

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 Kottlilil*, National Institute of Allergy and Infectious Diseases.

- Determining genetic diversity of HCV genes in response to therapy

2010 **INRO Summer Internship Research Fellow**, *Shyam Kottlilil*, 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

Mentoring

- 2019–2024 **Michael Gilbert**, *PhD student*, University of Pennsylvania.
 - Thesis: Investigating Caste Differences in *Atta cephalotes*
- 2018–2022 **Richard Lauman**, *PhD student*, University of Pennsylvania.
 - Thesis: Mass Spectrometry Methods for Studying RNA Modifications and RNA-Protein Interactions
- 2014–2016 **Keighley Reisenauer**, *Undergraduate student*, University of Wisconsin-Madison.
 - Project: Measuring rates of non-enzymatic acetylation
 - Protein purification and enzyme kinetics
- 2013–2016 **Nicole Rademacher**, *Undergraduate student*, University of Wisconsin-Madison.
 - Project: Investigating mitochondrial protein acetylation
 - In vitro biochemistry

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, FNDL 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 Carrodeguas*, 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 translome 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 translome by mass spectrometry reveals temporal and tissue-specific regulatory networks in utero**, *US Human Proteome Organization*, Washington DC.
- Sep 2018 **Quantifying the fetal tissue translome 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– **Committee Member**, *Proteomics Standards Research Group (sPRG)*, *Association of Biomolecular Resources Facilities (ABRF)*.
 Present
 - 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).