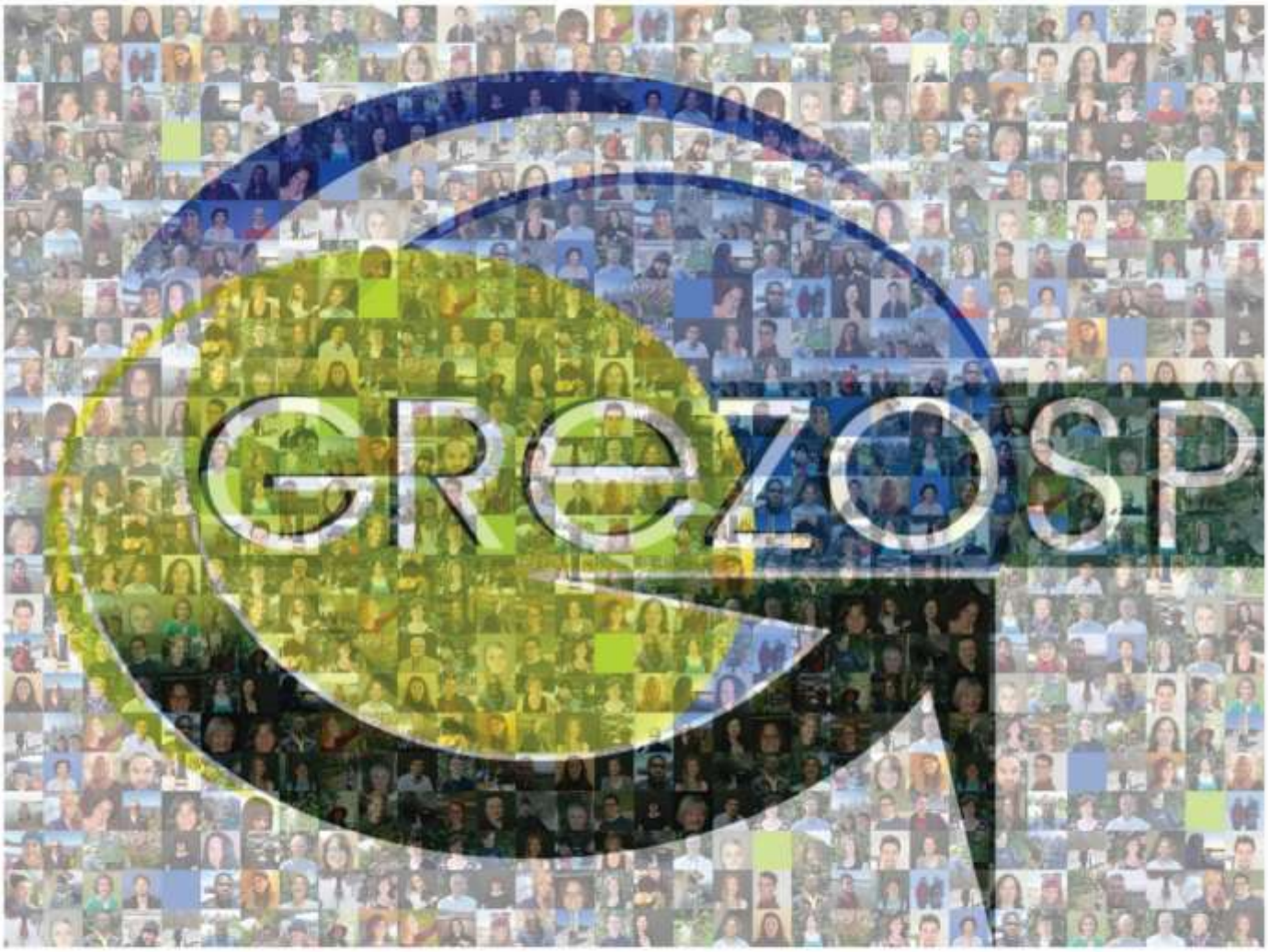
GROUPE DE RECHERCHE EN
ÉPIDÉMIOLOGIE DES ZOONOSES
ET SANTÉ PUBLIQUE

Université de Montréal

POUR la santé publique de demain



Activity Report

2019 - 2020

A brief overview

GREZOSP brings together researchers and organizations whose mission is to promote research on public health and animal health issues at a population level in order to steer collective actions and public policies.

For the year 2019-2020, GREZOSP has more than 125 members, including 15 research members, 27 regular members, 42 associate members, 5 post-doctoral fellows, 21 doctoral students and 18 master's students. Our members have worked on 86 research projects. They have published more than 60 scientific papers (http://grezosp.com/recherche/publications) and have lectured at over 10 national and international conferences.

GREZOSP co-coordinates the *Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques* (Quebec's multi-party monitoring centre for zoonoses and adaptation to climate change). It has also held its 7th Symposium on Veterinary Public Health, and provided a platform for 15 workshops and conferences.

Contents

COVER PAGE LAYOUT: Marie-Laure Le Carre
CONCEPTION AND EDITING: Liliane Fortin

Message from the Director

GREZOSP was born at the turn of the 21st century, its relevance justified by various outbreaks and emerging zoonotic issues, such as antimicrobial resistance, the major verotoxigenic E. coli outbreak in Walkerton, Ontario, the arrival by plane of the West Nile virus in New York and its quick expansion in North America. The interest, supported as much by a growing understanding than by addressing these issues to control and even eliminate them, required a more collaborative, integrated, interdisciplinary and multi-stakeholder approach between human health and animal health; in other words, a "One Health" public health approach.

As GREZOSP was getting ready to celebrate its twentieth anniversary in 2020, another global health crisis, more dramatic that GREZOSP has ever seen, put a damper on everything. However, its negative impact on GREZOSP is nothing compared to how humans in Quebec, Canada and throughout the world have been and will be professionally and personally affected by COVID-19.
This zoonotic scourge shed light on the importance of and the interest in epidemiology and its curves, public health and its vital role in the readiness and response of each society during such crises, the presence and impact of zoonotic infectious diseases and the risks we face as humans living in the vicinity of the animal world. Wildlife biodiversity is very vast, even if it is shrinking in this Anthropocene era. This wildlife is also sufficiently close to us humans, biologically speaking, for germs to be able to spread between species, including ours. At the same time, this wildlife is far enough, immunologically speaking, for such a spread to cause serious, even fatal, health alterations in humans. This planetary event strengthens, if there was still a need, the relevance of research on zoonotic diseases, and therefore, the relevance of GREZOSP.

Many GREZOSP members have legitimately focused their professional activities on COVID-19 to take part in the fight against this emerging infection. Before, during, and unfortunately, even after COVID-19, many other zoonotic concerns threaten and affect human, animal and public health. This GREZOSP annual report illustrates the extent of these concerns. It also provides an overview of the research projects and other activities GREZOSP members have undertaken in 2019-2020 to better manage these issues and train highly qualified staff, which the current crisis shows a great need for.

In hoping that you will appreciate, through this report, the dynamism and contribution of GREZOSP and its members in preventing, protecting and improving human, animal and public health, we wish you a pleasant reading.

André Ravel, DMV, M.Sc., Ph.D.

Presentation of our Research Group

The Groupe de recherche en épidémiologie des zoonoses et santé publique (GREZOSP - Research Group on Epidemiology of Zoonoses and Public Health) is a research group at Université de Montréal's Faculty of Veterinary Medicine, which stems from a partnership between Université de Montréal professors and Public Health Agency of Canada researchers.

In 2018, GREZOSP completed a strategic planning exercise for the years 2019 to 2021, the result of which is presented below (in French only).

Plan stratégique 2019-2021

Pour une interface humain-animal-environnement en meilleure santé

VISION S'affirmer comme un pôle d'excellence «Une seule santé» en santé publique

MISSION Le GREZOSP est un rassemblement de chercheurs et d'organisations dont la mission est de promouvoir la recherche sur des problématiques de santé publique et de santé animale au niveau des populations afin d'orienter les actions collectives et les politiques publiques

VALEURS

COLLÉGIALITÉ	COLLABORATION	INTERDISCIPLINARITÉ	EXCELLENCE	LEADERSHIP
› Consulter nos membres › Être à l'écoute des besoins du groupe › Être transparent dans la prise de décision	› Promouvoir et soutenir la collaboration › Promouvoir et soutenir le partenariat › Collaborer avec tous les niveaux et toute l'étendue de la santé publique	› Favoriser les projets permettant à plusieurs expertises de se rencontrer › Encourager l'ouverture et l'inclusion › Intégrer autant les savoirs que les ressources › Valoriser une pensée systémique	› Prôner la plus grande rigueur scientifique › Favoriser et intégrer l'innovation dans le fonctionnement du groupe, la recherche et son application › Exiger de tous un comportement éthique et intègre	› Guider l'action par nos recherches › Contribuer significativement à réaliser l'approche *Une seule santé*

Plan stratégique 2019-2021

Pour une interface humain-animal-environnement en meilleure santé

ORIENTATIONS ET OBJECTIFS

1. PARTENARIAT ET RÉSEAU	2. VIE SCIENTIFIQUE	3. RESSOURCES ET VIE DE GROUPE
› 1.1 Parfaire les partenariats existants › 1.2 Créer de nouveaux partenariats qui permettront un positionnement du groupe plus large › 1.3 Faire mieux connaitre le GREZOSP auprès de la FMV	› 2.1 Faire rayonner les activités de recherche › 2.2 Favoriser l'innovation dans nos recherches › 2.3 Développer le financement de projets structurants	› 3.1 Renforcer le dynamisme de la dimension collective et le sentiment d'appartenance au groupe › 3.2 Se doter de ressources humaines, physiques, matérielles et financières additionnelles afin de poursuivre notre développement

Partnerships

Public Health Agency of Canada | Agence de la santé publique du Canada

Agence canadienne d'inspection des aliments | Canadian Food Inspection Agency

INSPQ
Centre d'expertise et de référence en santé publique

Agreement with the Public Health Agency of Canada

In 2016, the cooperation agreement between the Public Health Agency of Canada (PHAC) and the Université de Montréal was renewed for the years 2015-2020. This agreement enhances the scientific and research capabilities in the field of epidemiology, zoonotic diseases and public health in a context of cooperation for the purpose of preventing and controlling zoonotic diseases of significance to Canada. This agreement also allows us to practice our research activities under one roof within the GREZOSP and thus, improve the synergy, performance and efficiency between and within PHAC and the Faculty of Veterinary Medicine (FMV).

Agreement with the Institut national de santé publique du Québec

A collaboration agreement between the Institut national de santé publique du Québec (INSPQ) and the Faculty of Veterinary Medicine through GREZOSP was signed to ensure the joint coordination and development of the *Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques* (Observatory). The Observatory's primary mission is to foresee zoonotic disease issues in Québec in order to support risk management and better adapt to climate change. The co-coordinators are Danaelle Page for the INSPQ and Audrey Simon for GREZOSP. A number of GREZOSP members contribute to the Observatory as either members with scientific expertise – André Ravel (EcoHealth approach), Julie Arsenault (enteric zoonoses) and Jean-Philippe Rocheleau (veterinary medicine) – or as public policy members – Ariane Massé (MFFP); Isabelle Picard (MAPAQ); Nicholas Ogden and Catherine Bouchard (PHAC); and Farouk El Allaki (CFIA).

Agreement with the Canadian Food Inspection Agency

The Canadian Food Inspection Agency (CFIA) and GREZOSP signed a contribution agreement in 2014. The renewal process for another 3-year term was completed in 2017; the current agreement is therefore ending on March 31st, 2020.

