Robert C. Sharp, Ph.D.

Postdoctoral Associate

University of Florida
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EDUCATION

University of Central Florida

Doctorate of Philosophy (Ph.D.) - Biomedical Sciences
June 2015 to December 2018
Overall GPA: 3.97

Master of Science (M.S.) - Biomedical Sciences
August 2013 to December 2014
Overall GPA: 3.66

Bachelors of Science (B.S.) - Biotechnology
Minors: Molecular/Microbiology
Coaching Athletics
May 2008 to April 2013
Overall GPA: 3.4

RESEARCH EXPERIENCE

University of Florida, Gainesville, FL

Postdoctoral Associate – Dr. Todd Brusko Laboratory

January 2019 to Present

- Discovering new biomarkers and potential therapeutic targets for type 1 diabetes (T1D) pathology focusing on T cell regulation
- Focused on how T cell regulation could be altered in T1D pathogenesis if problems in multiple immunoregulation pathways occurs including the signal regulatory protein (SIRP):CD47 (integrin associate protein (IAP)) signaling pathway and the protein tyrosine phosphatase, non-receptor type 22 (PTPN22) signaling pathway
- Developing CRISPR-Cas9 gene editing protocols for both knockouts and knock-ins
- Creating various phenotype/genotype assays to determine if T1D associated single nucleotide polymorphisms (SNPs) found in T cell regulation genes do cause alterations in T cell biology
- Working on multiple projects with the Network for Pancreatic Organ Donors with Diabetes (nPOD), an organization dedicated to utilizing pancreatic tissues from both T1D patients and control subjects to address key immunological, histological, viral, and metabolic questions related to how T1D develops
- Mentor for multiple undergraduates
- Review Editor for Frontiers in Cellular and Infection Microbiology Journal
    - Part of the COVID-19 Taskforce for Frontiers Journal as a reviewer editor

University of Central Florida, Orlando, FL

Ph.D. Candidate/Graduate Research Assistant – Dr. Saleh Naser Laboratory

June 2015 to December 2018

- Established the role of human PTPN2 and human PTPN22 along with *Mycobacterium avium* subspecies *paratuberculosis* (MAP) infection in Crohn's disease (CD), rheumatoid arthritis (RA) and T1D

- Developed new bacterial identification techniques utilizing multiplex polymerase chain reaction (PCR) and fluorescent *in situ* hybridization (FISH)
- Oversaw lab managerial work including training colleagues/collaborators, supervising students, and ordering supplies for the lab
- Worked on clinical trial from Red Hill Biopharma for RHB-104 treatment of Crohn's Disease patients

Teaching Assistant – University of Central Florida

August 2013 to April 2016

- Served as a teaching assistant for the following courses: Microbiology Lab, Health Microbiology Lab, Methods in Biotechnology Lab, Quantitative Biological Methods Lab, Infectious Processes, "Molecular Aspects of Obesity, Diabetes, and Metabolism"
- Taught lab courses
- Aided students in experiments
- Assisted students with questions about tests/quizzes
- Proctored and graded quizzes/tests
- Graded lab notebooks

Volunteer Lab Assistant

August 2014 to December 2014 (Dr. Herve Roy Laboratory)

- Investigated bacterial cell membrane modification via lipid remodeling in order to develop newer anti-microbials

August 2013 to December 2013 (Dr. Shadab Siddiqi Laboratory)

- Investigated the effect of very-low-density lipoproteins (VLDL) in the liver.

RESEARCH QUALIFICATIONS

- Experience with various laboratory techniques including, but not limited to:
  - **Bacteria Studies** (culturing, mutagenesis, vector production, DNA extractions/PCR, fluorescent *in situ* hybridization)
  - **Human Cell Line Studies** (culturing, DNA/RNA extraction, PCR, RT-PCR, proliferation assays, flow cytometry, CRISPR-Cas9 gene editing on culture cells)
  - **Clinical Studies/Clinical Trials** (blood processing, patient sample culturing, TaqMan genotyping, designing clinical protocols, DNA/RNA extractions, PCR, RT-PCR, proliferation assays, flow cytometry, CRISPR-Cas9 gene editing on primary cells)
- Confocal microscopy experience
- Laboratory managerial and leadership experience
- Teaching experience (teaching assistant for six different courses at the University of Central Florida)
- Skilled in a variety of computer programs including: Microsoft Office programs, Graphpad Prism, SOC Statistics, FlowJo, and molecular detection programs (RT-PCR plate readers, ELISA plate readers, sequencing programs, Nanodrop machine)

Bacterial Research

- Acid fast/Gram staining
- Agarose gel electrophoresis/Agarose gel extraction
- Bacterial Culturing: Gram positive, Gram negative, and *Mycobacteria*
- DNA quantification
- DNA/RNA extraction and purification
- Fluorescent in situ hybridization (FISH) of DNA probes for microbes
- Mutagenesis assay on E.coli model

