

Kevin G. Hicks, Ph.D.

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University of Utah School of Medicine
Department of Biochemistry

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Education

Ph.D. Microbiology University of Washington, Seattle	2015
B.Sc. Biology University of Oregon, Eugene	2008

Research Experience

Research Instructor University of Utah, Department of Biochemistry, Salt Lake City Project: Advance the MIDAS platform to characterize the human protein-metabolite interactome for improved understanding of human health and disease.	2021 – Current
Post-doc Research University of Utah, Department of Biochemistry, Salt Lake City Advisor: Jared Rutter, Ph.D. Project: Developed the MIDAS platform to discover protein-metabolite interactions. Determined the protein-metabolite interactome of human carbohydrate metabolism.	2016 – 2021
Ph.D. Research University of Washington, Department of Microbiology, Seattle Advisor: Samuel I. Miller, M.D. Project: Determined mechanisms by which a bacterial sensor kinase senses mammalian small molecules to coordinate intracellular virulence.	2008 – 2015
B.Sc. Research University of Oregon, Institute of Molecular Biology, Eugene Advisor: Karen Guillemin, Ph.D. Project: Determined mechanisms by which a bacterial chemoreceptor senses acidic pH and quorum-sensing molecules.	2007 – 2008

Consulting

Founding consultant Atavistik Bio https://atavistikbio.com/	2021 – Current
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Publications

Hicks KG, Cluntun AA, Schubert HL, Hackett SR, Berg JA, Leonard PG, Ajalla Aleixo MA, Zhou Y, Bott AJ, Salvatore SR, Chang F, Blevins A, Barta P, Tilley S, Leifer A, Guzman A, Arok A, Fogarty S, Winter JM, Ahn HC, Allen KN, Block S, Cardoso IA, Ding J, Dreveny I, Gasper WC, Ho Q, Matsuura A, Palladino MJ, Prajapati S, Sun P, Tittmann K, Tolan DR, Unterlass J, VanDemark AP, Vander Heiden MG, Webb BA, Yun CH, Zhao P, Wang B, Schopfer FJ, Hill CP, Nonato MC, Muller FL, Cox JE, Rutter J. [Protein-metabolite interactomics of carbohydrate metabolism reveal regulation of lactate dehydrogenase](#). *Science*. 2023 Mar 10;379(6636):996-1003. doi: 10.1126/science.abm3452. PubMed PMID: 36893255

Nielson JR, Nath AK, Doane KP, Shi X, Lee J, Tippetts EG, Saha K, Morningstar J, Hicks KG, Chan A, Zhao Y, Kelly A, Hendry-Hofer TB, Witeof A, Sips PY, Mahon S, Bebart VS, Davisson VJ, Boss GR, Rutter J, MacRae CA, Brenner

M, Gerszten RE, Peterson RT. [Glyoxylate protects against cyanide toxicity through metabolic modulation](#). *Sci Rep*. 2022 Mar 23;12(1):4982. doi: 10.1038/s41598-022-08803-y. PubMed PMID: 35322094.

Hao Q, Heo JM, Nocek BP, **Hicks KG**, Stoll VS, Remarcik C, Hackett S, LeBon L, Jain R, Eaton D, Rutter J, Wong YL, Sidrauski C. [Sugar phosphate activation of the stress sensor eIF2B](#). *Nat Commun*. 2021 Jun 8;12(1):3440. doi: 10.1038/s41467-021-23836-z. PubMed PMID: 34103529

Bezerra GA, Holenstein A, Foster WR, Xie B, **Hicks KG**, Burer C, Lutz S, Mukherjee A, Sarkar D, Bhattacharya D, Rutter J, Talukdar A, Brown PJ, Luo M, Shi L, Froese DS, Yue WW. [Identification of small molecule allosteric modulators of 5,10-methylenetetrahydrofolate reductase \(MTHFR\) by targeting its unique regulatory domain](#). *Biochimie*. 2021 Jan 18:S0300-9084(21)00009-2. doi: 10.1016/j.biochi.2021.01.007. PubMed PMID: 33476699.

Bezerra GA, Foster WR, Bailey HJ, **Hicks KG**, Sauer SW, Dimitrov B, McCorvie TJ, Okun JG, Rutter J, Kölker S, Yue WW. [Crystal structure and interaction studies of human DHTKD1 provide insight into a mitochondrial megacomplex in lysine catabolism](#). *IUCrJ*. 2020 Jun 10;7(Pt 4):693-706. doi: 10.1107/S205225252000696X. PubMed PMID: 32695416.

