LYDIA HELENA BEDERKA, PH.D.

Department of Diagnostics
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EDUCATION

Doctor of Philosophy
July 2008 – December 2014
University of California, Irvine Department of Molecular Biology & Biochemistry
Thesis Advisor: Michael J. Buchmeier, Ph.D.
Ph.D. Specialization in Molecular Virology and Viral Pathogenesis

Master of Science
September 2006 – June 2008
University of California, Irvine Department of Anatomy & Neurobiology
Mentor: Hans S. Keirstead, Ph.D.
M.S. Specialization in Biotechnology, Concentration in Stem Cell Biology

Bachelor of Science
August 2000 – May 2005
Colorado State University Department of Biomedical Sciences
Mentors: Kurt G. Beam, Ph.D.
Nancy M. Lorenzon, Ph.D.
B.S. in Microbiology

AWARDS AND HONORS

2012 Edward K. Wagner Memorial Award in Virology
2010 – 2012 National Science Foundation (NSF) GK-12 Fellowship
2010 – 2011 American Society for Virology Travel Award

RESEARCH EXPERIENCE

Department of Diagnostics, bioAffinity Technologies, Inc.

- Designed and implemented standard operating procedures for efficient bioassay performance
- Optimization of critical reagents for clinical diagnostic assay development
- Developed complex analysis protocols for flow cytometric analysis of induced sputum and bronchoalveolar lavage (BAL)-derived cells

Department of Virology and Immunology, Texas Biomedical Research Institute

- Performed high containment laboratory (BSL4) studies for advancing the development of Ebola virus diagnostic assays
- Communicated insights and unanswered questions using both verbal and written reports to biomedical and brand teams
- Maintained detailed and methodological record keeping and followed standard operating procedures to maintain accuracy and accountability in experimental outcomes and interpretations
- Mentored associates for maximum productivity and for developing technical skill sets

Department of Molecular Biology & Biochemistry, University of California, Irvine (Mentor: Dr. Michael J. Buchmeier)

- Mutagenic analysis and characterization of the LCMV stable signal peptide (SSP) functions in the context of arenavirus glycoprotein complex maturation and intracellular transport
- Screening of pan-arenavirus antiviral compounds targeting the conserved genome termini

Department of Anatomy & Neurobiology, University of California, Irvine

- Engineering of lentiviral vectors to combat glial scar formation in the context of human embryonic stem cell treatments for spinal cord injury

Department of Biomedical Sciences, Colorado State University

- Isolation of primary skeletal muscle for excitation-contraction coupling studies focusing on voltage-gated ion channel interactions

PUBLICATIONS

1. Lemieux ME, Reveles XT, Rebeles J, **Bederka LH**, Araujo PR, Sanchez JR, Grayson M, Lai SC, DePalo LR, Habib SA, Hill DG, Lopez K, Patriquin L, Sussman R, Joyce RP, Rebel VI (2023). *Detection of early-stage lung cancer in sputum using automated flow cytometry and machine learning* Respiratory Research 24(1):23 doi:10.1186/s12931-023-02327-3.

2. **Bederka LH**, Sanchez JR, Rebeles J, Araujo PR, Grayson MH, Lai SC, DePalo LR, Habib SA, Hill DG, Lopez K, Patriquin L, Sussman R, Humphreys J, Reveles XT, Rebel VI (2022). *Sputum analysis by flow cytometry; an effective platform to analyze the lung environment* PLoS One 7(8):e0272069.

3. Grayson M, Lai SC, **Bederka LH**, Araujo P, Sanchez J, Reveles XT, Rebel VI, Rebeles J (2021). *Quality-controlled sputum analysis by flow cytometry* Journal of Visualized Experiments Aug 9(174) doi: 10.3791/62785.

4. **Bederka LH**, Bonhomme CJ, Ling EL, Buchmeier MJ (2014). *Arenavirus stable signal peptide is the keystone subunit for glycoprotein complex organization* mBio 5(6) e02063-14.

5. Bonhomme CJ, Knopp KA, **Bederka LH**, Angelini MM, Buchmeier MJ (2013). *LCMV glycosylation modulates viral fitness and cell tropism* PLoS One 8(1) e53273.

6. Neuman BW, **Bederka LH**, Stein DA, Ting JPC, Moulton HM, Buchmeier MJ (2011). *Development of peptide-conjugated morpholino oligomers as pan-arenavirus inhibitors* Antimicrobial Agents and Chemotherapy 55(10): 4631-4638.

7. Bonhomme CJ, Capul AA, Lauron EJ, **Bederka LH**, Knopp KA, MJ Buchmeier (2011). *Glycosylation modulates arenavirus glycoprotein expression and function* Virology 409(2): 223-233.

CONFERENCE ORAL PRESENTATIONS

2022 "Sputum analysis by flow cytometry to assess lung health." *CHEST (Annual Meeting of the American College of Chest Physicians), Nashville, Tennessee, USA*

2012 "Multiple roles of the arenavirus stable signal peptide." *American Society for Virology Annual Meeting, Madison, Wisconsin, USA*

2011 "Understanding the roles of the multifunctional arenavirus signal peptide." *American Society for Virology Annual Meeting, Minneapolis, Minnesota, USA*

CONFERENCE POSTER PRESENTATIONS

2020 "Sputum-derived cellular profiles produced by flow cytometric analysis" *CYTO (International Society for Advancement of Cytometry), Virtual Meeting*

2013 "Arenavirus signal peptide mediates glycoprotein processing and maturation" *NIAID Regional Centers for Excellence (RCE) National Meeting, Seattle, Washington, USA*

2013 "Arenavirus signal peptide mediates glycoprotein processing and maturation" *Gordon Research Conference 'Virus and Cells', Il Ciocco, Italy*

2012 "Multiple roles of the signal peptide for arenavirus glycoprotein maturation" *American Association for the Advancement of Sciences (AAAS) Annual Meeting, Vancouver, British Columbia, Canada*

2011 "Understanding the multiple roles of the arenavirus signal peptide" *American Association for the Advancement of Sciences (AAAS) Annual Meeting, Washington, DC, USA*

2010 "Target regions for antiviral antisense therapy identified through the use of peptide conjugated morpholine oligomers" *American Society for Virology (ASV) Annual Meeting, Bozeman, Montana, USA*

TEACHING EXPERIENCE

2013 Teaching Assistant, *Biochemistry* lecture
2012 Resident Scientist at Santa Ana High School, Santa Ana, California
2011 – 2012 Resident Scientist at Costa Mesa Middle School, Costa Mesa, California
2010 – 2011 Resident Scientist at Middle College High School, Santa Ana, California
2009 Teaching Assistant, *Molecular Biology* laboratory and *Viral Pathogenesis & Immunity* lecture
2008 Teaching Assistant, *Protein Isolation and Characterization Biotechnology* laboratory and *Virus Engineering* laboratory
2007 Teaching Assistant, *Nucleic Acids Biotechnology* laboratory