

Artem Babaian, Ph.D.

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Education + Research

Assistant Professor – Molecular Genetics 09/2022 –

*Department of Molecular Genetics, University of Toronto
Donnelly Center for Cellular + Biomolecular Research*

- RNA virus discovery for Pandemic prevention

Banting Post-Doctoral Researcher 06/2021 – 09/2022

*Warren Lab, CIMR, University of Cambridge, UK
Post-Doctoral Research Associate, St. Edmunds College, UK*

- Deep RNA Virus Discovery and Virus-Host Interaction Networks

Post-Doctoral Fellow – Independent 10/2019 – 05/2021

University of British Columbia / Independent Researcher, Vancouver, BC

- Genetic and Epigenetic Variation of Ribosomal RNA in Human Cancer
- Ultra High-Throughput RNA Virus Discovery

Doctor of Philosophy – Medical Genetics 09/2012 – 09/2019

Mager Lab, University of British Columbia, Vancouver, BC

- Endogenous Retroviruses Drive Transcriptional Innovation in Human Cancer
- A+ earned in all courses; first in class

Honours Bachelor of Science – Biology (Molecular Biology & Genetics Co-op)

McMaster University, Hamilton, ON

09/2007-12/2011

- *Graduated with distinction*
- **Honours Thesis** w/ Dr. Ali Ashkar 01/2011-02/2012
Non-canonical IL15 Signalling in Murine Macrophages.

Publications

1. Edgar, R C *et al*, **Babaian A***. Petabase-scale sequence alignment catalyses viral discovery. *Nature*. 2022.
2. **Babaian A** and Edgar, R C. Ribovirus classification by a polymerase barcode sequence. *bioRxiv*. 2021.
3. **Babaian A***, Rothe K, Girodat D, Minia I, Djondovic S, et al. Loss of m¹acp³Ψ ribosomal RNA modification is a major feature of cancer. *Cell Reports*. 2020.
4. Rothe K, **Babaian A**, *et al*, Jiang X. Integrin-Linked Kinase Mediates Therapeutic Resistance of Quiescent CML Stem Cells to Tyrosine Kinase Inhibitors. *Cell Stem Cell*. 2020.

5. Lin H, Rothe K, Chen M, Wu A, **Babaian A**, *et al*, Jiang X. The miR-185/PAK6 Axis Predicts Therapy Response and Regulates Survival of Drug-Resistant Leukemic Stem Cells in CML. *Blood*. 2020.
6. Kasukabe, M. *et al.* (amongst authors: **Babaian A**), Weng A. Synthetic modeling reveals HOXB genes are critical for the initiation and maintenance of human leukemia. *Nat Commun*. 2019.
7. **Babaian A***, Thompson IR, Lever J, Gagnier L, Karimi MM, Mager DL. LIONS: analysis suite for detecting and quantifying transposable element initiated transcription from RNA-seq. *Bioinformatics*. 2019.
8. **Babaian A***, Ebou A, Fegen A, Kam HY, Novakovsky GE, *et al.* bioSyntax: syntax highlighting for computational biology. *BMC Bioinformatics*. 2018.
9. **hackseq Organizing Committee 2016***. hackseq: Catalyzing collaboration between biological and computational scientists via hackathon. *F1000Res*. 2017.
10. Lock FE, **Babaian A**, *et al*, Mager DL. A novel isoform of IL-33 revealed by screening for transposable element promoted genes in human colorectal cancer. *PLoS ONE*. 2017.
11. **Babaian A**, Mager DL. Endogenous retroviral promoter exaptation in human cancer. *Mob DNA*. 2016.
12. **Babaian A**, Romanish MT, Gagnier L, Kuo LY, Karimi MM, Steidl C, Mager DL. Onco-exaptation of an endogenous retroviral LTR drives IRF5 expression in Hodgkin lymphoma. *Oncogene*. 2016.
13. Gillgrass A, Gill N, **Babaian A**, Ashkar AA. The absence or overexpression of IL-15 drastically alters breast cancer metastasis via effects on NK cells, CD4 T cells, and macrophages. *J Immunol*. 2014.
14. Lock FE, *et al.* (amongst authors: **Babaian A**), Mager DL. Distinct isoform of FABP7 revealed by screening for retroelement-activated genes in diffuse large B-cell lymphoma. *PNAS*. 2014.
15. Mian MF, Ahmed AN, Rad M, **Babaian A**, Bowdish D, Ashkar AA. Length of dsRNA (poly I:C) drives distinct innate immune responses, depending on the cell type. *J Leukoc Biol*. 2013.
16. Zhang Y, **Babaian A**, Gagnier L, Mager DL. Visualized computational predictions of transcriptional effects by intronic endogenous retroviruses. *PLoS ONE*. 2013.

Awards + Fellowships

Banting Post-Doctoral Fellowship (CIHR)	\$140,000	06/2021 – 06/2023
Amazon AWS Cloud Innovation Grant	\$418,800	04/2020 - 01/2023
Roman M. Babicki Fellowship in Medical Research	\$50,000	09/2017 – 08/2019
RNA Society Travel Fellowship	\$1337	05/2019
Canadian Leukemia and Lymphoma Society – New Idea Grant (1 st Nationally)	\$75,000	07/2018 – 08/2020
Amazon AWS Research Grant	\$10,689	07/2018 – 07/2019
Patricia Baird Prize for Excellence in Medical Genetics	\$500	07/2018

