT, Summers SA, Johnson JM, Trinity JD, Funai K, Drummond MJ. **Short-term exposure to a clinical dose of metformin increases skeletal muscle mitochondrial H(2)O(2) emission and production in healthy, older adults: A randomized controlled trial.** *Exp Gerontol.* 2022 Jun 15;163:111804. doi: [10.1016/j.exger.2022.111804](https://doi.org/10.1016/j.exger.2022.111804). Epub 2022 Apr 9.
- Michaud TL, Pereira E, Porter G, Golden C, Hill J, Kim J, Wang H, Schmidt C, Estabrooks PA. **Scoping review of costs of implementation strategies in community, public health and healthcare settings.** *BMJ Open.* 2022 Jun 28;12(6):e060785. doi: [10.1136/bmjopen-2022-060785](https://doi.org/10.1136/bmjopen-2022-060785).
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## OPPORTUNITIES

### Teaching about metabolism?

Check out and use the new videos developed by Janet Iwasa's lab illustrating [how the body releases and stores fat](#). This video complements a previous visualization the Iwasa lab created on the [journey of a metabolite](#). The goal of these videos are to educate both the broader public, but also trainees within the metabolism research community both at the U and beyond.



These videos are a great tool to teach about how dietary intake is connected to common metabolic diseases. The video was created by Shradha Nayak, PhD in collaboration with Janet Lindsley, PhD and Amy Hawkins, PhD from the University of Utah, and Judith Simcox, PhD from the University of Wisconsin-Madison.

### Do you want to develop a new methodology or technique using a U of U Core?

Send your idea to [Sara Salmon](#). The DMRC is expanding its [Core Support Program](#) to include additional cores and areas of science exploring diabetes and metabolism related topics.

### Would you like external feedback on an upcoming grant submission?

Check out the [Extramural Grant Review Program](#)! The DMRC can pay an external reviewer to review your grant.

## STAY IN THE KNOW

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