Ph.D. Graduate Student Position

Vaccine and Infectious Disease Organization-International Vaccine Centre (VIDO-InterVac)

University of Saskatchewan, Saskatoon, Saskatchewan, Canada

Project Title: Towards a universal CpG recoding approach for flavivirus vaccines

Institution: VIDO-InterVac, University of Saskatchewan
120 Veterinary Road, Saskatoon, SK S7N 5E3

Start Date: The position will be opened until filled

Organization: VIDO-InterVac is a preeminent research institute with its primary focus on microbial pathogenesis, vaccine development, and mitigation strategies against both human and animal pathogens. VIDO-InterVac currently has over 150 personnel and state-of-the-art facilities, including the International Vaccine Centre (InterVac), one of the most advanced containment level 3 facilities in the world consisting of both laboratories and animal isolation suites. VIDO-InterVac scientists work with important human (Influenza, MERS, Zika virus, and Wuhan coronavirus) and animal viruses (PRRSV, PEDV, PCV2/3, and African swine fever virus); a candidate will have a unique opportunity to learn and contribute to multidisciplinary research on emerging and re-emerging pathogens.

Program of Study: Doctorate (Ph.D.) in Veterinary Microbiology.
https://grad.usask.ca/programs/veterinary-microbiology.php#Program

Project Description: Experimental increase of CpG dinucleotides in an RNA virus genome impairs infection providing a promising approach for vaccine development. While CpG recoding is an emerging and promising vaccine approach, little is known about infection phenotypes caused by recoded viruses *in vivo*. In our recent study (https://www.frontiersin.org/articles/10.3389/fimmu.2019.03077/full), we generated several Zika virus variants with the increasing CpG content and compared infection in neonatal and adult mice. Increasing the CpG content caused host-age-dependent attenuation of infection with considerable attenuation in neonates and high attenuation in adults. Zika virus variants with the increased CpG content evoked robust cellular and humoral immune responses and protection against lethal challenge.
The candidate will use Zika virus to fine-tune CpG recoding approach and develop optimal vaccine candidates that will not cause brain infection in neonatal mice but retain immunogenicity and protective efficacy in adult mice. Subsequently, the candidate will test whether this recoding technology can be used to generate vaccine candidates against other flaviviruses—e.g., dengue virus, West Nile virus, and Japanese encephalitis virus. The candidate will use a multidisciplinary approach which includes advanced animal models, molecular virology, bioinformatics, and

immunological methods. This project will provide excellent training for a candidate who desires to pursue a career in scientific research.

Financial Support: The project is fully funded and the candidate will be provided a stipend, but will also be expected to apply for internal and external scholarships.

Research Advisor: Uladzimir Karniychuk. For more information, visit:
https://www.vido.org/team/project-leaders-veterinarians/uladzimir-karniychuk

Candidate Profile: A Master's degree in biomedical or other relevant sciences with strong proven experience with virology methods. The candidate must be **1)** highly motivated and creative, **2)** diligent, including a willingness to support research experiments overtime and on weekends when required and **3)** excellent in verbal and written English skills**.** The candidate may be required to work under **high-security biocontainment level-3 conditions** after extensive training. The successful candidate will be required to undergo and clear a reliability status screening assessment, background check, and a criminal record check.

How to Apply: Interested candidates must submit electronically, **one single application document** (pdf file) that includes **1)** a letter of motivation, **2)** a complete *curriculum vitae* (CV), **3)** a copy of graduate transcripts, and **4)** contact information for individuals willing to provide references, to u.karniychuk@usask.ca

VIDO-InterVac and the University of Saskatchewan is strongly committed to a diverse and inclusive workplace. As such, applications from those who will contribute to the diversity of our community are welcome and all qualified candidates are encouraged to apply. However, Canadian citizens and permanent residents will be given priority.

Only candidates selected for interviews will be contacted