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EDUCATION

- PhD** University of Utah, 2007, Biochemistry
Dissertation: Ceramide Synthesis is Essential for Glucocorticoid-, Saturated Fat- and Obesity-Induced Insulin Resistance
Dissertation Committee: Scott Summers (Chair), Don McClain, E. Dale Abel, Jared Rutter, and Matt Topham
- MS** Colorado State University, 2004, Biochemistry.
- MA** University of Colorado at Denver and Health Sciences Center, 2002, Biology
Thesis: Metformin Inhibits Tyrosine Phosphatase Activity to Stimulate the Insulin Receptor Tyrosine Kinase
Thesis Committee: Brad Stith (Chair), Martin Gonzales, and Dave Albeck
- BA** University of Colorado; 2000, Biology
- BS** University of Colorado; 2000, Psychology
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EMPLOYMENT

Faculty Positions

- Associate Professor, Department of Nutrition and Integrative Physiology,
University of Utah College of Health 2021-Present
- Director of Postdoctoral Studies, University of Utah College of Health
& University of Utah Molecular Medicine Program 2021-Present
- Assistant Professor, Department of Nutrition and Integrative Physiology,
University of Utah College of Health 2018-2021
- Adjunct Assistant Professor, Department of Internal Medicine,
Touchstone Diabetes Center 2018-2021
- Assistant Professor, Department of Internal Medicine, Touchstone
Diabetes Center 2013-2018
- Instructor, Department of Internal Medicine, Touchstone Diabetes Center,
UT Southwestern Medical Center 2012-2013
- Assistant Instructor, Department of Internal Medicine, Touchstone Diabetes Center,
UT Southwestern Medical Center 2011-2012

Postdoctoral Training

Department of Internal Medicine, Touchstone Diabetes Center, UT Southwestern

Medical Center (Mentor: Philipp Scherer)	2008-2011
Department of Internal Medicine, Division of Endocrinology Diabetes and Metabolism, University of Utah (Mentor: Scott Summers)	2007-2008
<u>Visiting Research Fellow</u>	
Garvan Institute of Medical Research, Darlinghurst, Sydney, Australia (Mentors: Greg Cooney & Ted Kraegen)	2005
<u>Graduate Research Assistant</u>	
Department of Biochemistry, University of Utah,	2004-present
Department of Biochemistry, Colorado State University,	2002-2004
Department of Biology, University of Colorado at Denver	2000-2002
<u>Professional Research Assistant</u>	
Department of Biology, University of Colorado at Denver	2001-2002
<u>Undergraduate Research Assistant</u>	
Department of Biology, University of Colorado at Denver	1999-2000

HONORS, AWARDS, & LEADERSHIP

College of Health Pilot Award	2021
Margolis Foundation Research Award	2021
Juvenile Diabetes Research Foundation: Summer of Love Research Fund	2020
Helmholtz Young Investigator in Diabetes (HeIDI) Nomination, Munich Germany	2020
College of Health New Investigator Award	2019
University of Utah: Celebrate U	2019
University of Utah: Vitae Talk	2018
Travel Scholarship, Gordon Research Conference, Galveston TX	2018
Biochemical Journal Junior Investigator Award, Cashiers, NC	2016
Travel Scholarship, Gordon Research Conference, Il Ciocco, Italy	2016
Juvenile Diabetes Research Foundation Recognition Award, Dallas JDRF	2015
Grossman Award, UT Southwestern	2014
Keystone Symposia Scholarship, Keystone Symposia	2011
Finalist, Excellence in Postdoctoral Research Award, UT Southwestern	2011
Keystone Symposia Scholarship, Keystone Symposia	2007
Student Delegate, University of Utah, Department of Biochemistry	2004-2005
Outstanding Poster, University of Utah Biosciences Symposium	2004
Mauricio X. Zuber Memorial Award, Colorado State University	2004
Student Member, Graduate Affairs Committee, Colorado State University	2003-2004
Graduate Research Fellowship, Colorado State University	2002-2004
Graduate Student of the Year finalist, University of Colorado, Denver	2002
Travel Scholarship, Experimental Biology, Orlando	2001

RESEARCH EXPERIENCE

FUNDING

Pending

NIH: R01 Non-canonical role of GRK2 in mediating cardiac function PI: Priscila Sato, Drexel	2023-2028
NIH: R01 A novel role of cholesterol and SR-BI in adipocyte biology PI: Chieko Mineo, UT Southwestern	2023-2028
NIH: R01 The Role of Ceramides in HFpEF PIs: Scott Summers and Will Holland	2023-2028
NIH:R01 1R01 AG076748 Tissue senescence and age-associated metabolic dysfunction: the role of T cell mediated inflammation Role: Co-I, PI: Lesniewski (Priority Score 30, 13%)	2023-2028

Active

NIH: R01 Structural Insights to Insulin Receptor Ligands Role: Co-I, PI: Chris Hill, UofU Biochemistry	2022-2027
NIH: R01 The Role of Ceramides in the Pancreatic Beta Cell PIs: Scott Summers and Will Holland	2022-2027
NIH: R01DK112826 (PI, Holland) Glucagon Receptor Antagonism in Beta Cell Regeneration	2017-2026
NIH: R01DK128641 Genetic and Functional Analysis of Rapid Renal Decline in Diabetes; Role: Co-I, PI: Pezzolessi ADA 7-22-ICTSPM-24 (PI, Holland)	2021-2025
Leveraging the Genetics of Hyperceramidemia for Precision Therapy	2022-2025
NIH: R01 DK127979 Lands cycle and skeletal muscle insulin action Role: Co-I, PI: Katsu Funai	2022-2026

