

EDUCATION

Johns Hopkins University School of Medicine, Baltimore, Maryland

Ph.D., Human Genetics

Aug 2006-Feb 2013

University of Minnesota, Minneapolis, Minnesota

Bachelor of Science, Genetics, Cell Biology, and Development

Post-Secondary Enrolment for advanced high school students

Sept 2002-Dec 2004

Sept 2000-May 2002

WORK EXPERIENCE

Nuventra, Broomfield, Colorado

Programmer and Clinical Pharmacology Associate

Sept 2015-Present

- Use R programming to analyze, format, and display pharmacokinetic data
- Use programming tools to contribute to pharmacokinetic analyses and reporting
- Utilize GitHub for version control of internal codes
- Write and develop SOPs for company wide implementation
- Mentor and train undergraduate programming interns and other new hires
- Guide clients in creating datasets of high integrity and fitness for pharmacokinetic analysis
- Understand and keep up-to-date with changing CDISC data standards and regulations
- Develop and maintain R code for CDISC-compliant dataset formats
- Develop internal standards for resolution of CDISC compliance questions
- Train other employees on how to create datasets that are CDISC compliant
- Work with Quality Assurance Specialists to ensure our code and programming processes are compliant with current FDA standards
- Act as Quality Control personnel for other programmers to ensure excellence in the products we produce
- Develop and maintain custom R code to create novel figures, tables, and listings
- Provide overall guidance on drug development activities for clients.

Co-lead of Pharmacokinetic CDISC Data Standard Team

Aug 2016-Present

- Lead a volunteer team of individuals from diverse companies and backgrounds in developing a data standard specifically for use in the pharmaceutical industry

American Journal Experts

Nov 2013-Present

- Edit scientific papers written by non-native English speakers
- Edited papers are from a wide variety of scientific disciplines
- Ensure clear communication of scientific information without altering their meaning

RESEARCH EXPERIENCE

Colorado State University, Fort Collins, Colorado

Jan 2014 –Sept 2015

Research Scientist I, Advisor: Dr. Angelo Izzo

Research Project: The role of autophagy in vaccination against M. tuberculosis

- Collection and culture of bone marrow derived progenitor cells
- Immunological cell pathway analysis
- *In vitro* infection of cells using BCG
- ELISA assays interpretation and analysis
- ELISPOT assays
- Flow Cytometry

RESEARCH EXPERIENCE (continued)**Colorado State University, Fort Collins, Colorado****Jan 2014 –Sept 2015****Research Scientist I, Advisor: Dr. Angelo Izzo**

Research Project: Understanding the secondary immune response in mice vaccinated against M. tuberculosis

- Work and safety in a BSL3 animal facility
- Tuberculosis infection of mouse models
- Preparation of BCG inoculations
- H37Rv and BCG CFU preparation and analysis
- Organization and execution of multi-person projects
- Collection and preparation of multiple tissues for immunological analysis
- Bonchoalveolar lavage technique

Johns Hopkins University School of Medicine, Baltimore, Maryland**Feb 2013-Jan 2014****Postdoctoral Research, Advisor: Dr. Sanjay Jain**

Research Project: Microenvironmental influences and pharmacokinetic studies of pyrazinamide

- Mouse jugular vein catheterization surgery
- Mouse oral gavage drug delivery
- Disease relapse model analysis
- Adaptation of *in vivo* imaging tracers to new model systems

Research Project: Preclinical development of imaging tracers for the detection of bacterial infections in mouse models

- Synthetic radiochemistry
- Radioisotope handling and safety
- Radiolabeled tracer biodistribution analysis
- Assay development for the measurement of sugars in media
- Bacterial growth curves and handling of a variety of BSL2 bacterial strains
- Animal PET, SPECT, and CT scan

Johns Hopkins University School of Medicine, Baltimore, Maryland**Ph.D. Thesis Research, Advisor: Dr. Ronald Cohn****Aug 2006-Feb 2013**

Research Project: The use of a myostatin inhibitor to prevent several forms of acquired skeletal muscle atrophy

- Mouse sciatic nerve resection surgery
- Hind-limb immobilization
- Intraperitoneal and subcutaneous drug delivery
- Cryostat sectioning and histological staining
- Statistical analysis methods using R
- Western blot

Research Project: The role of Wnt signaling in skeletal muscle regeneration and maintenance

