

**Research project for a PhD student**  
(for candidates with training in organic chemistry)

**Project title:** Chemical synthesis, extraction, purification and neuroprotective properties of anthocyanins

**Location:** Centre [INRS – Institut Armand-Frappier](#), 531, boul. des Prairies, Laval (Québec), H7V 1B7, Canada

**Project description:** Alzheimer's disease (AD) is an age-related neurodegenerative disease that currently affects more than 40 million people worldwide. AD is a multifactorial disease characterized by the formation of amyloid plaques and neurofibrillary tangles in different regions of the brain. Anthocyanins, natural compounds found in various fruits and vegetables, are able to cross the blood-brain barrier at pharmacological concentrations and target the neuropathological mechanisms of AD. Researchers at the INRS-Institut Armand-Frappier have recently developed a formulation containing four anthocyanins (MAF14001) which shows synergistic antioxidant and neuroprotective properties ([Ramassamy, Cent. Nerv. Syst. Agents Med. Chem. 2015, 16, 37](#)). The availability of anthocyanins represents a major hurdle to the development of the MAF14001 formulation. As part of this project, we plan to: 1) develop new synthetic pathways for anthocyanins and their metabolites; 2) isolate anthocyanins from a new variety of wild cranberries; and 3) evaluate the neuroprotective activity of synthetic and natural anthocyanins *in vitro* and *in vivo*. The benefits of this project could help to find a prevention treatment for AD.

**Keywords:** Organic synthesis, bioactive natural products, anthocyanins, glycochemistry

**Starting date:** September 2018 or January 2019

**Supervisors:** [Pr Charles Gauthier](#) (chemist) et [Pr Charles Ramassamy](#) (neuropharmacologist)

**Funding:** This project is funded in part by the Fonds de recherche du Québec – Nature et technologies (FRQNT) through the “team research projects” program. The student will receive a scholarship for the duration of his/her PhD studies (maximum four years).

**Study program:** [PhD in biology](#)

**Eligibility:** The candidate must hold a BSc and an MSc in chemistry (or equivalent grade) and must have maintained a cumulative average of at least 3.2/4.3 or equivalent. The student must have experience in organic synthesis and in 1D and 2D NMR analysis. An interest in natural product chemistry and/or glycochemistry would be an asset.

**Questions:** Please contact Pr Gauthier (email: [charles.gauthier@iaf.inrs.ca](mailto:charles.gauthier@iaf.inrs.ca); phone: +1-450-687-5010 ext. 8886). For more details on Pr Gauthier's research topics, visit his website (<http://cgauthier.profs.inrs.ca/>).

**Submit your application:** Prospective students are requested to send their CV, the transcript of their most recent degree, a cover letter as well as the contact information of two individuals who can provide reference letters to the following email address: [charles.gauthier@iaf.inrs.ca](mailto:charles.gauthier@iaf.inrs.ca)