

Kevin Petrecca, BSc, MD, PhD, FRCS(C)

Department of Neurosurgery
McGill University Health Centre
Department of Neurology and Neurosurgery
Montreal Neurological Institute and Hospital
McGill University
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EDUCATION

Fellowship Skull-Base Surgery	University of Washington 2008
Residency Neurosurgery	Montreal Neurological Institute and Hospital, McGill University 2002-2007
M.D.	McGill University 1996-2002
Ph.D.	McGill University, Physiology 1994-2000
B.Sc.	McGill University, Physiology (Honours) 1990-1994

CERTIFICATIONS

Fellow of the American Association of Neurological Surgeons (2010)
Fellow of the Royal College of Physicians and Surgeons of Canada (Neurosurgery, 2007)
Province of Quebec Specialist License (Neurosurgery, 2007)
Province of Quebec Medical License (2007)
Licentiate of the Medical Council of Canada (2003)

APPOINTMENTS

2015 – present	William Feindel Chair in Neuro-Oncology
2014 – present	Chief, Department of Neurosurgery, McGill University Health Centre
2014 – present	Associate Chair (Neurosurgery), Department of Neurology and Neurosurgery, McGill University
2014 – present	Associate Professor/ Neurosurgeon Department of Neurosurgery Montreal Neurological Institute and Hospital McGill University Health Centre
2014 – present	Associate Professor / Neurosurgeon Department of Neurology and Neurosurgery Montreal Neurological Institute and Hospital

McGill University

2007 – 2014 Assistant Professor / Neurosurgeon
Department of Neurosurgery
Montreal Neurological Institute and Hospital
McGill University Health Centre

2007 – 2014 Assistant Professor / Neurosurgeon
Department of Neurology and Neurosurgery
Montreal Neurological Institute and Hospital
McGill University

AWARDS

CODE LiFE Leadership Award – Montreal General Hospital Foundation (\$7500) - 2022
McGill Neurosurgery Training Program Resident Education Recognition Award - 2021
Quebec Science Discovery of the Year - 2020
McGill Neurosurgery Training Program Resident Education Recognition Award - 2020
Quebec Science Discovery of the Year - 2017
McGill Neurosurgery Training Program Resident Education Recognition Award - 2017
Palmarès 2016 | Le Prix la Recherche - France
Personality of the Year (Science) 2015 – La Presse Newspaper
FRQS Clinician/Scientist Salary Award - Junior 2 (2015-2019)
Penfield McNaughton Award in Neurosurgery (2007)
First Prize Research Award - Association of Neurosurgeons of Quebec (2005)
K.G. McKenzie Memorial Prize - Canadian Neurosurgical Society Research (2005)
McGill University Faculty of Medicine Research Bursary (2000)
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McGill University Faculty of Medicine Research Bursary (1997)
McGill University Faculty of Medicine Research Bursary (1997)
Fonds pour la Formation de Chercheurs et l'Aide à la Recherche (1997-2000)
Lloyd Carr Harris McGill Major Fellowship (1997-1999)
McGill University Faculty of Medicine Research Bursary (1996)
Faculty Scholar (Science), McGill University (1991)

PEER-REVIEWED PUBLICATIONS (since 2017)

50. Desroches J, Laurence A, Jermyn M, Pinto M, Tremblay MA, **Petrecca K**, Leblond F. Raman spectroscopy in microsurgery: impact of operating microscope illumination sources on data quality and tissue classification. *Analyst*. 2017;142(8):1185-1191.
51. Mamo A, Baig A, Azam M, Rho YS, Sahebjam S, Muanza T, Owen S, **Petrecca K**, Guiot MC, Al-Shami J, Sharma R, Kavan P. Progression pattern and adverse events with bevacizumab in glioblastoma. *Current Oncology*. 2016;23:e468-e471.
52. Jermyn M, Desroches J, Mercier J, St-Arnaud K, Guiot MC, Leblond F, **Petrecca K**. Raman spectroscopy detects distant invasive brain cancer cells centimeters beyond MRI capability in humans. *Biomedical Optics Express*. 2016;7:5129-5137.