Previous Support

NIH: R01DK108833 Sphingolipid-Mediated Dysregulation of Glucose and Energy Homeostasis in the CNS	2016-2021
Driving Out Diabetes Pilot Grant: A dominant-negative mutation in Adiponectin	2020-2021
JDRF: Sponsored Research Agreement: Glucagon Receptor Antagonism in Beta Cell Survival and Proliferation 2-SRA-2016-149-Q-R	2016-2020
JDRF: Career Development Award: Sphingosine Kinases in Beta Cell Survival and Proliferation 5-CDA-2014-185-A-N	2014-2019
NIH: R00 Adiponectin Receptors and S1P Signaling in Beta Cell Survival and Proliferation. K00DK094973	2014-2017
NIH: R00 Metabolomics supplement R00DK094973-04S1	2016-2017
UT BRAIN Seed Grant	2015-2017
REMD Biotherapeutics: Tissue-Specific Improvements in Glucose uptake and Efflux in Response to REMD-477. SRA-107845	2015-2016
NIH: K99 Adiponectin Receptors and S1P Signaling in Beta Cell Survival and Proliferation. K99DK094973	2014-2016
AHA: Beginning Grant In Aid, Cardioprotective Effects of Adiponectin-Induced Ceramide Activity. BGIA8910006	2012-2014

NIH: Disability Supplement to PES, for Early Investigator 2011
NIH:(F32) National Research Service Award, Postdoctoral Fellowship 2009-2011
NIH:(T32) Taskforce for Obesity Research at Southwestern Fellowship 2008-2009
NIH: Disability Supplement to SAS, for Postdoctoral Scholar 2007
NSF East Asia and Pacific Summer Institute, Predoctoral Fellowship 2005
NIH National Research Service Award, Predoctoral Fellowship 2004-2007
Undergraduate Research Opportunities Program, Undergraduate Fellowship
2000

PUBLICATIONS

Student, Postdoctoral Fellow, URM trainee

Simeone CA, Wilkerson JL, Poss AM, Banks JA, Varre JV, Guevara JL, Hernandez EJ, Gorski B, Atkinson DL, Turapov T, Frodsham SG, Morales JCF, O'Neil K, Moore B, Yandell M, Summers SA, Krolewski AS, **Holland WL***, Pezzolesi MG*. A dominant negative ADIPOQ mutation in a diabetic family with renal disease, hypoadiponectinemia, and hyperceramidemia. * co-corresponding
NJP Genomic Medicine 7(1):43 (2022). PMID: 35869090

Poss AM, Krick B, Maschek JA, Haaland B, Cox JE, Karra P, Ibele AR, Hunt SC, Adams TD, **Holland WL**, Playdon MC, Summers SA. Following Roux-en-Y gastric bypass surgery, serum ceramides demarcate patients that will fail to achieve normoglycemia and diabetes remission.
Med 3(7):452-467 (2022). PMID: 35709767

Nicholson RJ, Norris MK, Poss AM, **Holland WL**, Summers SA. The Lard Works in Mysterious Ways: Ceramides in Nutrition-Linked Chronic Disease.
Annual Reviews in Nutrition. 42:115-144. (2022). PMID: 35584813

Castell AL, Vivoli A, Tippetts TS, Frayne IR, Angeles ZE, Moullé VS, Campbell SA, Ruiz M, Ghislain J, Des Rosiers C, **Holland WL**, Summers SA, Poitout V. Very-Long-Chain Unsaturated Sphingolipids Mediate Oleate-Induced Rat β -Cell Proliferation.
Diabetes. 71(6):1218-1232. (2022). PMID: 35287172

Varre JV, **Holland WL**, Summers SA. You aren't IMMUNE to the ceramides that accumulate in cardiometabolic disease.
Biochim Biophys Acta Mol Cell Biol Lipids. 1867(6):159125. (2022).

Tippetts TS, **Holland WL**, Summers SA. Cholesterol - the devil you know; ceramide - the devil you don't.
Trends in Pharmacological Sciences. 12(1):4829 (2021). PMID: 34750017

Ying L, Summers SA, and **Holland WL**. Gutting Out MYC to Lower Ceramides.
Nature Metabolism 3(7):890-891 (2021). PMID: 34211181

Castorena CM, Caron A, Michael NJ, Ahmed NI, Arnold AG, Lee J, Lee C, Limboy C, Tinajero AS, Granier M, Wang S, Horton JD, **Holland WL**, Lee S, Liu C, Fujikawa T, Elmquist JK. CB1Rs in VMH neurons regulate glucose homeostasis but not body weight.

Am J Physiology Endocrinology and Metabolism.321(1):E146-E155. (2021). PMID: 34097543

Montejano VG, Yang C, Hahner L, McAfee J, Johnson J, Holland W, Fernandez-Valdivia R, and Bickel P. Perilipin 5 links mitochondrial uncoupled respiration in brown fat to healthy white fat remodeling and systemic glucose tolerance.

Nature Communications (In Press)

Islam MT, Holland WL, and Lesniewski L. Multi-color fluorescence biosensors reveal a burning need for diversity in the single-cell metabolic landscape.

