March 2024

Richard K.P. Benninger, PhD.

Professor of Bioengineering (primary)
Professor of Pediatrics (secondary)

Barbara Davis Center for Diabetes
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Summary

I maintain a multi-disciplinary research program that focuses on the biophysical properties and molecular mechanisms of diabetes pathogenesis, with a strong emphasis on imaging technologies, systems biophysics and clinical translation. I have been awarded >$10M in research funding as PI, have published >50 peer-reviewed publications and been invited to speak at multiple international conferences. I have mentored many PhD students (8) and postdoctoral trainees (6), all whom are in successful tenure-track faculty positions and other research careers, and I serve as PD on a bioengineering-focused NIH training grant which I successfully applied for. I have developed multiple classes in bioengineering graduate and undergraduate programs and have a strong track record of teaching success. I have served in leadership roles within my department, college and institution, including directing the institutional microscopy core; and serving on international conference organizing committees and grant review panels.

Education

MSci in Physics **1998 – 2002**
Imperial College London, London, United Kingdom.
First class honours

PhD in Physics **2002 – 2006**
Imperial College London, London, United Kingdom.
"Applications of Multi-focal Multi-photon Microscopy to Multi-dimensional Fluorescence Imaging"
Supervisors: Paul M.W. French and Mark A.A. Neil.
Thesis viva: Tony Wilson and Robin W. Smith

Post-doctoral Research (Molecular Physiology and Biophysics) **2006 – 2011**
Vanderbilt University, Nashville, TN.
Primary Mentor: David W. Piston
Research topics: Quantitative fluorescence microscopy, Dynamics of pancreatic islet function

Academic Appointments

Assistant Professor (tenure-track): **2011 – 2017**
Department of Bioengineering, University of Colorado Anschutz Medical campus, Aurora, CO.

Associate Professor (with tenure): **2017 – 2023**

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Department of Bioengineering, University of Colorado Anschutz Medical campus, Aurora, CO.

Professor (with tenure): **2023 – present**
Department of Bioengineering, University of Colorado Anschutz Medical campus, Aurora, CO.

Director, Advanced light microscopy core **2019 – present**
NeuroTechnology Center, University of Colorado Anschutz Medical campus, Aurora, CO.

Honors and Awards

EPSRC PhD studentship with industrial CASE award (Kentech Ltd)	2002-2005
Institute of Physics (Optics section) travel scholarship:	2005
European Physical Society travel grant:	2005
Burrough's Welcome Fund, Career Award at Scientific Interface (Finalist)	2008
NIDDK Imaging the islet workshop travel award:	2009
NIH K99/R00 Career development award, DK085145 (Awarded)	2009-2014
Vanderbilt 2009 Scholar in Diabetes	2009
JDRF Career development award (Awarded)	2014-2019
Biophysical Society Young Fluorescence Investigator award	2015

Memberships in Professional Societies

Institute of Physics (UK)	1998 – present
Biophysical Society	2004 – present
Optical Society of America	2005 – present
American Diabetes Association	2011 – present
European Association for the Study of Diabetes	2013 – present
American Physiological Society	2013 – present

Professional Service: Institutional

Department of Bioengineering:

Chair, Curriculum committee (undergraduate and graduate)	2012-2017
Member, Admissions committee for Bioengineering program	2012-2016,
Chair, Faculty recruitment search committee	2015-2016
Member, Graduate Affairs Committee	2019-present
Chair, Primary Unit committee for reappointment, tenure and promotion	2019-present
Member, Chair of Bioengineering search committee	2022
Member, Bioengineering department strategic planning committee	2023-present

Barbara Davis Center for diabetes:

Organizer, Research in Progress seminar series.	2012-2015
Organizer, University of Colorado Diabetes seminar series.	2016-present

School of Medicine:

Member, Advanced Light Microscopy Core steering committee.	2011-2018

Member, Admissions committee for MSTP. 2013-2017
Director, Advanced Light Microscopy Core 2019-present

College of Engineering, Design and Computing (CEDC):

Member, Scholarship committee. 2015-2017
Member, Dean of CEDC search committee 2016-2017

Professional Service: External

Reviewer, grants and fellowships (ad hoc):