- PCR/Nested PCR/Multiplex PCR
- Protein extraction and isolation
- Vector production/insertion in E.coli model

Clinical Research

- Biopsy tissue culturing
- Blood processing (buffy coat extraction/plasma extraction, blood culturing, etc.)
- cDNA synthesis/RT-PCR
- DNA/RNA extraction and purification
- ELISA kits
- Protein extraction and isolation
- TaqMan genotyping
- T cell and NK cell isolation/culturing/proliferation assays
- Flow Cytometry
- CRISPR-Cas9 gene editing on isolated primary cells

In vitro Cell-line Research

- cDNA synthesis/RT-PCR
- Cell culturing (monocytes, T cells, NK cells pancreatic cells)
- DNA/RNA extraction and purification
- ELISA kits
- Extraction of lipoproteins from rat liver cells
- Protein extraction and isolation
- Use of continuous gradients and step-gradients to isolate specific proteins out of liver cells
- Western blot
- Flow Cytometry
- CRISPR-Cas9 gene editing

LEADERSHIP EXPERIENCE

- Postdoctoral Mentor to various undergraduates.
- Senior Ph.D. candidate in Dr. Saleh Naser's lab: mentoring graduate and undergraduate students, lead liaison of lab for high school tours/presentation, lead on the RHB-104 MAP antibiotic clinical trial project (Red Hill Biopharma), representative of the lab
- Lab managerial experience, which includes: everyday maintenance of the lab, teaching new lab students (both undergrad and graduate students), involved in all projects, involved in running RHB-104 clinical trial in lab, etc.
- Leadership role in the Biomedical Sciences Graduate Student Association (BSGSA)
- Assisted in the facilitation of Graduate Recruitment and Graduate Orientation Weeks for 2016-2018

PRESENTATIONS/AWARDS

Institutional Conferences

- **Robert C. Sharp, Ph.D. *** *Modeling of the SIRPγ and CD47 Pathway in the Pathogenesis of Type 1 Diabetes*. Pathology Research Day - "The 39th Annual Pathology Research Day Symposium". June 2020. University of Florida (Oral Presentation).

- **Robert C. Sharp, Ph.D.***, Wen-I Yeh, Ph.D., Matthew Brown, and Todd Brusko, Ph.D. *Interrogating the role of SIRPγ and CD47 pathway in the pathogenesis of type 1 diabetes.* College of Medicine Research Poster Session 2020. February 2020. University of Florida (Poster).

- **Robert C. Sharp, Ph.D.***, Wen-I Yeh, Ph.D., Matthew Brown, and Todd Brusko, Ph.D.

Interrogating the role of SIRPγ and CD47 pathway in the pathogenesis of type 1 diabetes. World Diabetes Day 2019. November 2019. University of Florida (Poster).

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh Naser, Ph.D. *Effects of polymorphisms in Protein Tyrosine Phosphatase Non-receptor type 2 and 22 (PTPN2/22) and mycobacterial infection in the pathophysiology of Crohn's disease*. 10th Annual Graduate Research Colloquium, August 2018. University of Central Florida (Poster).

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh Naser, Ph.D. *Effects of polymorphisms in Protein Tyrosine Phosphatase Non-receptor type 2 and 22 (PTPN2/22) and mycobacterial infection in the pathophysiology of Crohn's disease*. UCF Celebrates the Arts Opening Reception for Millican Society Members, April 2018. Dr. Phillips Center, Orlando, FL. (Poster)

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh Naser, Ph.D. *Effects of polymorphisms in Protein Tyrosine Phosphatase Non-receptor type 2 and 22 (PTPN2/22) and mycobacterial infection in the pathophysiology of Crohn's disease*. 15th Annual Graduate Research Forum, April 2018. Univeristy of Central Florida (Poster, **Won Participants Choice Award**).

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Role of single nucleotide polymorphisms (SNPs) and Mycobacterium avium subspecies paratuberculosis (MAP) in autoimmune disease*. 9th Annual Graduate Research Colloquium, August 2017. University of Central Florida (Poster).

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh Naser, Ph.D. *Association of single nucleotide polymorphisms (SNPs) in PTPN2 and PTPN22 and Mycobacterium avium subspecies paratuberculosis (MAP) in Rheumatoid Arthritis*. Graduate Research Symposium, May 2017. University of Central Florida (Oral Presentation).

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Role of single nucleotide polymorphisms (SNPs) and Mycobacterium avium subspecies paratuberculosis (MAP) in autoimmune disease*. 14th Annual Graduate Research Forum, April 2017. University of Central Florida (Poster).