Trends in Endocrinology and Metabolism 32(8):537-539 (2021). PMID:33972177

Choi RH, Tatum SM, Symons JD, Summers SA, Holland WL. Ceramides and other sphingolipids as drivers of cardiovascular disease.

Nature Reviews Cardiology doi:10.1038/s41569-021-00536-1. (2021) PMID: 33772258

Nicholson RJ, Poss AM, Maschek JA, Cox JE, Hopkins PN, Hunt SC, Playdon MC, Holland WL, Summers SA. Characterizing a common CERS2 polymorphism in a mouse model of metabolic disease and in subjects from the Utah CAD Study.

Clinical Endocrinology and Metabolism 11:dgab155 (2021) PMID: 33705551

Wang MY, Dean ED, Quittner-Strom E, Zhu Y, Chowdhury KH, Zhang Z, Zhao S, Li N, Ye R, Lee Y, Zhang Y, Chen S, Yu X, Leonard DC, Poffenberger G, Dylen AV, McCorkle SK, Schlegel A, Sloop KW, Efanov AM, Gimeno RE, Scherer PE, Powers AC, Unger RH, Holland WL. Glucagon Blockade Restores Functional Beta Cell Mass in Type 1 Diabetic Mice and Enhances Function in Human Islets.

Proceedings of the National Academy of Sciences 118(9) e2022142118 (2021). PMID: PMC7936318

Ferrara PJ, Rong X, Maschek JA, Verkerke AR, Siripoksup P, Song H, Green TD, Krishnan KC, Johnson JM, Turk J, Houmard JA, Lusis AJ, Drummond MJ, McClung JM, Cox JE, Shaikh SR, Tontonoz P, Holland WL, Funai K. Lysophospholipid acylation modulates plasma membrane lipid organization and insulin sensitivity in skeletal muscle.

The Journal of Clinical Investigation. 131(8):135963 (2021). PMID: 33591957

Bhagirath Chaurasia, Li Ying, Chad Lamar Talbot, John Alan Maschek, James Cox, Edward H. Schuchman, Yoshio Hirabayashi, William L. Holland, Scott A. Summers. Ceramides are necessary and sufficient for diet-induced impairment of thermogenic adipocytes.

Molecular Metabolism 45: 101145 (2021) PMID:337807150

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Cell Metabolism 33(3):629-648 (2020) PMID: 33333007

Anderson AK, Lambert JM, Montefusco D, Tran BN, Roddy P, **Holland WL**, Cowart LA. Depletion of Adipocyte Sphingosine Kinase 1 Causes Cell Hypertrophy, Impaired Lipolysis and NAFLD.

Journal of Lipid Research (In Press). PMID: 32690594

Panic V, Pearson S, **Banks J**, **Tippetts TS**, **Velasco-Silva JN**, Lee S, **Simcox J.**, Geoghegan G, Bensard CL, van Ry T, **Holland WL**, Summers SA, Cox J, Ducker GS, Rutter J, Villanueva CJ. Mitochondrial Pyruvate Carrier is Required for Optimal Brown Fat Thermogenesis.

Elife 9:e52558 (2020). PMID: 32795388

Correnti J, Lin C, Brettschneider J, Kuriakose A, Jeon S, Sorletti E, Oranu A, Mclever-Jenkins D, Kanaz I, Buyco D, Saiman Y, Furth EE, Argemi J, Bataller R, **Holland WL**, Carr RM. Liver-Specific Ceramide Reduction Alleviates Steatosis and Insulin Resistance in Alcohol-Fed Mice.

Journal of Lipid Research 61(7):983-994 (2020). PMID: 32398264

Petrocelli JJ, **McKenzie AI**, **Mahmassani ZS**, **Reidy PT**, Stoddard GJ, **Poss AM**, **Holland WL**, Summers SA, Drummond MJ. Ceramide Biomarkers Predictive of Cardiovascular Disease Risk Increase in Healthy Older Adults After Bed Rest.

Journal of Gerontology: Biological Sciences 75(9):1663-1670 (2020). PMID: 32215553

Poss AM, Maschek JA, Cox JE, Hauner BJ, Hopkins PN, Hunt SS, Holland WL, Summers SA, Playdon MC. Machine Learning Reveals Serum Sphingolipids as Cholesterol-Independent Biomarkers of Coronary Artery Disease.

JCI 130(3):1363-1376 (2020). PMID: 31743112

Zheng N, **Karra P**, VandenBerg MA, Kim JH, Webber MJ, **Holland WL**, Chou DH. Synthesis and Characterization of an A6-A11 Methylene Thioacetal Human Insulin Analogue with Enhanced Stability.

Journal of Medicinal Chemistry 62(24):11437-11443 (2019). PMID: 31804076

Xiong X, Blakely A, **Karra P**, VandenBerg MA, Ghabash G, Whitby F, Zhang YW, Webber MJ, **Holland WL**, Hill CP, Chou DH. Novel four-disulfide insulin analog with high aggregation stability and potency.

Chemical Science 11(1):195-200 (2019). PMID: 31804076

Summers SA, **Chaurasia B**, **Holland WL**. Metabolic Messengers: Ceramides.

