A master's student in microbial environmental genomics at Université Laval, Quebec City, Canada

We are looking to recruit a highly motivated master's student in microbial environmental genomics to work on a project fully funded by Genome Quebec's Genomics Integration Program (GIP) on 'Omics-based evaluation and biomonitoring of microbial inoculants in iron ore mining fields in northern Quebec.' The GIP aims to transform innovative ideas into concrete solutions with socio-economic impact for Quebec in sectors such as agriculture and agri-food, forestry, the environment and human health. We encourage under-represented groups (First Nations, women, visible and ethnic minorities, etc.) to apply.

Our project activities aim to evaluate the performance of microbial inoculated plants using the phenomic approach by measuring morpho-ecophysiological parameters and to track inoculant strains in roots and soils in a complex edaphic environment of microbial populations using the genomic approach (high-throughput sequencing of entire inoculant genomes). The master's student will use specific primers for microbial inoculants for ddPCR technology to quantify inoculants in roots and soils and assess their competitiveness in the consortium and their dispersion in the environment. After sequencing the entire genomes of the inoculants, specific primers will be developed by a postdoctoral fellow using appropriate bioinformatics tools for sequence assembly, annotation, and comparison to develop unique biomarkers for the identification of species and strains in the environment. Various machine learning algorithms will also be tested to increase identification accuracy. This work will demonstrate the high efficiency and specificity of this culture-independent approach, based on the use of strain-specific primers, enabling rapid and inexpensive detection of bioinoculants in the rhizosphere of plants for monitoring and quantification purposes under non-sterile and uncontrolled field conditions.

Required qualifications and skills: Master's students must be highly motivated, hold a bachelor's degree in biochemistry, microbiology or biology, and have a good command of written and spoken French and English or willingness to engage and learn French. The successful candidate must also have strong interpersonal skills and the ability to work well in an equitable, diverse and inclusive research environment.

Training environment: The Institute of Integrative and Systems Biology (IBIS, www.ibis.ulaval.ca) at Université Laval is an excellent EDI research environment for acquiring multidisciplinary scientific training in genomics, proteomics, metabolomics and bioinformatics, with experimental studies. IBIS has its own international EDI committee (https://edii.ibis.ulaval.ca).

Applications: To apply, candidates must send their CV and two letters of recommendation by email to Professor Juan Carlos Villarreal Aguilar (email: juan-carlos.villarreal-aguilar@bio.ulaval.ca), copying Profs Ilga Mercedes Porth (EM: ilga.porth@sbf.ulaval.ca), co-applicant, Paul George (EM: Paul. George@bcm.ulaval.ca), collaborator, and Damase P. Khasa (email: Damase.Khasa@ibis.ulaval.ca), project manager. Funding for the scholarship is available for two years: $CAD 20,000 per year starting in the winter semester of 2026 (January 2026).