

GROUPE DE RECHERCHE EN
ÉPIDÉMIOLOGIE DES ZOONOSES
ET SANTÉ PUBLIQUE



Activity Report 2018 - 2019



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 2018-2019, GREZOSP has more than 120 members, including 15 research members, 27 regular members, 42 associate members, 5 post-doctoral fellows, 18 doctoral students and 15 master's students. Our members have worked on 81 research projects. They have published more than 60 scientific papers (<http://grezosp.com/recherche/publications>) and have lectured at over 20 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 6th Symposium on Veterinary Public Health, and provided a platform for 33 workshops and conferences.

Contents

Message from the Director	3
Presentation of our Research Group	4
Partnerships	5
Administration and Committees.....	6
Our Members	9
Research Projects.....	13
Spotlight on Some of Our Research Projects	21
<i>Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques</i>	28
6 th Symposium on Veterinary Public Health	32
Les Échanges du GREZOSP	33
Journée du GREZOSP	34
Workshops	35
Students	36
Scientific Outreach	38
Follow Us on Facebook	42
Financial Statements	43

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Message from the Director



For a healthier human-animal-environment interface

Such is our group's motto for the 2019-2021 strategic plan.

The strategic planning exercise was deemed necessary to ensure the development of our growing group. The group has considerably grown since its creation almost 20 years ago: new partners, new collaborations, an increase in the number of members, which has doubled, and the growth and diversification of topics and research projects. The group's recognition has also expanded; for instance, GREZOSP co-coordinates the *Observatoire québécois multipartite sur les zoonoses et l'adaptation aux changements climatiques* (Quebec's multi-party monitoring centre for zoonoses and adaptation to climate change) with INSPQ. This momentum within our group reflects the evolving zoonotic issues that Quebec and Canada are faced with, as well as the need for collaborative and interdisciplinary strategies to address these issues and determine how they should be handled.

In order to pursue its substantial development, our group has put together its first strategic plan covering the years 2019-2021. This plan was built on an organizational diagnosis led by the group's Scientific Committee with the participation of various members. It was completed through consultations with the group's partners and key contributors. In light of the findings, the Scientific Committee continued its reflection concerning the group's mid-term future by consulting members in regard to GREZOSP's mission and vision, among others. This plan aims to ensure the group's growth without altering the research members' freedom to conduct research with the funding they receive.

Now that the planning process is completed, we are focusing our efforts on implementing the actions identified, and, eventually, measure their effects and impacts. Therefore, it is based on this commitment and this expectation that I invite you to review this strategic plan as well as the annual report.

I hope that you find them interesting and that you share our enthusiasm for our future endeavours.



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.

Over the last two years, GREZOSP has 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		<i>Pour une Interface humain-animal-environnement en meilleure santé</i>							
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				
	<ul style="list-style-type: none">› Consulter nos membres› Être à l'écoute des besoins du groupe› Être transparent dans la prise de décision	<ul style="list-style-type: none">› Promouvoir et soutenir la collaboration› Promouvoir et soutenir le partenariat› Collaborer avec tous les niveaux et toute l'étendue de la santé publique	<ul style="list-style-type: none">› 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	<ul style="list-style-type: none">› 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 intégré	<ul style="list-style-type: none">› Guider l'action par nos recherches› Contribuer significativement à réaliser l'approche <i>Une seule santé</i>				

Plan stratégique 2019-2021		<i>Pour une interface humain-animal-environnement en meilleure santé</i>		
ORIENTATIONS ET OBJECTIFS				
1. PARTENARIAT ET RÉSEAU		2. VIE SCIENTIFIQUE		3. RESSOURCES ET VIE DE GROUPE
<ul style="list-style-type: none">› 1.1 Parfaire les partenariats existants› 1.2 Créeer de nouveaux partenariats qui permettront un positionnement du groupe plus large› 1.3 Faire mieux connaître le GREZOSP auprès de la FMV		<ul style="list-style-type: none">› 2.1 Faire rayonner les activités de recherche› 2.2 Favoriser l'innovation dans nos recherches› 2.3 Développer le financement de projets structurants		<ul style="list-style-type: none">› 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 Geneviève Germain 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), Benoît Lévesque (environmental health) and Jean-Philippe Rocheleau (veterinary medicine) – or as public policy members – Ariane Massé (MFFP); Isabelle Picard (MAPAQ); Nicholas Ogden, Catherine Bouchard and Antoinette Ludwig (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

President

Jean-Pierre Lavoie
Université de Montréal

Members

Philippe Berthiaume
Public Health Agency of Canada

Michel Bigras-Poulin
Université de Montréal

Nicholas H. Ogden
Public Health Agency of Canada

André Ravel
Director of GREZOSP
Université de Montréal

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Jules Koffi
Public Health Agency of Canada

André Ravel
Director of GREZOSP
Université de Montréal

Jean-Philippe Rocheleau
Université de Montréal

Scientific Committee

Catherine Bouchard
Public Health Agency of Canada

Farouk El Allaki
Canadian Food Inspection Agency

Philippe Fravalo
Université de Montréal

Hélène Lardé, Student Representative
Université de Montréal

André Ravel
Director of GREZOSP
Université de Montréal

Ludivine Taieb, Student Representative
Université de Montréal

Patricia Turgeon
Public Health Agency of Canada

Communications Committee

Marie-Josée Champagne
Public Health Agency of Canada

Liliane Fortin
Université de Montréal

Marie-Laure Le Carre
Public Health Agency of Canada

André Ravel
Director of GREZOSP
Université de Montréal

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Symposium Committee

Cécile Aenishaenslin
Université de Montréal

Catherine Bouchard
Public Health Agency of Canada

Liliane Fortin
Université de Montréal

Kathleen Laberge
Public Health Agency of Canada

François Milord
Centre intégré de santé et de services sociaux de la Montérégie-Centre /
Direction de santé publique

Lucie Richard
Faculté des sciences infirmières
Université de Montréal, IRSPUM

Audrey Simon
Université de Montréal

Patricia Turgeon
Public Health Agency of Canada

Scholarships and Awards Selection Committee

Michel Bigras-Poulin
Université de Montréal

Josée Harel
Université de Montréal

Michelle Tessier
Public Health Agency of Canada

Administration and Committees

Échanges Committee

Cécile Aenishaenslin
Université de Montréal

Catherine Bouchard
Public Health Agency of Canada

Émilie Bouchard
University of Saskatchewan

Ariane Dumas
Université de Montréal

Liliane Fortin
Université de Montréal

Marie-Laure Le Carre
Public Health Agency of Canada

Audrey Simon
Université de Montréal

Ludivine Taieb
Université de Montréal

Web Committee

Catherine Bouchard
Public Health Agency of Canada

Liliane Fortin
Université de Montréal

Manon Racicot
Canadian Food Inspection Agency

André Ravel
Director of GREZOSP
Université de Montréal

Ludivine Taieb
Université de Montréal

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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
Benoit 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
Josée Harel, FMV
Andrée Lafaille, FMV
Louise Lambert, DSP
Marie-Ève Lambert, FMV
Anne Leboeuf, MAPAQ
Marie-Laure Le Carre, PHAC
Annick Marier, MAPAQ
Ariane Massé, MRN
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 and Research Projects

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
Virginie Lachapelle	Université de Montréal	Philippe Fraval	Manon Racicot	Développement d'un modèle d'évaluation du risque pour les établissements impliqués dans les aliments du bétail dans le contexte des risques pour la santé animale et la santé humaine
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
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 <i>Salmonella Dublin</i> dans les élevages laitiers
Doctoral Students				
Agathe Allibert	Université de Montréal	Patrick Leighton	Erin E. Rees	Modélisation de l'avenir de la Rage vulpine dans l'Arctique Canadien
Nicholas Bachand	University of Saskatchewan	Emily Jenkins		Évaluation du risque de toxoplasmose relié à la consommation d'animaux sauvages infectés dans l'Arctique canadien avec l'approche Une Santé
Émilie Bouchard	University of Saskatchewan	Emily Jenkins	Patrick Leighton	Distribution de <i>Toxoplasma gondii</i> 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
Tamazight Cherifi	Université de Montréal	Philippe Fraval	Sylvain Quessy	Le procédé d'abattage découpe des porcs sélectionne, par la capacité différentielle de formation de biofilm, les souches de <i>Listeria monocytogenes</i> , 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' <i>Escherichia coli</i> (<i>E. coli</i>) multi résistantes et de souches produisant des β-lactamases dans la population équine canadienne
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.