Nature Metabolism 1(12):1051-1058 (2019). PMID: 32694860

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Cell Reports 29(2):270-282 (2019). PMID: 31597091

Verkerke ARP, **Ferrara PJ**, Lin CT, Johnson JM, Ryan TE, Maschek JA, Eshima H, Paran CW, Laing BT, **Siripoksup P**, **Tippetts TS**, Wentzler EJ, Huang H, Spangenburg EE, Brault JJ, Villanueva CJ, Summers SA, **Holland WL**, Cox JE, Vance DE, Neuffer

PD, Funai K. Phospholipid Methylation Regulates Muscle Metabolic Rate through Ca²⁺ Transport Efficiency.

Nature Metabolism 1(9): 876-885 (2019). Cover Article

Karant S, Shaurasia B, **Bowman FM, Tippett TS, Holland WL**, Summers SA, Schlegel A. FOXN3 Controls Liver Glucose Metabolism by Regulating Gluconeogenic Substrate Selection.

Physiology Reports 7(18): e14238 (2019). PMID: 31552709

Poss AM, Holland WL, Summers SA. Risky Lipids: Refining the Ceramide Score that Measures Cardiovascular Health.

European Heart Journal (In Press) PMID: 313273070

Chaurasia B, Tippett TS, Mayoral Monibas R, Liu J, Li Y, Wang L, Wilkerson JL, **Sweeney CR, Pereira RF**, Sumida DH, Maschek JA, Cox JE, Kaddai V, Lancaster GI, Siddique MM, **Poss A, Pearson M**, Satapati S, Zhou H, McLaren DG, Previs SF, Chen Y, Qian Y, Petrov A, Wu M, Shen X, Yao J, Nunes CN, Howard AD, Wang L, Erion MD, Rutter J, **Holland WL**, Kelley DE, Summers SA. Targeting a Ceramide Double Bond improves Insulin Resistance and Hepatic Steatosis.

Science 365(6451):386-392 (2019). PMID: 31273070

Wilkerson JL, Summers SA, Holland WL. Listen to Your Heart When Ceramide's Calling for Higher Glucose.

EBioMedicine 41:3-4 (2019) PMID: 30738827

Katafuchi T., **Holland W.L.**, Kollipara R.K., Kittler R., Mangelsdorf D.J., Kliewer S.A. PPARgamma-K107 SUMOylation Regulates Insulin Sensitivity but Not Adiposity in Mice.

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Tippett T.S., Holland W.L., Summers S.A. The ceramide ratio: a predictor of cardiometabolic risk.

Cell Reports 24(2):312-319 (2018).

Chaurasia B, Holland WL, Summers SA. Does this Schlank Make Me Look Fat?

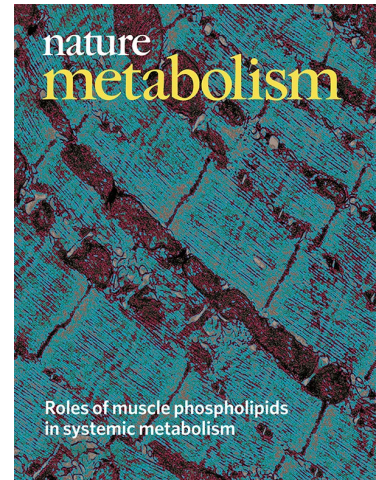
Trends Endocrinol Metab. 29(9):597-599 (2018).

Miller R.A., Shi Y., Lu W., Pirman D.A., Jatkar A., Blatnik M., Wu H., Cardenas C., Wan M., Foskett K., Park J.O., **Zhang Y., Holland W.L.**, Rabinowitz J.D., Birnbaum M.J. Targeting hepatic glutaminase activity to ameliorate hyperglycemia.

Nature Medicine 29(9):597-599 (2018).

Caron A., Dungan Lemko H.M., Castorena C.M., Fujikawa T., Lee S., Shao M., Vishvanath L., Busbuso N.C., Hepler C., Shan B., Sharma A.X., Chen S., Yu X., An Y.A., Zhu Y., Holland W.L., Gupta R.K. De novo adipocyte differentiation from PdgfrB+ preadipocytes protects against pathologic visceral adipose expansion in obesity.

Nature Communications 9(1):890 (2018).



Ye R., Gordillo R., Shao M., Onodera T., Chen Z., Chen S., Lin X., SoRelle JA, Li X., Tang M., Keller M.P., Kuliawat R., Attie A.D., Gupta R.K., **Holland W.L.**, Beutler B., Herz J., Scherer P.E. Intracellular lipid metabolism impairs B cell compensation during diet-induced obesity.

The Journal of Clinical Investigation 128(3): 1178-1189 (2018).

Sharma A.X., Quittner-Strom E.B., Lee Y., Johnson J.A., Martin S.A. Yu X., Li J., Lu J., Cai Z., Chen S., Wang MY, Zhang Y, Pearson MJ, Dorn AC, McDonald JG, Gordillo R, Yan H, Thai D, Wang ZV, Unger RH, **Holland WL**. Glucagon Receptor Antagonism Improves Glucose Metabolism and Cardiac Function by Promoting AMP-Mediated Protein Kinase in Diabetic Mice.

Cell Reports 22(7): 1760-1773 (2018).

Xia J.Y., Sun K., Hepler C., Ghaben A.L., Gupta R.K., An Y.A. **Holland W.L.**, Morley T.S., Adams A.C., Gordillo R., Kusminski C.M., Scherer P.E. Acute loss of adipose tissue-derived adiponectin triggers immediate metabolic deterioration in mice.

Diabetologia 61(4):932-941 (2018).

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The Journal of Clinical Investigation 128(1): 309-322 (2017).