Administration and Committees

Board of Directors

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Université de Montréal

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Public Health Agency of Canada

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Université de Montréal

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Public Health Agency of Canada

André Ravel
Director of GREZOSP
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André Ravel
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Jean-Philippe Rocheleau
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Canadian Food Inspection Agency

Hélène Lardé, représentante étudiante
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Public Health Agency of Canada

André Ravel
Director of GREZOSP
Université de Montréal

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Public Health Agency of Canada

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Mohamed Rhouma
Canadian Food Inspection Agency

Michelle Tessier
Public Health Agency of Canada

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Catherine Bouchard
Public Health Agency of Canada

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Université de Montréal, IRSPUM

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Université de Montréal

Patricia Turgeon
Public Health Agency of Canada

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Public Health Agency of Canada

Marie-Josée Champagne
Public Health Agency of Canada

Liliane Fortin
Université de Montréal

Valérie Hongoh
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Marie-Laure Le Carre
Public Health Agency of Canada

Manon Racicot
Canadian Food Inspection Agency

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Director of GREZOSP
Université de Montréal

Carol-Anne Villeneuve
Université de Montréal

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Université de Montréal

Juliana Ayres Hutter
Institut national de santé publique du Québec

Émilie Bouchard
University of Saskatchewan

Liliane Fortin
Université de Montréal

Marie-Laure Le Carre
Public Health Agency of Canada

Audrey Simon
Université de Montréal

Social Committee

Liliane Fortin
Université de Montréal

Stefany Ildefonso
Université de Montréal

Marie-Laure Le Carre
Public Health Agency of Canada

André Ravel
Director of GREZOSP
Université de Montréal

Patricia Turgeon
Public Health Agency of Canada

Our Members

Research Members

Research Member : professor, university researcher or career scientist performing most of their research activities within the GREZOSP.

Cécile Aenishaenslin, FMV
Julie Arsenault, FMV
Philippe Berthiaume, PHAC
Catherine Bouchard, PHAC
Hélène Carabin, FMV
Philippe Fravalo, FMV
Emily Jenkins, U. Saskatchewan
Patrick Leighton, FMV
Antoinette Ludwig, PHAC
Nicholas Ogden, PHAC
André Ravel, FMV
Erin Rees, PHAC
Audrey Simon, FMV
Patricia Turgeon, PHAC
Jean-Pierre Vaillancourt, FMV

Regular Members

Regular Member : professor, university researcher, career scientist or public health professional dedicating part of their time and resources to the group's projects.

Guy Beauchamp, FMV
Denise Bélanger, FMV
Michel Bigras-Poulin, FMV
Stéphanie Brazeau, PHAC
Marie-Josée Champagne, PHAC
Sylvie D'Allaire, FMV
Simon Dufour, FMV
Farouk El Allaki, CFIA
John M. Fairbrother, FMV
Christopher Fernandez Prada, FMV
Caroline Fortin, DSA-MAPAQ
Philippe Gachon, UQAM
Salima Gasmi, PHAC
Rebecca A. Guy, PHAC
Valérie Hongoh, PHAC
Jules Koffi, PHAC
Serge Olivier Kotchi, PHAC
Benoît Lévesque, INSPQ
Anne-Marie Lowe, PHAC
Samir Mechai, PHAC
Julie Paré, CFIA
Yann Pelcat, PHAC
Manon Racicot, CFIA
Jean-Philippe Rocheleau, FMV
Michelle Tessier, PHAC
Marie-Ève Turcotte, INSPQ
André Vallières, CFIA

Associate Members

Levon Abrahamyan, FMV
Ariane Adam-Poupart, INSPQ
Alain Aspirault, MAPAQ
Juliana Ayres Hutter, INSPQ
Luc Bergeron, MAPAQ
Lea Berrang-Ford, U. McGill
Diane Boucher, MAPAQ
Sandie Briand, INSPQ
Ann-Marie Cochrane, PHAC
Caroline Côté, IRDA
Geneviève Côté, MAPAQ
Julie David, ANSES (France)
Benjamin Delisle, FMV
Francine Essono
Julie-Hélène Fairbrother, MAPAQ
Cécile Ferrouillet, FMV
Claudia Gagné-Fortin, MAPAQ
Isabelle Gagnon, MAPAQ
Céline Gariépy, DSP Montérégie
Marcelo Gottschalk, FMV
Andrée Lafaille, FMV
Louise Lambert, DSP
Marie-Ève Lambert, FMV
Anne Leboeuf, MAPAQ
Marie-Laure Le Carre, PHAC
Annick Marier, MAPAQ
Ariane Massé, MFFP
Isabelle McKenzie, MAPAQ
Pascal Michel, PHAC
François Milord, DSP Montérégie
Bianca Morel, CFIA
Pascale Nérette, CFIA
Soulyvane Nguon, INSPQ / MAPAQ
Isabelle Picard, MAPAQ
Liliana Potes, IRSPUM
Chantal Proulx, MAPAQ
Fidisoa Rasambainarivo, U. Missouri
Mohamed Rhouma, CFIA
Gabriel Rotaru, PHAC
Alain Rousseau, INRS

Our Members

Student Members: Projects carried out by student members of the group within the framework of the GREZOSP

Name	Institution	Director	Co-director(s)	Project Title
Postdoctoral Fellows and Researchers				
Valérie Hongoh	Université de Montréal	**Patrick Leighton**		Modelling re-incursion, expansion and control of raccoon rabies in southern Quebec
Yi Moua	Université de Montréal	**Patrick Leighton**	**Erin E. Rees**	Modelling arctic fox rabies dynamics in the changing North
Olivia Tardy	Université de Montréal	**Patrick Leighton**		Interactions vecteurs-hôtes-pathogènes et hétérogénéité du paysage : développement d'approches de modélisation pour explorer les mécanismes écologiques qui régissent le risque de transmission et propagation de maladies à transmission vectorielle et de la rage en Amérique du Nord
Doctoral Students				
Agathe Allibert	Université de Montréal	**Patrick Leighton**	**Erin E. Rees**	Modélisation de l'avenir de la Rage vulpine dans l'Arctique Canadien
Émilie Bouchard	University of Saskatchewan	**Emily Jenkins**	**Patrick Leighton**	Distribution de Toxoplasma gondii chez les renards et lynx dans le nord Canadien
Antoine Boudreau Leblanc	ESPUM	Bryn Williams-Jones	**Cécile Aenishaenslin**	Potentialiser la surveillance et la recherche en santé et en écologie à partir d'une intégration des données vétérinaires et écologiques : une réflexion sur les enjeux scientifiques, institutionnels, culturels et éthiques de la circulation des mégadonnées avec une approche écosystémique
Léa Delesalle	Université de Montréal	**Cécile Aenishaenslin**	**André Ravel**	Priorisation des interventions de contrôle des risques liés aux populations de chiens au Nunavik
Ariane Dumas	Université de Montréal	**Patrick Leighton**	**Nicholas H. Ogden**	Écologie et dynamique d'émergence de la maladie de Lyme à fine échelle spatiale.
Camille Guillot	Université de Montréal	**Patrick Leighton**	**Catherine Bouchard**	Représentativité de la surveillance sentinelle pour la maladie de Lyme au Québec et au Canada
Stefany Ildefonso	Université de Montréal	**André Ravel**	Johanne Saint-Charles	Implémentation et évaluation d'interventions à l'interface humain-chien visant à réduire les risques et augmenter les bénéfices au Nunavik
Ellen Jackson	Université de Montréal	**Hélène Carabin**	Amanda Janitz	Impact de différents types de biais sur la validité de l'inférence causale de différents facteurs de risque et la transmission de Taenia solium
Sarah Mediouni	Université de Montréal	**Cécile Aenishaenslin**	**Hélène Carabin**	Évaluation du Programme intégré canadien de surveillance de la résistance aux antibiotiques (PICRA) dans une approche «Une seule santé»
Jérôme Pelletier	Université de Montréal	**Patrick Leighton**	**Jean-Philippe Rocheleau et Catherine Bouchard**	Le traitement des micromammifères à l'aide d'un acaricide oral dans le but de réduire le risque de transmission de la maladie de Lyme à l'humain
Miarisoa Rindra Rakotoarinia Randriamialy	Université de Montréal	**Antoinette Ludwig**	**Patrick Leighton et Nicholas H. Ogden**	Changements environnementaux globaux au Québec et en Ontario et impact sur le risque d'exposition aux maladies zoonotiques transmises par les moustiques
Caroline Sauvé	Université de Montréal	**Patrick Leighton**	**Erin E. Rees** et Amy Turmelle Gilbert	La rage chez la petite mangouste asiatique (Herpestes auropunctatus) dans les Caraïbes: dynamique spatiale, conditions de persistance, influence de l'écologie spatiale et implications relatives à la gestion et au contrôle de la maladie.

Our Members

Student Members: Projects carried out by student members of the group within the framework of the GREZOSP

Name	Institution	Director	Co-director(s)	Project Title
Masters Students				
Gabriel Ahui	Université Laval	Nathalie Barrette	**Serge Olivier Kotchi**	Utilisation d'un système d'information géographique pour la caractérisation des espaces à risque de paludisme à M'bahiakro (Côte d'Ivoire)
Julie Allostry	Université de Sherbrooke	Richard Fournier	**Serge Olivier Kotchi et Antoinette Ludwig**	Modélisation des densités de populations de moustiques associées à des maladies zoonotiques vectorielles représentant un risque pour la santé publique
Corinne Arsenault Pierre-Louis	ESPUM	**Julie Arsenault**	**Hélène Carabin**	Analyse coûts-bénéfices de la vaccination contre la fièvre Q des petits ruminants du Québec
Nestor Baraheberwa	Université de Montréal	**Julie Arsenault**	**Farouk El Allaki**	Évaluation de la stratégie de surveillance de la tuberculose bovine chez les cervidés d'élevage au Canada
Laurence Daigle	Université de Montréal	**Cécile Aenishaenslin**	**André Ravel**	Étude sur les facteurs de risque de morsure et l'accès aux services vétérinaires dans les communautés nordiques du Québec
Gabrielle Dimitri-Masson	Université de Montréal	**Patrick Leighton**	Claire Jardine	Sarolaner treatment of wild rodents: Breaking new ground in the fight against Lyme disease
William Donnelly	Université de Montréal	**Julie Arsenault**	Sébastien Buczinski	La paratuberculose dans les troupeaux ovins du Québec : prévalence, stratégies diagnostiques et impacts des pratiques de biosécurité et des mouvements des animaux sur le risque d'infection
Lauriane Duplaix	Université de Montréal	**Julie Arsenault**	**Benoit Lévesque et Patricia Turgeon**	Séroprévalence de Coxiella burnetii dans la population québécoise et impact des facteurs environnementaux sur son risque d'infection, sa dispersion et sa survie
Marie-Christine Frenette	Université de Montréal	**Patrick Leighton**	Nicolas Lecomte	Interactions entre renards et chiens en régions nordiques : transmission de maladies
Géraldine-Guy Gouin	Université de Montréal	**André Ravel**	**Cécile Aenishaenslin**	Réduction des interactions à risque pour la santé humaine entre les enfants et les chiens à Kuujjuaq
Antoine Levasseur	Université de Montréal	**Julie Paré**	**Julie Arsenault**	Étude épidémiologique des cas de virus du Nil occidental chez les équins au Canada de 2003-2018
Natasha Nofal	Université de Montréal	**Cécile Aenishaenslin**	**Catherine Bouchard**	Évaluer l'adaptation de la population canadienne à la maladie de Lyme dans une perspective «Une seule santé»
Ludivine Taieb	Université de Montréal	**Antoinette Ludwig** et Dominique Bicout	Carl A. Gagnon	Modélisation des espèces d'oiseaux hôtes principales pour le virus du Nil occidental dans le sud du Québec
Eyaba Tchamdja	Université de Montréal	**Julie Arsenault**	**Patricia Turgeon**	Risque pour la santé publique associé aux infections causées par Salmonella Dublin, Campylobacter spp et Escherichia coli résistants aux antimicrobiens chez les veaux de lait du Québec
Carol-Anne Villeneuve	Université de Montréal	**Patrick Leighton**	Nicolas Lecomte	Arbovirus en zone arctique, diversité et statut infectieux des vecteurs arthropodes au Nunavut et au Nunavik

