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Dr. Alexandre Pellan Cheng

Correspondence language: English
Sex: Male
Date of Birth: 2/09
Canadian Residency Status: Canadian Citizen
Country of Citizenship: Canada

Contact Information

The primary information is denoted by (*)

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Dr. Alexandre Cheng

Language Skills

Language	Read	Write	Speak	Understand
English	Yes	Yes	Yes	Yes
French	Yes	Yes	Yes	Yes

User Profile

Disciplines Trained In: Biomedical Engineering and Biochemical Engineering, Genetics

Research Disciplines: Biomedical Engineering and Biochemical Engineering, Genetics, Oncology

Areas of Research: Bioinformatics, Biotechnology, Cancer Diagnosis and Detection

Fields of Application: Biomedical Aspects of Human Health

Research Specialization Keywords: Bioinformatics, Genomics, Machine learning, Cell-free DNA, Circulating tumor DNA, Cancer detection, Liquid biopsy, Biotechnology development, Signal-to-noise enhancement, Noninvasive diagnostics

Degrees

2016/8 - 2021/8
Doctorate, Ph.D in Biomedical Engineering, Biomedical Engineering, Cornell University
Degree Status: Completed
Supervisors: Iwijn De Vlaminck

2012/8 - 2016/5
Bachelor's, Bachelors of Engineering, Biomedical Engineering, École Polytechnique de Montréal
Degree Status: Completed
Supervisors: Caroline Hoemann

Recognitions

2024/1 - 2024/10
American Cancer Society Postdoctoral Fellowship - 220,500 (United States dollar)
American Cancer Society
Prize / Award

2023/1 - 2023/12
Innovation & Discovery Award - 2,000 (United States dollar)
New York Genome Center
Prize / Award

2018/5 - 2021/5	NSERC Postgraduate Scholarship - 63,000 (Canadian dollar) Natural Sciences and Engineering Research Council of Canada (NSERC) Prize / Award
2016/8	De Vinci Profile École Polytechnique de Montréal Prize / Award
2016/8 - 2017/5	Fischell Graduate Scholarship in Bioengineering Cornell University Prize / Award
2014/8	NSERC Undergraduate Research Award Natural Sciences and Engineering Research Council of Canada (NSERC) Prize / Award

Employment

2025/1	Associate Professor Systems Engineering, École de technologie supérieure, École de technologie supérieure
2021/9 - 2024/10	Postdoctoral Associate Medicine, Medicine, Cornell University Medical College
2022/1 - 2023/6	Scientific consultant for technology transfer Eurofins-Viracor; Lenexa, Kansas
2022/12 - 2022/12	Scientific consultant for technology evaluation Karius; Redwood City, California
2016/8 - 2021/8	Graduate Research Assistant (Ph.D. researcher) Biomedical Engineering, Engineering, Cornell University
2013/5 - 2016/8	Research Assistant Chemical Engineering, Chemical Engineering, École Polytechnique de Montréal
2015/5 - 2015/8	Research Assistant Infectious disease, Medicine, McGill University Health Centre

Affiliations

The primary affiliation is denoted by (*)

2025/1	Associate Professor, École de technologie supérieure
2025/1	Research Member, Montreal Cancer Institute
(*) 2025/1	Principal Scientist, Centre hospitalier de l'Université de Montréal

Research Funding History

Awarded [n=5]

2025/1 - 2029/12
Principal Investigator

Montreal Cancer Institute start-up funds

Funding Sources:

2025/1 - 2029/12 Montreal Cancer Institute
Rapatriement des cerveaux
Total Funding - 250,000 (Canadian dollar)
Funding Competitive?: No

2025/2 - 2028/1
Co-investigator

Whole-genome sequencing-based circulating tumor DNA liquid biopsy and minimal residual disease detection in early-stage, tumor-mutational burden-high solid tumors

Co-investigator : Antoine Désilets; Zineb Hamilou;

Principal Investigator : Normand Blais

Funding Sources:

2025/2 - 2028/1 Saputo Family Foundation
Saputo Family Foundation
Total Funding - 1,400,000 (Canadian dollar)
Funding Competitive?: No

2025/1 - 2027/12
Principal Investigator

CRCHUM start-up funds

Funding Sources:

2025/1 - 2027/12 Centre de recherche du Centre hospitalier de l'Université de Montréal (CRCHUM)
Start-up funds
Total Funding - 225,000 (Canadian dollar)
Funding Competitive?: No