Our Members

Student Members and Research Projects

Name	Institution	Director	Co-director(s)	Project Title
Doctoral Students (continued)				
Jean-Philippe Gilbert	Université Laval	Nathalie Barrette	Erin E. Rees and Victoria Ng	Identification de la population vulnérable aux maladies infectieuses et prévision des épidémies – Étude de cas de l'épidémie de Zika
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 <i>Taenia solium</i>
Fidele Kabera	Université de Montréal	Simon Dufour	Jean-Philippe Roy	Traitements antibiotiques sélectifs par quartier au tarissement basé sur la culture de lait à la ferme à l'aide des Petrifilm®
Catarina Krug	Université de Montréal	Simon Dufour	Jean-Philippe Roy and Jocelyn Dubuc	Traite incomplète en début de lactation afin de limiter le bilan énergétique négatif et ses conséquences chez les vaches laitières
Hélène Lardé	Université de Montréal	Simon Dufour	David Francoz and 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 and David Francoz	Antibiorésistance dans les élevages de bovins laitiers du Québec
Miarisoa Rindra Rakotoarinia Randriamialy	Université de Montréal	Antoinette Ludwig	Patrick Leighton and 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 and Amy Turmelle Gilbert	La rage chez la petite mangouste asiatique (<i>Herpestes auropunctatus</i>) 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.
Fannie Shedleur-Bourguignon	Université de Montréal	Philippe Fravallo		Identification de composants de l'écosystème microbien des surfaces de production de viande porcine associés à l'absence de <i>Listeria monocytogenes</i> , vers une écologie dirigée des surfaces
Passoret Vounba	Université de Montréal	John M. Fairbrother	Rianatou Bada and Julie Arsenault	Pathogénicité potentielle et résistance antimicrobienne des <i>Escherichia coli</i> isolés des poulets de fermes au Québec, au Sénégal et au Vietnam

Our Members

Student Members and Research Projects

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 and Antoinette Ludwig	Modélisation des densités de populations de moustiques associées à des maladies zoonotiques vectorielles représentant un risque pour la santé publique
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
Gabrielle Claing	Université de Montréal	Julie Arsenault	Pascal Dubreuil	Prévalence des principales pathologies de l'abeille domestique (<i>Apis mellifera</i>) au Québec et impacts sur la mortalité hivernale
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
Hélène Déry	Université de Montréal	Patrick Leighton	André Ravel	Écologie de la population de chiens au Nunavik et analyse des problématiques parasitaires gastro-intestinales
Gabrielle Dimitri-Masson	Université de Montréal	Patrick Leighton	Claire Jardine	Sarolaner treatment of wild rodents: Breaking new ground in the fight against Lyme disease
Lauriane Duplaix	Université de Montréal	Julie Arsenault	Benoit Lévesque and Patricia Turgeon	Séroprévalence de <i>Coxiella burnetii</i> dans la population québécoise et impact des facteurs environnementaux sur son risque d'infection, sa dispersion et sa survie
Annie Fréchette	Université de Montréal	Simon Dufour	Caroline Côté and Gilles Fecteau	Impacts des méthodes de préparation de la litière à base de fumier recyclé (LFR) sur la santé des vaches laitières et sur la qualité du lait.
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 Kuujuaq
Camille Guillot	Université de Montréal	Patrick Leighton	Catherine Bouchard	Validation et optimisation de la surveillance sentinelle en tant qu'outil de surveillance des maladies chez les humains atteints de la maladie de Lyme dans la province de Québec
Geneviève Huard	Université de Montréal	Jean-Pierre Vaillancourt	Michèle Guérin	Évaluation des risques de contamination et de l'efficacité de la décontamination : connaissances essentielles pour réduire les maladies et augmenter l'observance en biosécurité
Jérôme Pelletier	Université de Montréal	Patrick Leighton	Catherine Bouchard	Projet d'intervention visant à réduire le risque de transmission de la maladie de Lyme via le traitement d'une population de souris sauvages
Ludivine Taieb	Université de Montréal	Antoinette Ludwig and Dominique Bicout	Carl A. Gagnon	Modélisation des espèces d'oiseaux hôtes principales pour le virus du Nil occidental dans le sud du Québec
Eyaba Tchamdjia	Université de Montréal	Julie Arsenault	Patricia Turgeon	Risque pour la santé publique associé aux infections causées par <i>Salmonella Dublin</i> , <i>Campylobacter spp</i> et <i>Escherichia coli</i> 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

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
Évaluer les facteurs de risques influençant l'incidence de la maladie de Lyme au Québec	Ariane Adam Poupart, INSPO ; 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 <i>Ixodes scapularis</i> 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, INSPO; CNR, Patrick Leighton and collaborators, FMV; 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 Häslar (Royal Veterinary College, UK), Cécile Aenishaenslin, FMV and collaborators	Research Network
The Canadian Arctic One Health Network	Emily Jenkins (U. Saskatchewan); Cécile Aenishaenslin, FMV and collaborators	ArcticNet
A National Research Network on Lyme Disease	Cécile Aenishaenslin, FMV and collaborators	IRSC
La maladie de Lyme en Estrie : Questions de prévention dans l'enquête de santé populationnelle estrienne (ESPE) 2018	Cécile Aenishaenslin, FMV and collaborators	MSSSQ
Développement et évaluation d'un outil de transfert des connaissances sur l'utilisation des médicaments vétérinaires au Burkina Faso	Cécile Aenishaenslin, Denise Bélanger, Christine Thoret, FMV	Fonds Régina-Devo (FMV)
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, FMV and collaborators	Ville de Bromont
Évaluation de la faisabilité et de la pertinence de développer un système de surveillance rehaussée pour la rage du renard arctique au Québec	Cécile Aenishaenslin, FMV	Ministère des forêts, de la faune et des parcs
Utilisation d'un système d'information géographique pour la caractérisation des espaces à risque de paludisme à M'Bahakro, 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

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
<i>Impacts des conditions environnementales et climatiques sur le risque d'infection par <i>Coxiella burnetii</i> au Québec</i>	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
<i>Étude épidémiologique des infections causées par <i>Salmonella Dublin</i>, <i>Campylobacter spp</i> et <i>E. coli</i> résistants aux antimicrobiens chez les veaux de lait du Québec</i>	Julie Arsenault , FMV; Patricia Turgeon , PHAC; Philippe Fraval , FMV; Geneviève Côté , MAPAQ, Eyaba Tchamdj , FMV	Innov'Action (MAPAQ)
<i>Modélisation du risque de campylobactériose selon les différentes sources d'exposition environnementales et alimentaires dans une perspective de changements climatiques au Canada</i>	Julie Arsenault , Philippe Fraval , André Ravel , FMV; Philippe Gachon , UQAM ; Amy Greer, University of Guelph ; Rob Deardon, UCalgary	Instituts de Recherche en Santé du Canada : programme Projet, automne 2017
<i>Vers des réponses socio-écologiques informatives contre la maladie de Lyme au Canada</i>	Catherine Bouchard , PHAC; Cécile Aenishaenslin , U. McGill; Erin E. Rees , Yann Pelcat , Jules Koffi , Robbin Lindsay, PHAC; Patrick Leighton , FMV	Fonds A-Base
<i>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 écosystémique</i>	Stéphanie Brazeau , Serge Olivier Kotchi , Nicholas H. Ogden , Marie-Josée Champagne , Antoinette Ludwig , Catherine Bouchard , Erin Rees , Yann Pelcat , Julie Légaré (PHAC-NML), Claude Codjia, Yves Baudouin (UQAM), Frédéric Hubert, Alain Viau, Thierry Badard, Nathalie Barrette (UL), Patrick Leighton (UdM), PHAC-CFEZID, StatCan, IRD (France), CNES (France), INSPQ, PHO, NSDHW, AAFC, NRCan, ECCC.	Agence spatiale canadienne (ASC)
<i>Chaire de Recherche du Canada de Niveau 1 en Épidémiologie et une seule santé</i>	Hélène Carabin , FMV	IRSC
<i>Épidémiologie et une seule santé</i>	Hélène Carabin , FMV	Fonds Canadiens pour l'Innovation Leaders John-R. Evans
<i>Canada One Health Network for global governance to control infectious diseases (LI)</i>	Hélène Carabin , FMV and collaborators	IRSC
<i>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</i>	Hélène Carabin , FMV	Fonds Régina-Devo (FMV)
<i>Using Host Responses to Neurocysticercosis to Develop Novel, Brain-Imaging Free Diagnostics: a US-India Partnership</i>	Hélène Carabin , FMV and collaborators	National Institute of Neurological Diseases and Stroke et Fogarty International Center
<i>Microbial Ecologies of Indigenous Communities</i>	Hélène Carabin , FMV and collaborators	National Institute of General Medical Sciences

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
Cysticercosis Network for Sub-Saharan Africa	Hélène Carabin , FMV and collaborators	Bundesministerium für Bildung und Forschung (Allemagne)
Factors associated with intramammary infection dynamic and development of tailored sampling strategies and analytical methods	Simon Dufour , FMV	CRSNG - Programme de subvention à la découverte
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 <i>Salmonella Dublin</i> 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
Évaluation des pratiques d'utilisation des agents antimicrobiens par les médecins vétérinaires et les producteurs de bovins laitiers du Québec	David Francoz, Simon Dufour , FMV	MAPAQ - Innov'Action
Prévalence, cause et contrôle de l'antibiorésistance sur les fermes laitières québécoises	Marie Archambault, David Francoz, Jean-Philippe Roy, Simon Dufour , Julie Arsenault , André Ravel , FMV ; Soulyvane Nguon, MAPAQ; Marie-Ève Paradis, AMVPQ	MAPAQ - Innov'Action AgroAlimentaire
Développement de stratégies de contrôle de la diarrhée à <i>Escherichia coli</i> chez le porc	John M. Fairbrother , Julie Arsenault , FMV	Cultivons l'avenir 2 – Programme Innov'Action agroalimentaire
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
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

