New Investigator Accomplishments: August 2022 – January 2023

Career

- Abdelfattah El Ouaamari, PhD
  - Appointed Associate Professor of Cell Biology and Anatomy at New York Medical College.

- Vira Kravets, PhD
  - Commenced as Assistant Professor II at the University of California San Diego. Jointly appointed to the Department of Bioengineering and Department of Pediatrics.

- Amelia Linnemann, PhD
  - Appointed Director of the NIH/NIDDK Summer Medical Student Program at the Indiana University School of Medicine
  - Appointed Associate Director of Pipeline Program Development for the Department of Pediatrics and Herman B Wells Center for Pediatric Research at the Indiana University School of Medicine

- Holger Russ, PhD
  - Transitioned to Associate Professor at the University of Florida, Department of Pharmacology and Therapeutics and the Diabetes Institute.

New Investigator Accomplishments: August 2022 – January 2023

New Grants/Funding

- Joana Almaça, PhD
  - Principal Investigator, NIH NIDDK R01: "Investigating the link between pericyte dysfunction and loss of glucose homeostasis in COVID-19",
  - Co-Investigator, NIH NIDDK U01: "Integrative analysis of multi-omic signatures and cellular function in human pancreas across developmental timeline at single-cell spatial resolution”

- Jing Hughes, MD, PhD
  - Doris Duke Fund to Retain Clinical Scientists, Washington University School of Medicine

- Eddie James, PhD
  - Principal Investigator, Cystic Fibrosis Foundation: “Investigating beta cell reactive T cells as a disease axis in cystic fibrosis-related diabetes”
  - Co-Investigator, NIH NIDDK R01: “Posttranslational Neoantigens in Autoimmunity and Metabolism in T1D”

- Alok Joglekar, PhD
  - NIH Director's New Innovator Award (DP2): "Signaling via MHC: engineering immune cells with new capabilities" Juvenile Diabetes Research Foundation Strategic Research Agreement "Defining the Antigenic Landscape of Islet-Infiltrating T cells in Type 1 Diabetes"

New Investigator Accomplishments: August 2022 – January 2023

New Grants/Funding

- Amelia Linnemann, PhD
  - Co-Investigator, NIH NIDDK R01: "Implications of Changes in Islet Exosomal Cargo in Type 1 Diabetes"
  - Co-Principal Investigator of a seed funding grant from the Herman B Wells Center for Pediatric Research, "Autophagy and Proinsulin Release in Diabetes Development"

- Baoyu Liu, PhD
  - Principal Investigator, NIH NIDDK R01: "Beta-cell self-antigen recognition by diabetogenic CD8 T cells"

- Holger Russ, PhD
  - Co-Principal Investigator, JDRF Innovation grant, "Engineered Nanocapsules for Targeted Drug Delivery to Protect Against β-Cell Death in T1D"
  - Co-Principal Investigator, JDRF SRA, "Tolerance Signals from Human Pregnancy for Beta Cell Therapy"

New Investigator Accomplishments: August 2022 – January 2023

Presentations

- Juan Alvarez, PhD
  - Invited Speaker at the University of Pennsylvania, Institute for Diabetes, Obesity, and Metabolism Seminar Series,, "Designer Islets for Diabetes Research & Replacement Therapy" (October 2022)

- Rafael Arrojo e Drigo, PhD
  - Invited Speaker at the HelmHoltz Munich Diabetes Conference, “Spatiotemporal Dynamics of Beta Cells” (September 2022) (Nominated for the HeiDi Award competition, which gathers 12 young leading faculty from around the world to speak at the conference in front of a scientific panel).
  - Invited Speaker at the 2022 HIRN Annual Investigator Meeting, “The Subcellular Architecture of Glucose Metabolism” (September 2022)
  - Invited Speaker at the University of Pennsylvania, Institute for Diabetes, Obesity, and Metabolism Seminar Series, “Aging compromises human beta cell structure-function and nutrient metabolism” (October 2022)

New Investigator Accomplishments: August 2022 – January 2023

Presentations

- Leonardo Ferreira, PhD
  - Invited Speaker for a HIRN Webinar, “Reprogramming human regulatory T cells to quell autoimmunity and organ transplant rejection” (September 2022)
  - Invited Speaker at the 20220 Asian Transplant Week (ATW), “Engineering regulatory T cells for immune tolerance” (November 2022)
  - Invited Speaker at the Barbara Davis Center for Diabetes Seminar Series, “Engineering regulatory T cells and beyond to treat type 1 diabetes” (January 2023)
  - Invited Speaker at Advanced Therapies Week, “Developing CAR Tregs as living therapeutics for type 1 diabetes” (January 2023)

- Jing Hughes, MD, PhD
  - Invited Speaker for the Kendall-Hench Lecture at the Mayo Clinic, "Cilia regulation of glucose homeostasis" (December 2022)