- Deep tissue cardiotoxin injections
- Developed computer program for automated measurements of muscle fibers
- Mouse genotyping
- Quantitative real-time PCR
- Immunofluorescence

RESEARCH EXPERIENCE (continued)**Kings College London, London, England****Nov 2008-Feb 2009***Collaborative project as part of Ph.D. thesis research**Advisors: Dr. Ronald Cohn and Dr. Peter Zammit*

Research Project: Examine the activation status of satellite cells from the skeletal muscle of unchallenged muscular dystrophy mice to assess contribution to pathogenic phenotype

- Learned technique for extracting and isolating single muscle fibers from whole EDL muscle for the purpose of bringing the technical expertise back to home laboratory

Johnson and Johnson, Roseville, Minnesota**Nov 2005-July 2006***Laboratory Technician*

- Perform clinical trials of prototype on human subjects
- Test fluid collection devices for monitoring blood-glucose levels in diabetics
- Responsible for improving effectiveness and usability of devices
- General laboratory maintenance

University of Minnesota, Minneapolis, Minnesota*Junior Scientist, Advisor: Dr. Deanna Koepf***Nov 2005-July 2006***Laboratory Assistant, Advisor: Dr. Deanna Koepf***Mar 2003-Mar 2005**

- Initial duties included dishwashing, supply ordering, media preparation, stock culture preparations, and general laboratory maintenance
- Quickly challenged with small research projects while continuing other duties and responsibilities
- Two pay raises within a year and a half due to job performance despite university wide pay freeze

Research Project: A yeast two-hybrid screen to identify proteins that interact specifically with the unique tail region of two isoforms of the E3 ubiquitin ligase Fbw7

- Molecular cloning techniques for plasmid construction
- Developed several assays for elimination of false positives from screen
- Yeast culture, transformation, and protein extraction methods
- Bacterial culture, transformation and protein extraction methods

Research Project: Examine expression differences in target gene through northern blot analysis

Research Project: Confirm a protein-protein interaction first detected through a genetic interaction by *in vivo* techniques

University of Tasmania, Launceston, Tasmania, Australia**Apr 2005-July 2005***Laboratory Technician, Advisor: Dr. Barbara Nowak*

Research Project: Optimization of PCR and *in situ* hybridization reactions to identify closely related, yet unique, pathogenic ameba species

- Duties included general lab maintenance, ameba isolation and collection
- Offered sponsorship for continuation of research after expiration of visa due to job performance

University of Minnesota, Minneapolis, Minnesota**Jan 2004-June 2004***Student Researcher, Advisor: Dr. Richard King*

Research Project: Used a luciferase assay to test the extent that specific polymorphisms in the regulatory region of the pigment enzyme tyrosinase affected expression levels

- Used common molecular cloning techniques for construction of the plasmids to transfect into mammalian cells

CONFERENCES and SYMPOSIUMS

- Company Wide Scientific Summit, Durham, North Carolina** Feb 2017
Oral presentation, Title: CDISC Data Standards
- World Muscle Society Conference, Perth, Australia** Oct 2012
Oral presentation, Advances in Therapy for Neuromuscular Disorders Session, Title: Myostatin inhibitor ActIIb rescues atrophy and protects muscle growth signaling pathways in immobilization but not denervation
- The Center for Musculoskeletal Research Symposium, Baltimore, Maryland** Oct 2012
Oral presentation, Title: Preclinical testing of TGF β inhibitors in models of acquired myopathies
- International Conference on Muscle Wasting Diseases, Ascona, Switzerland** Sept 2011
Poster presentation, Title: The Soluble Myostatin Inhibitor ActIIb(fc) Prevents Only Certain Forms of Acquired Muscle Atrophy
- American Society of Human Genetics, Honolulu, Hawaii** Oct 2009
Poster presentation, Title: Loss of the Frizzled-4 Receptor Causes Significant Skeletal Muscle Atrophy: A Potential New Model for Facioscapulohumeral Muscular Dystrophy