Hicks KG, Delbecq SP, Sancho-Vaello E, Blanc MP, Dove KK, Prost LR, Daley ME, Zeth K, Klevit RE, Miller SI. [Acidic pH and divalent cation sensing by PhoQ are dispensable for systemic salmonellae virulence](#). *Elife*. 2015 May 23;4:e06792. doi: 10.7554/eLife.06792. PubMed PMID: 26002083.

Goers Sweeney E, Henderson JN, Goers J, Wreden C, **Hicks KG**, Foster JK, Parthasarathy R, Remington SJ, Guillemin K. [Structure and proposed mechanism for the pH-sensing Helicobacter pylori chemoreceptor TlpB](#). *Structure*. 2012 Jul 3;20(7):1177-88. doi: 10.1016/j.str.2012.04.021. Epub 2012 Jun 14. PubMed PMID: 22705207.

Silverman JM, Austin LS, Hsu F, **Hicks KG**, Hood RD, Mougous JD. [Separate inputs modulate phosphorylation-dependent and -independent type VI secretion activation](#). *Mol Microbiol*. 2011 Dec;82(5):1277-90. doi: 10.1111/j.1365-2958.2011.07889.x. Epub 2011 Nov 4. PubMed PMID: 22017253.

Rader BA, Wreden C, **Hicks KG**, Sweeney EG, Ottemann KM, Guillemin K. [Helicobacter pylori perceives the quorum-sensing molecule AI-2 as a chemorepellent via the chemoreceptor TlpB](#). *Microbiology*. 2011 Sep;157(Pt 9):2445-2455. doi: 10.1099/mic.0.049353-0. Epub 2011 May 20. PubMed PMID: 21602215.

Hood RD, Singh P, Hsu F, Güvener T, Carl MA, Trinidad RR, Silverman JM, Ohlson BB, **Hicks KG**, Plemel RL, Li M, Schwarz S, Wang WY, Merz AJ, Goodlett DR, Mougous JD. [A type VI secretion system of Pseudomonas aeruginosa targets a toxin to bacteria](#). *Cell Host Microbe*. 2010 Jan 21;7(1):25-37. doi: 10.1016/j.chom.2009.12.007. PubMed PMID: 20114026.

Conference Presentations

Hicks KG. (2023) Protein-Metabolite Interactomics Reveals Regulation of Enzymes of Carbohydrate Metabolism by Long-chain Acyl-Coenzyme A. **Oral presentation**, American Society for Biochemistry and Molecular Biology, CoA and CoA-derivatives: From biochemistry and molecular biology to human diseases across lifespan, Madison, WI.

Hicks KG. (2023) Protein-Metabolite Interactomics of Carbohydrate Metabolism Reveals Regulation of Lactate Dehydrogenase. **Oral presentation**, Keystone Bioenergetics in Health and Diseases, Keystone, CO.

Hicks KG, Guzman A, Arok A, Leifer A, Rutter J. (2023) Protein-Metabolite Interactomics of Carbohydrate Metabolism Reveals Regulation of Glycerol 3-Phosphate Dehydrogenase. **Poster presentation**, Keystone Bioenergetics in Health and Diseases, Keystone, CO.

Hicks KG, Cluntun A, Berg J, Tilley S, Barta P, Blevins A, Schubert H, Hackett SR, Hill C, Cox JE, Rutter J. (2021) MIDAS: A Novel Platform for the Discovery of Protein-Metabolite Interactions. **Oral presentation**, Cold Spring Harbor Laboratories Mechanisms of Metabolic Signaling, virtual.

Hicks KG, Berg J, Cluntun A, Barta P, Blevins A, Schubert H, Hackett SR, Sabatini D, Hill C, Cox JE, Rutter J. (2021) MIDAS: A Systematic Approach for the Discovery of Protein-Metabolite Interactions. **Poster presentation**, Howard Hughes Medical Institute Metabolism and Disease conference, virtual.

Hicks KG. (2019) MIDAS: A Systematic Approach for the Discovery of Protein-Metabolite Interactions for Precision Medicine. **Oral Presentation**, STINT Conference, Lund, Sweden. Invitation. Dr. Carol Nilsson.

Hicks KG, Blevins A, Hackett SR, Cox JE, Rutter J. (2019) MIDAS: A Targeted Approach for the Systematic Discovery of Protein-Metabolite Interactions. **Poster presentation**, American Society for Mass Spectrometry, Atlanta, GA.