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Cell Metabolism 26(5):709-718 (2017).

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AJP-Heart and Circulatory Physiology 313(6):1098-1108 (2017).

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Am J Physiology Renal Physiol 314(1):122-131 (2017).

Sharma A.X., **Holland W.L.**, Adiponectin and its Hydrolase-Activated Receptors.

J Nature Sci e396 (2017).

Hepler C., Shao M., Xia J.Y., Ghaben A.L., Pearson M.J., Vishvanath L., Sharma A.X., Morley T.S., **Holland W.L.**, Gupta R.K. Directing Visceral White Adipocyte Precursors to a Thermogenic Adipocyte Fate Improves Insulin Sensitivity in Obese Mice.

Elife e27669 (2017).

Holland W.L. and Scherer P.E. Receptors Grease the Metabolic Wheels.
Nature 544(7648):42-44 (2017).

Wang M.Y., Yu X., Lee Y., McCorkle S.K., Li J., Wang Z.V., Davidson J.A., Scherer P.E.,
Holland W.L., Unger R.H., Roth M.G. Dapagliflozin Suppresses Glucagon Signaling In
Rodent Models Of Diabetes
PNAS 114(25):6611-6616 (2017).

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Int J of Molecular Science 18(5):e1099 (2017).

Dean E.D., Unger R.H., and **Holland W.L.** Glucagon Antagonism in Islet Cell
Proliferation.
PNAS 114(12):3006-3008 (2017).

Tao C., **Holland W.L.**, Wang Q.A., Shao M., Jia L., Sun K., Lin X., Kuo Y., Johnson J.J.,
Gordillo R., Elmquist J.K., and Scherer P.E. Short-Term vs.
Long-Term Effects of Adipocyte Toll-like Receptor 4
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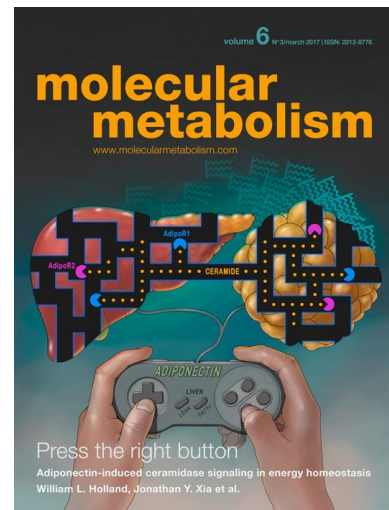
Holland W.L.*, Xia J.Y., Johnson J.A., Sun K., Pearson
M.J., Sharma A.X., Quittner-Strom E., Tippetts T.S.,
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Adiponectin Receptors Highlight the Roles of Adiponectin-
Induced Ceramidase Signaling in Lipid and Glucose
Homeostasis.

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***Corresponding Author.** Cover Article

Reviewed by: Reibe-Pal, S., and Febbraio M.A.
Adiponectin Serenades
Ceramidase to Improve Metabolism.

Molecular Metabolism 6(3):233-235 (2017).



Pearson M.J., Unger R.H., **Holland W.L.** Clinical Trials Triumphs Tributes and
Tribulations of Glucagon Receptor Antagonism.
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Johnson J.A., **Holland W.L.**, Kusminski C.M., Scherer P.E., Harris P.C., Trudel M.,
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Cell Metabolism 24(3):420-33 (2016).

Ding J., Xian X., **Holland W.L.**, Tsai S., Herz J. Low-density Lipoprotein Receptor-Related Protein-1 Protects Against Hepatic Insulin Resistance and Hepatic Steatosis. **eBioMedicine**. 7:135-145 (2016).

Amoasii L., **Holland W.L.**, Sanchez-Ortiz E., Baskin K.K., Pearson M.J., Burgess S.C., Nelson B.R., Bassel-Duby R., Olson E.N. A Med13-dependent skeletal muscle gene program controls systemic glucose homeostasis and hepatic metabolism.

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Cell Metabolism 23(6):1167-84 (2016).

Davidson J.A., **Holland W.L.**, Roth M.G., Wang M.Y., Lee Y., Yu X., McCorkle S.K., Scherer P.E., Unger R.H. Glucagon therapeutics, dawn of a new era for diabetes care.

Diabetes Metabolism Research Reviews (2016)

Wang Y., McNutt M.C., Banfib S., Levin M.G., **Holland W.L.**, Gusarova V., Gromada J., Cohen J.C., Hobbs H.H.

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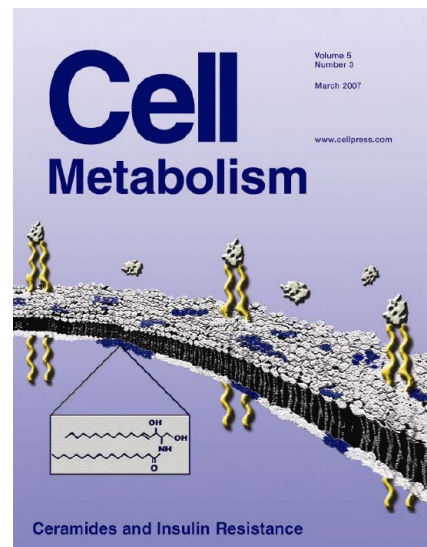
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Cover Article