Diabetes UK (ad hoc, 2014, 2015, 2018, 2020, 2021)
(UK) Medical Research Council (ad hoc)
EU Horizon 2020 'Personalizing health and care' (first-stage reviewer)
Czech Health Research Council (ad hoc, 2015, 2017)
The Welcome Trust (ad hoc, 2018, 2021),
The German Research Foundation (DFG) (ad hoc, 2021)
The French National Research Agency (ANR) (ad hoc, 2021)
The Canadian Institute of Health Research (CIHR) (ad hoc, 2021)
Juvenile Diabetes Research Foundation ('FY16 Islet Immune SRA' Review Panel)
NIH Cellular Aspects of Diabetes and Obesity study section (ad hoc, 2016)
Juvenile Diabetes Research Foundation ('FY17 Beta Cell Regeneration Training Awards Panel)
Juvenile Diabetes Research Foundation ('FY18 Restoring pancreatic alpha cell function to improve metabolic control in type 1 diabetes)
NIH Molecular and Cellular endocrinology study section (ad hoc, 2018)
Juvenile Diabetes Research Foundation ('FY18 Beta Cell Regeneration Training Awards Panel)
Juvenile Diabetes Research Foundation ('FY19 Beta Cell Regeneration Training Awards Panel)
NIH Molecular and Cellular endocrinology study section (ad hoc, 2019)
NIH Basic Mechanisms of Diabetes and Metabolism study section (ad hoc, 2021)

Study section membership:

NIH Basic Mechanisms of Diabetes and Metabolism (BMDM) study section 2022-2028

Reviewer, journal publications:

American Journal of Physiology – Cell Phys.;
American Journal of Physiology – Endo&Metab.;
Analytical Chemistry;
Australasian Physical & Engineering Sciences in Medicine;
Biological Research;
Biomedical Materials;
Biophysical Journal;
Cell Metabolism
Cell Reports
Cytometry partA;
Diabetes.
eLife
Federation of European Biochemical Societies Journal;
Islets;

Journal of Biomedical Optics;
Journal Mathematical Biology;
Journal of Optics;
Mathematical Biosciences;
Microfluidics and Nanofluidics;
Molecular Metabolism;
Nature BME;
Nature Communications;
Nature Metabolism;
Nature Methods;
New Journal of Physics;
Photochemistry & Photobiology;
PLoS Computational Biology;
PLoS ONE;
PNAS;
Scientific Reports.

Editorial work:

Guest Editor, PLoS Computational Biology 2014

Conference Service:

Abstract Reviewer, *American Diabetes Association Scientific Sessions*, Islet biology/Insulin secretion program, Boston MA (2015)

Session chair, *American Diabetes Association Scientific Sessions* "Metabolic and Molecular Mechanisms Regulating Insulin Secretion", Boston MA (2015)

Sub-committee for program development, *American Diabetes Association Scientific Sessions*, Islet biology/Insulin secretion program, New Orleans LA (2015)

Session chair, *American Diabetes Association Scientific Sessions* "The Excited Beta cell" New Orleans LA (2016)

Organizing committee, *American Diabetes Association Scientific Sessions* Orlando FL, San Francisco CA (2017-2019)

Abstract Reviewer, *American Diabetes Association Scientific Sessions*, Islet biology/Insulin secretion program, Virtual (2021)

Organizing committee, *Materials Research Society Conference*, "Biomaterials for Regenerative Engineering" symposium (2021)

Invited external seminars, symposia and workshops

Institutional seminars:

Invited seminar at Department of Cell Biology, University of North Carolina, Chapel Hill NC. (2010).
"*Live cell imaging of cell-cell communication in the islet of Langerhans*"

Invited seminar at Department of Bioengineering, Vanderbilt University, Nashville TN. (2011).
"*Live cell imaging of the islet of Langerhans and the regulation of insulin secretion*"

Invited seminar at Department of Biological Sciences, University of Denver, Denver, CO. (2013).