53. Shenouda G, Souhami L, **Petrecca K**, Owen S, Panet-Raymond V, Guiot MC, Corredor AG, Abdulkarim B. A Phase 2 Trial of Neoadjuvant Temozolomide Followed by Hypofractionated Accelerated Radiation Therapy With Concurrent and Adjuvant Temozolomide for Patients With Glioblastoma. *International Journal of Radiation Oncology, Biology, Physics*. 2017;97:487-494.
 54. Azoulay M, Santos F, Shenouda G, **Petrecca K**, Oweida A, Guiot MC, Owen S, Panet-Raymond V, Souhami L, Abdulkarim BS. Benefit of re-operation and salvage therapies for recurrent glioblastoma multiforme: results from a single institution. *Journal of Neurooncology*. 2017;132:419-426.
 55. Jermyn M, Mercier J, Aubertin K, Desroches J, Urmey K, Karamchandani J, Guiot MC, Marple E, Leblond F, **Petrecca K**. Highly accurate detection of cancer in situ with intraoperative, label-free, multimodal optical spectroscopy. *Cancer Research*. 2017;77:3942-3950.
 56. Savage P, Blanchet-Cohen A, Revil T, Badescu D, Saleh SM, Wang YC, Zuo D, Liu L, Bertos NR, Munoz-Ramos V, Basik M, **Petrecca K**, Asselah J, Meterissian S, Guiot MC, Omeroglu A, Kleinman CL, Park M, Ragoussis J. A targetable EGFR-dependent tumor-initiating program in breast cancer. *Cell Reports*. 2017;21:1140-1149.
 57. Shakir SI, Souhami L, **Petrecca K**, Mansure JJ, Khushdeep S, Panet-Raymond V, Shenouda G, Al Odaini A, Abdulkarim BS, Guiot MC. Analysis of Prognostic Factors for Local Recurrence in Atypical Meningiomas. *Journal of Neurosurgery*. 2018;19:1-9.
 58. St-Arnaud K, Aubertin K, Strupler M, Madore WJ, **Petrecca K**, Trudel D, Leblond F. Development and characterization of a hyperspectral Raman imaging system for mesoscopic tissue molecular characterization. *Medical Physics*. 2018;45:328-339.
 59. Desroches J, Jermyn M, Pinto M, Picot F, Tremblay MA, Obaid S, Marple E, Urmey K, Trudel D, Soulez G, Guiot MC, Wilson BC, **Petrecca K***, Leblond F*. In situ cancer diagnosis: a new method for targeted, real time, informed cancer tissue biopsy. *Scientific Reports*. 2018;8:1792.
- *denotes co-senior and corresponding authors**
Top 100 Scientific Reports oncology papers in 2018
60. Gerard I, Kersten-Oertel M, Drouin S, Hall J, **Petrecca K**, De Nigris D, Di Giovanni D, Arbel T, Collins D. Combining intra-operative ultrasound brain shift correction and augmented reality visualizations: a pilot study of 8 cases. *Journal of Medical Imaging*. 2018;5:2.
 61. Arnold AE, Malek-Adamian E, Le PU, Meng A, Martinez-Montero S, **Petrecca K**, Damha MJ, Shoichet MS. Antibody-Antisense Oligonucleotide Conjugate Downregulates a Key Gene in Glioblastoma Stem Cells. *Molecular Therapy - Nucleic Acids*. 2018;11:518-527.
 62. Liao LM, Ashkan K, Tran DD, Campian JL, Trusheim JE, Cobbs CS, Heth JA, Salacz M, Taylor S, D'Andre SD, Iwamoto FM, Dropcho EJ, Moshel YA, Walter KA, Pillainayagam CP, Aiken R, Chaudhary R, Goldlust SA, Bota DA, Duic P, Grewal J, Elinzano H, Toms SA, Lillehei KO, Mikkelsen T, Walpert T, Abram SR, Brenner AJ, Brem S, Ewend MG, Khagi S, Portnow J, Kim LJ, Loudon WG, Thompson RC, Avigan DE, Fink KL, Geoffroy FJ, Lindhorst S, Lutzky J, Sloan AE, Schackert G, Krex D, Meisel HJ, Wu J, Davis RP, Duma