Our Members

Student Members: Projects carried out by or involving GREZOSP student members which are associated with other research groups

Name	Institution	Director	Co-director(s)	Project Title
Postdoctoral Fellows and Researchers				
Maryse Michele Um	Université de Montréal	**Simon Dufour**	**André Ravel**	Validation des stratégies d'échantillonnage du lait de réservoir et identification des facteurs de risque de Salmonella Dublin dans les élevages laitiers
Doctoral Students				
Tamazight Cherifi	Université de Montréal	**Philippe Fravalo**	Sylvain Quessy	Le procédé d'abattage découpe des porcs sélectionne, par la capacité différentielle de formation de biofilm, les souches de Listeria monocytogenes, analyse complémentaire de la virulence pour adaptation des mesures de gestion du risque
Maud De Lagarde	Université de Montréal	**John M. Fairbrother**	**Julie Arsenault**	Prévalence et facteurs de risque de l'excrétion rectale de souches d'Escherichia coli (E. coli) multi résistantes et de souches produisant des ß-lactamases dans la population équine canadienne
Annie Fréchette	Université de Montréal	**Simon Dufour**	**Caroline Côté** et Gilles Fecteau	Impacts des méthodes de préparation de la litière à base de fumier recyclé sur la santé des vaches laitières et sur la qualité du lait
Jean-Philippe Gilbert	Université Laval	Nathalie Barrette	**Erin E. Rees** et Victoria Ng	Identification de la population vulnérable aux maladies infectieuses et prévision des épidémies – Étude de cas de l'épidémie de Zika
Fidele Kabera	Université de Montréal	**Simon Dufour**	Jean-Philippe Roy	Traitement antibiotique sélectif par quartier au tarissement basé sur la culture de lait à la ferme à l'aide des Petrifilm®
Daryna Kurban	Université de Montréal	**Simon Dufour**	Jean-Philippe Roy et Trevor DeVries	Impact des infections intramammaires à staphylocoques sur la production laitière et la composition du lait du quartier affecté
Hélène Lardé	Université de Montréal	**Simon Dufour**	David Francoz et Marie Archambault	Évaluation des pratiques d'utilisation des agents antimicrobiens par les médecins vétérinaires et les producteurs de bovins laitiers du Québec
Jonathan Massé	Université de Montréal	Marie Archambault	**Simon Dufour** et David Francoz	Antibiorésistance dans les élevages de bovins laitiers du Québec
Fannie Shedleur-Bourguignon	Université de Montréal	**Philippe Fravalo**		Identification de composants de l'écosystème microbien des surfaces de production de viande porcine associés à l'absence de Listeria monocytogenes, vers une écologie dirigée des surfaces
Passoret Vounba	Université de Montréal	**John M. Fairbrother**	Rianatou Bada et **Julie Arsenault**	Pathogénicité potentielle et résistance antimicrobienne des Escherichia coli isolés des poulets de fermes au Québec, au Sénégal et au Vietnam
Masters Students				
Gabrielle Claing	Université de Montréal	**Julie Arsenault**	Pascal Dubreuil	Prévalence des principales pathologies de l'abeille domestique (Apis mellifera) au Québec et impacts sur la mortalité hivernale
Lilia Rodriguez Sanchez	Université de Montréal	**Patrick Leighton**	Pascal Dubreuil	L'efficacité d'une matrice à relargage lent de doses croissantes d'acide oxalique en période pré-récolte afin de limiter l'accroissement estival des populations du parasite Varroa destructor dans les ruches du Québec

Research Projects

Projects carried out by members of the group and within the framework of GREZOSP (in progress between May 1st 2019 and April 30th 2020)

Title	Researchers	Funding
Évaluer les facteurs de risques influençant l'incidence de la maladie de Lyme au Québec	**Ariane Adam Poupart**, INSPQ; **Géraldine Gouin, Cécile Aenishaenslin**, FMV; **Catherine Bouchard**, PHAC; **Patrick Leighton**, FMV and collaborators	INSPQ -PHAC
Développement d'une formation bilingue visant la surveillance autonome des tiques Ixodes scapularis dans les parcs canadiens et la sensibilisation des travailleurs et de la population générale aux risques liés à la maladie de Lyme	**Ariane Adam Poupart**, INSPQ; **Patrick Leighton** FMV and collaborators; **Catherine Bouchard**, PHAC	
Développer et évaluer des programmes innovants pour lutter contre les maladies infectieuses émergentes dans une perspective « Une seule santé »	**Cécile Aenishaenslin**, FMV	FRQS
Convergence in evaluation frameworks for integrated surveillance of AMR, Joint Programming Initiative on Antimicrobial Resistance (JPIAMR)	Barbara Häsler, Royal Veterinary College (United Kingdom); **Cécile Aenishaenslin**, FMV and collaborators	Research Network
A National Research Network on Lyme Disease	**Cécile Aenishaenslin**, FMV and collaborators	IRSC
Evaluating One Health competencies: Are current and future One Health professionals prepared for climate change?	Jane Parmley et Katie Clow, U. Guelph; **Cécile Aenishaenslin**, FMV	Public Health Agency of Canada, Infectious Disease and Climate Change Fund
Développement et évaluation d'une intervention de santé publique pour réduire le risque péri-domestique de la maladie de Lyme sur le territoire de la Ville de Bromont	**Cécile Aenishaenslin**, **Patrick Leighton**, FMV and collaborators	Ville de Bromont et INSPQ
Caractérisation des espaces à risque de paludisme a M'Bahiakro, Côte d'Ivoire	**Gabriel Ahui**, Nathalie Barrette, U. Laval; **Serge Olivier Kotchi**, PHAC	U. Laval
Cartographie des abondances annuelles de quatre espèces de moustiques représentant un risque pour la santé publique selon un modèle environnemental et climatique, pour le sud du Québec	**Julie Allostry**, Richard Fournier, U. Sherbrooke; **Antoinette Ludwig, Serge Olivier Kotchi**, PHAC; François Rousseau, CRCHU de Québec	PHAC, U. Sherbrooke
Impacts des conditions environnementales et climatiques sur le risque d'infection par Coxiella burnetii au Québec	**Julie Arsenault**, FMV; **Patricia Turgeon**, PHAC; **Benoît Lévesque**, INSPQ; **Anne Leboeuf, Isabelle Picard**, MAPAQ; **Jean-Philippe Rocheleau, Lauriane Duplaix**, FMV	PHAC, Fonds du centenaire-Université de Montréal
Étude épidémiologique des infections causées par Salmonella Dublin, Campylobacter spp et E. coli résistants aux antimicrobiens chez les veaux de lait du Québec	**Julie Arsenault**, FMV; **Patricia Turgeon**, PHAC; **Philippe Fravalo**, FMV; **Geneviève Côté**, MAPAQ; **Eyaba Tchamdja**, FMV	Innov'Action (MAPAQ)

Research Projects

Projects carried out by members of the group and within the framework of GREZOSP (in progress between May 1st 2019 and April 30th 2020)

Title	Researchers	Funding
Modélisation du risque de campylobactériose selon les différentes sources d'exposition environnementales et alimentaires dans une perspective de changements climatiques au Canada	**Julie Arsenault, Philippe Fravalo, André Ravel**, FMV; **Philippe Gachon**, UQAM; Amy Greer, U. Guelph; Rob Deardon, U. Calgary	Instituts de Recherche en Santé du Canada : programme Projet, automne 2017
Vers des réponses socio-comportementales/écologiques informatives contre la maladie de Lyme au Canada	**Catherine Bouchard**, PHAC; **Cécile Aenishaenslin**, FMV; **Erin E. Rees, Yann Pelcat, Jules Koffi**, Robbin Lindsay, PHAC; **Patrick Leighton**, FMV	Fonds A-Base
Observation de la Terre et cartographie des risques de maladies vectorielles: Un outil pour la surveillance et l'évaluation des risques croissants de santé publique associés au changement climatique et ecosystémique	**Stéphanie Brazeau, Serge Olivier Kotchi, Nicholas H. Ogden, Marie-Josée Champagne, Antoinette Ludwig, Catherine Bouchard, Erin Rees, Yann Pelcat, Julie Légaré**, PHAC; Claude Codjia, Yves Baudouin, UQAM; Frédéric Hubert, Alain Viau, Thierry Badard, Nathalie Barrette, U. Laval; Patrick Leighton, FMV; PHAC-CFEZID, StatCan, IRD (France), CNES (France), INSPQ, PHO, NSDHW, AAFC, NRCan, ECCC	Agence spatiale canadienne (ASC)
Développement d'indicateurs de zones à risque de la maladie de Lyme à partir des données de surveillance passive de la tique Ixodes scapularis pour l'Ontario et le Manitoba	**Salima Gasmi, Nicholas H. Ogden**, PHAC; **Marion Ripoche**, INSPQ; **Patrick Leighton**, FMV; Robbin Lindsay, Mark Nelder, **Erin E. Rees, Catherine Bouchard**, Linda Vrbova, Richard Rusk, Curtis Russell, **Yann Pelcat, Samir Mechai, Serge Olivier Kotchi, Jules Koffi**, PHAC	PHAC
La distribution géographique et saisonnière des espèces de tiques d'importance pour la santé publique autres qu'Ixodes scapularis au Québec	Karine Thivierge, INSPQ; **Salima Gasmi, Catherine Bouchard, Nicholas H. Ogden**, PHAC; **Patrick Leighton**, FMV	Université de Montréal, PHAC
Développement d'indicateurs d'observation de la Terre pour la caractérisation des facteurs de risque de la maladie de Lyme à l'échelle locale	**Serge Olivier Kotchi, Nicholas H. Ogden, Catherine Bouchard, Erin E. Rees**, PHAC; **Patrick Leighton**, FMV; **Jules Koffi, Yann Pelcat, Stéphanie Brazeau**, PHAC	PHAC
Utilisation des images d'observation de la Terre pour le développement d'indicateurs d'alerte précoce du risque de maladies transmises par les moustiques	**Serge Olivier Kotchi, Antoinette Ludwig, Stéphanie Brazeau**, PHAC; Richard Fournier, U. Sherbrooke; Thibault Catry, IRD (France); **Patrick Leighton**, FMV	PHAC
Cartographie du risque d'Ixodes scapularis dans l'Est du Canada	**Serge Olivier Kotchi, Nicholas H. Ogden, Catherine Bouchard, Erin E. Rees**, PHAC; **Patrick Leighton**, FMV; **Jules Koffi, Yann Pelcat, Stéphanie Brazeau**, PHAC	PHAC
Réduire le risque et améliorer la santé publique via des approches aérospatiales innovantes.	**Serge Olivier Kotchi, Stéphanie Brazeau, Antoinette Ludwig, Catherine Bouchard, Erin Rees, Yann Pelcat, Julie Légaré**, PHAC; Nathalie Barrette, Alain A. Viau, Frédéric Hubert, U. Laval	PHAC
Apparition de la maladie de Lyme : étude éco-épidémiologique dans un parc périurbain	**Patrick Leighton, Ariane Dumas**, FMV; Pierre Drapeau, UQAM; **Catherine Bouchard, Nicholas H. Ogden**, Robbin Lindsay, PHAC	Université de Montréal, UQAM, PHAC