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"*Gap junction channels in pancreatic islet function and diabetes*"

Visiting seminar at Oxford Center for Diabetes, Endocrinology and Metabolism (OCDEM), Oxford University, Oxford UK. (2015).
"*Dynamics of pancreatic islet function and dysfunction in diabetes*"

Invited seminar at the Institute of Molecular Biophysics, Florida State University, Tallahassee FL. (2018).
"*Imaging and modelling cellular cross-talk and heterogeneity in the islet of Langerhans*"

Invited seminar at Department of Molecular Physiology and Biophysics, Vanderbilt University, Nashville TN. (2019).
"*Dissecting the electrical connectivity within pancreatic islets*"

Invited seminar at Department of Metabolism, Digestion and Reproduction, Imperial College London, London UK. (2020). {Postponed due to Coronavirus pandemic}
"*Emergent multicellular properties in pancreatic islet function and diabetes*"

Invited seminar at Einstein-Sinai Diabetes Research Center symposium, Icahn School of Medicine at Mount Sinai, New York NY. (2021). {Remote}
"*Endocrine cell heterogeneity driving pancreatic islet function*"

Invited seminar at UCLA Islet Research Seminar Series. (2022). {Remote}
"*Islet blood flow in type1 diabetes*"

Invited seminar at Stanford Golden State Islet Seminar. (2022). {Remote}
"*Ultrasound-based imaging diagnostics for tracking the progression of pre-symptomatic type1 diabetes*"

Invited seminar at Department of Physics / Biofrontiers center, University of Colorado Colorado Springs (UCCS), Colorado Springs, CO. (2023).
"*Emergent multi-cellular dynamics governing hormone secretion in the endocrine pancreas*"

Invited seminar at Department of Bioengineering, Imperial college London, London, UK. (2023).
"*Emergent multicellular properties in pancreatic islet function and diabetes*"

Invited seminar at Wells Center for Pediatric Research, University of Indiana, Indianapolis, IN. (2024).
"*Mind the Gap (Junction): Intra-islet regulation of hormone secretion in health and diabetes*"

Invited seminar at Department of Bioengineering, University of California San Diego (UCSD), San Diego, CA. (2024).
"*Bursting the bubble: Novel ultrasound imaging diagnostics and targeted therapies for type1 diabetes*"

Invited symposia/workshop speaker:

Invited speaker at South-East Two-photon Microscopy Workshop, Atlanta, GA. (2008)
"*An introduction to multi-photon FRET*"

Invited speaker at Biophysical Society Annual Meeting, Biological Fluorescence Subgroup, Boston MA. (2009). "*Quantitative multi-probe fluorescence microscopy of multi-cellular system dynamics*"

Invited speaker (Future approaches in life microscopy), EMBL, Heidelberg, Germany (2011).
"*Quantifying cellular signaling in the islet of Langerhans with pcFRET and live-cell imaging*"

Invited symposium speaker (Insulin pulsatility matters) at Endocrine Society Annual Meeting, San Francisco, CA. (2013)
"*Gap junction communication and coordination of pulsatile activity*"

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Award speaker (Young Fluorescence Investigator) at Biophysical Society Annual Meeting, Biological Fluorescence Subgroup, Baltimore, MD. (2015).
"*Probing the coordinated dynamics of insulin secretion with fluorescence microscopy*"

Invited symposium speaker (New Imaging Approaches to Assess Functional Beta-Cell Characteristics) at American Diabetes Association Scientific Sessions, New Orleans, LA. (2016)
"*Characterizing beta cell heterogeneity and dysfunction using optogenetics*"

Invited symposium speaker (Emerging Diabetes Technologies & Beta Cell Biology) at The Carousel of Hope Symposium, Beverly Hills, CA. (2016)
"*Intra-islet Regulation of Insulin Secretion*"

Invited symposium speaker at The Islet Society 2019, Maribor, Slovenia. (2019)
"*Functional Roles for Islet Heterogeneity and Electrical Communication*"
(note: a postdoc in my lab, Vira Kravets, spoke in my place)

Invited symposium speaker (From Gene to Cell to Micro-Organ) at The Keystone Symposia: Islet Biology, Sante Fe, NM. (2020)
"*Imaging Islet Heterogeneity and Connectivity*"

Invited symposium speaker (Imaging the Pancreas in Diabetes, Cancer and Pancreas Disease Research) at NIH: NIDDK, Bethesda, MD. (2020)
"*Cell-cell communication-channels in islet cell interactions*"

Invited symposium speaker (3rd IPITA/JDRF/HSCI Stem Cell-derived Beta Cell Conference) at Harvard Medical School, Boston, MA. (2020) {Remote due to Coronavirus pandemic}
"*Mapping Endocrine Cell Heterogeneity and Cross Talk Within the Human Islet*"