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
Orientation bénéfique du microbiote intestinal des porcs et des volailles	Philippe Fravallo , Ann Letellier, Stéphane Godbout, U. Laval ; Sylvain Quessey, FMV	CRIBIQ
Surveillance de <i>Salmonella</i> en filière avicole	Philippe Fravallo , Ann Letellier, Sylvain Quessey, FMV	RDC CRSNG Olymel
Évaluation de propriétés modulatrices de la flore digestive du poussin, en lien avec la colonisation de <i>Salmonella Enteritidis</i> et de <i>Campylobacter jejuni</i> chez le poulet de chair	Philippe Fravallo , FMV	Phytosynthèse
Modulation de la flore digestive des animaux de production en santé et impact sur la microbiologie de leurs produits	Philippe Fravallo , Sylvain Quessey, FMV	RDC, CRSNG, Porcima inc., CCP, Jefo Nutrition Inc., Prevtec Microbia, F. Ménard Inc.
Identification de contaminations microbiennes chroniques dans l'industrie alimentaire	Dominic Lambert, Philippe Fravallo , FMV; Burton Blais, Carleton University ; Catherine Carrillo, CFIA	CFIA
Environnement, santé et bien-être en élevage ovocole alternatif : Phase 1 : Mitigation	Stéphane Godbout, IRDA ; Philippe Fravallo , FMV and collaborators	MAPAQ Cultivons l'avenir 2 /
Développement d'indicateurs de zones à risque de la maladie de Lyme à partir des données de surveillance passive de la tique <i>Ixodes scapularis</i> pour l'Ontario et le Manitoba	Salima Gasmi , Nicholas H. Ogden , PHAC; Marion Ripoche , 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' <i>Ixodes scapularis</i> au Québec	Karine Thivierge, FMV; 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' <i>Ixodes scapularis</i> 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. Vlau, Frédéric Hubert (UL)	PHAC

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
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
Surveillance et prévision du risque émergent de la maladie de Lyme au Québec	Patrick Leighton , Camille Guillot, FMV ; Catherine Bouchard , PHAC ; François Milord , DSP Montérégie ; Kate Zinzser, IRSPUM	
Contrôle de la rage du raton laveur et épidémiologie de la rage du renard au Québec	Patrick Leighton , FMV	Ministère de la Santé et des Services sociaux (Québec)
Connectivité fonctionnelle du paysage et dynamique de l'invasion de parasites	Patrick Leighton , FMV	CRSNG
Modélisation de la propagation de la maladie de Lyme et autres maladies vectorielles au 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, MRN ; 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)
Traitements des rongeurs sauvages à base de Sarolaner : innovations dans la lutte contre la maladie de Lyme	Patrick Leighton , FMV; Catherine Bouchard , PHAC; Cécile Aenishaenslin , U. McGill; Christopher Fernandez- Prada, FMV; Claire Jardine, University of Guelph; Jean-Philippe Rocheleau , FMV; L. Robbin Lindsay, Nicholas H. Ogden , PHAC	Zoetis Investment in Innovation Fund
Maladies de la faune importantes à la santé humaine et la sécurité des aliments dans l'environnement changeant de la région subarctique de l'Est	Patrick Leighton , FMV; Emily Jenkins , Craig Stephen, Alvin Gajadhar, University of Saskatchewan; Philippe Gachon , UQAM; Stéphane Lair, André Ravel , FMV; Francis Lévesque, UQAT ; Dawn Marshall, Whitney H. Memorial University of Newfoundland, Nicholas H. Ogden , PHAC	Networks of Centres of Excellence of Canada : ArcticNet, Phase IV
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 , University of 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

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
Écologie de la rage du renard arctique dans un Nord changeant	Patrick Leighton , FMV; Erin E. Rees , PHAC; Philippe Gachon , UQAM	OURANOS et MITACS
Surveillance intégrée de la maladie de Lyme au Québec (2018)	Patrick Leighton , FMV; Karine Thivierge, U. McGill; Sandie Briand, INSPQ	INSPQ
Les Inuit et leurs chiens: la relation homme-animal actuelle au Nunavik et Nunavut	Francis Lévesque, UQAT; Patrick Leighton , FMV	SSHRC, Insight Development Grant
Surveillance de l'invasion des moustiques dans le sud du Québec, Canada. Utiliser l'espèce de substitut pour évaluer le risque d'introduction pour <i>Aedes albopictus</i> (Diptera : Culicidae) et <i>Aedes aegypti</i> (Diptera : Culicidae)	Anne-Marie Lowe , PHAC ; Antoinette Ludwig , PHAC ; Patrick Leighton , FMV ; Serge Olivier Kotchi , Robbin Lindsay, Antonia Dibernardo, PHAC ; Karl Forest-Bérard, INSPQ	Protocole d'accord entre INSPQ et PHAC
Documenter la présence d' <i>Ochlerotatus triseriatus</i> et <i>Oc. japonicus</i> comme espèces de substitut d' <i>Aedes albopictus</i> (Diptera : Culicidae) au sud de la province du Québec, Canada	Anne-Marie-Lowe , PHAC; 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
Evaluation 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
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	Nicholas H. Ogden , PHAC; Patrick Leighton , FMV; Emily Jenkins , University of Saskatchewan; and collaborators	
Evaluation de l'impact des changements environnementaux et climatiques sur la biodiversité des moustiques dans la South Nation River	Miarisoa Rakatoarinia , UdeM; Antoinette Ludwig , Patrick Leighton , Nick Ogden, David Lapen, PHAC	UDM, PHAC, AAFC

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
<i>Qimuksiq: un réseau multidisciplinaire sur les problématiques reliées aux chiens dans l'Arctique canadien (Nunavik et Nunavut)</i>	Francis Levesque, UQAT; Ashlee Cunsolo Willox, Cape Breton University ; Sherilee Harper, University of Guelph; Johanne Saint-Charles, UQAM; André Ravel , FMV; Cécile Aenishaenslin , U. McGill; Audrey Simon , FMV	Conseil de recherche en sciences humaines. Programme : Partnership Development Grant
<i>Équilibre maladie et bien-être à l'interface Inuit-chien dans le nord du Canada</i>	André Ravel , Christopher Fernandez-Prada, Patrick Leighton , FMV; Francis Lévesque, UQAT; Sherilee Harper, University of Guelph; Thora Martina Herrmann, UdeM; Johanne Saint-Charles, UQAM; Cécile Aenishaenslin , U. McGill; 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
<i>The Canadian Arctic One Health Network</i>	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
<i>Réseau Inondations intersectoriel du Québec</i>	Philippe Gachon , UQAM; André Ravel , FMV and collaborators	Fonds de recherche du Québec
<i>Observatoire international sur les impacts sociétaux de l'IA et du numérique</i>	Lyse Langlois, U Laval; André Ravel , FMV and collaborators	Fonds de recherche du Québec et le ministère de l'Économie et de l'Innovation
<i>Antimicrobial stewardship and its impact on antimicrobial use, antimicrobial resistance, and animal health on dairy farms</i>	Javier Sanchez, Luke Heider, Atlantic Veterinary College, UPEI; Greg Keefe, J. Trenton McClure, UPEI; Kapil Tahlan, Memorial U; Simon Dufour , FMV; David Kelton, UGuelph; Chris Luby, USaskatchewan; D. Leger, PHAC; H. Bakema, UCalgary; Marie Archambault, David Francoz, André Ravel , Jean-Philippe Roy, FMV; Scott McEwen, Jan Sargeant, Scott Weese, UGuelph; Cheryl Waldner, USaskatchewan; Richard Reid-Smith, PHAC; Juan C. Rodriguez, UPEI; Jeroen De Buck, UCalgary	Dairy Farmers of Canada programme Dairy Research Cluster 3

Research Projects

In progress between May 1, 2018 and April 30, 2019

Title	Researchers	Funding
<i>Cartographie de risque à échelle fine de la maladie de Lyme</i>	Erin E. Rees, Catherine Bouchard, Serge Olivier Kotchi, Nicholas H. Ogden, PHAC; Patrick Leighton, FMV	PHAC
<i>Integrating data analytics into health intelligence surveillance systems</i>	Erin E. Rees, Victoria Ng (PHAC); Philip AbdelMalik (WHO), David Buckeridge (McGill), Philippe Gachon (UQAM), Jean-Philippe Gilbert (Laval), Kevin Lawrence/Dan McKenny/John Pedlar/Denys Yemshanov (NRCan), Jane Parmely (U Guelph), Gerald Penn (U of Toronto), Julie Simon (PHAC)	Canadian Safety and Security Program (CSSP) from the Department of National Defense
<i>Risk of Ixodes scapularis biting exposure and occurrence of Lyme disease in Montérégie</i>	Erin E. Rees, Karon Hammond-Collins (PHAC); Catherine Bouchard, Nick Odgen (PHAC), Patrick Leighton (UdM), Mathieu Tremblay, François Milord (SSSS)	PHAC
<i>La progression des tiques Ixodes scapularis et Borrelia burgdorferi au Québec entre 2007 et 2014</i>	Marion Ripoche, FMV; Catherine Bouchard, Antoinette Ludwig, Nicholas H. Ogden, PHAC; Patrick Leighton, FMV and collaborators	Université de Montréal, PHAC
<i>Distribution spatiotemporelle des cas de VNO, Québec 2011-2016, et implications pour la prévention et la surveillance en santé publique</i>	Jean-Philippe Rocheleau (CSH, UdM), Serge Olivier Kotchi (PHAC), Julie Arsenault (UdM)	PHAC, Université de Montréal
<i>Rôle des oiseaux dans la dynamique de surveillance du virus du Nil occidental au Québec</i>	Ludivine Taieb, FMV; Antoinette Ludwig, PHAC; Dominique Bicout (Univ. Grenoble-Alpes), Carl A. Gagnon, FMV, Robbin Lindsay, Mahmood Iranpour (NML)	PHAC
<i>Modéliser la dynamique des maladies vectorielles sous l'influence du changement climatique pour prioriser des scénarios d'intervention</i>	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