Research Projects

Projects carried out by members of the group and within the framework of GREZOSP (in progress between May 1st 2019 and April 30th 2020)

Title	Researchers	Funding
Surveillance et prévision du risque émergent de la maladie de Lyme au Québec	**Patrick Leighton**, Camille Guillot, FMV; **Catherine Bouchard**, PHAC; **Francois Milord**, DSP Montérégie; Kate Zinzser, IRSPUM	
Modelling the spread of Lyme disease and other vector-borne diseases in Canada	**Patrick Leighton**, FMV	PHAC
Modélisation de la dynamique future de la rage du renard arctique et gestion du risque associé	**Patrick Leighton**, FMV; **Ariane Massé**, MFFP; **Erin E. Rees**, PHAC; **Philippe Gachon**, UQAM	MITACS
Évaluer un nouvel acaricide oral de traitement chez les petits mammifères comme une intervention locale pour réduire le risque de la maladie de Lyme au Québec	**Patrick Leighton**, FMV; **Catherine Bouchard**, PHAC; **Jean-Philippe Rocheleau, Cécile Aenishaenslin**, FMV; **Nicholas H. Ogden**, Robbin Lindsay, PHAC; Francis Beaudry, FMV and collaborators	Fonds Québécois de la Recherche sur la Nature et les Technologies (FQRNT)
Traitement des rongeurs sauvages à base de Sarolaner : innovations dans la lutte contre la maladie de Lyme	**Patrick Leighton**, FMV; **Catherine Bouchard**, PHAC; **Cécile Aenishaenslin**, **Christopher Fernandez- Prada**, FMV; Claire Jardine, U. Guelph; **Jean-Philippe Rocheleau**, FMV; L. Robbin Lindsay, **Nicholas H. Ogden**, PHAC	Zoetis Investment in Innovation Fund
Connaissance polaire du Canada, le réseau zoonoses arctique : un réseau de surveillance centré sur la communauté pour les maladies vectorielles et les zoonoses de la faune dans un arctique changeant	**Patrick Leighton**, FMV; **Emily Jenkins**, U. Saskatchewan; L. Robbin Lindsay, **Nicholas H. Ogden**, PHAC; Nicolas Lecomte, U. Moncton; **Philippe Gachon**, UQAM	Polar Knowledge Canada (POLAR) Northern Science and Technology
Modélisation de la ré-incursion, de l'expansion et des opérations de contrôle de la rage du raton-laveur dans le sud du Québec	**Patrick Leighton**, FMV; **Erin E. Rees**, PHAC	Ministère des Forêts, de la Faune et des Parcs
Écologie de la rage du renard arctique dans un Nord changeant	**Patrick Leighton**, FMV; **Erin E. Rees**, PHAC; **Philippe Gachon**, UQAM	OURANOS et MITACS
Enquête et sensibilisation auprès de la Nation huronne-wendat au risque d'acquisition de la maladie de Lyme et participation à la surveillance active des tiques	Amélie D'Astous, Conseil de la Nation huronne-wendat; **Patrick Leighton**, FMV	PHAC
Vector-borne diseases transmitted by endemic mosquitoes in Canada	**Patrick Leighton**, FMV	PHAC
Climate change and tick-borne diseases: A One Health approach in Alberta, British Columbia, and Saskatchewan	Erin Fraser et Michael Otterstatter, BCCDC; **Patrick Leighton**, FMV	PHAC
Best practices for urban planning in the context of climate change and emerging tick-borne diseases	Manisha Kulkarni, U. Ottawa; **Patrick Leighton**, FMV	PHAC
Integration of genomics and metagenomics for the surveillance of the Lyme disease vector Ixodes scapularis in Canada and the USA	Ioannis Ragoussis et Michael Reed, U. McGill; **Patrick Leighton**, FMV	McGill Interdisciplinary Initiative in Infection and Immunity (MI4)

Research Projects

Projects carried out by members of the group and within the framework of GREZOSP (in progress between May 1st 2019 and April 30th 2020)

Title	Researchers	Funding
Rôle de la tique d'hiver dans l'écologie des populations d'orignaux dans l'Est du Canada	Jean-Pierre Tremblay, U. Laval; **Patrick Leighton**, FMV	CRSNG
Canadian Lyme Disease Research Network (CLyDRN)	Kieran Moore, U. Queen's; **Patrick Leighton**, FMV	IRSC
Contrôle de la rage du raton laveur au Québec et épidémiologie de la rage du renard au Québec	**Patrick Leighton**, FMV	MSSS
Documenter la présence d'Ochlerotatus triseriatus et Oc. japonicus comme espèces de substitut d'Aedes albopictus (Diptera : Culicidae) au sud de la province du Québec, Canada	**Anne-Marie-Lowe**, **Antoinette Ludwig**, PHAC; **Patrick Leighton**, FMV; Karl Forest B., INSPQ; Robbin Lindsay, PHAC	INSPQ
L'impact des changements de l'utilisation des terres et des changements climatiques sur le risque de maladies transmises par les moustiques à l'est de l'Ontario	**Antoinette Ludwig**, PHAC; David Lapen, AAFC; **Nicholas H. Ogden**, PHAC; **Patrick Leighton, Rindra Miarisoa Rakatoarinia**, FMV	PHAC / AAFC
Évaluation de l'usage d'un indicateur basé sur les degré-jour pour la détection de la circulation du virus du Nil occidental dans le sud du Québec	Najwa Ouhoumanne, Julie Ducrocq, Alejandra Irace-Cima, INSPQ; **Antoinette Ludwig,** PHAC	INSPQ
Prêt pour la rage 2016-2019: Modéliser l'avenir de la dynamique de la rage du renard arctique et de la gestion du risque associé	**Nicholas H. Ogden**, PHAC; **Patrick Leighton**, FMV and collaborators	Ouranos
Lyme disease in children: Data from the Canadian Paediatric Surveillance Program	**Nicholas H. Ogden, Salima Gasmi, Jules K. Koffi**, Michelle Barton, Robbin L. Lindsay, Joanne M. Langley, PHAC	PHAC
Évaluation de l'impact des changements environnementaux et climatiques sur la biodiversité des moustiques dans la South Nation River	**Miarisoa Rakatoarinia**, FMV; **Antoinette Ludwig, Patrick Leighton, Nick Ogden**, David Lapen, PHAC	UDM, PHAC, AAFC
Équilibre maladie et bien-être à l'interface Inuit-chien dans le nord du Canada	**André Ravel**, **Christopher Fernandez-Prada**, **Patrick Leighton**, FMV; Francis Lévesque, UQAT; Sherilee Harper, U. Guelph; Thora Martina Herrmann, UdeM; Johanne Saint-Charles, UQAM; **Cécile Aenishaenslin**, **Audrey Simon**, FMV; Laine Chanteloup, U. Limoges; Ellen Avard, Nunavik Research Center; Marie Rochette et Jean-François Proulx, Direction régionale de santé publique du Nunavik ; Michael Barrett et Elise Rioux-Paquette, Administration régionale Kativik ; Jessica Mitchell, Naskapi Nation of Kawawachikamach	Instituts de Recherche en Santé du Canada : programme Projet, automne 2016

Research Projects

Projects carried out by members of the group and within the framework of GREZOSP (in progress between May 1st 2019 and April 30th 2020)

Title	Researchers	Funding
The Canadian Arctic One Health Network	**Emily Jenkins**, U. Saskatchewan; **Patrick Leighton, André Ravel**, FMV; Susan Kutz, U. Calgary; Sherilee Harper, U. Alberta; Nicolas Lecomte, U. Moncton	Networks of Centres of Excellence of Canada : ArcticNet
Réseau Inondations intersectoriel du Québec	**Philippe Gachon**, UQAM; **André Ravel**, FMV and collaborators	Fonds de recherche du Québec
Observatoire international sur les impacts sociétaux de l'IA et du numérique	Lyse Langlois, U. Laval; **André Ravel**, FMV and collaborators	Fonds de recherche du Québec et le ministère de l'Économie et de l'Innovation
Cartographie de risque à échelle fine de la maladie de Lyme	**Erin E. Rees, Catherine Bouchard, Serge Olivier Kotchi, Nicholas H. Ogden**, PHAC; **Patrick Leighton**, FMV	PHAC
Integrating data analytics into health intelligence surveillance systems	**Erin E. Rees**, Victoria Ng, PHAC; Philip AbdelMalik, WHO; David Buckeridge, U. McGill; Philippe Gachon, UQAM; Jean-Philippe Gilbert, U. Laval; Kevin Lawrence, Dan Mckenny, John Pedlar, Denys Yemshanov, NRCan; Jane Parmely, U. Guelph; Gerald Penn, U. Toronto; Julie Simon, PHAC	Canadian Safety and Security Program (CSSP) from the Department of National Defense
Risk of Ixodes scapularis biting exposure and occurrence of Lyme disease in Montérégie	**Erin E. Rees**, Karon Hammond-Collins, **Catherine Bouchard, Nick Odgen**, PHAC; **Patrick Leighton**, FMV; Mathieu Tremblay, **François Milord**, DSP Montérégie	PHAC
La progression des tiques Ixodes scapularis et Borrelia burgdorferi au Québec entre 2007 et 2014	**Marion Ripoche**, INSPQ; **Catherine Bouchard, Antoinette Ludwig, Nicholas H. Ogden**, PHAC; **Patrick Leighton**, FMV and collaborators	Université de Montréal, PHAC
Distribution spatiotemporelle des cas de VNO, Québec 2011-2016, et implications pour la prévention et la surveillance en santé publique	**Jean-Philippe Rocheleau**, FMV; **Serge Olivier Kotchi**, PHAC; **Julie Arsenault**, FMV	PHAC, Université de Montréal
Rôle des oiseaux dans la dynamique de surveillance du virus du Nil occidental au Québec	**Ludivine Taieb**, FMV; **Antoinette Ludwig**, PHAC; Dominique Bicout, U. Grenoble-Alpes; Carl A. Gagnon, FMV; Robbin Lindsay, Mahmood Iranpour, PHAC	PHAC
Modéliser la dynamique des maladies vectorielles sous l'influence du changement climatique pour prioriser des scénarios d'intervention	**Olivia Tardy**, FMV; **Catherine Bouchard, Erin E, Rees**, PHAC; **Patrick Leighton**, FMV; **Nicholas H. Ogden**, PHAC and collaborators	Protocole d'accord 2017-2018 avec l'Université de Montréal (UdeM) – Climate Change Fund

Research Projects

Projects led by or in which GREZOSP members participate which are associated with other institutions

