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## **Dr. Tobias Kadi Karakach**

Correspondence language: English

Sex: Male

Date of Birth: 10/13

Canadian Residency Status: Canadian Citizen

Country of Citizenship: Canada

## **Contact Information**

The primary information is denoted by (\*)

### **Address**

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Corporate <https://www.karakachlab.org>



Protected when completed

## Dr. Tobias Karakach

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### Degrees

2002/10 - 2007/5	Doctorate, PhD, Dalhousie University Degree Status: Completed
2000/9 - 2002/10	Master's Thesis, Msc, Dalhousie University Degree Status: Completed
1995/9 - 1999/11	Bachelor's, Bsc (Hons), University of Nairobi Degree Status: Completed

### Recognitions

2021/10	Winner Gairdner Early Career Investigator Competition Gairdner Foundation
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### Employment

2021/4	Assistant Professor Pharmacology, Faculty of Medicine, Dalhousie University
2019/6 - 2021/3	Bioinformatics Facility Manager Pediatrics and Child Health, Rady Faculty of Health Sciences, Children's Hospital Research Institute of Manitoba
2017/10 - 2019/5	Staff Scientist Oncology, Medicine, Vlaams Instituut voor Biotechnologie
2014/2 - 2017/10	Research Officer - Chemometrics National Research Council Canada
2013/2 - 2017/10	Chemometrics Research Officer Metrology, Halifax, NS, National Research Council Canada
2009/11 - 2013/1	Research Officer - Informatics National Research Council Canada
2009/9 - 2013/1	Informatics Research Officer Aquatic and Crop Resources Development Portfolio, Halifax, NS, National Research Council Canada
2007/8 - 2009/10	Research Associate National Research Council Canada
2007/9 - 2009/9	Research Associate Institute for Marine Biosciences, Halifax, NS, National Research Council Canada

2006/12 - 2007/9 Visiting Fellow  
Institute for Marine Biosciences, Halifax, NS, National Research Council Canada

## Affiliations

The primary affiliation is denoted by (\*)

(\*) 2019/6 Bioinformatician, Children's Hospital Research Institute of Manitoba

## Research Funding History

### Awarded [n=5]

2024/4 - 2029/3 Principal Investigator	Novel Strategies for the Analysis of Multivariate Data in the Omics Sciences <b>Funding Sources:</b> Natural Sciences and Engineering Research Council of Canada (NSERC) Discovery Program Total Funding - 170,000 Funding Competitive?: Yes
2022/7 - 2027/6 Principal Investigator	Dissecting Human Disease with Single-Cell (multi)-omics Measurements <b>Funding Sources:</b> Canada Foundation for Innovation (CFI) New Investigator Award Total Funding - 530,000 Funding Competitive?: Yes
2021/9 - 2026/8 Co-applicant	CircRNAs and their role in congenital diaphragmatic hernia <b>Funding Sources:</b> Canadian Institutes of Health Research (CIHR) Project Grant Total Funding - 980,000 Funding Competitive?: Yes
2022/3 - 2024/3 Principal Investigator	Integrated Multi-Omics Characterization and Validation of Chromosome 1 instability in Wilms Tumors" <b>Funding Sources:</b> Research Nova Scotia New Health Investigator Award Total Funding - 100,000 Funding Competitive?: Yes
2022/2 - 2024/2 Principal Investigator	Wilms Tumor Relapse is Exacerbated by the Activation of the MAPK pathways via small GTPases <b>Funding Sources:</b> Dalhousie Medical Research Foundation (The) New Investigator Award Total Funding - 99,675 Funding Competitive?: Yes