2025/1 - 2026/12
Principal Investigator

ÉTS start-up funds

Funding Sources:

2025/1 - 2026/12 École de Technologie Supérieure (ÉTS)
Start-up funds
Total Funding - 100,000 (Canadian dollar)
Funding Competitive?: No

2025/1 - 2026/12
Principal Investigator

ÉTS equipment fund

Funding Sources:

2025/1 - 2026/12 École de technologie superieure (ÉTS)
Start-up equipment fund
Total Funding - 25,000 (Canadian dollar)
Funding Competitive?: No

Completed [n=1]

2024/1 - 2024/10
Principal Investigator

Whole-genome error corrected sequencing for early stage melanoma detection without matched tumors

Funding Sources:

2024/1 - 2025/10 American Cancer Society
Postdoctoral Fellowship
Total Funding - 220,500 (United States dollar)
Funding Competitive?: Yes

Student/Postdoctoral Supervision

Master's Thesis [n=4]

Principal Supervisor	Eric Sonounameto (In Progress) , Université du Québec à Montréal Student Degree Start Date: 2025/8 Present Position: Master's student
Co-Supervisor	Catalina Moreno (In Progress) , Université de Montréal Student Degree Start Date: 2025/8 Present Position: Masters
Principal Supervisor	Théo Nenonene (In Progress) , École de technologie supérieure Student Degree Start Date: 2025/5 Present Position: Master's student
Principal Supervisor	Aliona Bedjeguelal (In Progress) , Université Lyon 1 Student Degree Start Date: 2024/9 Present Position: Master's student

Doctorate [n=3]

Principal Supervisor	Elena Fraiji (In Progress) , Ecole de technologie superieure Student Degree Start Date: 2026/1 Present Position: PhD student
Principal Supervisor	Cedric Cornede (In Progress) , Ecole de technologie superieure Student Degree Start Date: 2026/1 Present Position: PhD student
Co-Supervisor	Srinivas Rajagopalan (In Progress) , Weill Cornell Medical College Student Degree Start Date: 2021/8 Present Position: PhD candidate, Weill Cornell Medical College

Certificate [n=4]

Principal Supervisor	Eric Sonounameto (All But Degree) , Université de Québec à Montréal Student Degree Start Date: 2024/8 Present Position: Intern
Principal Supervisor	Elena Fraiji (All But Degree) , Université du Québec à Montréal Student Degree Start Date: 2024/8 Present Position: Intern
Principal Supervisor	Maha Abbaci (All But Degree) , Université du Québec à Montréal Student Degree Start Date: 2024/8 Present Position: Intern
Principal Supervisor	Ronald Sim (All But Degree) , Université du Québec à Montréal Student Degree Start Date: 2024/8 Present Position: Intern

Research Associate [n=4]

Co-Supervisor	Afnan Al-Saleh (In Progress) , CRCHUM Student Degree Start Date: 2025/1 Present Position: Research assistant

Co-Supervisor	Anna Perez (Completed) , CRCHUM Student Degree Start Date: 2025/1 Present Position: Research agent
Co-Supervisor	Wiam Belkaid (In Progress) , CRCHUM Student Degree Start Date: 2025/1 Present Position: Research Associate
Co-Supervisor	Imen Ben Aissa (Completed) , CRCHUM Student Degree Start Date: 2025/1 Present Position: Research assistant

Knowledge and Technology Translation

2022/1 - 2023/6	Scientific Consultant, Technology Transfer and Commercialization Target Stakeholder: Industry/Business (>500 employees) Outcome / Deliverable: Technology transfer of intellectual property Activity Description: Scientific consultation after Eurofins-Viracor acquired 3 licenses for patents for which I am an inventor. Patents were filed during graduate studies.

