

PhD program – Veterinary sciences (microbiology)



Project title. Characterization and modelization of the risk associated with poultry and swine barns and abattoirs for the dissemination of antibiotic resistance genes through the emission of bioaerosols.

Project description. The aim of the study is to describe the role of bioaerosols in the transport and transfer of antibiotic resistance genes in various environmental settings across Canada. Bioaerosols serve as a reservoir of antibiotic resistance genes and represent a source of exposition for humans and animals. As opposed to other well-known vectors such as water and soil, the role of bioaerosols in the dissemination of antibiotic resistance genes remains to be better defined. Through the sampling and analysis of bioaerosols collected from arctic, urban, rural and farming environments, the exposition of Canadians to antibiotic resistance genes will be documented and modeled. This study is part of a larger project conducted by an international multi-disciplinary research group with expertise applying to animal health, human health and environmental science.

Objectives

1. Establish the emission profiles of antibiotic resistance genes carried by bioaerosols collected from poultry and swine rearing and slaughtering establishments.
2. Describe the variability among antibiotic resistance genes emission profiles according to the animal production type, the barn and the antibiotic use regimen.
3. Contribute to the modelization of the risk associated with different antibiotic gene emission profiles.

Skills to be developed. The graduate student will develop skills in air sampling, in microbiology, in molecular biology and in bioinformatics and statistical analyses. The student will be working closely with members of the Chaire de recherche en salubrité des viandes (CRSV), consisting of veterinarians, biologists, biochemists and bioinformatics specialists. Research work will be conducted at both the farm and slaughter plant levels and laboratory analyses will be carried out in laboratories of the CRSV and of Dr. Caroline Duchaine at Laval University (Québec).

Profile required

Must be eligible for admission for a PhD program in Veterinary sciences at the Université de Montréal:

<https://admission.umontreal.ca/en/admissions/>

Having completed undergraduate and graduate (MSc) studies in biology, in microbiology or in any equivalent field

Knowledge and interest in molecular biology

Good to excellent academic record

Being self-contained with good analytical ability

Mastering written and spoken French would be an asset

Any expertise related to animal production, food science or environmental science would be an advantage

Host institution. The Chaire de Recherche en Salubrité des Viandes (CRSV) is a research and teaching group specialized in food safety and risk analysis. It is a dynamic team comprising 4 researchers, 2 research assistant and a dozen graduate students. Research projects conducted at the CRSV mainly focus on the characterization

of bacterial pathogens, on the study of antibiotic resistance genes and on the interactions between bacteria and their ecosystems in the farm to the table continuum.

Remuneration. A research scholarship (25 000\$ / year for 3 years) will be allocated. Well performing students are encouraged to apply for additional internal and external funding.

Project start. Interested candidates must send their application as soon as possible. The project is planned to begin in September 2020.

Submitting your application. Please send the required documents listed below to: marie-lou.gaucher@umontreal.ca

Letter of interest specifying your qualifications (maximum 1 page);

Curriculum vitae;

Transcript of the last academic record;

Name and contact information of two referees



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