Title	Researchers	Funding
Évolution de l'utilisation des antibiotiques et de l'antibiorésistance dans les troupeaux laitiers québécois avant et après la mise en application d'un règlement sur les antibiotiques d'importance critique	Jean-Philippe Roy, **Cécile Aenishaenslin**, FMV and collaborators	MAPAQ, Projet Innov'Action
Centre de recherche en santé publique (CReSP)	Louise Potvin, ESPUM; **Hélène Carabin,** FMV, responsable de l'axe Une seule santé mondiale, **Cécile Aenishaenslin, Julie Arsenault, Philippe Fravalo, Christopher Fernandez Prada, Patrick Leighton**, FMV; **Nicholas Ogden**, PHAC; **André Ravel,** FMV; **Erin E. Rees**, PHAC; and collaborators	Fonds de Recherche du Québec Santé, Nouveaux Centres et Instituts de Recherche
Chaire industrielle CRSNG-MAPAQ biosécurité en production laitière	**Simon Dufour**, **Cécile Aenishaenslin**, FMV and collaborators	MAPAQ, Novalait, Producteurs de lait du Canada, UdeM, FMV
A One Health approach towards sustainable, safe and cost-effective livestock systems: Canadian poultry production as a model	**Hélène Carabin**, FMV	CReSP
One Health Network for the Global Governance of Infectious Diseases and Antimicrobial Resistance	**Hélène Carabin**, FMV, Ron Labonté, U. Ottawa; **Cécile Aenishaenslin**, FMV and collaborators	IRSC
Towards Better Governance of Zoonotic Disease Risk: One Health Principles in the Coronavirus (COVID-19) Response	Ron Labonté, U. Ottawa; **Erin E. Rees,** PHAC; **Hélène Carabin**, FMV and collaborators	IRSC
Étude de faisabilité et développement d'un nouveau programme interfacultaire de 3ième cycle en Une seule santé	**Hélène Carabin**, **Cécile Aenishaenslin**, FMV	Université de Montréal, Programme d'appui initiatives interfacultaire en enseignement
Chaire de Recherche du Canada de Niveau 1 en Épidémiologie et une seule santé	**Hélène Carabin**, FMV	IRSC
Épidémiologie et une seule santé	**Hélène Carabin**, FMV	Fonds Canadiens pour l'Innovation Leaders John-R. Evans
Association entre la cysticercose et l'épilepsie parmi les membres des tribus de la vallée de Gudalur dans les Nilgiris, Inde : une étude cas-témoin transversale	**Hélène Carabin**, FMV	Fonds Régina-Devos (FMV)
Using Host Responses to Neurocysticercosis to Develop Novel, Brain-Imaging Free Diagnostics: a US-India Partnership	Douglas Drevets, U. Oklahoma Health Sciences Center; Vedantam Rajshekhar, Christian Medical College (Vellore, Inde); **Hélène Carabin**, FMV and collaborators	National Institute of Neurological Diseases and Stroke et Fogarty International Center

Research Projects

Projects led by or in which GREZOSP members participate which are associated with other institutions

Title	Researchers	Funding
Microbial Ecologies of Indigenous Communities	Cecil Lewis, U. Oklahoma; **Hélène Carabin**, FMV and collaborators	National Institute of General Medical Sciences
Cysticercosis Network for Sub-Saharan Africa	Helena Ngowi, Sokoine University of Agriculture (Tanzanie); **Hélène Carabin**, FMV and collaborators	Bundesministerium für Bildung und Forschung (Allemagne)
Technologie MALDI-TOF pour l'étude de la dynamique des infections de la glande mammaire	**Simon Dufour**, FMV	FCI Leaders John-Evans FEI
CRSNG – FONCER en Qualité du lait	**Simon Dufour**, Mario Jacques, FMV	CRSNG - programme FONCER
Validation de stratégies d'échantillonnage du lait dans les réservoirs et identification des facteurs de risque de Salmonella Dublin dans les fermes laitières	**Simon Dufour**, Olivia Labrecque, FMV; Luc Bergeron, Geneviève Côté, MAPAQ; Shereen Hassan, Jean Durocher, Valacta; Chantal Fleury, Catherine Lessard, PLQ; Gilles Fecteau, David Francoz, Marie Archambault, **Julie Arsenault, André Ravel**, FMV	CRSNG
The Canadian Bovine Mastitis and Milk Quality Research Network: continuing the advancement of milk quality in Canada	**Simon Dufour**, FMV	Grappe de recherche Laitière, AAFC-PLC
Occurrence and impact of microbial biofilms on milk quality and safety: from the farm to the cheese vats	Denis Roy, U. Laval; **Simon Dufour**, FMV	Grappe de recherche Laitière, AAFC-PLC
Novel methodologies for design and analysis of dairy health surveillance programs	**Simon Dufour**, FMV	CRSNG Découverte
Constitution d'une collection documentée de microorganismes associés à des produits laitiers en fin de code non-conformes et/ou Atypiques	Julie Jean, U. Laval; **Simon Dufour**, FMV	CRIBIQ, Novalait
Outil d'intelligence artificielle pour l'identification rapide et précise des microorganismes pathogènes responsables de la mastite et de la détérioration dans le lait	Arnaud Droit, U. Laval; **Simon Dufour**, FMV	CRIBIQ, Novalait
Towards a new feeding approach of neonatal and weanling piglet for optimizing nutritional status, immunity and microbiota and minimizing the use of antibiotics	Frédéric Guay, U. Laval; Martin Lessard, AAC; **Philippe Fravalo**, FMV and collaborators	Swine Cluster

Research Projects

Projects led by or in which GREZOSP members participate which are associated with other institutions

Title	Researchers	Funding
Transplantation de bactéries fécales pour améliorer le développement post-natal du microbiote intestinal et du système immunitaire	Martin Lessard, AAC; **Philippe Fravalo**, FMV and collaborators	INAF, CRIPA, AAC
Plan de mobilisation et de sensibilisation pour l'utilisation judicieuse des antibiotiques de la filière porcine québécoise	**Philippe Fravalo**, FMV	MAPAQ, Éleveurs de porcs du Québec
Orientation bénéfique du microbiote intestinal des porcs et des volailles	**Philippe Fravalo**, Ann Letellier, Stéphane Godbout, U. Laval ; Sylvain Quessy, FMV	CRIBIQ
Modulation de la flore digestive des animaux de production en santé et impact sur la microbiologie de leurs produits	**Philippe Fravalo**, Sylvain Quessy, FMV	RDC, CRSNG, Porcima inc., CCP, Jefo Nutrition Inc., Prevtec Microbia, F. Ménard Inc.
Environnement, santé et bien-être en élevage ovocole alternatif : Phase 1 : Mitigation	Stéphane Godbout, IRDA ; **Philippe Fravalo**, FMV and collaborators	MAPAQ Cultivons l'avenir 2 /
Production et analyse de métadonnées pour diminuer le risque d'introduction de porcs fortement excréteurs de Salmonella dans la chaine alimentaire	Martine Denis, Annaelle Kerouanton, Christelle Fablet, Françoise Pol, Anses; Guillaume Larivière-Gauthier, **Philippe Fravalo**, Cnam	Cnam financement Région Bretagne
L'apprentissage machine pour le traitement de données métagénomiques en industrie Agroalimentaire	Fannie Shedleur Bourguignon, FMV; **Philippe Fravalo**, Hocine Nacima, Cnam	Cnam
Antimicrobial stewardship and its impact on antimicrobial use, antimicrobial resistance, and animal health on dairy farms	Javier Sanchez, Luke Heider, Atlantic Veterinary College, UPEI; Greg Keefe, J. Trenton McClure, UPEI; Kapil Tahlan, Memorial U; **Simon Dufour**, FMV; David Kelton, U. Guelph; Chris Luby, U. Saskatchewan; D. Leger, PHAC; H. Bakema, U. Calgary; Marie Archambault, David Francoz, **André Ravel**, Jean-Philippe Roy, FMV; Scott McEwen, Jan Sargeant, Scott Weese, U. Guelph; Cheryl Waldner, U. Saskatchewan; Richard Reid-Smith, PHAC; Juan C. Rodriguez, UPEI; Jeroen De Buck, U. Calgary	Dairy Farmers of Canada programme Dairy Research Cluster 3

For our members' publications, please visit the Publications section of our website: http://grezosp.com/recherche/publications.

Spotlight on Some of Our Research Projects

Jérôme Pelletier : *Treating wild rodents to reduce the transmission of Lyme disease to humans*

Lyme disease is a vector-borne zoonosis. It is caused by the Borrelia burgdorferi bacteria and, in Quebec, is transmitted through Ixodes scapularis ticks. An individual infected by B. burgdorferi, if undiagnosed, can develop a serious debilitating disease that can affect their quality of life. The risk of transmitting this disease to humans has been increasing in southern Quebec. This increase is in parts caused by climate change, which creates an environment more suitable for the establishment of ticks in that region. In order to mitigate this increasing threat, our research team launched a project to control the presence of Lyme disease by treating wild rodents against ticks. This project relies on the hypothesis that by reducing the interaction between small rodents, which are both reservoirs for B. burgorferi and hosts for immature I. scapularis ticks, we can reduce the abundance of infected ticks in the environment, therefore reducing the risk of transmitting the disease to humans.

Throughout 2019-2020, our team's research activities took place on four fronts. We first completed the initial phase of the project, which was to show the efficient in-laboratory treatment of rodents against ticks by publishing our study in the Parasites and Vectors journal (Figure 1). A second phase of in-laboratory studies was also initiated to better characterize the pharmacokinetics of our treatment in rodents. We then completed a first field study of the treatment in Farnham with a final year of sampling of ticks and treatment (Figure 1). Finally, we launched a second field study in partnership with the municipality of Bromont. This second study will assess the feasibility of our treatment method in an urban setting, and test the method in different environments, including a peridomestic environment. This study will take place during summer 2020.

Figure 1. Photos taken as part of our research activities. On the left: to test the effectiveness of the product in the laboratory, experimental infestations under anesthesia were performed. On the right: in-field treatment is administered to rodents through a peanut butter bait placed in a station that guarantees access only to rodents of their size.

Spotlight on Some of Our Research Projects

Léa Delesalle: Prioritizing interventions to address the challenges of One Health at the human-dog interface in northern Quebec

This doctoral project falls within the context of the more extensive Balancing Illness and Wellness at the Human-Dog Interface in Northern Canada program led by André Ravel and financed by the Canadian Institutes of Health Research.

In northern Quebec, various environmental, structural and sociocultural factors tend to aggravate the risks to public health caused by dogs. Thus, the risk of being bitten is 10 times higher on average in northern Quebec than it is in the rest of the province, exposing residents to rabies, a deadly endemic disease in Nunavik. The overpopulation of dogs and the fear of attacks can also lead to a tense social climate, stress and fear. However, dogs are an integral part of the communities and occupy a central social and cultural place. The potential benefits of their presence for human health are numerous: in particular, they can promote physical activity, create a social bond and offer emotional support.

