Description:

The Department of Pathology and Laboratory Medicine at University of Illinois at Chicago, a top ranked research-intensive institution in the heart of the exciting city of Chicago, is seeking a full-time Postdoctoral Research Associate to join the research laboratory of **Professor Nahed Ismail MD PhD**. The Ismail laboratory focuses on the development of new immunotherapeutic or vaccination strategies for infectious diseases caused by intracellular bacterial pathogens. Research in this program is both basic and translational in nature and makes use of in vitro and in vivo animal-based model systems that are well-established in the lab. Specifically, her research program examines the innate and adaptive immunity and the role of NOD-like receptors (NLR) and autophagy in inflammation and sepsis caused by tick borne bacterial pathogens (e.g., *Ehrlichia, Rickettsia*). Ismail lab was first to define the contribution of Type-I IFN responses, MYD88 signaling, NLRP3 inflammasome, NK cells, NKT cells, and CD8 T cells to the development of liver injury during Ehrlichia-induced sepsis (publications in Immunity, Scientific Reports, Plos pathogens, Hepatology Communication, Journal of Immunology, Nature, Infection and Immunity, American Journal of Pathology to name a few PMID: 31732168; PMID: 31575880; PMID: 31134081; PMID: 29049365; PMID: 20616341; PMID: 15791258). Recently, her lab is focused in cell-specific responses during infection with emphasis on the contribution of macrophages, hepatocytes and endothelial cells, as target cells, to pathogenesis of Ehrlichia-induced sepsis and protective immunity. In addition to her primary research focus, Dr. Ismail directs the Clinical Microbiology Division at University of Illinois at Chicago where her clinical research lab is recently funded to expand COVID-19 diagnostics using current FDA-approved platforms as well as innovative technology such as CRSIPR-Cas9.

Three basic and translational projects are immediately available:

1. Cell-specific innate immune responses to Ehrlichia species. We recently demonstrated that hepatocyte-specific type I IFN signaling exacerbate liver pathology during infection with obligate intracellular Ehrlichia by promoting bacterial replication and detrimental caspase-11-mediated inflammasome activation (Hepatology communication). This project further examines the innate responses (e.g., inflammasome activation, autophagy) of target cells such as macrophages, hepatocytes, and endothelial cells and their contribution to adaptive immunity during *Ehrlichia*-induced liver injury and sepsis.
2. Metabolic stress and reprogramming during infection and their role in innate and adaptive immune responses against rickettsial pathogens. Oxidative stress results from the imbalance between reactive oxygen species production and antioxidant defenses. Reactive oxygen species (ROS) are byproducts of both physiological and pathological cellular processes occurring in the mitochondria, peroxisomes, and endoplasmic reticulum (ER). ROS could be exploited by several pathogens to evade host responses. Excessive production of ROS can cause damage to cellular components, including proteins, lipids, and DNA. We seek to understand the mechanistic basis underlying how *Ehrlichia*-infected cells differ in their ability to cope with metabolic stress and how these responses are regulated during development of liver injury and sepsis. A post-doctoral fellow is needed to characterize an under-studied modulator of metabolic stress using state-of-the-art molecular biology, biochemical methods and advanced microscopy using in vivo and in vitro infection model systems.
3. Development of novel COVID-19 diagnostics and understanding COVID-19 pathogenesis. Dr. Ismail clinical research program focuses on development of innovative

molecular and immunological assay for detection of SARS-COV2 in human samples as well as determining the magnitude and function of antibody responses in convalescent plasma. The goal is to determine the contribution of anti-viral IgG antibodies to protective immunity or immunopathology generated during mild and severe COVID-19 disease, respectively.

The Ismail Lab is seeking highly motivated, organized, and creative candidates to take on mentored leadership roles in the laboratory and train to become fully independent academic scientists. Successful candidates can expect a collaborative and supportive laboratory environment and to be immersed in scientific and technical excellence at University of Illinois at Chicago and other academic institutions in Chicago City.

Job Qualifications:

- Doctorate degree in related field received within the last five years is required.
- Track record in the field of microbiology, immunology, cell biology, molecular biology, metabolic stress, with relevant publications
- Experience with several of the following technical proficiencies: animal experimentation, flow cytometry, cell biology, cell culture, T cell functional assays, isolation of primary cells, CRISPR, viral vector-mediated overexpression or silencing, confocal microscopy, immunofluorescence, and general immunological and molecular biology methods.
- Independent, self-motivated, innovative, and demonstrated scientific and technical excellence.
- Excellent written and oral communication skills, organizational skills, and work ethics
- Interested in applying to independent grant opportunities and seeking funding from external sources
- Ability to work effectively and productively in a team environment and present their work at local and national meetings

To apply, please send current curriculum vitae to: Dr. Nahed Ismail, MD, Ph.D. Professor of Pathology, University of Illinois at Chicago, at email: ismail7@uic.edu.