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TEACHING EXPERIENCE

COURSES TAUGHT

University of Utah

NUIP 7975- Metabolic Basis of Disease Journal Club (Spring/Fall) 2022-Present

PhD students gain exposure to top research and methods in metabolism research. As a class, we will perform a detailed evaluation of top journal article in the broad field of metabolic disease. Dr. Holland and colleagues will supervise this journal-based course. Students will select a paper of their choice from: Cell, Nature, Science, Cell Metabolism, Nature Medicine, Nature Metabolism, or eLife from the last 3 years. Each week an assigned student will lead a discussion of their selected paper, its relevance to the field, and its relevance to their own research project. All students are required to read the paper in detail and be prepared to provide an overview of any figure. Key teaching points include technical pitfalls in experimental designs, addressing reviewer critiques, and how to overcome scientific pitfalls. *The key objective is to enhance the students ability to critically evaluate the literature, their own work, and the work of their colleagues.*

A highlight of this course is the opportunity to invite an author from the chosen paper, or an expert from the University of Utah to join our discussion via Zoom. Students are encouraged to use this as an opportunity to network as they identify future postdoctoral mentors. Recent guests include: Philipp Scherer, UT Southwestern; Kelly Drew, Alaska Fairbanks; Geraldine Maier, Salk; Melanie Gillingham, Oregon; Annarita DiLorenzo, Weil Cornell; Elizabeth Johnson, Cornell; Matt Merrins, Wisconsin; Claire Crewe, WUSTL; Joanne Cole, The Broad Institute; Natalia Harasymowicz, WUSTL; Sander Houten, Mount Sinai; John Albeck, UC Davis

NUIP- Graduate Journal Club, 1 credit (year round) 2018- 2022

This special topics NUIP 7960 course PhD students gained exposure to top research and methods in our field through the detailed evaluation of top journal articles in the broad field of metabolic disease. Dr. Holland and colleagues will supervise this journal-based course. Students will select a paper of their choice from: Cell, Nature, Science, Cell Metabolism, Nature Medicine, Nature Metabolism, or eLife from the last 3 years. Each week an assigned student will lead a discussion of their selected paper, its relevance to the field, and highlight 1 unique method from their chosen paper. All students are required to read the paper in detail and be prepared to provide an overview of any figure. *A highlight of this course is the opportunity to invite an author from the chosen paper, or an expert from the University of Utah to join our discussion via Zoom. Students are encouraged to use this as an opportunity to network as they identify future postdoctoral mentors. The key objective is to enhance the student's ability to critically evaluate the literature, their own work, and the work of their colleagues.*

** Notable outcome: Graduate students Torikul Islam, Shelby Hall and Rebecca Nicholson published preview articles which provide readers with a greater understanding of the impact and limitations of the journal club papers reviewed in class:

Islam MT, Holland WL, and Lesniewski L. Multi-color fluorescence biosensors reveal a burning need for diversity in the single-cell metabolic landscape. Trends in Endocrinology and Metabolism 32(8):537-539 (2021). PMID:33972177

Islam MT, Hall SA, Lesniewski LA. Chronic aerobic exercise: targeting two birds with one stone. Journal of Physiology 599(4):1015-1016 (2021). PMID: 33289103

Nicholson RJ, Ramkumar N, Summers SA. Gain of 'FAOnction', Loss of Fibrosis. Trends in Endocrinology and Metabolism 32(6):333-334 (2021). PMID:33773899

Macronutrient Metabolism (guest lecture glucagon) 2019-Current

The objective of this lecture is to provide students with an understanding of glucagon actions in normal physiology and the pathophysiology of diabetes. Key insights from current literature aid their understanding of current diabetes drugs, and the direction of the research field.

BIOC 6601 Regulation of Metabolism (guest lecture-glucagon) 2019- Current

The objective of this lecture is to enhance the student's understanding of the complex regulation of the endocrine pancreas that fine-tunes control of blood glucose. Key insights from current literature aid their understanding of novel factors governing the onset of diabetes

HLTH7890 American Professoriate (guest panelist-postdoctoral training) 2021- Current

The objective of this discussion is to enhance the student's understanding of what they should look for in a postdoctoral mentor, and to expose them to key training elements their postdoctoral mentors look for in their trainees. Key concepts include work/life balance, effective communication skills, and career development planning.

UT Southwestern Medical Center

IB Metabolism- Lipid Signaling and Insulin Resistance Lectures 3 credits (spring)	2014-2017
Cell and Molecular Biology- Metabolism Journal Club 1 credit (spring)	2014
Integrative Biology- Diabetes, Obesity and Homeostasis Journal Club 1 credit (fall and spring)	2016-2018

Graduate Teaching Assistant

Department of Biochemistry, Colorado State University Courses: Advanced Biochemistry Lab, Cell Biology Lab, and Developmental Biology Lab	2003-2004
Department of Biochemistry, University of Colorado at Denver Courses: Cellular Biology and Developmental Biology	2001-2002

TRAINING WORKSHOPS ORGANIZED

Utah Diabetes and Metabolism Research Center Recharge Nov 8-13 2021

I co-organized our week-long virtual retreat with Michelle Litchman. Our event included Keynotes from Barbara Kahn (BIDMC/Harvard), Corey Hood (Stanford), and plenary

sessions from Utah faculty. In addition to virtual poster sessions, we **organized daily career development workshops for Student/Postdoctoral trainees focused on:** academic career pathways, jobs outside the ivory tower, diversity in science, social media for scientists, career transitions, and in silico screening tools. Local and national experts were enlisted to lead discussions with trainees.