C, Etame AB, Mathieu D, Kesari S, Piccioni D, Westphal M, Baskin DS, New PZ, Lacroix M, May SA, Pluard TJ, Tse V, Green RM, Villano JL, Pearlman M, **Petrecca K**, Schulder M, Taylor LP, Maida AE, Prins RM, Cloughesy TF, Mulholland P, Bosch ML. First Results on Survival from a Large Clinical Trial of an Autologous Dendritic Cell Vaccine in Newly Diagnosed Glioblastoma. *Journal of Translational Medicine*. 2018;16(1):142.

63. Dankner M, Lajoie M, Moldoveanu D, Nguyen TT, Savage P, Rajkumar S, Huang X, Lvova M, Protopopov A, Vuzman D, Hogg D, Park M, Guiot MC, **Petrecca K**, Mihalciou C, Watson IR, Siegel PM, Rose AAN. Dual MAPK inhibition is an effective therapeutic strategy for class II BRAF mutant melanoma. *Clinical Cancer Research*. 2018;24:6483-6494.
64. Bernier C, Soliman A, Gravel M, Dankner M, Savage P, **Petrecca K**, Park M, Siegel PM, Shore GC, Roulston A. DZ-2384 has a superior preclinical profile to taxanes for the treatment of triple-negative breast cancer and is synergistic with anti-CTLA-4 immunotherapy. *Anticancer Drugs*. 2018;29:774-785.
65. Zhang I, Beus M, Stochaj S, Le P, Zorc B, **Petrecca K**, Maysinger D. Inhibition of glioblastoma cell proliferation, invasion, and mechanism of action of a novel hydroxamic acid hybrid molecule. *Cell Death Discovery*. 2018;4:41.
66. Giordano FA, Brehmer S, Mürle B, Welzel G, Sperk E, Keller A, Abo-Madyan Y, Scherzinger E, Clausen S, Schneider F, Herskind C, Glas M, Seiz-Rosenhagen M, Groden C, Hänggi D, Schmiedek P, Emami B, Souhami L, **Petrecca K***, Wenz F. Intraoperative radiotherapy in newly diagnosed glioblastoma multiforme (INTRAGO): an open-label, dose-escalation phase I/II trial. *Neurosurgery*. 2019;84:41-49.
* **Corresponding Author**
67. Desroches J, Lemoine E, Pinto M, Marple E, Urmey K, Diaz R, Guiot MC, Wilson B, **Petrecca K***, Leblond F*. Development and first in-human use of a Raman spectroscopy guidance system integrated with a brain biopsy needle. *Journal of Biophotonics*. 2019;12.
*denotes co-senior and corresponding authors
68. Picot F, Goyette A, Obaid S, Desroches J, Lessard S, Tremblay MA, Strupler M, Héon H, Wilson B, **Petrecca K**, Soulez G, Leblond F. Interstitial imaging with multiple diffusive reflectance spectroscopy projections for *in vivo* blood vessels detection during brain needle biopsy procedures. *Neurophotonics*. 2019;6:025003.
69. Sharifi Z, Abdulkarim B, Meehan B, **Petrecca K**, Daniel P, Eppert K, Rak J, Rupp M, Schmitt J, Jean-Claude B, Sabri S. Efficacy of dual EGFR inhibitory and DNA damaging combi-molecule, ZR2002, in glioblastoma cell lines and glioblastoma stem cells. *Clinical Cancer Research*. 2019;25:7594-7608.
70. Lemoine É, Dallaire F, Yadav R, Agarwal R, Kadoury S, Trudel D, Guiot MC, **Petrecca K***, Leblond F*. Feature Engineering Applied to Intraoperative Raman Spectroscopy Sheds Light on Molecular Processes in Brain Cancer: A Retrospective Study of 65 Patients. *Analyst*. 2019;144:6517-6532.
* **denotes corresponding authors**