- **Robert C. Sharp***, Swetha C. Vuyyuru, Seela Ramesh, Srinivas Seela, Harinath Sheela, Shazia Beg, and Saleh Naser, Ph.D. *Role of PTPN2 and PTPN22 in dysregulated immune response in patients with Crohn's Disease and Type 1 Diabetes.* 8th Annual Graduate Research Colloquium, August 2016. University of Central Florida (Poster).

- **Robert C. Sharp***, Swetha C. Vuyyuru, Seela Ramesh, Srinivas Seela, Harinath Sheela, Shazia Beg, and Saleh Naser, Ph.D. *Role of PTPN2 and PTPN22 in dysregulated immune response in patients with Crohn's Disease and Type 1 Diabetes.* 13th Annual Graduate Research Forum, April 2016. University of Central Florida (Poster).

Regional Conferences

- **Robert C. Sharp***, Shazia A. Beg, M.D. and Saleh Naser, Ph.D. *Pathophysiology of rheumatoid arthritis is associated with polymorphisms in protein tyrosine phosphatase non-receptor type 2 and 22 (PTPN2/22) and susceptibility to Mycobacteria*. Florida Branch American Society for Microbiology Annual Meeting, October 2018. Orlando, FL (Poster, **Won Third Place**).

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Downregulation of PTPN2/22 due to rs478582/rs2476601 in Rheumatoid Arthritis is linked to super-active T-cells, increase IFN-γ and susceptibility to Mycobacteria.* Florida Branch American Society for Microbiology Annual Meeting, October 2017. Clearwater, FL (Oral Presentation).

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Role of PTPN2 and PTPN22 in dysregulated immune response in patients with Crohn's Disease and Type 1 Diabetes.* Florida Academy of Sciences Meeting, March 2017. Florida Polytech Institute, FL (Oral Presentation).

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Role of PTPN2 and PTPN22 in dysregulated immune response in patients with Crohn's Disease and Type 1 Diabetes.* 2016 Florida Branch American Society for Microbiology Annual Meeting, October 2016. Miami, FL (Oral Presentation, **Won Second Place**).

- **Robert C. Sharp***, Swetha C. Vuyyuru, Seela Ramesh, Srinivas Seela, Harinath Sheela, Shazia Beg, and Saleh Naser, Ph.D. *Role of PTPN2 and PTPN22 in dysregulated immune response in patients with Crohn's Disease and Type 1 Diabetes.* Lake Nona Medical City Research Day, October 2016. Lake Nona, FL (Poster).

- Karel Alcedo***,** **Robert C. Sharp***, Seela Ramesh, M.D., and Saleh Naser, Ph.D. *Development of Multi-color In-situ hybridization Technique for Detection of Pathogens from Intestinal Mucosa of Crohn's Disease Patients.* 2015 Florida Branch American Society for Microbiology Annual Meeting, October 2015. Cocoa Beach, FL (Poster).

National/International Conferences

- **Robert C. Sharp, Ph.D.***, Matthew Brown, and Todd Brusko, Ph.D. *Modeling the SIRPγ and CD47 Pathway in Type 1 Diabetes Pathogenesis*. Human Islet Research Network (HIRN) 2020 Annual Meeting, September 2020. Virtual Poster Session (Poster)

- **Robert C. Sharp***, Shazia A. Beg, M.D. and Saleh A. Naser, Ph.D. *Pathophysiology of rheumatoid arthritis is associated with polymorphisms in protein tyrosine phosphatase non-receptor type 2 and 22 (PTPN2/22) and susceptibility to Mycobacteria*. American Association of Immunology: Immunology 2018 Annual Meeting, May 2018. Austin, TX. (Poster)

- **Robert C. Sharp*** and Saleh Naser, Ph.D. *Role of single nucleotide polymorphisms (SNPs) and Mycobacterium avium subspecies paratuberculosis (MAP) in autoimmune disease*. 5th Annual Meeting of the International Academy of Cardiovascular Sciences, September 2017. Lake Nona, FL (Poster and on Organizing Committee).

FELLOWSHIPS/SCHOLARSHIPS

- UCF College of Graduate Studies Presentation Fellowship (2018)

- Burnett School of Biomedical Sciences' Rudy J. Wodzinski Scholarship (2015-2017)

- Bright Futures Scholarship (2007-2013)

GRANTS RECEIVED

- **EPIG Grant (2908EPIG) Sharp (PI)** 8/29/2019 – 5/31/2020
  University of Florida Pathology Department
  Modeling of the SIRPγ and CD47 Pathway in the Pathogenesis of Type 1 Diabetes
  Award Won: Outstanding EPIG Project
- **HIRN Emerging Leaders in T1D Award Sharp (PI)** 6/1/2021 – 6/1/2022
  Human Islet Research Network (HIRN)

PUBLICATIONS

Peer-Review Publications

- **Robert C. Sharp, Ph.D.***, Matthew E. Brown, and Todd M. Brusko, Ph.D. *Alterations in Activation and Deactivation Markers in T cells after Disruption of the Signal Regulatory Protein Gamma (SIRPγ) and CD47 Signaling Pathway.* In preparation.