Utah Diabetes and Metabolism Research Retreat

2019-2020

I organized our annual retreat, including Keynotes from Barbara Kahn (BIDMC/Harvard), Corey Hood (Stanford), and plenary sessions from Utah faculty. In addition to virtual poster sessions, we **organized daily career development workshops for Student/Postdoctoral trainees focused on:** academic career pathways, jobs outside the ivory tower, diversity in science, social media for scientists, career transitions, and in silico screening tools.

Predocctoral Rising Stars in Metabolism

May 15-17, 2022

I organized and was awarded funding to host 5 graduate students from underrepresented backgrounds to present in an all day colloquium running in concert with Biochemistry and Neuroscience Rising stars. The three day visit was a successful recruiting venture, with two of these predoctoral trainees accepting postdoctoral training positions with DMRC faculty at the UofU. **Key career development opportunities were afforded to our local trainees** including: communication training from Brett Minsh on how to formulate an effective “elevator pitch”; David Perrin on the inner workings of Academia; and science marketing with Stellate Communications.

INVITED LECTURES

Indiana and Purdue Medical Center	2022
Gordon Conference, Lipidomics	2022
University of Wisconsin, Morgridge Metabolism Colloquium, Madison, WI	2021
Albert Einstein Diabetes & Metabolism Research Center NY, NY	2020
Mount Sinai Icahn Diabetes & Metabolism Research Center NY, NY	2020
FASEB Glucose Transporter Biology, Palm Springs, CA	2019
Helmholtz Diabetes Conference, Munich, Germany	2019
Gordon Conference, Glycolipid and Sphingolipid Biology, Galveston, TX	2018
Texas A&M University, College Station, TX	2017
FASEB Glucose Transporter Biology, Snowmass, CO	2017
University of Oklahoma Health Sciences Center, Oklahoma City, OK	2017
University of Utah, Seminars in Metabolism, SLC, UT	2017
Texas Tech Health Sciences Center, El Paso, TX	2016
Southeast Regional Lipid Conference, Cashiers, NC	2016
EASD-Hagedorn Oxford Workshop, Oxford, England	2016

Gordon Conference, Glycolipid and Sphingolipid Biology, Il Ciocco, Italy	2016
American Diabetes Association, 76 th annual sessions, New Orleans, LA	2016
Brigham Young University, Provo, UT	2016
Sanford Burnham, Translational Research Institute, Orlando, FL	2015
Merck Research Labs, Rahway, NJ	2015
Juvenile Diabetes Research Foundation, Annual Dallas Chapter Meeting	2015
University of Pennsylvania, Philadelphia, Institute for Diabetes, Obesity and Metabolism	2014
University of Alabama, Birmingham Alabama, Cellular and Molecular Pathology	2014
American Diabetes Association, 74 th annual Sessions, San Francisco, CA	2014
Gordon Conference, Glycolipid and sphingolipid biology, Ventura, CA	2014
University of Iowa, Iowa City, FOE Diabetes Research Center/Biochemistry	2013
University of California, San Diego, Pediatric Diabetes Research Center	2013
University of Virginia, Charlottesville, Department of Pharmacology	2013
University of Florida, Gainesville, Department of Pharmacology	2012
University of Utah, Department of Biochemistry	2012
University of Utah – Metabolic Signaling Symposium	2011
Eli Lilly and Company	2010
Duke University Medical Center, Stedman Nutrition and Metabolism Center	2010
University of Colorado, Denver, Department of Psychology	2004
University of Colorado, Denver, Department of Biology	2004
Support for Fellows (role: Sponsor)	
Joshua M. Johnson, NIH F30 1F30DK108534-01, Sphingolipid-mediated dysregulation of glucose and energy homeostasis by POMC neurons	2015-2019
Mackenzie J. Pearson, NIH T32 GM008203, Cell and Molecular Biology Training Grant	2014-2015
Mackenzie J. Pearson, Northwest Native American Research Center for Health	2015-2019
Ankit X. Sharma, American Heart Association 15UFEL25090280	2015
Tursun Turapov, Utah Undergraduate Research Opportunities program	2019, 2019
Joseph Wilkerson, NIH T32 DK091317, Interdisciplinary Training Program In Metabolism	2018-2021

MENTORING EXPERIENCE

Current Postdoctoral Fellows

Ran Hee Choi	2019-
Joseph Wilkerson (T32 Fellow)	2018-

Former Postdoctoral Fellows

Kamrul Chowdhury	2018-2022
Hatch Research Award recipient	2021
Currently: Research Scientist, Sumitomo Oncology	

Santhosh Karanth	2019-2021
Currently: Research Scientist, Scribe Therapeutics	
<i>Ray Joe</i>	2018-2019
Currently: Research Scientist, Sumitomo Oncology	
Peng Li	2018-2019
Currently: Chief of Cardiology, The Affiliated Hospital of Qingdao University	
Zhe Chen, PhD	2015-2017
Currently: Investigator, Future Pipeline Discovery, GSK	

Graduate Students

Mariah Stout, PhD student, NUIP	2021-
Joseph Vinod Varre, PhD student, NUIP	2020-
Marie Norris, PhD Candidate, NUIP	2020-
<i>Faith Bowman</i> , PhD Candidate, Biochemistry (NSF Fellow)	2019-
Sean Tatum, PhD Candidate, NUIP (T32 Fellow)	2019-
Rebekah Nicholson (T32 Fellow, F31 Fellow)	2019-