Invited symposium speaker (The Islet under Duress in Type 1 Diabetes) at American Diabetes Association Scientific Sessions, Chicago, IL. (2020) {Remote due to Coronavirus pandemic}
"*Novel Imaging Techniques to Detect Islet Inflammation*"

Invited symposium speaker (Islet Microenvironment) at NIDDK-CIHR Diabetes Symposium, Heterogeneity of Diabetes: Beta Cells, Phenotypes and Precision Medicine. Remote (2021) {Remote due to Coronavirus pandemic}
"*Human intra-islet cell crosstalk and heterogeneity*"

Invited symposium speaker (nPOD slice working group) at nPOD annual meeting, Atlantic Beach FL. (2022)
"*Characterizing endocrine cell cross-talk in human islets inn situ during the progression of type1 diabetes*"

Invited symposium speaker (Recent Developments in Medical Ultrasound) at Acoustical Society of America, Denver CO. (2022)
"*Ultrasound Phase-change Contrast Agents to Guide Therapeutic Intervention in Type1 Diabetes*"

Invited symposium speaker (Functional Imaging of the Pancreas) at Rachmiel Levine-Arthur Riggs Diabetes Research Symposium, Pasadena CA. (2022)
"*Beta cell functional heterogeneity*"

Invited symposium speaker (Novel Imaging Techniques) at nPOD annual meeting, Fernandina Beach, FL. (2023)
"*Contrast-enhanced ultrasound Imaging to track islet vascular remodeling and type1 diabetes progression*"

Teaching record

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Courses taught (University of Colorado 2011-present):

2012-2020 BIOE5053 "Optics and Microscopy in Biomedical Research" UG/Grad, 3 credit hours.
Sole Instructor, elective, newly developed by Benninger in 2012, cross-listed in 2015.

2012-2014 BIOE5030 "Technology for Bioengineers core" Grad, 3 credit hours
Co-Instructor, core, significantly modified by Benninger in 2012.

2014-2016 BIOE5011 "Systems Physiology for Bioengineers" Grad, 3 credit hours
Co-Instructor, core, significantly modified by Benninger in 2014.

2015-2022 BIOE3040 "Physiology for Bioengineers" UG, 3 credit hours
Sole Instructor, core, newly developed by Benninger in 2015.

2020-present BIOE5010 "Cell and Molecular Biology for Bioengineers" Grad, 3 credit hours
Sole Instructor, core, newly developed by Benninger in 2020.

2022-present BIOE5420-3 "Bioengineering and Diabetes" Grad, 1 credit hours
Sole Instructor, special topics elective, newly developed by Benninger in 2022.

Other teaching activities (University of Colorado 2011-present):

2012-present Literature discussion group leader, Biomedical Sciences Program

2021-present Literature discussion group leader, MSTP Molecules to Medicine Course

Other teaching activities (Vanderbilt University 2009-2011):

2009 2 guest lectures in Spectroscopy class (graduate), Department of Chemistry

2009-2010 Literature discussion group leader, Interdisciplinary Graduate Program

2010-2011 Literature discussion group leader, Chemical and Physical Biology program

2011 1 guest lecture in Molecular Endocrinology class, Interdisciplinary Graduate Program

2011 2 guest lectures in Imaging methods class, Program in Cell Biology

Mentoring

Program membership:

Bioengineering Graduate program; Integrated Physiology graduate program (IPHY); Cell biology, Stem cells and Development graduate program (CSD); Biomedical Sciences graduate program (BSP); Medical Scientist Training program (MSTP).

PhD students:

Matthew J. Westacott, PhD (2012-2017, Bioengineering)
Thesis: "Regulation of coupled β-cell electrical dynamics"
Current position: Staff scientist/bioinformatician at SomaLogic Inc

- *Awarded NIH/NIDDK F31 fellowship (Score 10)*
- *'Best thesis' 2017-2018, University of Colorado Denver | Anschutz medical campus*
- *Author on 7 peer-reviewed publications (3 as first author)*

David G. Ramirez, PhD (2015-2021, Bioengineering)
Thesis: "Contrast-enhanced ultrasound to assess insulitis and β-cell mass decline in type 1 diabetes"
Current position: Postdoc fellow at University of Colorado Anschutz medical campus.

