

Josue Baeza, Ph.D.

Scientific Investigator

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Qualifications and Research Interests

Highly productive analytical biochemist scientist, with 10⁺ years in quantitative proteomics and protein biochemistry. A team player with strong leadership skills and a passion for mentoring. Biopharmaceutical experience focused on large molecule characterization for mid and late phase biopharm assets.

Technical Skills

Mass Spectrometry | Quantitative Proteomics | Data-independent acquisition (DIA) | Parallel reaction monitoring (PRM) | Data-dependent acquisition (DDA) | SILAC | pulsed-SILAC | TMT | Protein turnover | R | Bioconductor | Python | Machine Learning

Education

- 2011–2017 **Ph.D.**, *University of Wisconsin-Madison*, Madison, WI.
 - Mechanisms of mitochondrial protein acetylation
 - PI: John M. Denu
- 2008–2010 **B.S.**, *University of Texas Permian Basin*, Odessa, TX.
 - Purification of the human T-cell leukemia virus
 - PI: Tracie M. Gibson

Experience

Pharmaceutical

- 2021– **Investigator**, *GSK*, Philadelphia, PA.
- Present
 - Mass spectrometry characterization
 - Large molecule characterization for mid and late phase development
 - Host Cell Protein analysis
 - Bioreactor proteomics support for Upstream Development

Research

- 2021 **Johnson Foundation Fellow**, *Dept of Biochemistry & Biophysics*, University of Pennsylvania.
 - Investigating the mechanisms of protein homeostasis during aging
 - Managing a mass spectrometry facility

2017–2021 **Vice Provost Postdoctoral Fellow**, *Benjamin A. Garcia*, University of Pennsylvania.

- Investigating the cross talk between protein turnover and epigenetics
- Quantifying histone post-translational modifications in health and disease
- Developing mass spectrometry-based proteomics technologies
- Developing computational tools for mass spectrometry

2011–2017 **Graduate Research Assistant**, *John M. Denu*, University of Wisconsin-Madison.

- Thesis aimed at understanding the mechanisms of mitochondrial protein acetylation
- Developed a mass spectrometry-based method to quantify lysine acetylation stoichiometry
- Coupled in vitro biochemistry methods with high resolution mass spectrometry technologies
- Determined second order rate constants for non-enzymatic acetylation

Internships

2011 **INRO Postbaccalaureate Research Fellow**, *Shyam Kottlil*, National Institute of Allergy and Infectious Diseases.

- Determining genetic diversity of HCV genes in response to therapy

2010 **INRO Summer Internship Research Fellow**, *Shyam Kottlil*, National Institute of Allergy and Infectious Diseases.

- Determined cytokine gene expression in HIV/HCV coinfection cell system

2008–2010 **Undergraduate Research Assistant**, *Tracie M. Gibson*, University of Texas Permian Basin.

- Applied biochemical techniques to purify the human T-cell leukemia virus (HTLV)

Awards and Honors

- Dec 2023 Exceptional Analytical Recognition - Gold Award. GSK
- Dec 2022 Exceptional Analytical Recognition - Silver Award. GSK
- Jan 2021 Rising Stars in Proteomics and Metabolomics: 40 under 40. Journal of Proteome Research
- Jun 2019 ASMS Postdoctoral Career Development Award. American Society for Mass Spectrometry
- May 2018 May Institute Computation and Statistics for Mass Spectrometry and Proteomics. May Institute
- Apr 2017 UPenn Vice Provost Postdoctoral Fellowship for Academic Diversity. University of Pennsylvania
- Jan 2015 AAAS/Science Program for Excellence in Science. University of Wisconsin-Madison
- Jun 2014 Journal of Biological Chemistry (JBC) Author Profile. Journal of Biological Chemistry
- Jun 2014 Dept of Biological Chemistry Travel Award. University of Wisconsin-Madison
- Jun 2012 National Science Foundation (NSF) Graduate Research Fellowship (GRFP). National Science Foundation
- Jan 2012 Honorable Mention - The Why Files Cool Science Image <http://tinyurl.com/NeuroFlare>. University of Wisconsin-Madison
- Aug 2011 Molecular Biosciences Training Grant (NIH T32). University of Wisconsin-Madison
- Aug 2011 Science and Medicine Graduate Research Scholars Fellowship (SciMed GRS). University of Wisconsin-Madison
- Apr 2010 Xi Zeta Chapter Gamma Sigma Epsilon Chemistry Honor Society. University of Texas Permian Basin
- Feb 2010 National Institute of Allergy and Infectious Diseases (NIAID) Intramural Research Opportunities (INRO). National Institute of Allergy and Infectious Diseases
- Jun 2009 University of Texas Louis Stokes Alliance for Minority Participation (UT-LSAMP) Summer Research Academy. University of Texas Permian Basin