International Collaboration Activities

2023/2 - 2025/7	Project Supervisor, United States of America I co-supervise an international project seeking to apply a novel sequencing methodology developed by Ultima Genomics (ppmSeq) for the detection of circulating tumor DNA in low input plasma samples.
2023/1 - 2025/7	Project supervisor, United Kingdom Here, I co-supervise a project seeking to develop a next-generation sequencing assay for non-cancerous somatic disease. This collaborative project joins research teams from New York (Weill Cornell Medical College and the New York Genome Center) with laboratories in Texas (University of Texas Southwestern), Miami (the University of Miami), and the United Kingdom (Wellcome Sanger Institute, University of Oxford)
2021/9 - 2025/4	Project lead, United States of America This international collaboration included research centers in New York (Weill Cornell Medicine, Memorial Sloan Kettering Cancer Center and the New York Genome Center), the Massachusetts General Hospital and the United Kingdom (The Francis Crick Institute, The Royal Marsden NHS Foundation Trust). Here, I developed a whole genome error-corrected sequencing assay for circulating tumor DNA monitoring.
2020/8 - 2022/7	Project lead, United States of America This international collaboration between Cornell University, Weill Cornell Medical College, NewYork Presbytarian Hospital and the Infectious Disease Research Collaboration in Uganda sought to develop a metagenomic DNA sequencing assay that is robust to environmental DNA contamination and improves the specificity of infection diagnosis.
2018/8 - 2022/1	Project lead, United States of America In this collaboration, I developed a cell-free DNA assay and bioinformatic pipeline designed to inform major complications of stem cell transplants. This work was led by Cornell University with the Dana Farber Cancer Institute and Brigham and Women's Hospital in Massachusetts.

2020/2 - 2021/4 Project lead, United States of America
Co-lead on an international COVID-19 discovery project where I utilized my previously developed whole-genome methylation sequencing assay to tissue damage related to COVID-19 severity. This collaboration included Cornell University, the University of California in San Francisco and McGill University.

Presentations

1. (2025). Whole genome sequencing for sensitivie tumor monitoring. Precision Oncology Experimental Therapeutics, Calgary, Canada
Main Audience: Researcher
Invited?: Yes
2. (2025). Le rôle de l'IA dans la biopsie liquide. Symposium sur la biopsie liquide en oncologie, Canada
Main Audience: Knowledge User
Invited?: Yes
3. (2024). Whole genome sequencing for circulating tumor DNA detection. Circulating Nucleic Acids in Plasma and Serum, Austria
Main Audience: Researcher
Invited?: Yes
4. (2023). Whole genome error-corrected sequencing for sensitive circulating tumor DNA cancer monitoring.American Association for Cancer Research, United States of America
Main Audience: Researcher
Invited?: No
5. (2022). Deep and error corrected sequencing via the low-cost Ultima Genomics platform enables ultra-sensitive circulating tumor DNA cancer monitoring. American Society of Human Genetics, United States of America
Main Audience: Researcher
Invited?: No
6. (2020). Cell-free DNA Tissues of Origin Profiling To Monitor Infections and Immune-related Disease.Biomedical Engineering Society, United States of America
Main Audience: Researcher
Invited?: No
7. (2020). Liquid biopsies for infectious and immune diseases. Université de Montréal, Canada
Main Audience: Researcher
Invited?: Yes
8. (2020). Cell-free DNA tissues-of-origin profiling to monitor infectious and immune-related disease. American Society of Human Genetics, United States of America
Main Audience: Researcher
Invited?: No
9. (2020). Liquid biopsies for infectious and immune diseases. McGill University, Canada
Main Audience: Researcher
Invited?: Yes
10. (2020). Liquid biopsies for infectious and immune diseases. Hackensack Meridian Health Center for Discovery and Innovation, United States of America
Main Audience: Researcher
Invited?: Yes

11. (2020). A metagenomic sequencing assay that integrates the host-damage response to infection. The Biology of Genomes, United States of America
Main Audience: Researcher
Invited?: No

Broadcast Interviews

2025/05/22	Liquid biopsies in Quebec and the Montreal Cancer Institutes "Rapatriement des cerveaux" program, Salut Bonjour, TVA

Text Interviews

2025/05/12	Is Whole Genome Sequencing Now Cost-Effective Enough for the Clinic?, The Analytical Scientist
2020/10/26	Cell-Free DNA provides a dynamic window into health, American Society of Human Genetics