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- *Awarded NIH/NIDDK F31 fellowship (Score 13)*
- *Bioengineering department outstanding PhD student award 2020.*
- *Author on 9 peer-reviewed publication (2 as first author)*

JaeAnn M. Dwulet, PhD (2016-2022, Bioengineering)
Thesis: "How β-cell heterogeneity impacts islet function under gap junction communication"
Current position**:** Postdoc fellow a Technical University Munich.

- *Awarded NIH/NIDDK F31 fellowship (Score 20)*
- *Bioengineering department outstanding PhD student award 2021.*
- *Author on 8 peer-reviewed publications (2 as first author), 1 manuscript in preparation*

Mark Ciccaglione (2019-present, Bioengineering)
Project: "Submicron ultrasound contrast agents as diagnostic agents and therapeutic vehicles in type 1 diabetes."

- *Awarded a TL1 studentship from CCTSI CTSA*
- *Awarded NIH/NIDDK F31 fellowship (Score 18)*
- *Author on 2 peer-reviewed publication, 2 manuscripts in preparation (first author).*

Jennifer K Briggs (2020-present, Bioengineering)
Project: "Investigating Neurological Injuries and Diabetes from a Temporal Complexity Theory Perspective"

- *Awarded a NSF GRFP fellowship*
- *Author on 3 peer-reviewed publication (1 as first author), 1 manuscript in preparation (first author).*

Claire H Levitt (2021-present, Bioengineering)
Project: "Tissue models to assess gap junction coordination of human islet endocrine cell function."

- *Author on 1 peer-reviewed publication, 1 manuscript in submission (first author).*

Evelyn Ibarra (2023-present, Bioengineering)

Katie HartMoore (2023-present, Bioengineering)

<u>MS students:</u>

Thomas Hraha (2011-2013, Bioengineering)

- *RACAS outstanding graduate research award.*
- *Bioengineering department outstanding graduate student award 2013.*
- *Author on 4 peer-reviewed publications (2 as first author)*

Chris Wilson (2012-2014 , Bioengineering)

Alireza Hemmati (2013-2016, Bioengineering)

- *Author on 2 peer-reviewed publications*

Aleena Notary (2013-2015, Bioengineering)

- *Author on 2 peer-reviewed publication (1 as first author)*

Nurin Ludin (2015-2017, Bioengineering)

- *Author on 2 peer-reviewed publication (1 as co-first author)*

Vinh Pham (2017-2020, Bioengineering)

- *Author on 3 peer-reviewed publication (1 as first author)*

Dominic Isaacs (2018-2020, Bioengineering)

- *Author on 1 manuscript in submission*

Anna Davis (2018-2021, Bioengineering)

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- *Author on 1 peer-reviewed publication*

Andrea Laurin (2022-2023, Bioengineering)
- *Author on 1 manuscript in preparation*

Postdoctoral fellows:

Nikki L Farnsworth, PhD (2012-2019, Barbara Davis center)
Project: "Mechanisms of islet gap junction dysregulation in diabetes; PKCdelta in β-cell apoptosis"
Current Position: Assistant Professor (tenure track) Colorado School of Mines
- *Awarded NIH/NIDDK F32 fellowship (Score 10)*
- *Awarded JDRF Advanced Postdoc Fellowship*
- *Bioengineering department outstanding postdoc award 2014.*
- *Author on 7 peer-reviewed publications (5 as first author), 1 manuscript in submission (first author)*

Joshua St.Clair, PhD (2015-2017, Department of Bioengineering)
Project: "Contrast enhanced ultrasound measurement of pancreas perfusion dynamics during T1D; Regulation of islet gap junction coupling"
Current Position: Director of Medical Affairs, Cardiovascular and Metabolic Diseases at Astrazeneca/MedImmune
- *Awarded an F32 from NIH/NIDDK (Score 19)*
- *Author on 3 peer-reviewed publication (2 as first author), 1 manuscript in submission (first author)*

Jose G Miranda, PhD (2016-2023, Department of Bioengineering)
Project: "Dynamics of electrical activity regulating CaN-NFAT signaling and gene expression"
Current Position: Research Instructor at University of Colorado Anschutz medical campu
- *Author on 3 peer-reviewed publication (1 as first author), 1 manuscript in submission*