- **Robert C. Sharp, Ph.D.***, Matthew E. Brown*, Melanie R. Shapiro, Ph.D., and Todd M. Brusko, Ph.D. *The Immunoregulatory Role of the Signal Regulatory Protein Pathway and CD47 in Type 1 Diabetes*. Diabetologia, In preparation (Review; IF: 7.11).

- Melanie R. Shapiro*, Ph.D., Puchong Thirawatananond*, Leeana Peters, **Robert C. Sharp, Ph.D.**, Similoluwa Ogundare, Amanda Posgai, Ph.D., Daniel J. Perry, Ph.D., and Todd M. Brusko, Ph.D. *Decoding genetic risk variants in type 1 diabetes*. Immunology & Cell Biology, 01/2021; DOI: 10.1111/imcb.12438. (Review; IF: 3.8)

- Amna Naser*, Ahmad K. Odeh*, **Robert C. Sharp, Ph.D.,** Ahmad Qasem, Ph.D., Shazia A Beg M.D., and Saleh A. Naser, Ph.D. *Polymorphisms in TNF Receptor Superfamily 1B (TNFRSF1B:rs3397) are Linked to Mycobacterium avium paratuberculosis Infection and Osteoporosis in Rheumatoid Arthritis.* Microorganisms, 12/2019; 7(11)., DOI: https://doi.org/10.3390/microorganisms7120646 (Original Research; IF: 4.17)

- **Robert C. Sharp*,** Ebraheem S. Naser*, Karel P. Alcedo, Ahmad Qasem, Latifia S. Abdelli, Ph.D. and Saleh A. Naser, Ph.D.: *Development of multiplex PCR and fluorescent in situ hybridization (m-FISH) coupled protocol for detection of pathogens involved in inflammatory bowel disease pathogenesis*. Gut Pathogens, 12/2018; 10 (51)., DOI: https://doi.org/10.1186/s13099-018-0278-1. (Original Research; IF: 2.81)

- Brent L. Cao*, Ahmad Qasem, **Robert C. Sharp**, Latifa S. Abdelli, Ph.D. and Saleh A. Naser, Ph.D. *Systematic review and meta-analysis on the association of tuberculosis in Crohn's disease patients treated with tumor necrosis factor-α inhibitors*. World Journal of Gastroenterology, 07/2018; 24 (25)., DOI: 10.3748/wjg.v24.i25.2764. (Original Research; IF: 3.36)

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh A. Naser, Ph.D.: *Role of PTPN2/22 polymorphisms in pathophysiology of Crohn's disease.* World Journal of Gastroenterology 02/2018; 24 (6)., DOI:10.3748/wjg.v24.i6.657. (Original Research; IF: 3.36)

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh A. Naser, Ph.D.: *Polymorphisms in Protein Tyrosine Phosphatase Non-receptor type 2 and 22 (PTPN2/22) are linked to hyper-proliferative T-cells and susceptibility to Mycobacteria in rheumatoid arthritis*. Frontiers in Cellular and Infection Microbiology 01/2018; 8 (11)., DOI: 10.3389/fcimb.2018.00011. (Original Research; IF: 4.3)

- **Robert C. Sharp***, Muna Abdulrahim*, Ebraheem S. Naser, and Saleh A. Naser, Ph.D.: *Genetic variations of PTPN2 and PTPN22: Role in the Pathogenesis of Type 1 Diabetes and Crohn's Disease*. Frontiers in Cellular and Infection Microbiology 12/2015; 5(186)., DOI:10.3389/fcimb.2015.00095. (Review; IF: 4.3)

Conference Abstract Publications

- **Robert C. Sharp***, Shazia A. Beg, M.D., and Saleh A. Naser, Ph.D. *Pathophysiology of rheumatoid arthritis is associated with polymorphisms in Protein Tyrosine Phosphatase Non-receptor type 2 and 22 (PTPN2/22) and susceptibility to Mycobacteria*. The Journal of Immunology 06/2018; 200 (1 Supplement). (Abstract, IF: 4.92)

Dissertation Publication

- **Robert C. Sharp**. *Role of Single Nucleotide Polymorphisms (SNPs) in PTPN2/22 and Mycobacterium Avium Subspecies Paratuberculosis (MAP) in Rheumatoid Arthritis and Crohn's Disease*. Electronic Theses and Dissertations 12/2018; 6225 (2018). DOI: https://stars.library.ucf.edu/etd/6225. (Dissertation)