Academic Teaching

- 2019 **Epigenetics**, *University of Pennsylvania*, Philadelphia, PA.
- Guest Lecturer
 - Mass spectrometry analysis of histone proteins
- 2019 **Intro to R workshops**, *University of Pennsylvania*, Philadelphia, PA.
- Intro to R: Data wrangling and visualization
 - Ongoing workshops teaching basic R

- 2017–2019 **Introduction of Mass Spectrometry Based Proteomics**, *UPenn Epigenetics Institute*, Philadelphia, PA.
- Annual workshops organized by UPenn Epigenetics Institute
 - Teaching fundamentals of mass spectrometry
- 2017–2019 **Applied Proteomics**, *UPenn Epigenetics Institute*, Philadelphia, PA.
- Second series of workshops hosted by the Epigenetics Institute
 - overview of quantitative mass spectrometry
 - Experimental design and statistics
- 2014 **Introduction to Human Biochemistry (TA)**, *University of Wisconsin-Madison*, Madison, WI.
- organized tutoring sessions for pre-medical undergraduate students
- 2013 **Human Biochemistry (TA)**, *University of Wisconsin-Madison*, Madison, WI.
- organized tutoring sessions for pre-medical undergraduate students
- 2009 **General Biology (TA)**, *University of Texas Permian Basin*, Odessa, TX.
- Biol 1307
 - Teaching assistant for freshman biology students
- 2009 **General Chemistry (TA)**, *University of Texas Permian Basin*, Odessa, TX.
- Chem 1312
 - Teaching assistant for freshman chemistry students
- 2008 **Chemistry (TA)**, *Odessa College*, Odessa, TX.
- Teaching assistant for chemistry students
- 2008 **Advancement Via Individual Determination**, *Odessa High School*, Odessa, TX.
- AVID tutor for high school students