Vira Kravets, PhD (2017-2022, Department of Bioengineering)
Project: "Beta cell heterogeneity and functional networks driving islet function"
Current Position: Assistant Professor (tenure track) University of California San Diego
- *Awarded JDRF Postdoc Fellowship*
- *Awarded HIRN Emerging Leaders in T1D funding*
- *Awarded Burrough's Welcome Fund, Career Award at Scientific Interface*
- *Bioengineering department outstanding postdoc award 2020.*
- *Author on 6 peer-reviewed publications (1 as first author), 2 manuscripts in preparation (first author)*

Kelly Vazquez, PhD (2022-2023, Barbara Davis center)
Project: "Biomechanical signaling influencing β-cell function and maturity"
Current Position: Assistant Professor (tenure track) Wheaton College
- *Awarded BDC Acorn fellowship*
- *Awarded NIH supplement*
- *Author on 1 manuscript in preparation (first author)*

Anne Gresch, PhD (2023-present, Department of Bioengineering)
Project: "Temporal stability of β-cell heterogeneity and coordination"
- *Author on 1 peer-reviewed publication, 1 manuscript in submission (first author)*

Thesis committees (PhD candidates):

Gregory Futia, Bioengineering [PI: Emily Gibson] *Committee chair* (2012-2017)
Tina Govindarajan, Bioengineering [PI: Robin Shandas] (2012-2019)
Amin Famili, Bioengineering [PI: Daewon Park] *Committee chair* (2013-2014)

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Hans Andersen, Bioengineering [PI: Richard Weir] *Committee chair* (2013-2017)
Arjun Fontaine, Bioengineering [PI: Richard Weir] *Committee chair* (2013-2017)
Mason McClatchey, Bioengineering [PI: Jane Reusch] (2013-2017)
Kelly Shekiro, Chemical and Biological Engineering [PI: Kristi Anseth] (2013-2020)
Abena Watson-Siriboe, Integrative Biology [PI: Jefferson Knight] (2014-2015)
Baris Ozbay, Bioengineering [PI: Emily Gibson] *Committee chair* (2014-2017)
Jennifer Wagner, Bioengineering [PI: Kendall Hunter] (2014-2021)
Laura Elson, Bioengineering [PI: Richard Weir] *Committee chair* (2015-2018)
Robert Hefferen, Bioengineering [PI: Emily Gibson] *Committee chair* (2016-2018)
Braxton Jamison, Integrated Immunology [PI: Katy Haskins] (2016-2020)
Shelly Jones, Neuroscience [PI: Nathan Schoppa, Joel Zylberberg] (2017-2020)
Alexandra Theis, Cell Biology, Stem Cell and Development [PI: Lori Sussel] (2018-2022)
Ali Shilleh, Cell Biology, Stem Cell and Development [PI: Holger Russ] *Committee chair* (2019-2022)
Roberto Castro-Gutierrez, Molecular Biology [PI: Holger Russ] (2019-2022)
Kinga Suba, Endocrinology & Metabolism (Imperial College London) [PI: Victoria Salem] (2020)
Elliott Brooks, Cell Biology, Stem Cell and Development [PI: Lori Sussel] (2020-present)
Dylan Sarbaugh, Molecular Biology [PI: Lori Sussel] (2021-present)
James Delisio, Integrated Immunology [PI: Katy Haskins] (2022-present)
Chris Schaaf, Cell Biology, Stem Cell and Development [PI: Lori Sussel] (2023-present)
Mikaela Follmer, Cell Biology, Stem Cell and Development [PI: Emily Bates] (2023-present)
Madison Rodriguez, Pharmacology [PI: Emily Bates] (2023-present)

Undergraduate students:

Amy Nguyen (2012) - *NIDDK summer internship in diabetes research*

Rachelle Walter (2014-2017)
- *Awarded a American Physiological society summer research fellowship*
- *Second author on 1 peer-reviewed publication*

Dan Pham (2015) - *Children's Hospital Colorado Summer Child Health Research Internship*

Kelly Stanek (2016) - *Children's Hospital Colorado Summer Child Health Research Internship*

Samantha Passman (2016-2018)
- *Author on 2 peer-reviewed publications*
- *Recipient of UROP grant award*
- *Outstanding undergraduate student award (2018)*