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

Spotlight on Some of Our Research Projects

Catherine Bouchard, Cécile Aenishaenslin, Erin Rees, Yann Pelcat, Jules Koffi, Marion Ripoche, François Milord, Robbin Lindsay, Nicholas Ogden and Patrick Leighton : An Innovative Approach to Mapping Geographical Zones Where to Prioritize Public Health Responses in Order to Prevent Lyme disease

The risk of contracting Lyme disease varies considerably due to the spatial heterogeneity of social-behavioural factors (i.e. if the population is informed and adopts disease prevention

measures) and exposure to ecological risk factors (i.e. where infected ticks are located). To this day, little research has been done on human social-behavioural factors related to Lyme disease, which represents a significant shortcoming.

This research on Lyme disease would be the first to develop an integrated mapping approach of ecological and social-behavioural risks in order to prioritize intervention zones and prevent Lyme disease. To do this, our researchers created social-behavioural indicators (data from population surveys) and a tick abundance index (tick monitoring data) in a region where Lyme disease has recently become endemic.

Our researchers determined that the social-behavioural and ecological components of the risk related to Lyme disease are spread differently in the region being studied. These observations suggest that their integrated approach should be taken into account to plan locally adapted interventions, such as reinforcing public health messages to promote prevention measures in targeted regions.

Identifying sensitive areas or "hotspots" where the risk of Lyme disease is high provides useful targets to prioritize public health interventions in most-at-risks zones and populations. It also provides a tool to assess the relative contribution of various types of risk factors related to emerging "hotspots" for cases of Lyme disease in humans. Thus, we can better anticipate, prevent and address the risk of Lyme disease.

This research also highlights a new field of study on the development and validation of integrated maps of social-behavioural and ecological risks. This approach can easily be applied to other vector-borne diseases or zoonoses and epidemiological settings where risk trends are determined by the interaction between social-behavioural factors and ecological factors.



Spotlight on Some of Our Research Projects

Émilie Bouchard : Distribution of Toxoplasma Gondii in Foxes and Lynx in Northern Canada

Toxoplasma gondii is a protozoan that infects a large number of birds and mammals across the planet. While it usually causes no symptoms, it can lead to neurological, ocular and reproductive issues when the immune system is weakened or during gestation. As a parasite transmitted through food, *T. gondii* disproportionately affects public health in Nunavik with an average human seroprevalence of 60% compared to the rest of North America (<15%). The transmission in humans and animals can also be influenced by demographic and environmental changes that affect northern regions more quickly than other regions. The three aims of my projects are to 1) measure exposure and prevalence in Arctic and red foxes acting as sentinels in the North of Canada; 2) determine whether lynx serve as final hosts for *T. gondii*; and 3) create an epidemiological model for the transmission of *T. gondii* in foxes related to preys and climate change.

Carcasses were provided to us by trappers in Nunavik, Quebec's boreal regions, Nunatsiavut, Nunavut and Inuvialuit during their regular trapping activities from 2016 until now. This collaboration requires many meetings in these communities to share knowledge, carry out necropsies and present results. Different methods were used to detect the presence of antibodies and DNA in the tissues. The laboratory, which will be continued in Saskatoon this fall, includes the extraction of DNA

from the animals' heart and brain through magnetic capture, PCR, real-time PCR by analyzing the melting curve of feces to determine whether lynx transmit the parasite, serological analyses (IFAT and ELISA) on heart fluids sampled during necropsies, and isotopic analyses on muscles and hair to identify the foxes' diet. The isolated *T. gondii* DNA from positive animals will be analyzed shortly to determine the parasite's genotypes. By knowing the prevalence and genetic diversity of the parasite in lynx acting as potential final hosts, as well as in foxes acting as sentinels and intermediate hosts, we will have a greater insight into the parasite's distribution and a better understanding of how *T. gondii* is introduced and how it prevails in northern ecosystems.

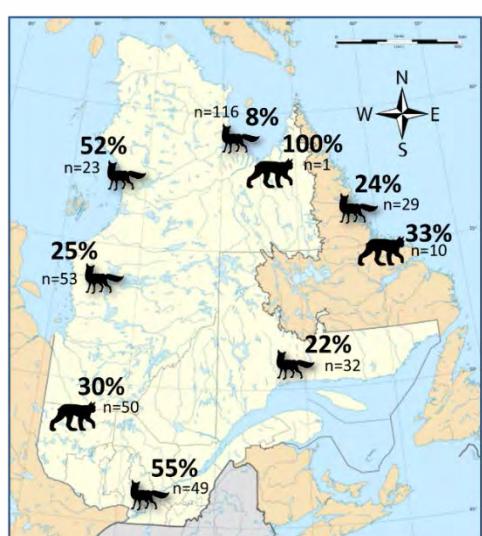


Figure 1. Regional differences in the prevalence of *T. gondii*'s tissue cysts in lynx and foxes in Quebec and Labrador in 2016-2017.

Spotlight on Some of Our Research Projects

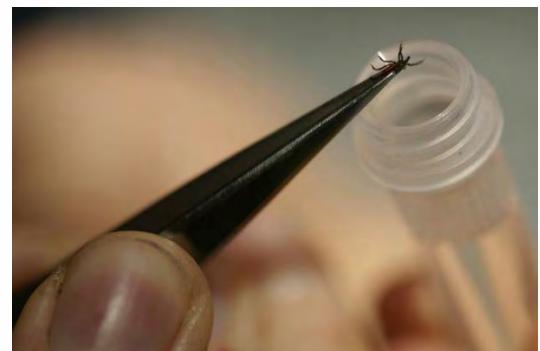
Ariane Dumas : Ecology and Dynamics of Fine Spatial Scale Lyme Disease Emergence

During summer 2018, the third and last summer of field sampling took place at the Mont-Saint-Bruno park. Sampling activities included capturing tick hosts, small mammals and birds, and sampling ticks in a forest environment using flannel.



Black-legged ticks (*Ixodes scapularis*)

Mature stage, female (large) and nymph (small). Specimen collected on flannel for analysis purposes. © A. Dumas



Black-legged ticks (*Ixodes scapularis*) at mature stage.

Specimen collected and transferred for subsequent in-lab analysis to detect *Borrelia burgdorferi*. © A. Dumas

This project mostly focuses on the role of hosts in the invasion dynamics of the *Ixodes scapularis* tick and the *Borrelia burgdorferi* pathogen, as well as the influence of spatial ecology on the local emergence process of these organisms.



Song sparrow (*Melospiza melodia*)

Animal captured and parasitised by a tick (mature stage). Birds were captured for inventory purposes and individual inspection to identify their ticks and determine the reservoir efficiency of various host species for *Borrelia burgdorferi*. © D. Dufault



White-footed mouse (*Peromyscus leucopus*)

during anaesthesia. Rodents were captured for inventory purposes and individual inspection to identify their ticks and determine the reservoir efficiency of various host species for *Borrelia burgdorferi*. © A. Dumas

Spotlight on Some of Our Research Projects

Hélène Lardé and Jonathan Massé : Comics to Communicate the Importance of Fighting Against Antibiotic Resistance in Dairy Herds



* CHUV : Centre Hospitalier Universitaire Vétérinaire de la Faculté de Médecine Vétérinaire de l'Université de Montréal

Hélène Lardé and Jonathan Massé, both doctoral students at Université de Montréal's Faculty of Veterinary Medicine and student members of GREZOSP, created an original comic to share the results of their studies and promote awareness of the importance of fighting against antibiotic resistance in dairy herds. Countless hours of work were summarized to deliver a clear message: a research project on antibiotics is currently underway in Quebec's dairy farms.

As part of this extensive project, over a hundred operations in Quebec's southern regions were followed for a year to collect data on the use of antibiotics. Samples were also collected to determine antibiotic resistance in each farm. Dairy cattle veterinary doctors from Quebec were also involved in the project in order to shed light on the daily challenges they face. This research, the results of which will be available in the following months, will lead to a better understanding of the use of antibiotics and resistance in dairy farms.

You can learn more on this project and its main contributors by reading the comic entitled *Les aventures ExtrANTIBIOrdinaires des 6 Fantastiques* (The fantastic 6's extrantibiodinary adventures). Written and illustrated with humor, this series explains how researchers collect and analyze an impressive amount of information in order to make recommendations. The comic is available on the Op+lait website at oplait.org.