## Publications

### Journal Articles

1. Victoria Northrup, Lester J. Perez, Brittany A. Edgett, Tobias Karakach, Jeremy A. Simpson, and Keith R. Brunt. (2024). Intron retention is a mechanism of erythropoietin regulation in brain cell models. *Gene*. 898: 148099.  
Published  
Refereed?: Yes, Open Access?: Yes
2. Brendon D. Parsons, Daniel Medina-Luna, Michal Scur, Marinella Pinelli, Gayani S. Gamage, Rebecca A. Chilvers, Yannick Hamon, Ibrahim H.I. Ahmed, Stephane Savary, Andrew P. Makrigiannis, Nancy E. Braverman, Juan F. Rodriguez-Alcazar, Eicke Latz, Tobias K. Karakach, and Francesca Di Cara. (2024). Peroxisome deficiency underlies failures in hepatic immune cell development and antigen presentation in a severe Zellweger disease model. *Cell Reports*. 43(2): 113744.  
Published  
Refereed?: Yes, Open Access?: Yes
3. Kanokporn Noy Rithidech, Tanat Peanlikhit, Louise Honikel, Jinyu Li, Jingxuan Liu, Tobias Karakach, Thomas Zimmerman, and James Welsh. (2024). Consumption of Apigenin Prevents Radiation-induced Gut Dysbiosis in Male C57BL/6J Mice Exposed to Silicon Ions. *Radiation Research*. Epub: 23-00110.  
Published  
Refereed?: Yes, Open Access?: No
4. Jasmine Barra, Federico Taverna, Fabian Bong, Ibrahim Ahmed, and Tobias K. Karakach. (2024). Error Modelled Gene Expression Analysis (EMOGEA) Provides a Superior Overview of Time Course RNA-seq Measurements and Low Count Gene Expression. *Briefings in Bioinformatics*. 25(5): bbae233.  
Published  
Refereed?: Yes, Open Access?: Yes
5. Jasmine Barra, Federico Taverna, Fabian Bong, Ibrahim Ahmed, Tobias K Karakach. (2024). Error modelled gene expression analysis (EMOGEA) provides a superior overview of time course RNA-seq measurements and low count gene expression. *Briefings in Bioinformatics*. 25(3): bbae233.  
Published  
Refereed?: Yes, Open Access?: Yes
6. Lucien G.J. Cayer, Arun Surendran, Tobias Karakach, Harold M. Aukema, and Amir Ravand. (2023). Valvular Prostaglandins are Elevated in Severe Human Aortic Valve Stenosis. *Arteriosclerosis, Thrombosis, and Vascular Biology*. 44: e131–e144.  
Revision Requested  
Refereed?: Yes
7. Channakeshava Sokke Umeshappa, Harish Babu Kolla, Karam Pal Singh, Tobias Karakach, Roopa Hebbandi Nanjundappa, and Peter Paul Clement Mertens. (2023). Computational prediction of highly conserved CD8+ and CD4+ T cell epitopes in bluetongue virus: A promising data for developing broad-spectrum bluetongue vaccine. *The Journal of Immunology*. 210: 224.11-224.11.  
Published  
Refereed?: Yes, Open Access?: Yes
8. Juan Fernández-García, Fabien Franco, Sweta Parik, Antonino A. Pane, Dorien Broekaert, Joke van Elsen, Ines Vermeire, Thomas van Brussel, Rogier Schepers, Elodie Modave, Tobias K. Karakach, Peter Carmeliet, Diether Lambrechts, Ping-Chih Ho, Sarah-Maria Fendt. (2022). CD8+ T-Cell Metabolic Rewiring Defined by Single-Cell RNA-Sequencing Identifies a Critical Role of ASNS Expression Dynamics in T-Cell Differentiation. *Cell Reports*. 41: 111639.  
Accepted  
Refereed?: Yes