New Investigator Accomplishments: August 2022 – January 2023

Presentations

- Eddie James, PhD
  - Invited Speaker for a ThermoFisher Research Workshop, “HLA Tetramers: Tools to Define Targets and Characterize Epitope Specific T cells” (September 2022)
  - Invited Speaker at the 2022 HIRN Annual Investigator Meeting, “Probing linked CD4+ T Cell and autoantibody recognition of nucleus-associated islet autoantigens in subjects with type 1 diabetes” (September 2022)
  - Invited Speaker at the Frontiers in Diabetes Research Symposium, “Recognition of Unconventional Islet Antigens in Subjects with T1D” (November 2022)

- Hirotake Komatsu, PhD
  - Invited Speaker at a Cincinnati children’s Hospital, “Designing islet oxygenation strategies to improve clinical transplantation outcomes” (October 2022)
  - Invited Speaker at a UCLA Research Seminar, “Oxygenation strategies for pancreatic islets” (November 2022)
  - Invited Speaker at the Advanced Research Seminar, Juntendo University School of Medicine, “Does cell transplantation cure diabetes?” (November 2022)

New Investigator Accomplishments: August 2022 – January 2023

Presentations

- Vira Kravets, PhD
  - Invited Speaker at the Genetics, Bioinformatics, and Systems Biology Colloquium at the University of California, San Diego, "Pancreatic beta cell networks in heath and disease“ (Nov, 2022)

- Amelia Linnemann, PhD
  - Invited Speaker at the Rachmiel Levine-Arthur Riggs Diabetes Research Symposium, “*In Vivo* Imaging of Islet Autophagy” (November 2022)
  - Invited Speaker at the University of Chicago Endocrine Seminar Series, “Islet Autophagy in the Pathogenesis of Type 1 Diabetes” (December 2022)

- Holger Russ, PhD
  - Invited Speaker at the International Society for Stem Cell Research, “CD9 marks a human beta cell subpopulation with increased immunogenicity” (September 2022)

- Joao Pedro Saar Werneck de Castro, PhD
  - Invited Speaker at the American Thyroid Association Annual Meeting, “Overactivation of the mechanistic target of rapamycin (mTOR) by targeted disruption of tuberous sclerosis complex 2 gene in thyrocytes induces follicular hyperplasia, inflammation, and impaired thyroid function” (October 2022)

New Investigator Accomplishments: August 2022 – January 2023

Publications

- Juan Alvarez, PhD
  - Stem cell-based multi-tissue platforms to model human autoimmune diabetes. Molecular Metabolism (2022)

- Rafael Arrojo e Drigo, PhD
  - Aging com-promises human islet beta cell function and identity by decreasing transcription factor activity and inducing ER stress. Science Advances, October 2022
  - Weight cycling impairs pancreatic insulin secretion but does not perturb whole-body insulin action in diet-induced obese mice. Diabetes, July 2022

- Sangeeta Dhawan, PhD
  - The Yin and Yang of Modulating β-Cell DNA Damage Response and Functional Mass. Diabetes. August 2022
  - Yo-Yo Dieting: Mixed Messages for β-Cell Plasticity. Diabetes. November 2022
  - DNA methylation Dependent Restriction of Tyrosine Hydroxylase Contributes to Pancreatic β-cell Heterogeneity. Diabetes. January 2023

- Abdelfattah El Ouaamari, PhD
  - Activation of Arcuate Nucleus Glucagon-Like Peptide-1 Receptor-Expressing Neurons Suppresses Food Intake. Cell and Bioscience. October 2022

New Investigator Accomplishments: August 2022 – January 2023

Publications

- Eddie James, PhD
  - Cytotoxic CD8+ T cells target citrullinated antigens in rheumatoid arthritis. Nature Communications (2023)
  - Characterizing T cell responses to enzymatically modified beta cell neo[1]epitopes. Frontiers of Immunology (2023)
  - Autoantibody and T cell responses to oxidative post-translationally modified insulin neoantigenic peptides in type 1 diabetes. Diabetologia (2023)
  - Recognition of mRNA Splice Variant and Secretory Granule Epitopes by CD4+ T Cells in Type 1 Diabetes. Diabetes (2023)
  - Clonal IgA and IgG autoantibodies from individuals at risk for rheumatoid arthritis identify an arthritogenic strain of Subdoligranulum. Science Translational Medicine (2022)
  - Mechanism-driven strategies for prevention of rheumatoid arthritis. Rheumatology & Autoimmunity (2022)
  - Carbonyl Posttranslational Modification Associated With Early-Onset Type 1 Diabetes Autoimmunity. Diabetes (2022)
  - Immunological Interaction of HLA-DPB1 and Proteinase 3 in ANCA Vasculitis is Associated with Clinical Disease Activity. Journal of the American Society of Nephrology (2022)
  - Isolation of HLA-DR-naturally presented peptides identifies T-cell epitopes for rheumatoid arthritis. Annals of Rheumatic Disease (2022)