Publications

- 2024 **Two DOT1 enzymes cooperatively mediate efficient ubiquitin-independent histone H3 lysine 76 tri-methylation in kinetoplastids**, VS Frisbie, H Hashimoto, Y Xie, FN DL Vitorino, J Baeza, T Nguyen, Z Yuan, J Kiselar, BA Garcia, EW Debler, Nature Communications.
- 2024 **In utero pulse injection of isotopic amino acids quantifies protein turnover rates during murine fetal development**, J Baeza, BE Coons, Z Lin, J Riley, M Mendoza, WH Peranteau, BA Garcia, Cell Reports Methods.
- 2023 **Histone chaperone HIRA, Promyelocytic Leukemia (PML) protein and p62/SQSTM1 coordinate to regulate inflammation during cell senescence and aging.**, N Dasgupta, X Lei, R Arnold, MG Teneche, KN Miller, A Rajesh, A Davis, V Anschau, AR Campos, R Gilson, A Havas, S Yin, ZM Chua, J Proulx, M Alcaraz, MI Rather, J Baeza, DC Schultz, SL Berger, PD Adams, bioRxiv.
- 2021 **Improved SILAC quantification with data-independent acquisition to investigate bortezomib-induced protein degradation**, LK Pino, J Baeza, R Lauman, B Schilling, BA Garcia, Journal of proteome research.
- 2021 **Sex-specific effects of in vitro fertilization on adult metabolic outcomes and hepatic transcriptome and proteome in mouse**, L Narapareddy, EA Rhon-Calderon, LA Vrooman, J Baeza, DK Nguyen, C Mesaros, Y Lan, BA Garcia, RM Schultz, MS Bartolomei, FASEB journal: official publication of the Federation of American Societies
- 2021 **Self-acetylation at the active site of phosphoenolpyruvate carboxykinase (PCK1) controls enzyme activity**, P Latorre-Muro, J Baeza, R Hurtado-Guerrero, T Hicks, I Delso, C Hernandez-Ruiz, A Velazquez-Campoy, AJ Lawton, Jus Angulo, JM Denu, JeA Carrodegua, Journal of Biological Chemistry.
- 2020 **Revealing dynamic protein acetylation across subcellular compartments**, J Baeza, AJ Lawton, J Fan, MJ Smallegan, I Lienert, T Gandhi, OM Bernhardt, L Reiter, JM Denu, Journal of proteome research.
- 2020 **Sex-specific effects of in vitro fertilization on adult metabolic phenotypes and hepatic transcriptomic and proteomic pathways in mouse**, L Narapareddy, EA Rhon-Calderon, LA Vrooman, J Baeza, DK Nguyen, Y Lan, BA Garcia, RM Schultz, MS Bartolomei, bioRxiv.

- 2019 **The E3 ligase adaptor molecule SPOP regulates fetal hemoglobin levels in adult erythroid cells**, *X Lan, E Khandros, P Huang, SA Peslak, SK Bhardwaj, JD Grevet, O Abdulmalik, H Wang, CA Keller, B Giardine, J Baeza, ER Duffner, OE Demerdash, XS Wu, CR Vakoc, BA Garcia, RC Hardison, J Shi, GA Blobel*, Blood Advances.
- 2019 **Deep profiling and custom databases improve detection of proteoforms generated by alternative splicing**, *LM Agosto, MR Gazzara, CM Radens, S Sidoli, J Baeza, BA Garcia, KW Lynch*, Genome research.
- 2019 **Site-specific lysine acetylation stoichiometry across subcellular compartments**, *AJ Lindahl, AJ Lawton, J Baeza, JA Dowell, JM Denu*, Protein Acetylation: Methods and Protocols.
- 2018 **Dynamic acetylation of phosphoenolpyruvate carboxykinase toggles enzyme activity between gluconeogenic and anaplerotic reactions**, *P Latorre-Muro, J Baeza, EA Armstrong, R Hurtado-Guerrero, F Corzana, LE Wu, DA Sinclair, P Lopez-Buesa, JA Carrodeguas, JM Denu*, Molecular cell.
- 2018 **Quantifying dynamic protein acetylation using quantitative stoichiometry**, *J Baeza, AJ Lawton, J Fan, MJ Smallegan, I Lienert, T Gandhi, OM Bernhardt, L Reiter, JM Denu, AG Biognosys*, Preprint at <https://www.biorxiv.org/content/>.
- 2017 **Scalable and purification-free synthesis of a myristoylated fluorogenic sirtuin substrate**, *I Galleano, J Nielsen, AS Madsen, CA Olsen, Synlett*.
- 2016 **Mechanisms and dynamics of protein acetylation in mitochondria**, *J Baeza, MJ Smallegan, JM Denu*, Trends in biochemical sciences.
- 2016 **Investigating histone acetylation stoichiometry and turnover rate**, *J Fan, J Baeza, JM Denu*, Methods in Enzymology.
- 2015 **Site-specific reactivity of nonenzymatic lysine acetylation**, *J Baeza, MJ Smallegan, JM Denu*, ACS chemical biology.
- 2014 **Stoichiometry of Site-specific Lysine Acetylation in an Entire Proteome*?**, *J Baeza, JA Dowell, MJ Smallegan, J Fan, D Amador-Noguez, Z Khan, JM Denu*, Journal of Biological Chemistry.
- 2013 **Activation of the Protein Deacetylase SIRT6 by Long-chain Fatty Acids and Widespread Deacylation by Mammalian Sirtuins*?**, *JL Feldman, J Baeza, JM Denu*, Journal of Biological Chemistry.

