



Happy Holidays



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Happy Holidays and Happy New Year 2019!

In 2020, CARTaGENE will begin its 11th year of activity!

We would not have been able to take this important step without the involvement of participants helping to generate new data and the contribution of researchers using this data to advance health research.

The CARTaGENE team wishes you a wonderful holiday season and a happy new year 2020. May this new year be synonymous with discoveries and successes for all health research projects!

[Discover our holiday card 2019-2020.](#)

CARTaGENE presents its new scientific lead team

New experts join Dr. Broët forming a high-caliber scientific lead team.

Philippe Broët, M. D., Ph. D. is a professor at the Université de Montréal and researcher at CHU Sainte-



Justine. His areas of expertise are clinical epidemiology and clinical predictive medicine. His research focuses on the development of new analytical strategies adapted to genomic studies in multifactorial diseases. These projects combine both methodological and clinical transfer components. He also teaches at the University Paris-Sud / Paris-Saclay.



Guillaume Lettre, Ph. D. is a professor at the Université de Montréal and researcher at the Montreal Heart Institute. He holds a Canada Research Chair in Complex Trait Genetics since November 2010. His laboratory is funded by grants from the Canadian Institutes of Health Research (CIHR), the Heart and Stroke Foundation of Canada, the “Fonds de Recherche du Québec – Santé”, and the Montreal Heart Institute Foundation. In 2019, he was appointed to The College of New Scholars of the Royal Society of Canada.



Simon Gravel, Ph. D. is a professor at McGill University and researcher at the McGill University and Génome Québec Innovation Center. He holds a Canada Research Chair in Statistical and Population Genetics. He is interested in biology and evolution through creative analysis of high throughput biological data. His group develops mathematical and statistical methods that use a variety of data sources to refine the understanding of the fundamental parameters of human history and biology.

Genotyping the entire cohort!

The year 2019 ends with good news. Thanks to funding from **Génome Québec**, the entire CARTaGENE cohort will be genotyped, which represents genomic data for approximately 18,000 additional participants. At the end of this project, the CARTaGENE databases will contain genotyping data for 30,000 participants.

The genotyping platform used is the Global Screening Array (illumina) version 2 chip including the multi-disease panel. A custom content of variants suggested by Quebec geneticists (following a survey) was added to the chip (approximately 4500 variants) . The new genotyping data should be available for sharing by the summer of 2020.

New data available at CARTaGENE

CARTaGENE aims to improve the resources available to researchers by generating and integrating new data. Here is a brief overview of the newly available data:

Magnetic resonance imaging (MRI) of the brain and heart: Images and associated data for approximately 1415 participants in the Canadian Alliance Study for Healthy Hearts and Minds.

CARTaGENE health follow-up data: Participants were re-contacted in 2018 and health follow-up data are available for more than 17,000 participants.

Administrative health data (recent update): These include hospitalization data, cancer data, claimed medical services data, pharmaceutical data, and death and mortality data. Currently, these data, related to the period between January 1998 and March 2019, are stored on CARTaGENE's servers.

Canadian Healthy Eating Index (HEI) scores: The HEI are calculated from the nutrition follow-up data (for approximately 9,000 participants).

CANUE: Very high resolution environmental databases (air quality (particulates, ozone, etc), green spaces, climate and weather, characteristics of the built environment, social and material deprivation) are linked with CARTaGENE data using postal codes.

16 new projects in 2019

This year again, many projects have been approved by CARTaGENE's access committee:

Lifestyle and Cancer: Identifying new risk factors for the most common cancers in Canada

Principal investigator: Rachel Murphy, The University of British Columbia

Characterization of Quebec population structure

Principal investigator: Simon Gravel, Université McGill

Longitudinal Genome and Phenome Analyses of Human Populations

Principal investigator: Philip Awadalla, University of Toronto

Évaluation de l'exposition des travailleurs à la chaleur à l'aide des données de la cohorte québécoise CARTaGENE

Principal investigators: Nolwenn Noisel, Ariane Adam-Poupart, CARTaGENE, Université de Montréal and INSPQ