71. Perlman K, Couturier CP, Yaqubi M, Tanti A, Cui QL, Pernin F, Stratton JA, Ragoussis I, Healy L, **Petrecce K**, Dudley R, Srour M, Hall JA, Kennedy TE, Mechawar N, Antel JP. Developmental Trajectory of Oligodendrocyte Progenitor Cells in the Human Brain Revealed by Single Cell RNA Sequencing. *Glia*. 2020;68:1291-1303.
72. Wheeler MA, Clark IC, Tjon EC, Li Z, Zandee SEJ, Couturier CP, Watson BR, Scalisi G, Alkwai S, Rothhammer V, Rotem A, Heyman JA, Thaploo S, Sanmarco LM, Ragoussis J, Weitz DA, **Petrecce K**, Moffitt JR, Becher B, Antel JP, Prat A, Quintana FJ. MAFG-driven Astrocytes Promote CNS Inflammation. *Nature*. 2020;578:593-599.
73. Couturier CP, Ayyadhury S, Le PU, Monlong J, Allache A, Baig S, Riva G, Bourgey M, Lee C, Yan X, Wang YUD, Yong VW, Guiot MC, Misic B, Antel J, Bourque G, Ragoussis J, **Petrecce K**. Single-cell RNA-seq reveals that glioblastoma recapitulates a normal neurodevelopmental hierarchy. *Nature Communications*. 2020;11:3406.
74. Perrier S, Gauquelin L, Fallet-Bianco C, Dishop M, Tran LT, Guerrero K, Michell-Robinson MA, Darbelli L, Srour M, **Petrecce K**, Saito M, Leiz S, Haack T, Rodriguez Espinosa N, Tejera Martin I, Wolf N, Pohl D, Nageswaran S, Grefe A, Glamuzina E, Bernard G. Expanding the Phenotypic and Molecular Spectrum of RNA Polymerase III (POLR3)-Related Leukodystrophy. *Neurology Genetics*. 2020;6:e425.
75. Mathur R, Zhang Y, Grimmer MR, Hong C, Bollam S, **Petrecce K**, Clarke J, Berger MS, Phillips JJ, Oberheim-Bush NA, Molinaro AM, Chang SM, Costello JF. MGMT promoter methylation level in newly diagnosed low-grade glioma is a predictor of hypermutation at recurrence. *Neuro-Oncology*. 2020;noaa059.
76. Savage P, Pacis A, Kuasne H, Liu L, Lai D, Wan A, Muñoz-Ramos V, Pilon V, Monast A, Zhao H, Souleimanova M, Dankner MG, Annis M, Aguilar-Mahecha A, Bertos NR, Asselah J, Bouganim N, **Petrecce K**, Siegel PM, Omeroglu A, Shah SP, Aparicio S, Basik M, Meterissian S, Park M. Chemogenomic profiling of breast cancer patient-derived xenografts reveals targetable vulnerabilities for difficult-to-treat tumors. *Communications Biology*. 2020;3:310.
77. Dallaire F, Picot F, Tremblay JP, Sheehy G, Lemoine E, Agarwal R, Kadoury S, Trudel D, Lesage F, **Petrecce K**, Leblond F. Quantitative spectral quality assessment technique validated using intraoperative Raman spectroscopy measurements. *Journal of Biomedical Optics*. 2020;25:1-8.
78. DePaoli D, Lemoine E, Ember K, Parent M, Prud'homme M, Cantin L, **Petrecce K**, Leblond F, Côté D. The Rise of Raman spectroscopy in neurosurgery. *Journal of Biomedical Optics*. 2020;25:1-36.
79. Cloughesy TF, **Petrecce K**, Walbert T, Butowski N, Salacz M, Perry J, Damek D, Bota D, Bettegowda C, Zhu JJ, Iwamoto F, Placantonakis D, Kim L, Elder B, Kaptain G, Cachia D, Moshel Y, Brem S, Piccioni D, Landolfi J, Chen CC, Gruber H, Rao A, Hogan D, Accomando W, Ostertag D, Montellano TT, Kheoh T, Kabbinar F, Vogelbaum MA. Vocimagene amiretrorepvec in combination with Toca FC in patients with recurrent high grade glioma. *JAMA Oncology*. 2020;6:1939-1946.
80. Alhaj AK, Al-Saadi T; Hébert-Blouin MN, **Petrecce K**, Dudley RWR. Endoscopic third ventriculostomy for VP shunt malfunction during the third trimester of pregnancy and the