- 2012 **Rapid identification of ESKAPE bacterial strains using an autonomous microfluidic device**, *JY Ho, NJ Cira, JA Crooks, J Baeza, DB Weibel*, PLoS One.
- 2012 **Human immunodeficiency virus enhances hepatitis C virus replication by differential regulation of IFN and TGF family genes**, *X Zhang, M Daucher, J Baeza, C-W Kim, R Russell, S Kottlil*, Journal of medical virology.

Selected Research Talks

- Aug 2023 **Quantitative proteomics to characterize the cell culture process in drug substance development**, *Chinese American Society for Mass Spectrometry (CASMS)*, Online.
- Jun 2020 **Applications of Skyline for Method Development and Quantification of Histone PTMs**, *Skyline User Group Meeting*, Online.
- Jun 2019 **Quantitative analysis of the fetal tissue transcriptome reveals temporal and tissue-specific regulatory networks in utero**, *American Society for Mass Spectrometry*, Atlanta, GA.
- Mar 2018 **Quantifying protein synthesis rates during fetal development reveals temporal and tissue specific regulatory networks**, *US Human Proteome Organization*, Minneapolis, MN.

Selected Posters

- Oct 2020 **A robust and flexible method for quantifying protein turnover rates across an entire proteome**, *US Human Proteome Organization - Connect*, Online.
- Mar 2019 **Quantitative analysis of the fetal tissue transcriptome by mass spectrometry reveals temporal and tissue-specific regulatory networks in utero**, *US Human Proteome Organization*, Washington DC.
- Sep 2018 **Quantifying the fetal tissue transcriptome reveals temporal and tissue specific regulatory networks during development**, *Human Proteome Organization*, Orlando, FL.
- Jun 2017 **Acetylation stoichiometry analysis of the Sirt3 deficient liver**, *American Society for Mass Spectrometry*, San Antonio, TX.

- Jun 2015 **Site specific reactivity of non-enzymatic lysine acetylation**, *American Society for Mass Spectrometry*, St. Louis, MO.
- Dec 2014 **Site specific reactivity of non-enzymatic lysine acetylation**, *American Society for Cell Biology*, Philadelphia, PA.
- Jun 2014 **Stoichiometry of acetylation in an entire proteome**, *American Society for Mass Spectrometry*, Minneapolis, MN.
- Aug 2013 **Stoichiometry of acetylation determined by isotopic modification and mass spectrometry**, *Molecular Biosciences Training Grant Retreat*, Madison, WI.
- Sep 2011 **MicroRNA expression profiling identifies potential anti-viral targets in HCV-infected human hepatoma cells**, *International Symposium on Hepatitis C Virus*, Seattle, WA.
- Aug 2010 **Determining hepatitis C virus diversity and evolution during antiviral therapy using quantitative deep sequencing**, *NIH Summer Research Program Poster Day*, Bethesda, MD.
- Feb 2010 **Purification of the human T-cell leukemia virus type-1 virion using sucrose density gradient ultracentrifugation**, *American Association for the Advancement of Science*, San Diego, CA.

Committee and Research Group Membership

- 2021–
Present **Committee Member**, *Proteomics Standards Research Group (sPRG)*, *Association of Biomolecular Resources Facilities (ABRF)*.
- To design and develop performance standards and resources for mass spectrometry-based proteomic applications

Professional Organizations

- 2021 American Biomolecular Resources Facilities (ABRF).
- 2017 Human Proteome Organization (HUPO).
- 2017 US Human Proteome Organization (US HUPO).
- 2014 American Society for Cell Biology (ASCB).
- 2013 American Society for Mass Spectrometry (ASMS).
- 2010 American Association for the Advancement of Science (AAAS).