Spotlight on Some of Our Research Projects

André Ravel and collaborators: *Balancing Illness and Wellness at the Human-Dog Interface in Northern Canada*

This project, led by André Ravel and currently funded primarily by the Canadian Institutes for Health Research, focuses on health and wellness issues at the human-dog interface as well as wildlife in northern Canadian towns.

Indeed, while dogs have been an integral element of the northern society's physical, social and cultural environment for centuries and have proven to be beneficial, they may also pose a risk to the health of contemporary northern communities.

Attacks, bites, injuries, sometimes death, as well as the transmission of deadly rabies rampant in Nunavik and possibly other microbes are part of northern communities' reality and concern, rightfully so, public health authorities.

This project aims to 1) extensively assess the dog-related risks and advantages to human health in northern communities, taking into account the epidemiological, social and cultural dimensions of this extremely complex question; 2) reduce dog-related risks to human health while maintaining and promoting health advantages by selecting, implementing and assessing various interventions aiming at reducing dog-related health risks; 3) compare issues, intervention results and project processes among northern communities in order to identify key universal success elements to address human health risks related to the human-dog interface in northern Canada.

This project began in Kuujjuaq with the help of previous funding. It is currently ongoing and launching in other Inuit, Cree, Naskapi and Innu communities in Quebec and Nunavut.

This project is highly interdisciplinary as it involves different medical science (epidemiology, parasitology, veterinary medicine, zoonoses, public health) and social science (anthropology, communication, and social and cultural geography) expertises from different departments and universities. The following GREZOSP members are also taking part in this project: Cécile Aenishaenslin, Patrick Leighton, Christopher Fernandez- Prada, Audrey Simon and students Géraldine-Guy Gouin (MSc), Laurence Daigle (Msc), Léa Delesalle (PhD), Sarah Mediouni (MPublic health), Stefany Ildefonso (PhD) and Wilmer Martinez Martinez (MSc). Other researchers and their students include Thora Herrmann from Université de Montréal's Department of Geography, Laine Chanteloup from Université de Limoges and Élisa Cohen-Bucher (MSc); Johanne Saint-Charles from Université du Québec à Montréal's Department of Social and Public Communication; Francis Lévesque from Unité du Québec en Abitibi-Témiscamingue's School of Native Studies, Patricia Brunet (MA) and Roxane Blanchard-Gagné (MA).



Spotlight on Some of Our Research Projects

This highly participatory project is being carried out with the close collaboration of local, regional and provincial organizations: municipality or band council of each town, Nunavik Department of Public Health, Kuujjuaq's Mushers Association (dog team guide), Makivik Corporation's Nunavik Research Centre, Kativik Regional Government, Quebec Department of Agriculture, Fisheries and Aquaculture, and Quebec Department of Forests, Wildlife and Parks.

More generally, this project applies the ecosystem approach to health as developed by the International Development Research Centre: this research focuses on a durable solution according to a process that is interdisciplinary, participatory and concerned with social and gender equity. Furthermore, this project applies the "two-eyed seeing" model through which the knowledge and points of view of both Aboriginal people and Westerners concerning health and dogs are taken into account and respected.

Finally, this project is an excellent example of how to apply the One Health approach. In the context of northern towns, our preliminary results clearly prove that human health issues at the human-dog interface are anchored in canine health and inter-animal interaction (dogs-wildlife) issues. Trying to resolve these human health issues without solving animal health issues is doomed to failure, as previous attempts have proven. Interestingly enough, this project recognizes the dogs' benefits to human physical, mental and sociocultural health. The project not only seeks to maintain these benefits but to also possibly magnify them.



Spotlight on Some of Our Research Projects

Caroline Sauvé : Rabies in Small Asian Mongooses (*Herpestes Auropunctatus*) in the Caribbean: Spatial Dynamics, Conditions of Persistence, Influence of Spatial Ecology and Implications Relating to the Disease's Management and Control

The mongoose was introduced between the end of the XIX century and beginning of the XX century in 28 sugar cane production islands in order to control rodent populations. Since then, this species has been considered invasive and represents the main wildlife rabies reservoir for many Caribbean islands. Public health authorities in Puerto Rico are planning to implement, on a short-term basis, the oral vaccination of mongooses across its territory. The current project aims to improve knowledge of the mongoose's ecology (density, habitat selection, movement behaviour, size of vital area, frequency of intra-specific interactions, etc.) in order to set an individual-based and spatially explicit epidemiological simulation model. This model will help simulate different intervention strategies to manage and control rabies and mongooses in the Caribbean and will also be used to inform public health authorities in order to optimize their oral vaccination program. The project is still in its early stages; a sensitivity analysis performed on the model helped identify research priorities. In fact, the parameters with the most influence over the epidemiological model's simulation results represent the variables that must be measured primarily in the field.

In the summer of 2018, Caroline spent a first summer in the field in St-Kitts where a capture-mark-recapture protocol was implemented to assess the mongooses' density in four typical Caribbean habitats (tropical forest, dry woodland, residential area and pasture). Furthermore, in October 2018, a VHF radio-telemetry grid was put in place. Sixteen antennas positioned on four towers continuously monitor the movement of 19 mongooses wearing tracking collars. Results from these devices will allow us to document the movement habits of both males and females, assess the size of their vital area and calculate the frequency of interindividual contacts between creatures sharing the same habitat.



Release of adult mongooses without handling. Recaptures are not anesthetized; their microchip is read through the trap before the animal is released.



Young mongooses ready to be released after handling. When first captured, mongooses are weighed, measured, microchipped and sampled (blood and hair sample) while under intramuscular anaesthesia, before being released.

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), **Benoît Lévesque** (environmental health) 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.

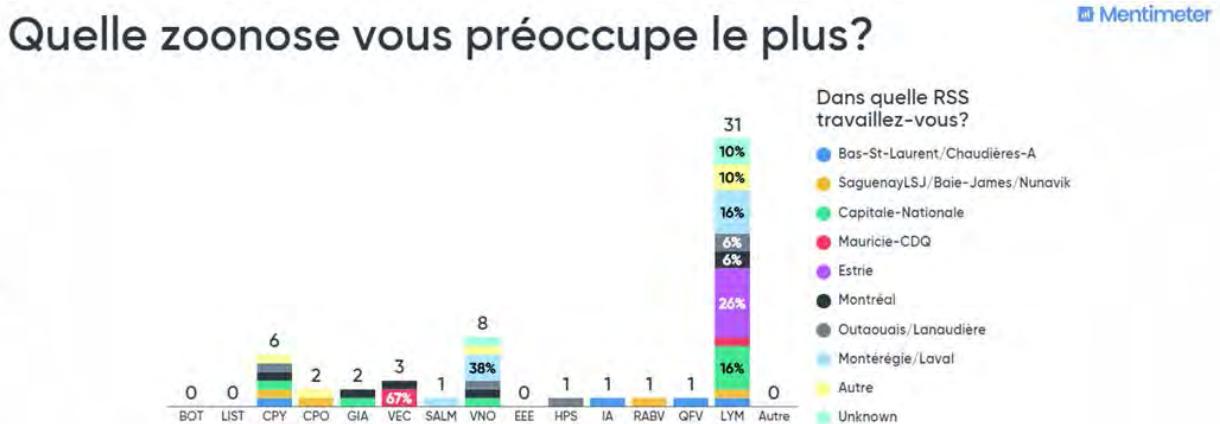
OBSERVATOIRE multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques

Workshop on regional vulnerabilities to zoonoses and adaptation to climate change in municipalities (JASP 2018)

The Observatoire held a theme day during the Journées annuelles de santé publique (JASP - public health annual days) on December 4, 2018 entitled: Regional vulnerabilities to zoonoses: towards adaptation to climate change in municipalities.

This workshop brought together 70 participants from various provincial and federal organizations, different Quebec municipalities and regional health agencies (Bas-Saint-Laurent, Chaudière-Appalaches, Saguenay-Lac-Saint-Jean, Baie-James, Québec, Mauricie-Centre-du-Québec, Estrie, Montréal, Outaouais, Lanaudière, Montérégie, Laval). Through conferences and participatory activities, health professionals and municipal stakeholders were asked to intervene, directly or indirectly, to actions relating to climate change adaptation.

The objectives on this ambitious day were to outline current zoonose-related risks influenced by climate, explain the mechanisms through which climate change has an impact on exposure to zoonoses, depict vulnerabilities to zoonoses in different Quebec regions and identify courses of action so that current zoonose-related concerns can be included in municipalities' climate change adaptation plans.



Results of a survey carried out with workshop participants to identify which zoonose concerns them the most given the health region where they work. [Botulism (BOT), Listeriosis (LIST), Campylobacteriosis (CPY), Cryptosporidiosis (CPO), Giardiasis (GIA), Verotoxigenic Escherichia Coli Infections (VEC), Salmonellosis (SALM), West Nile Virus Infection (VNO), Eastern Equine Encephalitis (EEE), Hantavirus Pulmonary Syndrome (HPS), Avian Influenza (IA), Rabies (RABV), Q Fever (QFV), Lyme Disease (LYM)].