postnatal period: Report of two cases and literature review. *Journal of Neurosurgery: Case Lessons*. 2021;1:1-4.

81. Fernandes MGF, Luo J, Cui QL, Perlman K, Pernin F, Yaqubi MY, Hall J, Dudley R, Srouf M, Couturier C, **Petrecce K**, Larochelle C, Healy L, Stratton JA, Kennedy TE, Antel JA. Distinct Age-Related Injury Responses of Human Oligodendrocytes to Metabolic Insults: Link to BCL-2 Family and Autophagy Pathways. *Communications Biology*. 2021;4:20.
 82. Dankner M, Caron M, Al-Saadi T, Yu WQ, Ouellet V, Ezzeddine R, Annis MG, Le PU, Nadaf J, Neubarth NS, Savage P, Zuo D, Couturier CP, Monlong J, Djambazian H, Altoukhi H, Bourque G, Ragoussis J, Diaz RJ, Park M, Guiot MC, Lam S, **Petrecce K***, Siegel PM*. Invasive growth associated with Cold-Inducible RNA-Binding Protein expression drives recurrence of surgically resected brain metastases. *Neuro-Oncology*. 2021;23:1470-1480.
- *denotes co-senior and corresponding authors**
83. Tawil N, Bassawon R, Meehan B, Nehme A, Montermini L, Gayden T, De Jay N, Spinelli C, Chennakrishnaiah S, Choi D, Adnani A, Zeinieh M, Jabado N, Kleinman CL, Witcher M, Riazalhosseini Y, Key NS, Schiff D, Grover S, Mackman N, Couturier C, **Petrecce K**, Suvà ML, Patel A, Tirosh I, Najafabadi H, Rak J. Glioblastoma Cell Populations with Distinct Oncogenic Programs Release Podoplanin as Procoagulant Extracellular Vesicles. *Blood Advances*. 2021;5:1682-1694.
 84. Totten SP, Im YK, Najyb O, Cañedo EC, Nguyen A, Hébert S, Ahn R, La Selva R, Sabourin V, Martinez Ramírez C, Savage P, Kuasne H, Avizonis D, Santos Martínez N, Chabot C, Aguilar-Mahecha A, Goulet ML, Dankner M, Witcher M, **Petrecce K**, Basik M, Pollak M, Topisirovic I, Lin R, Siegel PM, Kleinman C, Park M, St-Pierre J, Ursini-Siegel J. STAT1-induced inflammation potentiates oxidative stress and sensitizes breast cancers to mitochondrial complex I inhibitors. *Nature Communications*. 2021;3;12:3299.
 85. Daoust F, Nguyen T, Orsini P, Bismuth J, De Denus-Baillargeon MM, Veilleux I, Wetter A, Mckoy P, Dicaire I, Massabki M, **Petrecce K**, Leblond F. A handheld macroscopic Raman spectroscopy imaging instrument for machine learning based molecular tissue margins characterization. *Journal of Biomedical Optics*. 2021;26:022911.
 86. Dankner M, Lam S, Degenhard T, Garzia L, Guiot MC, **Petrecce K**, Siegel P. The underlying biology and therapeutic vulnerabilities of leptomeningeal metastases in adult solid cancers. *Cancers*. 2021;13:732.
 87. MacDonald A, Lu B, Caron M, Caporicci-Dinuucci N, Hatrock D, **Petrecce K**, Bourque G, Stratton JA. Single cell transcriptomics of ependymal cells across age, region and species reveals cilia-related and metal ion regulatory roles as major conserved ependymal cell functions. *Frontiers in Cellular Neuroscience*. 2021;15:703951.
 88. Malagon T, Yong JHE, Tope P, Miller Jr. WH, Franco EL, and the McGill Task Force on the Impact of COVID-19 on Cancer Control and Care. Predicted long-term impact of COVID-19 pandemic-related care delays on cancer mortality in Canada. *International Journal of Cancer*. 2022;150:1244-1254.
 89. Moldoveanu D, Ramsay LA, Lajoie M, Anderson-Trocme L, Berry D, Lingrand M, Perus L, Wei Y, Moraes C, Alkallas R, Rajkumar S, Zuo D, Najafabadi HS, Gravel S, Costantino S,