9. Jasmine Barra, Nithya Ramakrishnan and Tobias K. Karakach. (2022). The time for Ordinal Measurements in Metabolomics. *Metabolomics*. EMBOR-2022-56342V1: NA.  
Revision Requested  
Refereed?: Yes
10. Laure-Anne Teuwen, Laura P.M.H.De Rooij , Anne Cuypers, Katerina Rohlenova, Sébastien J.Dumas, Melissa García-Caballero, Elda Meta, Jacob Amersfoort, Federico Taverna, Lisa M.Becker, Nuphar Veiga, Anna Rita Cantelmo, Vincent Geldhof, Nadine V.Conchinha, Joanna Kalucka, Lucas Treps, Lena-Christin Conradi, Shawez Khan, Tobias K.Karakach, Stefaan Soenen, Stefan Vinckier, Luc Schoonjans, Guy Eelen, Steven Van Laere, Mieke Dewerchin, Luc Dirix, Massimiliano Mazzone, Yonglun Luo, Peter Vermeulen and Peter Carmeliet. (2021). Tumor vessel co-option probed by single-cell analysis. *Cell Reports*. 35(11): 109253.  
Published  
Refereed?: Yes, Open Access?: Yes
- [11.](#) A Bruinooge, E Poole, C Pascoe, T Karakach, G Buduhan, L Tan, S Srinathan, A Halayko, B Kidane. (2021). Examination of local and systemic inflammatory changes during lung surgery. *Canadian Journal of Surgery*. 64: S122-S122.  
Published  
Refereed?: Yes
- [12.](#) Tobias K. Karakach Federico Taverna Jasmine Barra. (2021). Error Modelled Gene Expression Analysis (EMOGEA) Provides A Superior Overview of Time Course RNA-SEQ Measurements and Low Count Gene Expression. *Nature Methods*. NA: NA.  
Submitted  
Refereed?: Yes
13. Thomas H Mahood, Christopher D Pascoe, Tobias K Karakach, Aruni Jha, Sujata Basu, Peyman Ezzati, Victor Spicer, Neeloffer Mookherjee, Andrew J Halayko,. (2021). Integrating Proteomes for Lung Tissue and Lavage Reveals Pathways that Link Responses in Allergen-Challenged Mice. *ACS Omega*. 6(2): 1171-1189.  
Published  
Refereed?: Yes
14. Katerina Rohlenova Jermaine Goveia Melissa García-Caballero Abhishek Subramanian Joanna Kalucka Lucas Treps Kim D. Falkenberg Laura P.M.H. de Rooij Yingfeng Zheng Lin Lin Liliana Sokol Laure-Anne Teuwen Vincent Geldhof Federico Taverna Andreas Pircher Lena-Christin Conradi Shawez Khan Steve Stegen Dena Panovska Frederik De Smet Frank J.T. Staal Rene J. Mclaughlin Stefan Vinckier Tine Van Bergen Nadine Ectors Patrik De Haes Jian Wang Lars Bolund Luc Schoonjans Tobias K. Karakach Huanming Yang Geert Carmeliet Yizhi Liu Bernard Thienpont Mieke Dewerchin Guy Eelen Xuri Li Yonglun Luo Peter Carmeliet. (2020). Single-Cell RNA Sequencing Maps Endothelial Metabolic Plasticity in Pathological Angiogenesis. *Cell Metabolism*. 31: 862-877.  
Published  
Refereed?: Yes
15. Joanna Kalucka Laura P.M.H. de Rooij Jermaine Goveia Katerina Rohlenova Sébastien J. Dumas Elda Meta Nadine V. Conchinha Federico Taverna Laure-Anne Teuwen Koen Veys Melissa García-Caballero Shawez Khan Vincent Geldhof Liliana Sokol Rongyuan Chen Lucas Treps Mila Borri Pauline de Zeeuw Charlotte Dubois Tobias K. Karakach Kim D. Falkenberg Magdalena Parys Xiangke Yin Stefan Vinckier Yuxiang Du Robert A. Fenton Luc Schoonjans Mieke Dewerchin Guy Eelen Bernard Thienpont Lin Lin Lars Bolund Xuri Li Yonglun Luo Peter Carmeliet. (2020). Single-Cell Transcriptome Atlas of Murine Endothelial Cells. *Cell*. 180: 764-779.  
Published  
Refereed?: Yes