Publications

Journal Articles

1. Cheng, A.P., Rusinek, I., Sossin, A., Widman, A.J., Meiri, E., Krieger, G., Hirschberg, O., Shem Tov, D., Gilad, S., Jaimovich, A., Barad, O., Avaylon, S., Rajagopalan, S., Potenski, C., Prieto, T., Yuan, D.J., Furatero, R., Runnels, A., Costa, B.M., Shoag, J.E., Al Assaad, M., Sigouros, M., Manohar, J., King, A., Wilkes, D., Otilano, J., Malbari, M.S., Elemento, O., Mosquera, J.M., Altorki, N.K., Saxena, A., Callahan, M.K., Robine, N., Germer, S., Evrony, G., Faltas, B.M., Landau, D.A. (2025). Paired plus-minus sequencing is an ultra-high throughput and accurate method for dual strand sequencing of DNA molecules. bioRxiv.
First Listed Author
Published
Refereed?: No

2. Coorens, T.H.H., et al., Somatic Mosaicism across Human Tissues Network. (2025). The somatic mosaicism across human tissues network. Nature. 643(8070): 47-59.
Co-Author
Published
Refereed?: No

3. Cheng, A.P., Widman, A.J., Arora, A., Rusinek, I., Sossin, A., Rajagopalan, S., Midler, N., Hooper, W.F., Murray, R.M., Halmos, D., Langanay, T., Chu, H., Inghirami, G., Potenski, C., Germer, S., Marton, M., Manaa, D., Helland, A., Furatero, R., McClintock, J., Winterkorn, L., Steinsnyder, Z., Wang, Y., Alimohamed, A.I., Malbari, M.S., Saxena, A., Callahan, M.K., Frederick, D.T., Spain, L., Sigouros, M., Manohar, J., King, A., Wilkes, D., Otilano, J., Elemento, O., Mosquera, J.M., Jaimovich, A., Lipson, D., Turajlic, S., Zody, M.C., Altorki, N.K., Wolchok, J.D., Postow, M.A., Robine, N., Faltas, B.M., Boland, G., Landau, D.A. (2025). Error-corrected flow-based sequencing at whole-genome scale and its application to circulating cell-free DNA profiling. Nature Methods. (22): 973–981.
First Listed Author
Published
Refereed?: Yes

4. Kounatse Djomnang, L.A., Li, C., Mzava, O., Cheng, A.P., Chang, A., Lenz, J.S., Suthanthiran, M., Lee, J.R., Dadhania, D.M., De Vlaminck, I. (2024). A quantitative comparison of urine centrifugation and filtration for the isolation and analysis of urinary nucleic acid biomarkers. Scientific Reports. 14: 10872.
Co-Author
Published
Refereed?: Yes

5. Widman, A.J., Shah, M., Øgaard, N., Khamnei, C.C., Frydendahl, A., Deshpande, A., Arora, A., Zhang, M., Halmos, D., Bass, J., Langanay, T., Rajagopalan, S., Steinsnyder, Z., Liao, W., Rasmussen, M.H., Jensen, S.Ø., Nors, J., Therkildsen, C., Sotelo, J., Brand, R., Shah, R.H., Cheng, A.P., Maher, C., Spain, L., Krause, K., Frederick, D.T., Malbari, M.S., Marton, M., Manaa, D., Winterkorn, L., Callahan, M.K., Boland, G., Wolchok, J.D., Saxena, A., Turajlic, S., Imielinski, M., Berger, M.F., Altorki, N.K., Postow, M.A., Robine, N., Andersen, C.L., Landau, D.A. (2024). Ultrasensitive plasma-based monitoring of tumor burden using machine-learning-guided signal enrichment. Nature Medicine. 30: 1655-1666.
Co-Author
Published
Refereed?: Yes

6. Loy, C.J., Sotomayor-Gonzalez, A., Servellita, V., Nguyen, J., Lenz, J., Bhattacharya, S., Williams, M.E., Cheng, A.P., Bliss, A., Saldhi, P., Brazer, N., Streithorst, J., Suslovic, W., Hsieh, C.J., Bahar, B., Wood, N., Foresythe, A., Gliwa, A., Bhakta, K., Perez, M.A., Hussaini, L., Anderson, E.J., Chahroudi, A., Delaney, M., Butte, A.J., DeBiasi, R.L., Rostad, C.A., De Vlaminck, I., Chiu, C.Y. (2023). Nucleic acid biomarkers of immune response and cell and tissue damage in children with COVID-19 and MIS-C. Cell Reports Medicine. 4(6): 101034.
Published
Refereed?: Yes