RNA Society Travel Fellowship	\$1182	05/2018
hackseq17: Genomics Hackathon – 1 st Place	\$350	10/2017
UBC Four Year Fellowship – PhD	\$18,200 + \$54,600*	09/2014 – 08/2018
UBC Four Year Fellowship – Tuition Award	\$1,462	09/2017 – 08/2018
Alexander Graham Bell Canada Graduate Scholarship – Doctoral (NSERC CGS-D)	\$105,000	09/2014 – 08/2017
RiboWest 2017– Graduate Poster Prize (Runner up)	\$200	05/2017
IDT CRISPR Challenge 2016 – 1 st Prize	\$2,000	12/2016
TFRI-BC Node Research Day – Poster Prize (1 st)	\$250	11/2016
MedGen Research Day 2016 – Poster Prize (1 st)	\$150	11/2016
UBC Faculty of Medicine Discussion Group Grant	\$1,500	09/2015 – 09/2016
UBC Graduate Student Travel Fund – PhD	\$500	07/2015
Alexander Graham Bell Canada Graduate Scholarship – Masters (NSERC CGS-M)	\$17,500	09/2013 – 09/2016
UBC Graduate Student Travel Fund – Masters	\$500	07/2013
UBC Medical Genetics Entrance Scholarship	\$16,000	09/2012 – 08/2013
McMaster Senate Scholarship	\$1,500	09/2010 – 09/2011
McMaster Honour Entrance Award	\$750	09/2007

Σ **\$917,970**

*Accepted in title only

Select Presentations

1. **Babaian A.** (2022) Computational biology Will Lead Future Pandemic mitigation. Invited Speaker at Intelligent Systems for Molecular Biology 2022. Madison, WI.
2. **Babaian A.** (2022) Foundations for the discovery of 100 million RNA viruses. Invited Speaker at European Virus Bioinformatics Center viruses *in silico* lectures. Digital.
3. **Babaian A.** (2022) Increasing known RNA viruses by an order of magnitude; Again. Invited Speaker at RNA Club. University of Cambridge, UK.
4. **Babaian A, et al.** (2021) Exploring the planetary virome for novel coronaviruses. Invited speaker at Amazon Health and Life Sciences Symposium. Digital.
5. **Babaian A. et al.** (2021) Petabase-scale sequence alignment catalyses viral discovery. Oral Presentation at 26th RNA Society Meeting. Digital.
6. **Babaian A. et al.** (2020) Serratus: Ultra-deep search to discover novel coronaviruses. Invited Speaker at Institute Pasteur, INCEPTION lecture. Digital.
7. **Babaian A. et al.** (2020) Serratus: Ultra-deep search to discover novel coronaviruses. Invited Speaker at SciLifeLabs, BiG Talks. Digital. (available on YouTube)
8. **Babaian A. et al.** (2020) Loss of m¹acp³Ψ ribosomal RNA modification is a major feature of cancer. Oral Presentation at 25th RNA Society Meeting. Digital.
9. **Babaian A. et al.** (2019) The Onco-Ribosome: A frontier of ribosome heterogeneity. Poster at 24th RNA Society Meeting, Krakow, Poland.

10. **Babaian A.** *et al.* (2019) Onco-Ribosomes: Ribosomal RNA as the last great oncogene. Invited Speaker at Leukemia/Bone Marrow Transplant Program Noon Rounds. Vancouver, BC.
11. **Babaian A.** *et al.* (2018) Oncogenic Variation of Ribosomal RNA in Human Cancer. Oral Presentation at 23rd RNA Society Meeting. Berkeley, USA.
12. **Babaian A.** (2017) Intra- and Inter-individual genetic variation in human ribosomal RNA. Poster at RiboWest 2017. Vancouver, BC.
13. **Babaian A.** *et al.* (2016) Onco-exaptation: endogenous retroviral LTRs as promoters of oncogenic transcripts in cancer. Poster at American Society of Human Genetics Meeting 2016 and Terry Fox Research Institute Conference 2016. Vancouver, BC.
14. **Babaian A.** *et al.* (2015) Onco-exaptation of Endogenous Retroviral LTRs in Cancer Evolution. Oral Presentation at the Mobile DNA in Mammalian Genomes Conference. Florida, USA.
15. **Babaian A.** *et al.* (2013) Endogenous Retroviruses and the Dark Regulatory Network. Invited Speaker at the VanBug Bioinformatics Seminar. Vancouver, BC.

Select Media Engagements

1. *Supercomputer helps Canadian researcher uncover thousands of viruses that could cause human diseases* (2022). Canadian Broadcasting Corporation. National news. <https://www.cbc.ca/news/health/supercomputer-virus-study-disease-1.6345158>
2. *Researchers discover 130,000 new viruses, giving us a new way to watch for emerging pathogens* (2022). CBC Quirks and Quarks. National radio. <https://www.cbc.ca/radio/quirks/jan-29-130-000-new-viruses-discovered-chimpanzee-social-learning-what-s-moving-the-tectonic-plates-and-more-1.6329726>
3. *New Dangers? Computers uncover 100,000 novel viruses in old genetic data* (2022). Science Magazine. International news. <https://www.science.org/content/article/new-dangers-computers-uncover-100-000-novel-viruses-old-genetic-data>

Select Community Experience

Instructional Skills Workshop Facilitator	UBC Centre for Teaching, Learning & Technology.
Co-founder + Organizer	hackseq: Genomics hackathon (hackseq.com).
Co-founder + Producer	Jobs in Science Interview Podcast (JobsInScience.ca).
President + Executive	Varsity Outdoor Club, UBC (ubc-voc.com).
Reviewer	Nature Genetics, NAR Genomics and Bioinformatics, Bioinformatics, Frontiers in Chemistry: Cellular Biochemistry, Leakey Foundation.
Emergency Medical Responder	Emergency First Response Team, McMaster.