16. James Dooley, Vasiliki Lagou, Jermaine Goveia, Anna Ulrich, Katerina Rohlenova, Nathalie Heirman, Tobias Karakach, Yulia Lampi, Shawez Khan, Jun Wang, Tom Dresselaers, Uwe Himmelreich, Marc J Gunter, Inga Prokopenko, Peter Carmeliet, Adrian Liston. (2020). Heterogeneous Effects of Calorie Content and Nutritional Components Underlie Dietary Influence on Pancreatic Cancer Susceptibility. *Cell Reports*. 32(107880): 1-14.  
Published  
Refereed?: Yes
- [17.](#) Sébastien J. Dumas, Elda Meta, Mila Borri, Jermaine Goveia, Katerina Rohlenova, Nadine V. Conchinha, Kim Falkenberg, Laure-Anne Teuwen, Laura de Rooij, Joanna Kalucka, Rongyuan Chen, Shawez Khan, Federico Taverna, Weisi Lu, Magdalena Parys, Carla De Legher, Stefan Vinckier, Tobias K. Karakach, Luc Schoonjans, Lin Lin, Lars Bolund, Mieke Dewerchin, Guy Eelen, Ton J. Rabelink, Xuri Li, Yonglun Luo and Peter Carmeliet. (2020). Single-Cell RNA Sequencing Reveals Renal Endothelium Heterogeneity and Metabolic Adaptation to Water Deprivation. *Journal of the American Society of Nephrology*. 31(1): 118 LP - 138.  
Published  
Refereed?: Yes, Open Access?: Yes
18. Federico Taverna, Jermaine Goveia, Tobias K Karakach, Shawez Khan, Katerina Rohlenova, Lucas Treps, Abhishek Subramanian, Luc Schoonjans, Mieke Dewerchin, Guy Eelen and Peter Carmeliet. (2020). BIOMEX: an interactive workflow for (single cell) omics data interpretation and visualization. *Nucleic Acids Research*. 48: W385–W394.  
Published  
Refereed?: Yes
19. J. Barra, G. Gaidosh, E. Blumenthal, F. Beckedorff, M. Tayari, N. Kirstein, T. K. Karakach, T. Jensen, F. Impens, K. Gevaert, E. Leucci, R. Shiekhhattar, and J. –C. Marine. (2020). Integrator restraints paraspeckles assembly by promoting the 3'-end processing of the lncRNA NEAT1\_1. *Science Advances*. 6(eaaz90): 1-16.  
Published  
Refereed?: Yes, Open Access?: Yes
- [20.](#) Jermaine Goveia, Katerina Rohlenova, Federico Taverna, Lucas Treps, Lena-Christin Conradi, Andreas Pircher, Vincent Geldhof, Laura P.M.H. de Rooij, Joanna Kalucka, Liliana Sokol, Melissa García-Caballero, Yingfeng Zheng, Junbin Qian, LaureAnne Teuwen, Shawez Khan, Bram Boeckx, Els Wauters, Herbert Decaluwé, Paul De Leyn, Johan Vansteenkiste, Birgit Weynand, Xavier Sagaert, Erik Verbeken, Albert Wolthuis, Baki Topal, Wouter Everaert, Hanibal Bohnenberger, Alexander Emmert, Dena Panovska, Frederik De Smet, Frank J.T. Staal, Rene J. Mclaughlin, Francis Impens, Vincenzo Lagani, Stefan Vinckier, Massimiliano Mazzone, Luc Schoonjans, Mieke Dewerchin, Guy Eelen, Tobias K. Karakach, Huanming Yang, Jian Wang, Lars Bolund, Lin Lin, Bernard Thienpont, Xuri Li, Diether Lambrechts, Yonglun Luo, and Peter Carmeliet. (2020). An Integrated Gene Expression Landscape Profiling Approach to Identify Lung Tumor Endothelial Cell Heterogeneity and Angiogenic Candidates. *Cancer Cell*. 37(1): 21-36.e13.  
Published  
Refereed?: Yes, Open Access?: Yes
21. Dachon, J. Choi, C. Miguez, L. Masson and B. Tartakovsky. (2019). Fluorescence-Based Real-Time Monitoring and Diagnostics of Recombinant *Pichia Pastoris* Fermentations. *Biotechnology Progress*. 35(2): e2761.  
Published  
Refereed?: Yes, Open Access?: Yes
22. Shawez Khan, Federico Taverna, Katerina Rohlenova, Lucas Treps, Vincent Geldhof, Laura de Rooij, Liliana Sokol, Andreas Pircher, Lena-Christin Conradi, Joanna Kalucka, Luc Schoonjans, Guy Eelen, Mieke Dewerchin, Tobias Karakach, Xuri Li Jermaine Goveia and Peter Carmeliet. (2019). EndoDB: a database of endothelial cell transcriptomics data. *Nucleic Acids Research*. 47: D737.  
Published  
Refereed?: Yes, Open Access?: Yes