Phénotype de polymorphismes du récepteur NTS1 de la neurotensine

Principal investigator: Philippe Sarret, Université de Sherbrooke

Lifestyle and environmental factors, DNA methylation and lung cancer risk

Principal investigator: Vikki Ho, Université de Montréal

Genetic Variants Associated with Pain Reduction in Patients with Low Back Pain or Neuropathic Pain

Principal investigator: Luda Diatchenko, Université McGill

Évaluation des biomarqueurs de sénescence cellulaire chez les participants de la cohorte CARTaGENE

Principal investigator: Francis Rodier, Université de Montréal

Evaluation of predictive models on the occurrence of breast cancer at 5 years

Principal investigator: Philippe Broët, CARTaGENE and Université de Montréal

Aging-induced dysregulation of gene expression networks

Principal investigator: Alan Cohen, Université de Sherbrooke

Essential Tremor Genome-wide Association Study

Principal investigator: Guy Rouleau, MNI

Nutritional, behavioral and lifestyle mediators of genetic susceptibility to obesity

Principal investigator: Louis Pérusse, Université Laval

Zoonoses: Changements climatiques et zoonoses priorisées: portrait de situation à l'aide des données de la cohorte populationnelle québécoise CARTaGENE et établissement de projets de surveillance et de recherche

Principal investigators: Nolwenn Noisel, Ariane Adam-Poupart, CARTaGENE, Université de Montréal and INSPQ

Depression, metabolic factors and the risk of cancer: prospective associations in the CARTaGENE study

Principal investigator: Norbert Schmitz, Université McGill

Signatures of Cardiovascular Health Derived from Integrated Biomics, Environment and Lifestyle – Findings from the Canadian Alliance for Healthy Hearts and Minds - CARTaGENE Cohort

Principal investigator: Matthias Friedrich, Université McGill

Environnement bâti et santé

principal researcher: Éric Robitaille, INSPQ

16 new publications

Also, CaG data have led to 16 new scientific publications:

- I. Fortier, N. Dragieva, M. Saliba, C. Craig, P.J. Robson; with the Canadian Partnership for Tomorrow Project's scientific directors and the Harmonization Standing Committee, Harmonization of the Health and Risk Factor

Questionnaire data of the Canadian Partnership for Tomorrow Project: a descriptive analysis, *CMAJ Open*. 7(2):E272-E282

- F. Wünnemann, K.S. Lo, A. Langford-Avelar, D. Busseuil, M.P. Dubé, J.C. Tardif, G. Lettre, Validation of Genome-wide Polygenic Risk Scores for Coronary Artery Disease in French Canadians, *Circ Genom Precis Med*. 12(6):e002481
- H.D. Hosgood III, M. Klugman, K. Matsuo, A.J. White, A. Sadakane, X.O. Shu, R. Lopez-Ridaura, A. Shin, I. Tsuji, R. Malekzadeh, Nolwenn Noisel et al., The Establishment of the Household Air Pollution Consortium (HAPCO), *Atmos*. 10(7): 422
- S.S Deschênes, R.J. Burns, E. Graham, N. Schmitz, Depressive symptoms and sleep problems as risk factors for heart disease: a prospective community study, *Epidemiol Psychiatr Sci*. 1-10
- F. Allum, Å.K. Hedman, X. Shao, W.A. Cheung, J. Vijay, F. Guénard, T. Kwan, M.M. Simon, B. Ge, C. Moura, L. Rönnblom, S. Bernatsky, M. Lathrop, M.I. McCarthy, P. Deloukas, A. Tchernof, T. Pastinen, M.C. Vohl, E. Grundberg, Dissecting features of epigenetic variants underlying cardiometabolic risk using full-resolution epigenome profiling in regulatory elements, *Nat Commun*. 10(1):1209
- X. Shao, M. Hudson, I. Colmegna, C.M.T. Greenwood, M.J. Fritzler, P. Awadalla, T. Pastinen, S. Bernatsky, Rheumatoid arthritis-relevant DNA methylation changes identified in ACPA-positive asymptomatic individuals using methylome capture sequencing, *Clin Epigenetics*. 11(1):110
- S.S. Anand, J. Tu, P. Awadalla, P. Robson, S. Jacquemont, et al. , Cardiovascular risk scoring and magnetic resonance imaging detected subclinical cerebrovascular disease, *Eur Heart J Cardiovasc Imaging*. 00:1-9
- F. Akçimen, J. P. Ross, F. Sarayloo, C. Liao, R. De Barros Oliviera, J. A. Ruskey, C. V. Bourassa, P.A. Dion, L. Xiong, Z. Gan-Or, G.A. Rouleau, Genetic and epidemiological characterization of restless legs syndrome in Québec, *Sleep*. zsz265
- L. C. Desbiens, R. Goupil, F. Mac-Way, Predictive value of quantitative ultrasound parameters in individuals with chronic kidney disease: A population-based analysis of CARTaGENE, *Bone*. 115120
- S. Glentis, A. C. Dimopoulos, K. Rouskas, G. Ntritsos, E. Evangelou, S. A. Narod, A. M. Mes-Masson, W. D. Foulkes, B. Rivera, P. N. Tonin, J. Ragoussis, A. S. Dimas, Exome Sequencing in BRCA1- and BRCA2-Negative Greek Families Identifies MDM1 and NBEAL1 as Candidate Risk Genes for Hereditary Breast Cancer, *Front Genet*. 18(10): 1005
- A. Krajcoviechova, F.C. Marois-Blanchet, S. Troyanov, F. Harvey, P. Dumas, J. Tremblay, R. Cifkova, P. Awadalla, F. Madore, P. Hamet, Uromodulin in a pathway between decreased renal urate excretion and albuminuria, *Am J Hypertens*. 32(4):384-392