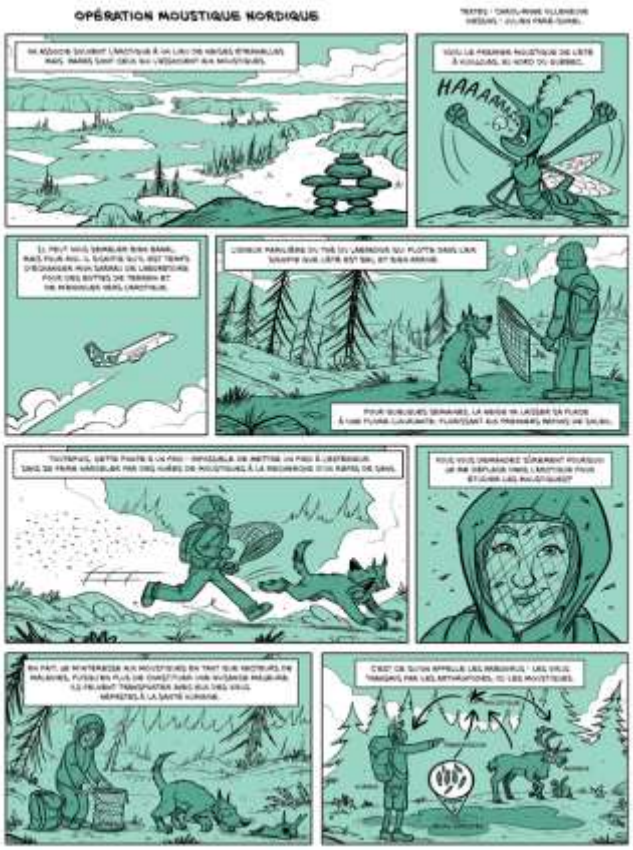
Many public health interventions have already been put in place in northern communities to address these challenges. However, up until now, most initiatives have focused on reducing risks, without considering the benefits and the socio-cultural context. The absence of lasting results shows the need to target at once the various components of the issue and to include local perspectives. This project aims to identify the key elements of a sustainable action plan that is socially acceptable and effective in addressing the challenges of One Health at the human-dog interface in northern Quebec, by using a multicriteria decision support method integrated into a participatory approach: One Health and Ecohealth.

During spring and winter 2019, Léa went over to five partner communities, four of which are Aboriginal, to present the project and develop with them an adapted and acceptable protocol. Afterwards, discussion groups and participatory workshops led with community researchers will help put together a collaborative decision support tool. The data collected will be used in a multicriteria decision support model to establish prioritized lists of interventions to improve health at the human-dog interface.

Spotlight on Some of Our Research Projects

Norther Mosquito Operation

Master's student Carol-Anne Villeneuve was one of the 5 finalists of the "L'illustre recherche" (illustrious research) contest organized by the Fédération des associations étudiantes du campus de l'Université de Montréal (www.faecum.qc.ca). Participants had to submit a 500-word text explaining a research project. Finalists were paired with a cartoonist to produce a comic strip inspired by the text submitted. Carol-Anne had the opportunity to work with cartoonist Julien Paré-Sorel (www.julienparesoleil.com); together, they combined science and humour to create "Northern Mosquito Operation".



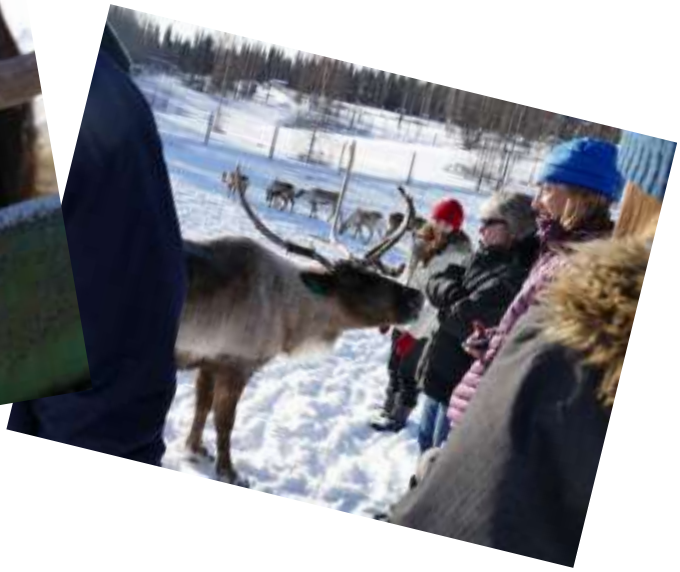
Research Spotlight : A Few Anecdotes

Beyond serious and intellectual professional activities, scientific research is also a human adventure, one where animals are never far from GREZOSP researchers. The two following testimonials are perfect examples.

A Pre-Quarantine Trip
by Carol-Anne Villeneuve

At first glance, the One Health One Future Conference in Alaska had it all: a glacial landscape worthy of Hollywood's best movies, passionate researchers ready to share with us and the opportunity to take the pulse of different northern communities. This international conference would have probably been an amazing experience if it had not been held during the Coronavirus pandemic. In transit to Seattle, a few hours before boarding the plane to Fairbanks, we received an email informing us that the conference was being cancelled as a precaution. At the time we received this announcement, Alaska had no COVID-19 cases. We can only imagine how ironic it would have been if the One Health One Future Conference became Alaska's primary outbreak for COVID-19…

We took advantage of our stay in Fairbanks to meet some collaborators and visit the Large Animal Research Station (LARS). This 130-acre station houses dozens of reindeers and muskoxen for research and education purposes. The Arctic cold made this experience even more memorable: the curious animals' hot breath was visible when they approached their big muzzles to smell us. This magical experience had us forgetting, if only for a moment, the quarantine that was awaiting us in Canada.



Research Spotlight : A Few Anecdotes

The Kingdom of Wild Pigs
by Agathe Allibert

Last year, I went to Saint Kitts many times to help my colleague Caroline Sauvé catch mongooses for her doctoral project. It is a beautiful but arduous Caribbean field: we had to get up very early to catch animals that were not happy to end up in cages and dreamed of retaliation by munching on our fingers. It was hot and the terrain was often rugged. We had to create our own paths using machetes in tall sharp grass.

While I was working in the dry forest, I stepped into the Kingdom of Wild Pigs. I did not understand right away that I was in their kingdom, despite bones scattered throughout the forest from all the pigs that had been born, had lived and died here without ever leaving their luxurious forest. At first, I feared wild pigs. They would come down the paths I was making for myself in the tall grass, and I would often feel as though I was being followed, without knowing by whom, until I would end up nose to nose with one of them. I hated it and would scream out in fear while the animal ran away as quickly as possible. Eventually, we got used to one another and I started putting the mongooses to sleep and measuring them under the pigs' curious eyes.

I even discovered the Wild Pig Paradise: a great meadow under a huge tree where lives an enormous pig, the father and grandfather of all the other pigs in the forest. Amazingly, it let me install a trapping cage right under its nose as it was taking a mud bath. I would say hi to it every morning when I would come to remove my cage and it would grunt as a friendly reply. Since then, all pigs are my friends!

OBSERVATOIRE multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques

What is the *Observatoire*?

The Observatory provides a structure for partner organizations to network and collaborate by centralizing expertise and more specifically, bringing together disciplines of human, animal and environmental health in order to offer an overview on the issue of zoonotic diseases related to climate change in Québec. The Observatory's primary mission is to foster the collaboration of scientists and public policy makers working on issues at the animal-human-environment interface in the context of adaptation to climate change.

The Institut national de santé publique du Québec (INSPQ) and GREZOSP jointly oversee the Observatory's development and coordination. The co-coordination for the GREZOSP is led by **Audrey Simon**. Several members of GREZOSP are involved in the Observatory as specialists on specific themes: **André Ravel** (EcoHealth approach), **Julie Arsenault** (enteric zoonoses) and **Jean-Philippe Rocheleau** (veterinary medicine); or as public policy makers, representing their organization : **Ariane Massé** (MFFP), **Isabelle Picard** (MAPAQ), **Nicholas Ogden** and **Catherine Bouchard** (PHAC), **Farouk El Allaki** (CFIA).

What is the mandate of the *Observatoire*?

The general mandate of the Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques (Quebec's multi-party monitoring centre for zoonoses and adaptation to climate change) is to foresee zoonose-related issues in Quebec in order to adapt to climate change, by supporting risk management in terms of monitoring, prevention, control and zoonose-related research. The Observatoire's specific mandates are to: 1) follow the evolution of zoonoses in Quebec; 2) identify challenges, as well as knowledge and tool requirements to foresee zoonose-related issues in Quebec; 3) promote concrete actions to support zoonose management and meet the identified knowledge and tool requirements in terms of monitoring, prevention, control and zoonose-related research; and 4) transfer knowledge to mobilize adaptation stakeholders around zoonose-related issues in connection with climate change.

Symposium on Veterinary Public Health: Assessing "One Health": How and Why

The Observatoire took part in the 7th Colloque en santé publique (public health symposium), organized by GREZOSP on August 22, 2019. **Audrey Simon** made a presentation entitled: L'Observatoire québécois multipartite sur les zoonoses et l'adaptation aux changements climatiques : une structure innovante pour concrétiser l'approche « Une seule santé ».

As part of the symposium, the Observatoire was chosen as a case study for the afternoon workshop on the use of a "One Health" evaluation framework. The goal of this workshop, co-moderated by Simon Rüegg and **Audrey Simon**, was to further discuss some challenges relating to the implementation of this evaluation framework and to understand the importance of a systemic approach in addressing complex health problems.

More than 50 participants from various provincial and federal organizations and many regional health agencies were able to learn more about the evaluation tool and begin the first analysis of the "One Health" aspects developed by the Observatoire.

Which work is underway and what are the upcoming projects?

Main challenges relating to zoonoses in Quebec and course of action in a context of climate change adaptation

In 2015, the Observatoire drew a portrait of the zoonoses given priority in the context of climate change in Quebec1. This also helped to identify some challenges and knowledge gaps for each prioritized zoonose. Five years later, Observatoire members have decided to update and prioritize these challenges and gaps. These priorities will be featured in the Observatoire's report, to be published by March 2021.

1 Portrait des zoonoses priorisées par l'Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques en 2015 : https://www.inspq.qc.ca/publications/2290

OBSERVATOIRE multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques

The goal of this report is to identify, prioritize and communicate priority issues to organizations and decision-makers taking part in the fight against climate change to support them in their adaptation efforts to zoonotic risks. First, experts, many of which are GREZOSP members, will update and prioritize the challenges for the zoonoses identified by the Observatoire and sort them into three groups: zoonoses transmissible through food and water, zoonoses transmissible through contact with animals, and zoonoses transmissible through arthropods. Second, Observatoire members will develop strategies and products that will be communicated to targeted stakeholders to promote concrete actions that will support the management of zoonoses and meet the need for prioritized knowledge and tools, in terms of zoonose monitoring, prevention, control and research.

Scientific Watch

Last year, the Observatoire worked closely with INSPQ groups of experts to develop a scientific watch on zoonoses and the influence of climate change. This watch focuses more specifically on the zoonoses prioritized by the Observatoire.
For several months now, this watch has been shared with Observatoire members, who have noted its usefulness. The formatting and broadcast of a product stemming from this watch to various target audiences (health professionals, academic experts) should be finalized in coming months.

Vulnerability Assessment

To address the lack of assessment of vulnerabilities to zoonoses in the context of climate change in Quebec, the Observatoire led a project from April to September 2019. The project aimed to draw a portrait of these vulnerabilities and to identify the challenges and needs in terms of knowledge and tools to improve this portrait. The project's report is being drafted and should be published in the coming months. This initial integrated summary of vulnerabilities will help, among other things, to inform government stakeholders of vulnerabilities to zoonoses, and hopefully guide their efforts in implementing adaptation plans to climate change.

OBSERVATOIRE multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques

Table 1 outlines all knowledge transfer activities carried out between May 2019 and Mars 2020.