Michaela Pott (2017-2018)
- *Outstanding undergraduate student award*

Manal Yunes (2019) - *Biological Sciences Initiative award*

Layla Bitar (2021-2022)

Sarah Keller (2022-present) - *SRTP summer student*

Devon Horton (2022-present)

Vincent Afetse (2023-present) - *SRTP summer student*

Grant support

Active Research Funding:

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R01 DK102950 07/2015 – 02/2025
NIH/NIDDK
"*Gap Junction Communication and Islet Function in Diabetes*"
Role: Principal Investigator
250,000 USD/year direct costs, current year

R01 DK106412 07/2015 – 04/2025
NIH/NIDDK
"*Emergent multi-cellular properties regulating pancreatic islet function*"
Role: Principal Investigator
260,200 USD/year direct costs, current year

P30 DK116073 (core 2) 04/2020 – 03/2025
NIH/NIDDK
"Cell and tissue analysis core"
Role: Principal Investigator (Core director)
120,000 USD/year direct costs

T32 DK120520 07/2020 – 06/2025
NIH/NIDDK
"Interdisciplinary Bioengineering Research Training in Diabetes"
Role: Program Director
222,064 USD/year direct costs

11-22-ICTSPM-02 11/2022 – 10/2025
American Diabetes Association
"Contrast enhanced ultrasound imaging of pancreas microvascular function to track type1 diabetes"
Role: Principal Investigator
199,143 USD/year direct costs, current year

3-SRA-2023-1365-S-B 04/2023 – 03/2026
Juvenile Diabetes Research Foundation
"Development of a safe and effective islet-targeted nanoplasmid based CXCL12 gene delivery system using cationic nanobubble-mediated sonotransfection to restore and immune protect the residual beta cell mass in T1D"
Role: Sub-contract PI
298,027 USD/year direct costs, current year (48,145 USD/year for subcontract)

Completed Research Funding:

nPOD slice subaward 01/2020 – 12/2021
The Helmsley Charitable Trust (nPOD, University of Miami)
"*Characterizing endocrine cell cross talk in human islets insitu during T1D*"
Role: Principal Investigator (subaward)
$32,596 USD/year direct costs

JDRF 1-INO-2019-783-S-B 06/2019 – 04/2021
Juvenile Diabetes Research Foundation
"Image-guided therapeutic targeting the islet microenvironment"
Role: Principal Investigator
136,362 USD/year direct costs

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JDRF 5-CDA-2014-198-A-N 06/2014 – 05/2019
Juvenile Diabetes Research Foundation
"*Interactions between islet function and beta cell autoimmunity during the pathogenesis of type1 diabetes*"
Role: Principal Investigator
136,363 USD/year direct costs

JDRF 1-INO-2017-435-A-N 06/2017 – 03/2019
Juvenile Diabetes Research Foundation
"Non-invasive imaging of pancreas blood flow redistribution to assess insulitis and islet decline in type1 diabetes"
Role: Principal Investigator
100,000 USD/year direct costs

OT2 OD023852 09/2016 – 07/2018
NIH/OD (SPARC)
"*Development of a Bidirectional Optogenetic Minimally Invasive Peripheral Nerve Interface with Single Axon Read-in & Read-out Specificity*"
Role: Co Investigator
328,802 USD/year direct costs {*subject to increase or decrease with milestones*}

U01 AI101990 subaward 04/2015 – 10/2016
Cooperative Study Group for Autoimmune Disease Prevention (Benaroya Research Institute)
"*Non-invasive imaging of islet vascular dysfunction associated with the progression of type 1 diabetes*"
Role: Principal Investigator (subaward)
72,495 USD/year direct costs

JDRF 47-2014-1 11/2013 – 04/2015
Juvenile Diabetes Research Foundation
"*Mapping the histopathological landscape of type 1 diabetes: a pilot study*"
Role: Co-Principal Investigator
136,113 USD/year direct costs (between 3 investigators)

R00 DK085145 09/2011– 08/2014
NIH/NIDDK
"*Multi-cellular interactions and dynamics underlying islet function*"
Role: Principal Investigator
233,189 USD/year direct costs

S10 OD016257 07/2013 – 07/2014
NIH/NIDDK
"*Zeiss 2-photon (2P) LSM780 laser scanning confocal microscope*"
Role: Co-Principal Investigator / Principal Investigator
594,525 USD/year direct costs