7. Chang, A., Mzava, O., Lenz, J.S., Cheng, A.P., Burnham, P., Motley, S.T., Bennett, C., Connelly, J.T., Dadhania, D.M., Suthanthiran, M., Lee, J.R., Steadman, A., De Vlaminck, I. (2022). Measurement biases distort cell-free DNA fragmentation profiles and define the sensitivity of metagenomic cell-free DNA sequencing assays. Clinical Chemistry. 68: 163-171.
Published
Refereed?: Yes

8. Mzava, O., Cheng, A.P., Chang, A., Smalling, S., Kounatse Djomnang, L.A., Lenz, J.S., Longman, R., Steadman, A., Gómez-Escobar, L.G., Schenck, E.J., Salvatore, M., Satlin, M.J., Suthanthiran, M., Lee, J.R., Mason, C.E., Dadhania, D., De Vlaminck, I. (2022). A metagenomic DNA sequencing assay that is robust against environmental DNA contamination. Nature Communications. 13(1): 4197.
Published
Refereed?: Yes

9. Chandrasekaran, R., Mathieu, C., Sheth, R., Cheng, A.P., Fong, D., McCormack, R., El-Gabalawy, H., Alishetty, S., Paige, M., Hoemann, C.D. (2022). UDP-glucose dehydrogenase (UGDH) activity is suppressed by peroxide and promoted by PDGF in fibroblast-like synoviocytes: Evidence of a redox control mechanism. Plos one. 17: e0274420.
Published
Refereed?: Yes

10. Burnham, P., Chen, F., Cheng, A.P., Srivatana, V., Zhang, L.T., Edusei, E., Albakry, S., Botticelli, B., Guo, X., Renaghan, A., Silberzweig, J., Dadhania, D.M., Lenz, J.S., Heyang, M., Iliev, I.D., Hayden, J.A., Westblade, L.F., De Vlaminck, I., Lee, J.R. (2022). Peritoneal effluent cell-free DNA sequencing in peritoneal dialysis patients with and without peritonitis. Kidney Medicine. 4: 100383.
Published
Refereed?: Yes

11. Cheng, A.P., Cheng, M.P., Loy, C.J., Lenz, J.S., Chen, K., Smalling, S., Burnham, P., Timblin, K.M., Orejas, J.L., Silverman, E., Polak, P., Marty, F.M., Ritz, J., De Vlaminck, I. (2022). Cell-free DNA profiling informs all major complications of hematopoietic cell transplantation. Proceedings of the National Academy of Sciences. 119: e2113476118.
Published
Refereed?: Yes

12. AP Cheng, DA Landau. (2021). Lightning does strike twice: leveraging phased variants to enhance minimal residual disease detection. Med. 2: 1114-1116.
Published
Refereed?: No

13. Cheng, A.P., Cheng, M.P., Gu, W., Lenz, J.S., Hsu, E., Schurr, E., Bourque, G., Bourgey, M., Ritz, J., Marty, F.M., Chiu, C.Y., Vinh, D.C., De Vlaminck, I. (2021). Cell-free DNA tissues of origin by methylation profiling reveals significant cell, tissue, and organ-specific injury related to COVID-19 severity. Med. 2: 411-422.
Published
Refereed?: Yes

14. Burnham, P., Gomez-Lopez, N., Heyang, M., Cheng, A.P., Lenz, J.S., Dadhania, D.M., Lee, J.R., Suthanthiran, M., Romero, R., De Vlaminck, I. (2020). Separating the signal from the noise in metagenomic cell-free DNA sequencing. Microbiome. 8: 1-9.
Published
Refereed?: Yes

Intellectual Property

Patents

1. Sequencing Library Preparation Methods. United States of America. 63/800,248. 2025/05/05.
Patent Status: Pending

2. Contamination-Free Metagenomic DNA Sequencing. United States of America. US PROV. USSN 63/237,367. 2024/02/23.
Patent Status: Granted/Issued

3. Nucleic acid error correction. United States of America. PCT/US23/35877. 2023/10/25.
Patent Status: Granted/Issued

4. Methods for assessing the severity and progression of sars-cov2 infections using cell-free dna. United States of America. WO2022020662A2. 2021/07/23.
Patent Status: Granted/Issued

5. Methods for detecting tissue damage, graft versus host disease, and infections using cell-free dna profiling. United States of America. WO2021216985A2. 2021/04/23.
Patent Status: Granted/Issued

6. Methods of detecting cell-free dna in biological samples. United States of America. US20240026456A1. 2018/04/05.
Patent Status: Granted/Issued