The bulk of the material produced for that day was used to develop the Observatoire's upcoming newsletter on zoonoses and climate change (to be published shortly) and will also be used to fuel a pilot study on the vulnerability of Quebec's population to zoonoses in the context of climate change (project underway).

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

Table 1 summarizes all knowledge transfer activities carried out between May 2018 and April 2019.

Table 1: Knowledge transfer activities carried out by 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) between May 2018 and April 2019

Events	Theme	Date
Publications*	<p>Institut national de santé publique du Québec (INSPQ) et Université de Montréal (UdeM). Priorisation des zoonoses au Québec dans un contexte d'adaptation aux changements climatiques à l'aide d'un outil d'aide à la décision multicritère. Auteurs : Audrey Simon, Cécile Aenishaenslin, Valérie Hongoh, Anne-Marie Lowe, Membres de l'Observatoire multipartite québécois sur les zoonoses et l'adaptation aux changements climatiques. Montréal : INSPQ, 2017. 59 p.</p> <p>Simon A. Une structure innovante au Québec pour répondre aux enjeux zoonotiques dans un climat changeant. Le Veterinarius. Numéro 18, Vol. 35 N° 1 Hiver 2019 : 14-15.</p> <p>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 ?</p> <p>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.</p> <p>Using a multi-criteria decision analysis to illustrate de gaps in knowledge, identified during the exercise of prioritization of zoonoses in Quebec, in a context of climate change</p>	August 2018 December 1st 2018 In press In press
Webinars	Gestion d'écllosions de maladies infectieuses émergentes associées aux changements climatiques (atelier INSPQ/PHAC)	June 15 2018
Symposiums	<p>Monitorage d'Aedes albopictus à la frontière canado-américaine : actualités, résultats et exploration d'espèces indicatrices dans le sud du Québec</p> <p>Modélisation des niches écologiques et climatiques de 4 espèces de moustiques vectrices de maladies zoonotiques représentant un risque pour la santé publique dans le sud du Québec</p> <p>Journée thématique aux JASP : Vulnérabilités régionales aux zoonoses : vers une adaptation aux changements climatiques dans les municipalités</p>	December 7 2018 February 13 2019 December 4 2018

*All publications are available online on the Observatoire's website :
<https://www.inspq.qc.ca/zoonoses/observatoire>.

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

Which work is in progress and which projects are coming up?

The Observatoire recently developed, in close collaboration with INSPQ's groups of experts, a scientific watch on zoonoses and the influence of climate change. This watch targets more specifically the zoonoses identified as priorities by the Observatoire. The results of this watch should be formatted and distributed to different target audiences (Observatoire members, health professionals, academic experts) in the coming months.

A project is currently underway at the Observatoire (April to September) to compensate for the lack of assessment of zoonose-related vulnerabilities in the context of climate change in Quebec. The project aims to paint a first portrait of these vulnerabilities and to identify challenges and needs in terms of knowledge and tools to improve this portrait. This first synthesis of vulnerabilities will be used to provide stakeholders from different government levels with information on zoonose-related vulnerabilities, and may also help guide their efforts in implementing climate change adaptation plans.

After the Observatoire finished prioritizing zoonoses using a multi-criteria decision aid, two other zoonoses - the Hantavirus Pulmonary Syndrome and Listeriosis - were added to the list of the 12 previously prioritized zoonoses (<https://www.inspq.qc.ca/zoonoses/observatoire>). A summary sheet for each of these two zoonoses is currently being developed. These sheets will complete the portrait of the zoonoses prioritized by the Observatoire, with an update scheduled for 2021. The English version of this portrait should soon be available on the Observatoire's website.

This year, the Observatoire will attend the **7th edition of the Symposium on Veterinary Public Health**, the theme of which will be the assessment of the One Health approaches. A conference on the Observatoire will take place during this key annual event, which will take place on Thursday, August 22, 2019, at Université de Montréal's Faculty of Veterinary Medicine.

For more information or to sign up for the symposium, go to: <http://grezosp.com/colloque-en-sante-publique-veterinaire/colloque-en-sante-publique-veterinaire7e-edition-du-colloque-en-sante-publique-veterinaire/>

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/>

6th Symposium on Veterinary Public Health

September 20th 2018

The 6th edition of the Symposium on Veterinary Public Health, organized jointly by the GREZOSP and Microprograms on Veterinary Public Health, took place on Thursday, September 20, 2018 at the Faculty of Veterinary Medicine.

At a time when information sources are considerable and diversified, it is quite a challenge to formulate a message that will not only reach the target audience but also effect behaviour change. Which communication tools can help make stakeholders and the general population more aware of veterinary public health issues and, ultimately, lead them to change their behaviours and actions? How to develop communication strategies to better adapt these messages and assess their effectiveness?

These questions were addressed in the context of animal-human-environment interface during this one-day symposium, the theme of which was "One health: communication at the heart of our actions". The event was open to everyone in order to encourage networking between practitioners, researchers and students.

During the event, which welcomed more than a hundred participants, three speakers addressed the audience: Paul Chadwick, Senior Researcher on Behaviour Change, Trainer and Consultant in Clinical and Health Psychology at the UCL Centre, **Dr. Simon Dufour**, Associate Professor with the Faculty of Veterinary Medicine's Pathology and Microbiology Department and Director of the Canadian Bovine Mastitis and Milk Quality Research Network, as well as **Ariane Massé**, Biologist, PhD. Quebec Department of Forests, Wildlife and Parks' Division of Wild Animals' Biosecurity and Health.



Several participants join the three speakers and the organizing committee (photo credits: Marc Paré).

Les Échanges du GREZOSP



The Échanges du GREZOSP are weekly meetings taking place at the Agora of the Pavillon de santé publique vétérinaire. 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, Catherine Bouchard, Émilie Bouchard, Ariane Dumas, Liliane Fortin, Marie-Laure Le Carre, Audrey Simon and Ludivine Taieb.

During the 2018-2019 academic year, the GREZOSP is proud to have featured several guest speakers, including:

- Audrey-Ann Journault, IRSPUM - "Prévention de la maladie de Lyme: une analyse de contenu des sites Internet canadiens des associations de patients et des gouvernements"
- Dre Johanne Saint-Charles, Institut Santé Société – "Santé humaine, société et santé animale: un dialogue à faire?"
- Bryn Williams-Jones, ESPUM – "Conduite responsable et Big Data: Le rôle des chercheurs"
- Malek Batal, Faculté de médecine de l'UdeM – "Sécurité alimentaire, systèmes alimentaires et santé"

Journée du GREZOSP



In the early days of GREZOSP, the GREZOSP Day was held annually. This day, which brought together various members, provided a unique and rewarding opportunities for participants to present their researches and discuss scientific issues. In other words, it was GREZOSP's internal symposium, which was greatly appreciated.

After a few years of hiatus, this event was once again organized by the Exchange Committee following a request made by GREZOSP's Board of Directors, Scientific Committee and Director.

As occasions to meet are rare, GREZOSP research members, regular members, associate members and students came together to ensure the success of this day.

This event was held on Wednesday, May 9, 2018 at Maison Gault in Mont-Saint-Hilaire and its goal was to inform colleagues on ongoing research projects, discuss research activities within GREZOSP, showcase various GREZOSP's projects and members' fields of expertise, and encourage new collaborations between members.

Many GREZOSP research members and regular members presented their work and upcoming research themes. Furthermore, many GREZOSP students took part in the "My thesis in 180 seconds" contest; Gabrielle Claing won first place while Fidèle Kabera won second.



My thesis in 180 seconds: Audrey Simon presenting the 1st prize to Gabrielle Claing and the 2nd prize to Fidele Kabera.

Workshops

R 2.0 Software – Statistical Modeling

In January 2019, GREZOSP held four days of training on the R software at Université de Montréal's Faculty of Veterinary Medicine.

The main goal of the workshop was to deepen learning acquired during winter 2018.

R is a programming language that is extremely powerful but difficult to access through its interface. Language learning is required to easily process data. This training offered a more in-depth look into more advanced notions, such as the specification, construction and validation of linear models, generalised linear models, mixed models, additive models, as well as interpretation of results.

The workshop presenters were :

- **Agathe Allibert**, Ph.D. student at the University of Montréal. While working at CIRAD on the Island of Réunion as a statistical study engineer for two years, she provided training on R language and statistical support to the research center's personnel.
- **Caroline Sauvé**, DVM-Ph.D. student at the University of Montréal. While completing a Masters degree in biology at Université Laval in 2014 where she studied ecology and marine mammal behavior, she acquired many skills on R software.



Agathe Allibert



Caroline Sauvé

Students

Lucie-Dutil Award



The Lucie-Dutil Award was created in memory of Dr. Lucie Dutil (1965-2011), a highly valued colleague and friend. This award aims to support a M.Sc. or Ph.D. student, or a postdoctoral fellow or researcher, member of the GREZOSP, in acknowledgement of their remarkable contribution to our research group through their human qualities, in particular their ability to listen, commit and respect others.

For the 2018-2019 academic year, the Lucie-Dutil Award was presented to **Ludivine Taieb** by the selection committee named by GREZOSP's Scientific Committee. Ludivine is a master's student studying under Antoinette Ludwig. Her work focuses on the modelling of bird species, main hosts of the West Nile Virus in southern Quebec.