Tableau 1 : Activités de transfert de connaissances réalisées par l'Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques entre mai 2019 et mars 2020

Événements	Thématique	Date
Publications*	Germain G, Simon A, Arsenault J, Baron G, Bouchard C, Chaumont D, El Allaki F, Kimpton A, Lévesque B, Massé A, Mercier M, Ogden NH, Picard I, Ravel A, Rocheleau JP, Soto. *Quebec's Multi-Party Observatory on Zoonoses and Adaptation to Climate Change*. Can Commun Dis Rep 2019;45(5):143–8.	Mai 2019
	Bulletin de l'Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques Vol.2 Numéro 1 : *Comment les changements climatiques influencent la transmission des zoonoses au Québec ?*	Juin 2019
Webinaires	*Réduction des agents pathogènes, de la ferme à la table.*	29 octobre 2019
	Faits saillants du Portrait des zoonoses entériques au Québec 2000-2017.	10 décembre 2019
Colloques - congrès	Colloque en santé publique vétérinaire	22 août 2019

*Toutes les publications sont disponibles en ligne sur le site l'Observatoire : https://www.inspq.qc.ca/zoonoses/observatoire.

To learn more :

Observatoire's website : https://www.inspq.qc.ca/zoonoses/observatoire

2013-2020 PACC: http://www.environnement.gouv.qc.ca/changementsclimatiques/plan-action-fonds-vert.asp

Québec's Green Fund: http://www.environnement.gouv.qc.ca/ministere/fonds-vert/

7th Symposium on Veterinary Public Health August 22nd 2019

The 7th edition of the Symposium on Veterinary Public Health, organized jointly by the GREZOSP and Microprograms on Veterinary Public Health, was held on July 22, 2019 at the Faculty of veterinary medicine.

The emergence of zoonotic infectious diseases in the context of global change requires the development and implementation of initiatives that integrate the "One Health" concept. More than 15 years after adopting this concept and deeming it essential at local, national and international levels, questions are raised about what has been done so far. What are the benefits of "One Health" initiatives? What tools are available to assess their implementation and effectiveness?

This 7th symposium examined the subject of assessing "One Health" initiatives, by discussing the relevance and effectiveness of this approach, presenting examples of such initiatives, and introducing participants to an existing evaluation framework. The symposium was open to all to encourage networking between practitioners, researchers and students.

At the symposium, some 100 participants had the chance to listen to three speakers: **Melanie Rock**, B.A., MSW, Ph.D., University of Calgary / O'Brien Institute for Public Health, **Simon Rüegg**, DVM, Ph.D., Senior Researcher at the Veterinary Epidemiology Department of the University of Zurich, and **Audrey Simon**, Ph.D., Research Officer and Co-coordinator at the Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques.

In the usual order: Patricia Turgeon, André Ravel, Liliane Fortin, Audrey Simon, Simon Rüegg, Melanie Rock, Catherine Bouchard, Cécile Aenishaenslin, Hélène Carabin et Audrey Gauthier (photo: Guy Choquette).

Les Échanges du GREZOSP

The *Échanges du GREZOSP* are weekly meetings taking place at the Faculty of Veterinary Medicine. The discussion activities include presentations by GREZOSP members or guest speakers as well as journal club sessions (review and discussion of an article suggested by a member). The calendar for the *Échanges du GREZOSP* is available online and accessible to all members on our website.

For GREZOSP, this weekly series of talks are an important vehicle for disseminating knowledge and showcasing the Group's work. To ensure the meetings are dynamic and useful, good organization is essential. This involves drawing up a schedule and inviting GREZOSP members and guest speakers to give seminars/presentations and propose articles for the journal club. A committee was therefore formed to ensure a rich and varied program, with members Cécile Aenishaenslin, Juliana Ayres Hutter, Émilie Bouchard, Liliane Fortin, Marie-Laure Le Carre and Audrey Simon.

During the 2019-2020 academic year, the GREZOSP is proud to have featured several guest speakers, including:

- Isabelle Dusfour, Institut Pasteur / INRS-Centre Armand-Frappier Santé Biotechnologie - «Medical entomology research in mosquito-borne disease hot-spot»
- José Denis-Robichaud, D.M.V., M.Sc., Ph.D., veterinary epidemiology consultant - «Supporter l'amélioration de la production laitière en Ouganda »
- Dr. Benoit Talbot, postdoctoral fellow, École d'épidémiologie et de santé publique de l'Université d'Ottawa- «Multidisciplinarité en science: comment des connaissances en écologie, en génétique et en géographie peuvent bénéficier à la recherche en santé»
- Jane Parmley, D.V.M., Ph.D., Associate professor, University of Guelph - «OneHealth: preparing and adapting to change»
- Rubens Do Monte, Fiocruz Research Center Renê Rachou, Belo Horizonte, Brazil - «L'impression 3D, du hobby à la Santé Publique»

Symposium on the *Plateforme nationale de surveillance sanitaire de la chaîne alimentaire* in France

GREZOSP, GRESA and Cnam invited Renaud Lailler (Anses), Deputy Coordinator for the *Plateforme nationale de surveillance sanitaire de la chaîne alimentaire* (PSCA - health monitoring platform for the food supply chain), to come to Quebec and present the original structuring and results after pooling health expertise between the industry and regulatory bodies in France. The event brought together some thirty participants on February 6, 2020.


Colloque

La Plateforme nationale de Surveillance sanitaire de la Chaîne Alimentaire, une approche intégrative originale – 2 ans d'expérience et de succès à partager

par Renaud Lailler (Anses), coordinateur adjoint de la PSCA

le 6 février 2020 à la Faculté de médecine vétérinaire, Saint-Hyacinthe

Organisation :

GRESA

le cnam

In the afternoon, twenty-some professionals from Quebec's food supply chain took part in a workshop where discussions were structured around themes such as:

- Self-inspections, a wealth of information greatly underutilized (the difficulty of exploiting data even before thinking of pooling them together)
- Differentiating risk monitoring and management, a requirement?
- In Canada, room for a university / monitoring centre for this type of approach

We thank Philippe Fravalo (Cnam), Alexandre Thibodeau (GRESA) and André Ravel (GREZOSP) for this rewarding initiative.

Workshops

Introduction to Mathematical Modelling

A two-day training on mathematical modelling organized by the GREZOSP was held in January 2020 at the University of Montréal's Faculty of veterinary medicine. The workshop was facilitated by Karine Chalvet-Monfray, DVM, Ph.D, HDR, Biostatistics and Epidemiology Professor, Vet-Agro-Sup (Lyon).

The main objectives of this workshop were to introduce participants to mathematical modelling and basic underlying concepts, and to develop and handle some simple models.

Strategies for Effective Scientific Communication

Two half-days of training on scientific communication, facilitated by Vinko Culjak Mathieu, were organized in March 2020 at the University of Montréal's Faculty of veterinary medicine.

The goal of this workshop was to break the mould of traditional scientific communication. After more than 8 hours of training, the 10 participants were better equipped to talk to the media, eliminate jargon and know the audience better. In the age of social media, where simple and effective scientific communication is becoming more and more important, GREZOSP is proud to help train tomorrow's scientific communicators!

Students

Veterinary Public Health Awards and Scholarships

GREZOSP students are eligible for three awards and scholarships presented by the Faculty of veterinary medicine: the Victor Théodule Daubigny award, the Alain-Bourges scholarship and the Caisse Desjardins for the region of Saint-Hyacinthe scholarship. These awards and scholarships were presented during the 2019-2020 annual ceremony held at the Faculty of veterinary medicine on March 12, 2020.

The ***Victor Théodule Daubigny award*** comes from the Société de conservation du patrimoine vétérinaire québécois (Quebec's society for the conservation of veterinary heritage) to support an undergraduate student for an activity carried out or to be carried out in the field of public health during the 2019-2020 academic year. This award was presented to DVM student **Antoine Levasseur** for his retrospective study of West Nile Virus cases in horses from 2003 to 2018.

The ***Alain-Bourges scholarship*** stems from in memoriam funds from the Bourges family and friends following the death of Dr. Alain Bourges, 1957 FVM graduate. This admission scholarship aims to support a GREZOSP graduate student. For the 2019-2020 academic year, this scholarship was awarded to doctoral student **Jérôme Pelletier**.

The ***Caisse Desjardins for the region of Saint-Hyacinthe scholarship*** is awarded to a graduate student for research excellence in the field of public health. For the 2019-2020 academic year, this scholarship was presented to doctoral student **Camille Guillot**.

Antoine Levasseur, DMV student, is presented with the Victor-Théodule Daubigny award.

Camille Guillot, Ph.D. student, is awarded the Caisses Desjardins de la région de Saint-Hyacinthe scholarship.

Students

GREZOSP Scholarship Program

GREZOSP Financial Assistance and Recruiting Scholarships

The GREZOSP offers financial assistance and recruiting scholarships through its program intended for students of the Faculty of Veterinary Medicine of the Université de Montréal in order to promote GREZOSP research activities.

To be eligible, students must be enrolled in a masters or doctoral program in veterinary sciences at the Université de Montréal, his or her director must be a research or regular member of GREZOSP and the research project must be within the framework of the GREZOSP's mission and objectives.

The purpose of these financial assistance scholarships, of a maximum amount of $6,000, is to allow students to reach an amount of funding equal to $20,000 annually for a masters student, and $23,000 annually for a doctoral student.

GREZOSP Conference Scholarships

These scholarships aim to support a Master's or Doctoral student in order to encourage them to present the results of their research project through an oral presentation at a scientific meeting or symposium.

The amount awarded will cover transportation, lodging and registration fees up to an amount of $2,000 upon presentation of supporting documents.

Scientific Outreach

2019-2020 Presentations

Aenishaenslin, C. et **H. Carabin**. *Evaluating governance in information and surveillance systems*, Atelier organisé par le Global 1H Network, Ottawa, Canada, 9 mars 2020.

Aenishaenslin, C. *Développer et évaluer des programmes innovants pour lutter contre les maladies infectieuses émergentes dans une perspective Une seule santé*, Université de Liège, Belgique, 22 janvier 2020.

Aenishaenslin, C. *From data to action: An evaluation of the impacts on decision-making of the Canadian integrated program for Antimicrobial resistance surveillance* (CIPARS), Atelier organisé par le CoEval AMR Network, Paris, France, 24 octobre 2019.

Aenishaenslin, C. *Adaptation to Lyme Disease emergence: A One Health Approach*, Atlantic Tick-Borne Disease Network, Webinar,15 mai 2019.

Bouchard C., C. Aenishaenslin, E. Rees, J. Koffi, M.Ripoche, Y. Pelcat, F. Milord, R. Lindsay, **N. Ogden, P. Leighton**, *Social-behavioral/ecological risk assessment for Lyme disease in southern Québec, Canada*, GeoVet 2019, Davis, Californie, États-Unis, 9 octobre 2019.

Boudreau LeBlanc, A., C. Aenishaenslin et B. Williams-Jones. *Collaboration à l'interface entre l'humain, l'animal et l'environnement : Vers un partage plus efficient des données*. Canadian association of veterinary epidemiology and preventive medicine (CAVEPM) Annual conference: Data avalanche and science information overload, how to find our way?, Université de Montréal, Saint-Hyacinthe, Canada, 24 et 25 mai 2019.

Gouin, G-G., C. Aenishaenslin, F. Lévesque et **A. Ravel**. *At-risk interaction of children and dogs in Kuujjuaq (Nunavik)*, 21e Congrès d'Études Inuit, Montréal, Canada, 3-6 octobre 2019.

Mediouni, S., M. Brisson, M. Rochette et **A. Ravel**. *Epidemiological situation of dog bites in Nunavik-Québec (2008-2017)*, 21e Congrès d'Études Inuit, Montréal, Canada, 3-6 octobre 2019.