- [23.](#) Tiemeier, Gesa L Wang, Gangqi Dumas, Sébastien J Sol, Wendy M P J Avramut, M Cristina Karakach, Tobias Orlova, Valeria V van den Berg, Cathelijne W Mummery, Christine L Carmeliet, Peter van den Berg, Bernard M Rabelink, Ton J. (2019). Closing the Mitochondrial Permeability Transition Pore in hiPSC-Derived Endothelial Cells Induces Glycocalyx Formation and Functional Maturation. *Stem Cell Reports*. 13(5): 803-816.  
Published  
Refereed?: Yes, Open Access?: Yes

## Presentations

1. Karla Valenzuela; Fabian Bong; Andrew Murphy. (2023). The role of Epithelial cells in Wilms Tumor progression. Canadian Society for Molecular Biology, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: Yes
2. Karla Valenzuela\*, Tobias Karakach. (2023). Rap1GAP, a tumor suppressor protein that regulates breast cancer progression. Canadian Society for Molecular Biology, Canada  
Main Audience: Researcher  
Invited?: No, Keynote?: No
3. Seketoulie Keretsu and Tobias K. Karakach. (2022). Low Signal Intensity, Measurement Errors and Biological Significance: A model for LC-MS proteomics. International Conference on Chemometrics in Analytical Chemistry, Italy  
Main Audience: Researcher  
Invited?: No, Keynote?: No
4. Seketoulie Keretsu and Tobias K. Karakach. (2022). Measurement Error Models for LS-MS Proteomics Measurements. International Conference on Analytical Spectroscopy and Sciences, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: Yes
5. Tobias K. Karakach and Hermann Nabi. (2021). In the quest for precision medicine in oncology. Gairdner Science Week 2021 Symposium, Canada  
Main Audience: Researcher  
Invited?: Yes, Keynote?: No

## Knowledge and Technology Translation

- 2021/7 - 2021/12      Lead Author, Community Engagement  
2020/1 - 2021/2      Lead Author, Consultation Service

## Student/Postdoctoral Supervision

### Master's Thesis [n=2]

- 2022/9 - 2024/9      Fabian Bong, Dalhousie University  
Principal Supervisor      Thesis/Project Title: Pursuing Interesting Projection Indices in -Omics Data  
Present Position: Student
- 2021/9 - 2023/8      Maddison Hodgins, Dalhousie University  
Principal Supervisor      Thesis/Project Title: Molecular characterization of the progression of frailty in the mouse kidney  
Present Position: Student

**Post-doctorate [n=3]**

- 2022/5 - 2024/5  
Principal Supervisor Karla Valenzuela, Dalhousie University  
Thesis/Project Title: Validation of Biomarkers for Wilms Tumor Progression  
Present Position: Post-doctoral Fellow
- 2021/9 - 2023/9  
Principal Supervisor Ibrahim Hussin Ibrahim Ahmed, Dalhousie University  
Thesis/Project Title: Error Modelled Gene Expression Analysis for ordinal multi-omics data  
Present Position: post-doctoral fellow
- 2021/9 - 2023/5  
Principal Supervisor Nithya Ramakrishnan, Dalhousie University  
Thesis/Project Title: Analysis of ordinal trends in single-cell RNAseq data  
Present Position: Assistant Professor