Hicks KG. (2014) Restricting conformational flexibility in the PhoQ sensor kinase separates pH and antimicrobial peptide recognition. **Oral Presentation**, Gordon Research Seminar, Microbial Toxins and Pathogenicity, Waterville Valley NH.

Hicks KG, Delbecq S, Sancho-Vaello E, Blanc MP, Dove KK, Prost LR, Daley ME, Zeth K, Klevit RE, Miller SI. (2014) Restricting conformational flexibility in the PhoQ sensor kinase separates pH and antimicrobial peptide recognition. **Poster presentation**, Gordon Research Conference, Microbial Toxins and Pathogenicity, Waterville Valley NH.

Hicks KG, Prost LR, Daley ME, Delbecq S, Klevit RE, Miller SI. (2011) The PhoQ sensor kinase is activated by acidic pH via structural destabilization of the periplasmic domain. **Poster presentation**, Cold Spring Harbor Laboratory, Microbial Pathogenesis & Host Response, Cold Spring Harbor, NY.

Guest Speaker

Hicks KG. (2019) MIDAS: A Systematic Approach for the Discovery of Protein-Metabolite Interactions. **Oral Presentation**, Structural Genomics Consortium and Target Discovery Institute, University of Oxford, Oxford, UK. Invitation: Dr. Wyatt Yue.

Ongoing Research Support

Center for Iron and Heme Disorders U54 Protein-Metabolite Discovery Core	Phillips (Director)	2021 – 2026
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The goal of this core is to provide protein-metabolite interactomic services in the form of MIDAS and non-enzymatic covalent modification proteomics for the CIHD community. I am responsible for the management, operation, execution, data collection and analysis for MIDAS related projects in this core.
Role: Co-director

Calico Life Sciences Systematic Discovery of Metabolite-Protein Interactions	Rutter (PI)	2021 – 2024
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The goal of this project is to develop a technological platform for the discovery of membrane protein-metabolite interactions. I am responsible for the design, management, operation, execution, data collection and analysis of this project.
Role: Project leader

Pfizer Pharmaceutical Company Discovery of Protein-Metabolite Interactions from Cell Lysate	Rutter (PI)	2020 – 2023
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The goal of this project is to develop a technological platform for discovery of protein-metabolome interactions using tissue extracts. I am responsible for the management, operation, execution, data collection and analysis of this project.
Role: Project leader

Completed Research Support

NextGen Award Huntsman Cancer Institute	Perovanovic/Hicks (PI)	2019 – 2020
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The goal of this postdoctoral project was to investigate the role of POU factors on metabolomic reprogramming during cell fate specification. I was responsible for the analysis and interpretation of metabolomics datasets for this project.
Role: Co-PI

T32 DK007115 NIH/NIDDK Research Training in Hematology	Leibold/Prchal (Directors)	2019 – 2020
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The goal of this postdoctoral T32 award was to identify the protein-metabolite interactome of the human heme biosynthetic pathway. I was responsible for the management, operation, execution, data collection and analysis of this project.
Role: Project leader

Calico Life Sciences Rutter (PI) 2016 – 2020
Systematic Discovery of Metabolite-Protein Interactions
The goal of this project was to develop a technological platform for the discovery of protein-metabolite interactions. I was responsible for the management, operation, execution, data collection and analysis of this project.
Role: Project leader

T32 DK091317 Fisher (Director) 2016 – 2018
NIH/NIDDK
Interdisciplinary Training Program in Metabolism
The goals of this postdoctoral T32 training award were to gain technical and analytical skills in mass spectrometry and metabolomics in order to develop a technological platform for the discovery of protein-metabolite interactions. I was responsible for the management, operation, execution, data collection and analysis of this project.
Role: Project leader

Academic Honors and Awards

University of Utah Innovation Impact award 2023

Neal B. Groman Award for Excellence in Teaching 2010

Teaching Experience

M431 Prokaryotic Recombinant DNA Techniques 2009
University of Washington, Department of Microbiology, Seattle

M402 Fundamentals of General Microbiology Laboratory 2009
University of Washington, Department of Microbiology, Seattle

BI330/331 Microbiology 2007 – 2008
University of Oregon, Department of Biology, Eugene

BI214 Biochemistry & Genetics 2006 – 2007
University of Oregon, Department of Biology, Eugene

References

Jared Rutter, Ph.D.

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Samuel I. Miller, M.D.

Professor of Allergy and Infectious Diseases, Microbiology, Genome Sciences, and Medicine
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Daniel Gottschling, Ph.D.

Distinguished Principal Investigator
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