Richard, L., C. Aenishaenslin, S. DeGroote, V. Ridde, **J.P. Vaillancourt, N. Ogden**. *Research and intervention onzoonotic diseases and social determinants in Canada : Identification of priority themes through a Delphi consultation*, APHA 2019 Annual Meeting and Expo, Philadelphie, Pennsylvanie, États-Unis. 3 novembre 2019. Affiche.

Sadoine, M.L., **L. Delesalle**, K. Zinszer, **C. Aenishaenslin**, C. Zarowsky, **H. Carabin**, *Integration of the One Health approach into policy and practice: a scoping review*, Conférence canadienne sur la santé mondiale, Ottawa, Canada, 17-19 octobre 2019. Affiche.

Saint-Charles, J., **C. Aenishaenslin**, F. Aimon, F. Lévesque et **A. Ravel**. *Tackling the complexity of the "dog situation" in the North: challenges and pathways to success*, 21e Congrès d'Études Inuit, Montréal, Canada, 3-6 octobre 2019.

Scientific Outreach

Our Researchers in the Media

- **Levon Abrahamyan**, Un parasite aide à mieux comprendre les infections chez les abeilles, La Presse +, 27 juillet 2019
- **Levon Abrahamyan**, Quebec virologist battles COVID-19 coronavirus from Saint-Hyacinthe, Global News, 13 février 2020
- **Levon Abrahamyan**, À la recherche de l'origine animale du nouveau coronavirus, Les Années Lumière, Radio-Canada, 14 février 2020
- **Levon Abrahamyan**, Quebec research into coronavirus, Montreal CityNews, 17 février 2020
- **Levon Abrahamyan**, Immunité collective: entrevue avec Mario Dumont, TVA Nouvelles, 24 février 2020
- **Levon Abrahamyan et Hélène Carabin**, COVID-19: faire son épicerie avec précaution, Protégez-vous, 30 mars 2020
- **Levon Abrahamyan**, La COVID-19 transmissible aux animaux?, La Presse, 8 avril 2020
- **Levon Abrahamyan**, Protecting zoo animals from COVID-19, Montreal CityNews, 9 avril 2020
- **Levon Abrahamyan**, COVID-19 : Crémation ou inhumation ? Aux familles de choisir, La Presse,18 avril 2020
- **Levon Abrahamyan**, On ne sera pas comme l'école d'avant, La Presse, 23 avril 2020
- **Cécile Aenishaenslin**, Pandémies : "Ce qui nous attend pourrait être pire encore", Le Média (France), 29 mars 2020
- **Cécile Aenishaenslin**, Réfléchir à notre responsabilité collective à l'ère de la COVID-19, Le Devoir, 28 mars 2020
- **Cécile Aenishaenslin**, La destruction de la nature, une source de pandémies, Le Devoir, 28 mars 2020
- **Cécile Aenishaenslin**, Quand l'humain est l'artisan de son propre malheur, La Presse, 22 mars 2020
- **Cécile Aenishaenslin**, Nord-du-Québec : un bambin tué par des chiens de traîneau, La Presse, 5 juillet 2019

Scientific Outreach

Our Researchers in the Media

- **Cécile Aenishaenslin**, Maladie de Lyme : moins de cas, mais la situation toujours préoccupante, Journal de Montréal, 4 juin 2019
- **Cécile Aenishaenslin**, Maladie de Lyme : moins de cas mais toujours préoccupante, TVA Nouvelles, 4 juin 2019
- **Cécile Aenishaenslin**, Bromont sera le terrain de jeu de chercheurs sur la maladie de Lyme, Journal Le Guide, 4 juin 2019
- **Annie Fréchette**, Jessika Beauchemin, Marlen Lasprilla-Mantilla, **Simon Dufour**, La litière de fumier recyclé: pas sans risques, La Terre de chez nous, 23 mars 2020.
- **Hélène Lardé**, Le défi de compter les antibiotiques. La Terre de chez nous, 9 avril 2020.
- **Hélène Lardé**, La nouvelle réglementation sur l'utilisation des antibiotiques modifiera les pratiques en production laitière, Le Bulletin des Agriculteurs, 29 novembre 2019
- **Hélène Lardé**, **Jonathan Massé**, Marketa Kopal, **Simon Dufour**, Jean-Philippe Roy, David Francoz, Antibiotiques et temps de retrait : questions et réponses, Le Producteur de Lait Québécois, Mai 2019, pp. 28-30
- Stéphane Lair et **Antoinette Ludwig**, Où se cache le virus du Nil occidental?, Le Devoir, 13 juillet 2019
- **André Ravel**, Plus de cas de rage, dû au réchauffement, Journal de Montréal, 11 octobre 2019
- **André Ravel**, Le réchauffement climatique pourrait favoriser les cas de rage, Forum, UdeM Nouvelles, 20 septembre 2019
- **André Ravel**, Mort d'un Canadien: comment se transmet la rage?, Huffington Post, 17 juillet 2019
- **Mohamed Rhouma**, Résistance à la colistine : première détection dans un élevage porcin canadien, La Terre de chez nous, 10 février 2020
- **Caroline Sauvé**, La petite mangouste asiatique fait rage aux Caraïbes, Terra Darwin, 2019 :6, 73
- **Maryse Michèle Um, Simon Dufour**, Marketa Kopal, Ibtissem Doghri, S'attaquer à la Salmonella Dublin au Québec, Le Producteur de Lait Québécois, Décembre 2019, pp. 26-28

Scientific Outreach

GREZOSP was very much present at the CAVEPM annual conference that took place on May 23 and 24, 2019 at the University of Montréal's Faculty of veterinary medicine. Many of our members helped organize this event, and more than a dozen of our members made a presentation during this major conference.

During the graduation ceremony on June 18, 2019, the title of Professor Emeritus was awarded to **Dr. Denise Bélanger**, one of GREZOSP's founding members. This exceptional pioneer signed the University of Montréal's Golden Book and leaves a significant legacy for the entire Faculty of veterinary medicine's community.

At the University of Montréal's Excellence in Teaching award ceremony, Faculty of veterinary medicine associate professor **Mohamed Rhouma** was awarded the 2019 Excellence Award for lecturers and internship supervisors.

Simon Dufour's student **Daryna Kurban** received an NMC Scholar grant to attend the National Mastitis Council Conference in February 2020.

Hélène Carabin's student **Ellen Jackson** received an IVADO distinguished doctoral fellowship.

Levon Abrahamyan was a lecturer at the North American Porcine Reproductive and Respiratory Syndrome Symposium held in Chicago on November 2, 2019. The symposium was held at the same time as the Conference of Research Workers on Animal Disease (CRWAD) where Dr. Abrahamyan was invited to facilitate the American College of Veterinary Microbiologists (ACVM)'s "Microbiology & Disease Pathogenesis Featured Speakers" session.

Hélène Carabin was the keynote speaker at the 5th International Congress on Pathogens at the Human-Animal Interface (ICOPHAI) held on September 24-26, 2019. Dr. Carabin was named co-responsible commissioner for the Lancet Commission on One Health's "Shared Environment" workgroup. She was also appointed member of the Tropical Medicine and Infectious Diseases' editorial group. She was one of three University of Montréal delegates at the annual M8 Alliance, which organizes the annual World Health Summit in Berlin. Dr. Carabin also took part in the "Workshop 10: The SDG3 Global Action Plan for Health and Wellbeing - Are we ready for a change in mindset – One Health as an Accelerator".

Christopher Fernandez Prada was a guest speaker at the 5th GEIVEX Symposium held in Spain on November 6 to 8, 2019, where he presented "Novel exosome-based biomarkers for the diagnosis of drug-resistant parasites". He was also a guest speaker at the 1st Extracellular Vesicles Workshop held at the McGill University Health Centre on October 29, 2019, where he presented "Exosomes in the context of drug resistance and parasite's fitness". Dr. Prada was also a guest speaker at the 2019 Quebec veterinary conference held on October 26; his presentation was entitled "L'Échinococcose et autres zoonoses parasitaires" (echinococcosis and other parasitic zoonoses). He was the plenary speaker at the 5th International Congress on Pathogens at the Human-Animal Interface – ICOPHAI, held in Quebec on September 24 to 26. Additionally, Dr. Prada attended the 5th Meeting of the Brazilian Society of Tropical Medicine, the XXVI Meeting of the Brazilian Society of Parasitology, the 34th Meeting of Applied Research in Chagas Disease and the 22nd Meeting of Applied Research in Leishmaniasis where he presented "Drug resistance in Leishmania parasites: a knife with two cutting edges" on July 27 to 30 in Brazil.

Levon Abrahamyan co-organized an international workshop on virology in Colombia on June 6 and 7, 2019, which focused on emerging and re-emerging infectious diseases. This training was developed at the Pontifica Universidad Javeriana.

Jean-Pierre Vaillancourt, Professor at the Department of clinical sciences and specialist in farm biosecurity and infectious disease control strategies, was made knight of the French Republic's Order of Agricultural Merit.

Science Infuse: GREZOSP's new podcast series!

Science Infuse : un balado du GREZOSP, a podcast created on the occasion of the group's 20th anniversary, is a brand new media that aims to promote science. Hosted by four research students, **Léa Delesalle**, **Valérie Hongoh, Hélène Lardé** and **Carol-Anne Villeneuve**, the podcast has listeners discover in thirty minutes the main topics of the One Health research at the interface between animal health and public health.

From antibiotic resistance to vector-borne diseases and research carried out in the North, testimonials from GREZOSP researchers and students shed light on key concepts and discuss the group's latest advances in these fields.

Whether you are a researcher, a student, a professional, or simply a curious individual, this podcast is for you!

Do not miss an episode! Follow our podcasts on the GREZOSP website and our social media, including our Facebook page.

Follow Us on Facebook and Twitter!

In addition to its Facebook page, which has more than 500 followers, GREZOSP has also been active on Twitter since August 2019!

Follow our Facebook page to get all the information on different events, the latest news such as publications, prizes and scholarships, employment opportunities or anytime our researchers are featured in the media!

On Twitter, you can follow us **@grezosp** for real-time reactions during events such as symposiums and journal clubs!

For our members' publications, please visit the Publications section of our website: http://grezosp.com/recherche/publications.

Financial Statements

Financial Statements from May1st 2019 to April 30th 2020

Sources of Funding	
Annual Funding under PHAC Agreement 2019-2020	$77 500,00
Funding under CFIA Agreement 2019-2020	$19 970,55
Funding Total	**$97 470,55**
Expenses	
General	
Administrative Salaries	$65 507,75
Office supplies	$546,71
Travel Expenses	$151,36
Telecommunications	$277,64
Maintenance	$55,35
	$66 538,81
Scientific Committee	
Graduate Student Scholarships and Support	$6 700,00
Scientific Workshops	$1 688,66
	$8 388,66
Communications and web Committee	
Activity Report	$1 230,40
Website	$531,32
Podcasts	$318,09
	$2 079,81
Échanges Committee	
Guest Lecturers	$317,31
Technical Support	$585,00
	$902,31
GREZOSP Annual Symposium	$6 842,23
Social Committee	$415,66
GREZOSP's 20th Anniversary	$558,85
Expenses Total	**$85 726,33**
Balance for the year 2019-2020	**$11 744,22**
Year-end Balance 2018-2019	$103 661,03
Year-end Balance 2019-2020	**$115 405,25**

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ET SANTÉ PUBLIQUE

Université de Montréal