This award highlights Ludivine's outstanding contribution to our research group, including her significant commitment to the growth of GREZOSP, especially the student group, as well as her generous contributions to various projects and committees. Ludivine has worked directly with students to facilitate their arrival and integration, and has also developed many friendships along the way. Her listening skills, compassion, support, enthusiasm and dedication make her an exceptional person to be around



Catherine Bouchard, on behalf of the Scientific Committee, presenting the Lucie-Dutil Award to Ludivine Taieb.

Dr. Lucie Dutil (1965-2011) obtained her diploma at Faculty of Veterinary Medicine of the Université de Montréal in 1988. She completed her academic training with a residency in livestock medicine and surgery. After a few years of veterinary practice in the Bois-Francs region, she returned to the Faculty of Veterinary Medicine to complete her Masters in epidemiology (1991-1994) and work as a project manager in research and development for goat and beef cattle. In September 2002, Lucie took the position of epidemiologist and chief analyst for Public Health Agency of Canada's Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS). Her contribution to the implementation and development of CIPARS during the following years was exceptional.

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.

For the 2017-2018 academic year, seven financial assistance scholarships were awarded for a total amount of \$18,500. Congratulations to the recipients **Tamazight Cherifi, Maud de Lagarde, Lauriane Duplaix, Géraldine-Guy Gouin, Rindra Rakotoarinia and Carol-Anne Villeneuve**.

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

2018-2019 Presentations

Aenishaenslin, C. *History of research initiatives in Kuujuaq, Human-dog interface consultation workshop, Iqaluit, Canada, March 19 2019.*

Aenishaenslin, C. *One Health surveillance systems for antimicrobial resistance: An evaluation approach based on the Canadian experience, Atelier «Convergence in evaluation frameworks for integrated surveillance of AMR: Moving towards a harmonised evaluation approach», London, United Kingdom, January 17 2019.*

Aenishaenslin, C., L. Richard, D. Buckeridge. *Prévention et contrôle des zoonoses à l'ère numérique: Potentiel et enjeux, Journées annuelles de santé publique (JASP), Montréal, Canada, December 4 2018.*

Aenishaenslin, C. *One Health and Ecohealth in Canada, conférence dans le cadre du congrès «Creating impacts for One Health and Ecohealth: Advancements in implementation, evaluation, and governance», Bologna, Italy, September 11 2018.*

Aenishaenslin, C. *Evaluating the added value of OH surveillance of Antimicrobial Resistance, conférence dans le cadre du congrès «Creating impacts for One Health and Ecohealth: Advancements in implementation, evaluation, and governance», Bologna, Italy, September 11 2018.*

Aenishaenslin, C. *Veterinary services and Northern communities in Canada: FMV projects, Symposium organized by Veterinarians Without Borders Canada, Vancouver, Canada, July 6 2018.*

Aenishaenslin, C., B. Haesler, A. Ravel, E.J. Parmley, D. Buckeridge. *One Health surveillance systems for antimicrobial resistance: An evaluation approach based on the Canadian experience, InnovSur Conference, Montpellier, France, May 14-18 2018.*

Aenishaenslin, C., B. Haesler, A. Ravel, E.J. Parmley, D. Buckeridge. *How can the level of integration be measured in a One Health surveillance system for antimicrobial resistance? InnovSur Conference, , Montpellier, France, May 14-18 2018. Poster.*

Antoine-Moussiaux, N., O. Vandenberg, Z. Kozlakidis, **C. Aenishaenslin**, S. Eremin, M. Peyre, M. Roche, P. Bonnet, **A. Ravel**. *Valuing health surveillance as an information system: interdisciplinary insights, InnovSur Conference, , Montpellier, France, May 14-18 2018.*

Bhattarai, R., **H. Carabin**, J.V. Proano, H. Flores-Rivera, T. Corona, A. Flisser, C.M. Budke. *The monetary burden of cysticercosis in Mexico. The 15th International Symposium of Veterinary Epidemiology and Economics. Chaing Mai. Thailand, November 12-16 2018. Poster.*

Bouchard, C., C. Aenishaenslin, E.E. Rees, S.O. Kotchi, C. Russel, C. Jardine, **J. Koffi, Y. Pelcat, M. Ripoche, F. Milord**, R. Lindsay, **N.H. Ogden, P. Leighton**. *Toward social-behavioral/ecological informed responses against Lyme disease in Canada. ESOVE, Palermo, Italy, October 2018.*

Bouchard, É., R. Sharma, A. Hernández-Ortiz, T. Kolapo, J. Schurer, B. Wagner, A. Simon, A. Massé, P. Leighton, E. Jenkins. *Toxoplasma gondii and other zoonotic endoparasites in foxes and lynx in Arctic and Subarctic Québec, Canada. Short presentation and poster at the One Arctic - One Health Conference 2019, Oulu, Finland, February 7-9, 2019.*

Scientific Outreach

2018-2019 Presentations

Bouchard, É., R. Sharma, A. Hernández-Ortiz, T. Kolapo, J. Schurer, B. Wagner, A. Simon, A. Massé, P. Leighton, E. Jenkins. *Toxoplasma gondii and other zoonotic endoparasites in foxes and lynx in Arctic and Subarctic Québec, Canada.* Oral presentation at ArcticNet Annual General Meeting, Ottawa, Canada, December 10-14 2018.

Bouchard, É., J. Schurer, A. Bryant, S. Revell, G. Chavis, A. Lichtenwalner, T. Kolapo, E. Jenkins. *Echinococcus and other parasitic zoonoses in wild canids in Québec (Canada) and Maine (USA).* Oral presentation at the American Association of Veterinary Parasitologists 63rd Annual Meeting, Denver, Colorado, July 14-17 2018.

Boudreau Leblanc, A., C. Aenishaenslin, B. Williams-Jones. *Décentraliser pour mieux gérer : le cas d'un réseau vétérinaire de partage de données médicales et d'animaux sentinelles pour améliorer la pratique médicale et la santé*, Colloque étudiant de l'Institut d'éthique appliquée, Québec, Canada, April 25 2019.

Boudreau Leblanc, A., C. Aenishaenslin, B. Williams-Jones. *Mégadonnées en santé et en écologie comme outil de surveillance et d'aménagement intégré du développement social et des écosystèmes*, Forum environnement, Université de Montréal, Montréal, Canada, February 14 2019. Poster.

Daigle, L., A. Ravel, C. Aenishaenslin. *Revue exploratoire de la littérature: La morsure en terrain indigène*, Journée de la recherche, Faculté de médecine vétérinaire, Université de Montréal, Saint-Hyacinthe, Canada, November 2018. Poster.

Evangeline, B., J.R. Hocker, S. Shinde, M. Raviswamygh, J.S. Hanas, J. Babu, R. Anupryia, R.K. Moorthy, A. Oommen, V. Rajshekhar, M.P. Anderson, D.A. Drevets, **H. Carabin**, V. Prabhakaran. *Serum peptides and proteins identified by mass spectrometry distinguish parasite infection associated epilepsy from idiopathic epilepsy*. 87th Annual Conference of Society for Biological Chemist (India). Manipal, Karnataka, India. November 25-27 2018. Poster.

Journault, A.A., **L. Richard, C. Aenishaenslin**. *Informations transmises sur la prévention et le contrôle de la maladie de Lyme au Canada: Une analyse de contenu des sites internet – Phase 1*, Journée scientifique de psychologie, Université de Montréal, Montréal, Canada, April 6 2018. Poster.

Journault, A.A., **L. Richard, C. Aenishaenslin**. *Informations transmises sur la prévention et le contrôle de la maladie de Lyme au Canada*, Colloque de l'Association des étudiants en santé publique de l'Université de Montréal, Université de Montréal, Canada, May 4 2018.

Karmakar, A., B. Evangeline, J. Babu, R. Anupryia, R.K. Moorthy, A. Oommen, V. Rajshekhar, M.P. Anderson, D.A. Drevets, **H. Carabin**, V. Prabhakaran. *Inflammatory genes distinguish parasite infection associated epilepsy from other cases of epilepsy*. 87th Annual Conference of Society for Biological Chemist (India). Manipal, Karnataka, India. November 25-27 2018. Poster.

Moorthy, R., V. Prabhakaran, A. Oommen, M.P. Anderson, V. Rajshekhar, D.A. Drevets, H. Carabin. *Imaging and serum enzyme-linked immunoelectrotransfer blot (EITB) profile correlations among 548 Indian patients with Neurocysticercosis (NCC)*. 67th Annual meeting of the American Society of Tropical Medicine and Hygiene, New Orleans, LA, October 29-30 2018. Poster.

Scientific Outreach

2018-2019 Presentations

Richard, L., C. Aenishaenslin, D. Buckeridge. *Une application mobile pour prévenir la maladie de Lyme*, Journées annuelles de santé publique (JASP), Montréal, Canada, December 4 2018.

Sánchez Mendoza L.J., C.A. Valle Tejada, C. Provost, C.A. Gagnon, F. Beaudry, **L. Abrahamyan**. *Decoding Intraviral and Virus-Host protein Interaction Networks of Porcine Nidoviruses by Quantitative Proteomics*. 2nd Canadian Virology Society meeting, Halifax, June 13-15, 2018. Poster.

