Institut national de la recherche scientifique

Research project for a master's student in Virology and Immunology

Project title: Evaluation of the adjuvant potential of immunostimulating synthetic chimeric saponins

Location: Centre Armand-Frappier Santé Biotechnologie, Institut national de la recherche scientifique (INRS), Réseau International des Instituts Pasteur (RIIP), 531, boulevard des Prairies, Laval (Québec), H7V 1B7, Canada

Project description: Vaccine adjuvants are substances that activate the immune system in the presence of an antigen and promote the development of a more effective vaccine response. To date, very few vaccine adjuvants have been clinically approved. The natural saponin QS-21 is a promising adjuvant for the development of subunit vaccines. However, QS-21 is unstable, toxic, and has a complex molecular structure. We recently demonstrated the non-toxic nature of lupane-type saponins obtained from birch bark residues. As part of a collaborative project funded by the Fonds de recherche du Québec − Nature et technologies (FRQNT, team research projects, 2020-2023), our research team (Pr Charles Gauthier, glycochemist, INRS; Pr Alain Lamarre, immunologist, INRS; and Prof. André Pichette, natural products chemist, UQAC) has proposed to synthesize chimeric saponins and to evaluate of their immunostimulating potential on a vaccine model in mice. As there are no *in vitro* reliable biological tests to predict the *in vivo* immunostimulatory activity of an adjuvant candidate in a vaccination context, animal studies are essential for the success of our research project. Our team is therefore looking for a candidate who can perform these experiments as part of the master's degree in virology and immunology dispensed at the INRS.

Research fields: Immunology; vaccine adjuvants; immunostimulating natural products

Starting date: May or September 2021

Research directors: Pr Alain Lamarre (immunologist) et Pr Charles Gauthier (glycochemist)

Funding: This project is funded by the FRQNT via the "Team research projects" program. The student will receive a scholarship for the duration of their master's studies (maximum two years). If their application is selected, the recruited student must agree to submit their academic file to the provincial (FRQNT or FRQS) and federal (NSERC or CIHR) granting agencies, if eligible, as well as to the Armand-Frappier Foundation (FAF) for the annual graduate scholarship competitions.

Study program: Master in Virology and Immunology (INRS)

Eligibility: The candidate must hold a BSc in Biology, Biochemistry or Microbiology or any other field related to health biosciences (or an equivalent degree) and have maintained a cumulative average of at least 3.0/4.3 or equivalent. The student must have enough knowledge of French and English.

Questions about the project: Please contact Pr Alain Lamarre (email: alain.lamarre@inrs.ca; phone: +1 450 687-5010 ext. 4262) and/or Pr Charles Gauthier (email: charles.gauthier@inrs.ca; phone: +1 450 687-5010 ext. 8886).

How to apply: Those interested are asked to send their CV, the transcripts of their most recent diploma, a cover letter, and the contact details of two people who agree to provide references, to the following email addresses: alain.lamarre@inrs.ca and/or charles.gauthier@inrs.ca

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