Richer MJ, Lund AW, Del Rincon SV, Jamal R, Spatz A, Miller Jr W, Mes Massons AM, Lapointe R, Turcotte S, Xu E, Bertos NR, **Petrecca K**, Dumitra S, Meguerditchian A, Richardson K, Tremblay F, Wang B, Chergui M, Guiot MC, Watters K, Stagg J, Quail D, Mihalciou C, Meterissian S, Watson IR. The spatial immune landscape of cutaneous melanoma. *Science Immunology*. 2022;70: eabi5072.

90. Sommerlath VN, Bürgy D, Etminan N, Brehmer S, Reuss D, Sarria GR, Guiot MC, Hänggi D, Wenz F, **Petrecca K**, Giordano FA. Molecular features of glioblastomas in long-term survivors compared to short-term survivors – A matched-pair analysis. *Radiation Oncology*. 2022;17:15.
91. Couturier CP, Nadaf J, Li Z, Baig S, Riva G, Le P, Kloosterman DJ, Monlong J, Meyong AN, Allache R, Degenhard T, Al-Rashid M, Guiot MC, Bourque G, Ragoussis J, Akkari L, Quintana FJ, **Petrecca K**. Glioblastoma scRNAseq Shows Treatment-induced, Immune-dependent Rise In Mesenchymal Cancer Cells, and Structural Variants in Distal Neural Stem Cells. *Neurooncology*. 2022;24:1494-1508.
92. Lim M, Weller M, Idbaih A, Steinbach J, Finocchiaro G, Raval R, Ashby L, Ansstas G, Baehring J, Taylor J, Honnorat J, **Petrecca K**, De Vos F, Wick A, Sumrall A, Sahebjam S, Mellinghoff I, Kinoshita M, Roberts M, Slepatis R, Warad D, Leung D, Lee M, Reardon D, Omuro A. Nivolumab or Placebo Combined With Radiotherapy Plus Temozolomide for Newly Diagnosed Glioblastoma With Methylated or Indeterminate MGMT Promoter. *Neurooncology*. 2022;noac116.
93. Yaqubi M, Luo JXX, Baig S, Cui QL, **Petrecca K**, Desu H, Larochelle C, Afanasiev E, Hall JA, Dudley R, Srour M, Haglund L, Ouellet J, Georgiopoulos M, Santaguida C, Sonnen JA, Healy LM, Stratton JA, Kennedy TE, Antel JP. Regional and age-related diversity of human mature oligodendrocytes. *Glia*. 2022;70:1938-1949.
94. Nowakowski A, Maleki F, Lahijanian Z, Panet-Raymond V, Lam S, Siegel PM, **Petrecca K**, Dankner M. Radiomics as an emerging tool in the management of brain metastases. *NeuroOncology Advances*. In Press