U24 DK076169 subaward 10/2010 – 09/2011
MMPC MicroMouse program (Georgia Health Science University)
"*β-cell gap-junctional coupling effects on plasma insulin oscillations*"
Role: Principal Investigator (subaward)
35,528 USD/year direct costs

K99 DK085145 09/2009 – 08/2011
NIH/NIDDK
"*Multi-cellular interactions and dynamics underlying islet function*"
Role: Principal Investigator
88,776 USD/year direct costs

Active and Completed Mentored grants:

F31 DK126360 06/2023 – 05/2025
NIH/NIDDK
"*Submicron ultrasound contrast agents as diagnostic agents and therapeutic vehicles in type 1 diabetes*"
Role: Primary Mentor (Mark Ciccaglione PI)
47,694 USD/year direct costs

CASI 25B1756 03/2022 – 02/2027
Burrough's Welcome Fund – Career Award at Scientific Interface
"*Beta cell networks and neural interactions in healthy and diabetic conditions*"
Role: Primary Mentor (Vira Kravets PI)
500,000 USD total direct costs

UC24 DK104162 03/2021 – 02/2023
NIH/NIDDK (HIRN – Emerging Leaders in T1D, City of Hope)
"*Beta-cell 1st responders and functional networks in healthy and diabetic human islets*"
Role: Primary Mentor (Vira Kravets PI)
110,000 USD total direct costs

DGE-1938058 09/2021 – 08/2024
NSF – Graduate Research fellowship Program
"*Imaging and theoretical approaches to understand emergent and adaptive properties of heterogeneous multi-cellular systems*"
Role: Primary Mentor (Jennifer Briggs PI)
46,000 USD/year direct costs

F31 DK126360 09/2020 – 08/2022
NIH/NIDDK
"*How Human Beta Cell Heterogeneity Impacts Islet Function*"
Role: Primary Mentor (JaeAnn Dwulet PI)
45,520 USD/year direct costs

F31 DK121488 07/2019 – 06/2021
NIH/NIDDK
"*Contrast Enhanced Ultrasound with Submicron Nanobubble Contrast Agent Detects Diabetes Progression in Mouse Models of Type 1 Diabetes*"
Role: Primary Mentor (David Ramirez PI)
38,016 USD/year direct costs

JDRF 3-APF-2019-749-A-N 03/2019 – 022022
Juvenile Diabetes Research Foundation

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"The Role of Protein Kinase C delta and Extracellular Matrix Interactions in Mediating Beta Cell Decline in Type 1 Diabetes"
Role: Primary Mentor (Nikki Farnsworth PI)
284,308 USD/year direct costs

JDRF 3-PDF-2019-741-A-N 03/2019 – 02/2022
Juvenile Diabetes Research Foundation
"Beta cell heterogeneity under diabetic conditions in human islets in situ"
Role: Primary Mentor (Vira Kravets PI)
177,876 USD/year direct costs

F32 DK112525 12/2016 – 05/2018
NIH/NIDDK
"*The role of gap junction coupling in regulating islet dysfunction in type2 diabetes*"
Role: Primary Mentor (Josh St Clair PI)
54,294 USD/year direct costs

F31 DK107043 08/2016 – 07/2017
NIH/NIDDK
"*Examination of Functional Subpopulations in the Islet of Langerhans Using Optogenetics*"
Role: Primary Mentor (Matthew Westacott PI)
34,776 USD/year direct costs

F32 DK102276 09/2014 – 08/2017
NIH/NIDDK
"*Regulation of islet gap junction coupling and function under inflammatory conditions*"
Role: Primary Mentor (Nikki Farnsworth PI)
53,282 USD/year direct costs

Internal competitive funding:

AB Nexus Existing Collaboration Award 07/2021 – 06/2022
AB Nexus
"*Molecular targeting Phase-Change Ultrasound Contrast agents for Early Diagnosis and Guided Treatment of Type 1 Diabetes*"
Role: Joint Principal Investigator
125,000 USD/year direct costs

Novel Clinical-Translational Methods 05/2013 – 04/2014
NIH CTSA (CCTSI)
"*Multi-parameter quantitative analysis of cellular populations in-situ*"
Role: Principal Investigator
25,000 USD/year direct costs

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Peer-Reviewed Review Articles:

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