Valle Tejada C.A., L.J. Sánchez Mendoza, C. Provost, C.A. Gagnon, F. Beaudry, **L. Abrahamyan**. *Global Picture of Nidovirus-Host Cell Interactions Revealed by Comparative Proteomics*. North American PRRSV Symposium, Chicago, USA. December 1-2 2018.

Valle Tejada C.A., L.J. Sánchez Mendoza, C. Provost, C.A. Gagnon, F. Beaudry, **L. Abrahamyan**. *Global Picture of Nidovirus-Host Cell Interactions Revealed by Comparative Proteomics*. 97th Conference of Research Workers in Animal Diseases Meeting, Chicago, USA, December 3-6 2018.

Valle Tejada, C.A., L.J. Sánchez Mendoza, C. Provost, C.A. Gagnon, F. Beaudry, **L. Abrahamyan**. *Optimization of the efficiency of viral infection of two porcine nidoviruses (PRRSV and PEDV) of veterinary importance*. 11e Symposium du CRIPA, St-Hyacinthe, QC, Canada. May 15-16 2018. Poster.

Our Researchers in the Media

- **Émilie Bouchard**, [La toxoplasmose, une maladie due à un parasite qui touche une personne sur trois](#), March 8 2019, «ICI Saskatchewan», Radio Canada
- **Catherine Bouchard** and **François Milord**, [Des pharmaciens pour prévenir la maladie de Lyme](#), April 19 2019, «ICI Grand Montréal», Radio Canada
- **Catherine Bouchard** and **François Milord**, [Bulletin d'information du 19 avril 2019](#), «Le téléjournal avec Patrice Roy», Radio Canada
- **Simon Dufour**, et al., [Modifier le bilan énergétique des vaches](#), La terre de chez nous, February 4 2019.
- **Simon Dufour**, [Déjà du lait américain sur nos tablettes](#), TVA Nouvelles, October 10 2018
- **Philippe Fraval**, [Listeria: comment faciliter le travail des transformateurs](#), La terre de chez nous, April 29 2019
- **Philippe Fraval**, [Orienter la flore microbienne intestinale pour une agriculture durable](#), La terre de chez nous, July 30 2018
- **Cécile Ferrouillet** and **Philippe Fraval**, [Étude sur le risque de propagation de Salmonella Dublin lors de la mise en marché des bovins](#), La terre de chez nous, May 11 2018
- **Hélène Lardé**, **Jonathan Massé**, David Francoz, **Simon Dufour**, Jean-Philippe Roy, [Nouvelle réglementation pour un usage judicieux des antibiotiques](#), La terre de chez nous, April 1 2019.
- Hélène Lardé and Jonathan Massé, [Les superhéros se cachent aussi dans les labos!](#), La terre de chez nous, October 31 2018.

Scientific Outreach

Marcelo Gottschalk was invited to be a speaker at the Pig Veterinary Society Congress in Chongqing, China, from June 10 to June 15. His conference was entitled "Actinobacillus pleuropneumoniae: why do we still have problems to control the disease?". Dr. Gottschalk also acted as moderator during the "Bacterial disease" panel.

Hélène Lardé received the prestigious Alexander Graham Bell Canada Graduate Scholarship - Doctoral study grant.

Jonathan Massé received a scholarship for excellence in graduate studies from the Fonds de recherche du Québec – Nature et technologies (Quebec research funds - nature and technologies) as part of his doctoral studies.

Levon Abrahamyan co-wrote the "Interaction of the Mouse Polyomavirus Capsid Proteins with Importins Is Required for Efficient Import of Viral DNA into the Cell Nucleus" article, which was published by *Viruses*, one of the most prestigious virology journal.

John M. Fairbrother, associate professor and full professor at the Faculty of Veterinary Medicine, and co-founder of Prevtec Microbia, received the Meritorious Service Medal from Governor General Julie Payette. This honor was awarded to him in recognition of his work, which led to the invention of innovative vaccines as alternatives to antibiotics in pig farming.

Christopher Fernandez Prada published a chapter of a book entitled "Repurposed molecules: A New hope in Tackling Neglected Infectious Diseases. In: In Silico Drug Design Methods for Drug Repurposing".

Christopher Fernandez Prada was invited to lecture at two conferences of the Ordre des médecins vétérinaires du Québec (Quebec's professional association of veterinarians) on October 26 and 27 in Saint-Hyacinthe. The conferences were entitled "Global Changes and Emerging Diseases in Quebec" and "The 10 Most Frequently Asked Questions in Parasitology". Dr Prada was also invited to lecture at three international conferences during summer 2018: from June 18 to 21 at the 14th Boehringer Ingelheim Symposium on Parasitosis and Arthropod-Born Diseases, in Panama; on August 21 at the International Course on Biochemical, Molecular and Immunological Aspects in the Interaction of Tripananosomatids with Vectors and Vertebrate Hosts and in the Chemotherapy, Belo Horizonte, in Minas Gerais, Brazil; and on August 22 at the International Seminars on Biological Science - Immunobiology and Immunopathology on Protozoology, at Universidade Federal de Ouro Preto, in Minas Gerais, Brazil.

Hélène Carabin was key speaker during the Faculty of Veterinary Medicine's Journée de la recherche (research day), which was held at the Faculty on November 8, 2018. More than 160 participants attended approximately 70 oral presentations and poster presentations from graduate students and research professionals.

André Ravel, Faculty professor and GREZOSP Director, created a video illustrating the "One Health" concept in a concrete application in Nunavik, as part of the One Health Day dedicated by the World Health Organization (WHO), the Food and Agriculture Organization of the United Nation (FAO) and the World Organisation for Animal Health (OIE). Held on November 3, the purpose of this day is to raise awareness of the public and professionals as to the importance of collaboration between the fields of human health, animal health and environmental health, as much on an institutional level as on a research and educational level.

On February 7, 2019, during the Faculty of Veterinary Medicine's Annual Scholarship and Awards Ceremony, **Simon Dufour** received the Vétoquinol excellence award for his research, and **Agathe Allibert** received the Lucie Besner grant, highlighting her excellent academic record and research in the field of zoonoses.

Follow Us on Facebook!



Since Fall 2018, GREZOSP is on social media with its Facebook page, an initiative of its Web Committee comprised of Catherine Bouchard, Liliane Fortin, Manon Racicot and Ludivine Taieb.

Les Échanges du GREZOSP, symposiums, défenses, séminaires, sessions de formation et ateliers sont maintenant annoncés à travers les événements Facebook. Aimez notre page et suivez-nous sur Facebook pour rester à jour sur toutes les dernières nouvelles, y compris les prix et bourses, les opportunités d'emploi, et lorsque nos chercheurs sont dans les médias!

The screenshot shows the GREZOSP Facebook page. The profile picture is a green and blue circular logo with the text 'GREZOSP'. The page name is 'Groupe de Recherche en Épidémiologie des Zoonoses et Santé Publique' and the handle is '@grezosp'. The page has 1,111 likes. The cover photo is a group photo of approximately 30 people sitting on a grassy hillside next to a lake, with mountains in the background. Below the cover photo are several interactive buttons: 'Liked', 'Following', 'Share', 'Send Message', 'Create Post', 'Live', 'Event', 'Offer', 'Job', 'Write a post...', 'Photo/Vidéo', 'Get Messages', and 'Feeling/Activ...'. To the right of the main post area is a smaller thumbnail for a post titled 'Education in Saint-Hyacinthe, Québec' with a photo of the same group in front of a building.



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

Financial Statements

Financial Statements from May 1, 2018 to April 30, 2019

Sources of Funding

Annual Funding under PHAC Agreement (2018-2019)	\$78 500,00
Funding under CFIA Agreement (2017-2018)	\$19 603,68
Funding under CFIA Agreement (2018-2019)	\$19 927,89
Funding Total	\$118 031,57

Expenses

General

Administrative Salaries	\$60 853,11
Office Supplies	\$84,17
Travel Expenses	\$95,49
Telecommunications	\$576,54
Maintenance	\$178,05
	\$61 787,36

Scientific Committee

Graduate Student Scholarships and Support	\$20 000,96
Lucie-Dutil Award	\$633,67
Scientific Workshops	\$1 930,69
2019 CAPEPM Conference Sponsorship	\$1 000,00
	\$23 565,32

Communications and Web Committee

Activity Report	\$1 040,51
Website	\$404,07
	1 444,58 \$

Échanges Committee

Guest Lecturers (Regular Seminars and Thesis Defence)	-\$500,00
Journée du GREZOSP	\$1 896,36
	\$1 396,36

Student Activities

GREZOSP Annual Symposium	\$4 165,91
Social Committee	\$261,08

Expenses Total	\$94 120,61
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Balance for the year 2018-2019	<u>\$23 910,96</u>
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Year-End Balance 2017-2018	\$79 950,08
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Year-End Balance 2018-2019	<u>\$103 861,04</u>
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GROUPE DE RECHERCHE EN
ÉPIDÉMIOLOGIE DES ZOONOSES
ET SANTÉ PUBLIQUE



Université 
de Montréal