- P. Hystad, Y. Payette, N. Noisel, C. Boileau, Green space associations with mental health and cognitive function, *Environ Epidemiol.* 3(1):e040
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- Z. Slim, C.S. Moura, S. Bernatsky, E. Rahme, Capture of Rheumatoid Arthritis Cases within Quebec Health Administrative Database, *J Rheumatol.* 181121
- Z. Slim, C.S. Moura, S. Bernatsky, E. Rahme, Care quality for rheumatoid arthritis patients in Quebec, *Int J Rheum Dis.* 22(7):1233-1238

CARTaGENE is proud of your scientific successes! Remember to inform the team when you plan to submit an article based on CARTaGENE data.

Projects and publications using CARTaGENE's data pique your interest?

[Learn more](#)

Several collaborations

Recently, CARTaGENE has developed collaborations with news partners and strengthened existing collaborations:

i-Balsac: This is a multidisciplinary platform for cutting-edge research in biological and social sciences funded by the Canada Foundation for Innovation. The project, led by H  l  ne V  zina, is based on the integration and linkage of genealogical, genetic and geographical data as well as the development of analytical, statistical and cartographic tools to optimize the exploitation of these data.

INSPQ: Two collaborative projects were created with the Institut national de sant   publique du Qu  bec. The aim of the first project is to assess the exposure of workers to heat in the context of climate change while the aim of the second project is to establish a situational overview of prioritized zoonoses.

Health Canada: In collaboration with CARTaGENE, Dr. Vinita Chauhan of Health Canada is conducting a study to measure radon gas levels in the home of CARTaGENE participants to better understand the effects of radon on health.

PSY-CA: CARTaGENE is one of the 7 international cohorts included in the European PSY-CA Consortium which studies the links between psychosocial

factors and cancer through the conduct of a large meta-analysis of about 600,000 participants.

HAPCO: This is a Consortium (Household Air Pollution Consortium) led by Dr. Hosgood to assess the relative and absolute risks of cancer mortality attributed to indoor air pollution. CARTaGENE contributed with preliminary data and analyses and a first article was published in early 2019.

CPTP: The Canadian Partnership for Tomorrow Partnership is the largest population health research platform in Canada. It contains a wealth of data from more than 300,000 Canadians from 5 cohorts including CARTaGENE.

Follow us on social media

CARTaGENE has expanded its presence on social media. Tell us about your successes and other announcements! We will be happy to share on our platforms!



Nos partenaires :

