

Josue Baeza, PhD

Postdoctoral Fellow

University of Pennsylvania

817-980-7281

✉ baeza@penmedicine.upenn.edu

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Summary

Postdoctoral research fellow developing mass spectrometry-based proteomics methods for studying biological systems. My postdoctoral research is aimed at understanding biochemical mechanisms of protein homeostasis with a major focus on the study of protein turnover during fetal development.

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

Research Experience

2017 **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

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

- 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
- 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

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

- 2020 **Revealing dynamic protein acetylation across subcellular compartments**, Josue Baeza, Alexis J Lawton, Jing Fan, Michael J Smallegan, Ian Lienert, Tejas Gandhi, Oliver M Bernhardt, Lukas Reiter, John M 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.**, Marisa S Bartolomei, Laren Narapareddy, Richard M Schultz, Benjamin A Garcia, Eric Rhon-Calderon, Lisa A Vrooman, Duy Nguyen, Josue Baeza, Yemin Lan, *bioRxiv*.
- 2019 **The E3 ligase adaptor molecule SPOP regulates fetal hemoglobin levels in adult erythroid cells**, Xianjiang Lan, Eugene Khandros, Peng Huang, Scott A Peslak, Saurabh K Bhardwaj, Jeremy D Grevet, Osheiza Abdulmalik, Hongxin Wang, Cheryl A Keller, Belinda Giardine, Josue Baeza, Emily R Duffner, Osama El Demerdash, Xiaoli S Wu, Christopher R Vakoc, Benjamin A Garcia, Ross C Hardison, Junwei Shi, Gerd A Blobel, *Blood advances*.

- 2019 **Site-Specific Lysine Acetylation Stoichiometry Across Subcellular Compartments**, *Anastasia J Lindahl, Alexis J Lawton, Josue Baeza, James A Dowell, John M Denu*, Protein Acetylation.
- 2019 **Deep profiling and custom databases improve detection of proteoforms generated by alternative splicing**, *Laura M Agosto, Matthew R Gazzara, Caleb M Radens, Simone Sidoli, Josue Baeza, Benjamin A Garcia, Kristen W Lynch*, Genome research.
- 2018 **Dynamic acetylation of phosphoenolpyruvate carboxykinase toggles enzyme activity between gluconeogenic and anaplerotic reactions**, *Pedro Latorre-Muro, Josue Baeza, Eric A Armstrong, Ramon Hurtado-Guerrero, Francisco Corzana, Lindsay E Wu, David A Sinclair, Pascual Lopez-Buesa, Jose A Carrodeguas, John M Denu*, Molecular cell.
- 2018 **Quantifying dynamic protein acetylation using quantitative stoichiometry**, *Josue Baeza, Alexis J Lawton, Jing Fan, Michael J Smallegan, Ian Lienert, Tejas Gandhi, Oliver M Bernhardt, Lukas Reiter, John M Denu*, bioRxiv.
- 2016 **Mechanisms and dynamics of protein acetylation in mitochondria**, *Josue Baeza, Michael J Smallegan, John M 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**, *Josue Baeza, Michael J Smallegan, John M Denu*, ACS chemical biology.
- 2014 **Stoichiometry of site-specific lysine acetylation in an entire proteome**, *Josue Baeza, James A Dowell, Michael J Smallegan, Jing Fan, Daniel Amador-Noguez, Zia Khan, John M Denu*, Journal of Biological Chemistry.
- 2013 **Activation of the protein deacetylase SIRT6 by long-chain fatty acids and widespread deacylation by mammalian sirtuins**, *Jessica L Feldman, Josue Baeza, John M Denu*, Journal of Biological Chemistry.
- 2012 **Rapid identification of ESKAPE bacterial strains using an autonomous microfluidic device**, *Jack Y Ho, Nate J Cira, John A Crooks, Josue Baeza, Douglas B Weibel*, PloS one.

- 2012 **Human immunodeficiency virus enhances hepatitis C virus replication by differential regulation of IFN and TGF family genes**, Xiaozhen Zhang, Marybeth Daucher, Josue Baeza, Cheol-Woo Kim, Rodney Russell, Shyamasundaran Kottiril, *Journal of medical virology*.

Research Talks

- 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 ‘Translatome’ 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 translatome by mass spectrometry reveals temporal and tissue-specific regulatory networks in utero**, *US Human Proteome Organization*, Washington DC.
- Sep 2018 **Quantifying the fetal tissue translatome 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.

Professional Organizations

- 2017 Human Proteome Organization.
- 2017 US Human Proteome Organization.
- 2013 American Society for Mass Spectrometry.