New Investigator Accomplishments: August 2022 – January 2023

Publications

- Leonardo Ferreira, PhD
  - The dichotomous roles of TNFa signaling in CD4+ T cells. Frontiers of Immunology (2022)
  - The emerging role of regulatory cell-based therapy in autoimmune disease. Frontiers of Immunology (2022)
  - Regulatory T cell homeostasis: requisite signals and implications for clinical development of biologics. Clinical Immunology (2023)

- Jing Hughes, MD, PhD
  - Islet primary cilia motility controls insulin secretion. Science Advances (2022)
  - Fluorescence imaging of beta cell primary cilia. Frontiers in Endocrinology (2022)
  - Islet cilia and glucose homeostasis. Frontiers in Cell and Developmental Biology (2023)
  - Molecular phenotyping of single pancreatic islet leader beta cells using Flash-Seq. Life Sciences, (2023)

- Alok Joglekar, PhD
  - De novo identification of CD4+ T cell epitopes, Biorxiv (preprint)

- Karla Leavens, MD, PhD
  - Stem cell-based multi-tissue platforms to model human autoimmune diabetes. Molecular Metabolism, December 2022.

New Investigator Accomplishments: August 2022 – January 2023

Publications

- Hirotake Komatsu, PhD
  - Micropyramid-patterned, oxygen-permeable bottomed dish for high density culture of pancreatic islets. Biofabrication, December 2022
  - Microwell culture platform maintains viability and mass of human pancreatic islets. Front Endocrinol (Lausanne). November 2022
  - Submilligram Level of Beetle Antifreeze Proteins Minimize Cold-Induced Cell Swelling and Promote Cell Survival. Biomolecules. October 2022

- Vira Kravets, PhD
  - Engineered vasculature induces functional maturation of pluripotent stem cell-derived islet organoids. Biorxiv, September 2022
  - Quantifying the relationship between emergent islet function, gap junctions, and beta cell dynamics: a network theory approach. Diabetologia 2022

- Amelia Linnemann, PhD
  - Mouse Models and Human Islet Transplantation Sites for Intravital Imaging. Front Endocrinol, October 2022.

New Investigator Accomplishments: August 2022 – January 2023

Publications

- Holger Russ, PhD
  - High throughput identification of RNA localization elements in neuronal cells. Nuclei Acid Res, October 2022
  - Stem-Cell-Derived-Beta-Like Cells with a Functional PTPN2 Knockour Display Increased Immunogenicity. Cells, November 2022
  - Human stem cell derived beta-like cells engineered to present PD-L1 improve transplant survival in NOD mice carrying human HLA class I. Front Endocrinol, November 2022
  - Stem cell-based multi-tissue platforms to model human autoimmune diabetes. Molecular Metabolism, December 2022.

- Joao Pedro Saar Werneck de Castro, PhD
  - Novel roles of mTORC2 in regulation of insulin secretion by actin filament remodeling. Am J Physiol Endocrinol Metab, August 2022.
  - The Transcription Factor YY1 Is Essential for Normal DNA Repair and Cell Cycle in Human and Mouse β-Cells. Diabetes, August 2022

New Investigator Accomplishments: August 2022 – January 2023

Additional Updates

- Juan Alvarez, PhD
  - Research lab expanded and welcomed three PhD and two undergraduate. Several new projects maturing into papers and grant applications in 2023.
  - Invited to serve as Associate Editor, Frontiers in Cell and Developmental Biology, Stem Cell Research
  - Lab graduate student selected for "Lighting Talk" for Penn Institute for Regenerative Medicine annual retreat (January 2023)
  - Lab Post-bac student admitted to Molecular and Cell Biology PhD program at Harvard University

- Rafael Arrojo e Drigo, PhD
  - PI's Postdoctoral Fellow was an Invited Speaker at the 2022 HIRN Annual Investigator Meeting, "Caloric restriction modifies beta cell structure-function and promotes cell longevity in mice" and was selected for a Trainee Award (September 2022)

New Investigator Accomplishments: August 2022 – January 2023

Additional Updates

- Abdelfattah El Ouaamari, PhD
  - Invited to serve as a NIH NIAID Grant Reviewer, Special Emphasis Panel (U01 Clinical Trial Required) ZAI1 HSC-I (M2)

- Leonardo Ferreira, PhD
  - Invited to serve as Guest Editor: Nutrition and Gut Microbiota-Immune System interplay in Chronic Diseases special issue, Nutrients, 2022
  - Invited to serve as Topic Editor: Repurposing Cancer therapeutics in Autoimmune Conditions article collection, Frontiers in Immunology, 2022
  - Invited to serve as Associated Editor: Aging and the Immune System, Frontiers in Aging, 2022

- Holger Russ, PhD
  - Graduated two PhD students: Drs. Roberto Castro- Gutierrez and Ali H. Shilleh