Former Graduate Students:

Joshua Johnson, PhD Integrative Biology UTSW (F30 Fellow)	2013-2017
<i>Mackenzie Pearson</i> , PhD Integrative Biology UTSW (T32 Fellow, NWNARCH Fellow)	2013-2017
Previously: Applications Support Scientist & North American Lead- Lipidomics Sciex	
Currently: Investigator, Eli Lilly and Company	
Yiyi Zhang, MS	2017-2018
<i>Trevor Tippetts</i> , PhD NUIP(T32 Fellow)	2018-2022
Currently, Postdoc DiBerardinis Lab UT Southwestern/HHMI	
Annelise Poss, PhD NUIP (T32 Fellow, F31 Fellow)	2018-2022
Currently, Postdoc Deb Muoio lab, Duke	

Undergraduate Premedical Students directly supervised (URM)

<i>Emmanuel Onyeagba</i> (UROP Fellow)	2021-
Kyle Harshany (UROP Fellow)	2021-
Calvin Coates (UROP Fellow)	2021-
<i>Darrien Smiley</i> (NARI Fellow)	2022
<i>Daniella Ramos</i> (GRSM Fellow)	2022
<i>Tyrell Natawa</i> (NARI Fellow)	2020
Tanho Warren (NARI Fellow)	2018
Tursun Turapov, weighing multiple acceptances	2018-2020
Ankit Sharma, Pitt MSTP class of ~2028	2013-2020
Ezekiel Quittner-Strom, UT San Antonio class of 2022	2016-2018
Andie Caroline Dorn, McGovern Medical School class of 2025	2016-2017
Esha Singhal, Texas Tech Class of 2022	2012, '15, '16

Zainib Fatama, UTSW class of 2021	2013
Andrew John, MD (Green Fellow) Indiana and Purdue class of 2020)	2014-2015
Scott Simpson MD, University of Utah	2007-2008
Steven Sharp MD, University of Colorado	2002
Erin Stauter, MD, University of Colorado	2001-2002

Undergraduate Researchers

Katherine Sargent (Varex Imaging)	2006-2008
<i>Vincent Tenorio</i> (2019 Masters in Environmental Management, Yale)	2010-2012
<i>Tyrell Natewa</i> (NARI Fellowship)	2018
Thayer McCollum (UROP Fellow)	2018-2022
Tursun Turapov (UROP Fellow)	2018-2020
<i>James Banks</i> (Askew Award winner)	2019-2022
Allanah Beasley	2019
Ankit Sharma (American Heart Association, Undergraduate Fellowship)	2013-2020

TRAINEE AWARDED FELLOWSHIPS (Mentored Awards)

Kyle Harshany, Utah Undergraduate Research Opportunities	2022
Emmanuel Onyeagba, Utah Undergraduate Research Opportunities	2022
Calvin Coates, Utah Undergraduate Research Opportunities	2022
Rebekah Nicholson F31	2023-2025
Annelise Poss, F31DK127603	2020-2022
Sean Tatum, T32DK1202142	2020-2022
Rebekah Nicholson, T32DK123452	2020-2022
Thayer McCollum, Utah Undergraduate Research Opportunities	2020-2022
Tursun Turapov, Utah Undergraduate Research Opportunities	2019-2020
Joseph L. Wilkerson, NIH 5T32DK091317	2019-2021
Joshua M. Johnson, NIH F30 1F30DK108534-01, Sphingolipid-mediated dysregulation of glucose and energy homeostasis by POMC neurons	2015-2019
<i>Mackenzie J. Pearson</i> , Northwest Native American Research Center for Health	2015-2019
NIH T32 GM008203	2014-2015
Ankit X. Sharma, American Heart Association 15UFEL25090280	2015

SERVICE

LEADERSHIP ROLES

Biosciences Program, Curriculum Committee	2020-current
Director of Postdoctoral Studies, UofU Molecular Medicine Program	2020-current
Director of Postdoctoral Studies, UofU College of Health	2020-current
Faculty Search Committee for Metabolism- Biochemistry, NUIP, Genetics	2019-2020
Oversight Committee, University of Utah Metabolomics Core	2018-current
Oversight Committee, University of Utah Metabolic Phenotyping Core	2018-current
Diabetes and Metabolism Research Center, Steering Committee	2018-current
Metabolic Phenotyping and Mass Spec Core Remodeling Committee	2017-2018
Director, Clamp Services, Metabolic Phenotyping Core UT Southwestern Medical Center	2013-2018
Diabetes and Metabolism Research Center, Retreat Planning Committee	2019
Diabetes and Metabolism Research Center, Chair Retreat Planning Committee	2020

PEER REVIEW OF GRANTS

NIH: DP-2 (Ad-hoc)	2021
NIH: DDK-B (review of T32, K01, and K99), Standing Member	2020-Present
NIH: Integrative Physiology of Diabetes (Ad-hoc)	2018
King Abdullah International Medical Research Center	2018
Juvenile Diabetes Research Foundation	2017-Current
Australian Diabetes Association	2018
American Diabetes Association, Standing Member	2014-Current
Co-Chair, Basic 2	2018-2019
Chair, Basic 2	2020-2023
Congressionally Directed Medical Research Programs: Diabetes	2014-Current
American Diabetes Association Fellowships	2013
Canadian Diabetes Association	2013