PUBLICATIONS

- Elizabeth M. MacDonald** and Angelo Izzo. "TB vaccine development; it's history and future directions", book chapter in "Tuberculosis", October 2014
- Edward A. Weinstein, Alvaro A. Ordonez, Vincent P. DeMarco, Allison M. Murawski, Supriya Pokkali, **Elizabeth M MacDonald**, Mariah Klunk, Ronnie C. Mease, Martin G. Pomper and Sanjay K. Jain. "Imaging Enterobacteriaceae infection in vivo with ^{18}F -fluorodeoxysorbitol positron emission tomography", *Science translational Medicine* (cover article), October 2014
- Elizabeth M. MacDonald**, Eva Andres-Mateos, Rebeca Mejias, Jessica L. Simmers, Ruifa Mi, Jae-Sung Park, Stephanie Ying, Ahmet Hoke, Se-Jin Lee, and Ronald D. Cohn. "Denervation atrophy is independent from Akt and mTOR activation and is not rescued by myostatin inhibition", *Disease Models and Mechanisms*, April 2014
- Ran Xu, Eva Andres-Mateos, Rebeca Mejias, **Elizabeth M. MacDonald**, Leslie A Leinwand, Dana K Merriman, and Ronald D. Cohn. "Hibernating squirrel muscle activates the endurance exercise pathway despite prolonged immobilization and starvation", *Experimental Neurology*, February 2013
- Elizabeth M. MacDonald**, Ronald D. Cohn. "TGF β Signaling: It's Role in Fibrosis Formation and Myopathies", *Current Opinion in Rheumatology*, November 2012
- Wei Zhang, **Elizabeth M. MacDonald**, and Deanna M. Koepp. "The stomatin-like protein SLP-1 and Cdk2 interact with the F-box protein Fbw7- γ ", *PLoS ONE*, September 2012
- Swarna Swaminathan, Andrew C. Kile, **Elizabeth M. MacDonald**, and Deanna M Koepp. "Yra1 is required for S phase entry and affects Dia2 binding to replication origins", *Molecular Cell Biology*, April 2007

AWARDS and HONORS

- *Disease Models and Mechanisms* top 5 most-read papers of 2014
- Elsevier Prize for Best Oral Presentation by a Young Investigator, World Muscle Society Conference, Perth Australia, October 2012
- Fellowship for World Muscle Society Conference, Perth, Australia, October 2012
- Deans list, University of Minnesota, 2002-2004

MENTORING EXPERIENCE

- Mentored high school student for research internship **Spring 2013**
- Center For Talented Youth workshop instructor **Mar 2011**
- Mentored high school students on summer research project **Summers 2010-2012**
- Mentored undergraduate researcher as part of summer internship project **Summer 2004**
- Mentored and trained two undergraduate research assistants **Sept 2003-Dec 2004**
- Juniors Coach for the Baltimore Rowing Club **Mar 2009-June 2009**

SOCIETIES and COMMITTIES

- World Muscle Society **2012-2013**
- Association for Women in Science **2011-2014**
- American Society of Human Genetics **2009**
- Human Genetics Student Events Committee **Sept 2009-Aug 2011**
- Charm City Swing Organizational Committee **Sept 2011-July 2012**
- Baltimore Rowing Club **May 2008-Aug 2009**
- USRowing **May 2008-Aug 2009**

COMMUNITY SERVICE and OTHER ACTIVITIES

- MeetUp group organizer for community events **Jan 2017–Present**
 - Cat enrichment volunteer, Larimar Humane Society **Jan 2015-June 2016**
 - Organization, development, and teaching of activities for World TB Day **2014-2015**
 - Judge for undergrad research symposium at Colorado State University **Mar 2014**
 - Virtual Judge for eCYBERMISSIONS (online middle school science competition) **2008-2014**
 - Basic Sciences Community Science Day **Mar 2012**
 - New Era High School Outreach Program Science Workshop **Mar 2008**
 - Minnesota State Science Fair Semi Finals Judge **June 2006**
 - Charm City Swing volunteer staff member **2010-2013**
 - City Uprising Local Park Clean Up Day **June 2012**
 - Exit242 Young Adult Ministry **June 2011-Jan 2012**
 - The Book Thing of Baltimore **June 2010**
 - Learn To Row Day **June 2008 and June 2009**
 - Baltimore Rowing Club **2008**
- Stonewall Regatta, Womens 4x, 1st place*
Diamond States Regatta, Womens 2x, 2nd place
Charm City Sprints, Womens 8+ 1st place, Womens 4x, 1st place
Head of the Ohio Regatta Womens 2x, 1st place