

# Eric Y. Zhao

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MD PhD student - Bioinformatics

Dedicated to **compassionate** medical care and health advocacy.  
Experienced in **bioinformatics**, **genomics**, and **medical physics** research.  
A student **leader** in academic engagement and policy.

**Passionate** about technological solutions to medicine's big data problems.

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curriculum**vitae**

2016 10 01

# scholar

## education

**Bachelor of Science**  
Honours Physiology, Minor in Physics  
The University of British Columbia

**2013**

**2009 Graduation**

University Hill Secondary School

**MD PhD student - Bioinformatics**

The Faculties of Medicine and Graduate Studies  
The University of British Columbia

## scholarships - awards - distinctions

### Research Scholarships

**Genome Science and Technology**  
funded summer studentship (\$3600)

**BC Clinical Genomics Network**  
summer research award (\$3750)

**Child and Family Research Institute**  
summer student program scholarship (\$3750)

**UBC Science Undergraduate Society**  
professional development grant (\$250)

**Int'l Society for Magnetic Resonance in Medicine**  
educational stipend (\$440)

**UBC Dean of Science**  
undergraduate summer research award (\$2500)

**UBC Four Year Doctoral Fellowship (4YF)**  
\$18 000 per year + tuition coverage

The Faculty of Medicine Graduate Scholarship

**Canadian Graduate Scholarships - Master's**  
CGS-M awarded by the CIHR (\$17 500).

**Vanier Canada Graduate Scholarship**  
awarded by the CIHR (\$50 000 per year for 3 years).

**2010**

**2012**

**2014**

### Awards and Distinctions

**2009**

The UBC President's Entry Scholarship

**2011**

The Trek Excellence Scholarship  
The UBC Dean of Science Scholarship

The Trek Excellence Scholarship

**2013**

**Faculty of Science Achievement Award**  
for staff, students, and faculty whose contributions in service, administration, leadership, and outreach have had a significant positive impact in achieving the goals of the Faculty of Science.

**Science Student Recognition Award**  
I was awarded the first ever SSRA, for students "who go above and beyond in their commitment to their clubs and the UBC community at large."

**The Physiology Prize**

for best undergraduate thesis in my department.

**student speaker** at my convocation ceremony

**The Best of SLC** for best collaborative workshop at the 2014 Student Leadership Conference

**UBC Alumni Association Scholarship**

Awarded annually to two students who have demonstrated strong leadership at UBC and within Greater Vancouver.

**commencement address** at the 2014 University Transition Program graduation ceremony.

**2015**

## peer reviewed journal articles

2011

### [Frequent mutation of histone-modifying genes in non-Hodgkin's lymphoma](#)

**Nature. 18 August 2011.** Ryan D. Morin, Maria Mendez-Lago, Andrew J. Mungall, Rodrigo Goya, Karen L. Mungall, Richard D. Corbett, Nathalie A. Johnson, Tesa M. Severson, Readman Chiu, Matthew Field, Shaun Jackman, Martin Krzywinski, David W. Scott, Diane L. Trinh, Jessica Tamura-Wells, Sa Li, Marlo R. Firme, Sanja Rogic, Malachi Griffith, Susanna Chan, Oleksandr Yakovenko, Irmtraud M. Meyer, **Eric Y. Zhao**, Duane Smailus, Michelle Moksa, Suganthi Chittaranjan, Lisa Rimsza, Angela Brooks-Wilson, John Spinelli, Susanna Ben-Neriah, Barbara Meissner, Bruce Woolcock, Merrill Boyle, Helen McDonald, Angela Tam, Yongjun Zhao, Allen Delaney, Thomas Zeng, Kane Tse, Yaron Butterfield, Inanc Birol, Rob Holt, Jacqueline Schein, Douglas E. Horsman, Richard Moore, Steven J.M. Jones, Joseph M. Connors, Martin Hirst, Randy D. Gascoyne, Marco A. Marra.

2013

### [Getting Ready for the Human Phenome Project: The 2012 Forum of the Human Variome Project](#)

**Human Mutation. 8 February 2013.** William S. Oetting, Peter N. Robinson, Marc S. Greenblatt, Richard G. Cotton, Tim Beck, John C. Carey, Sandra C. Doelken, Marta Girdea, Tudor Groza, Carol M. Hamilton, Ada Hamosh, Berit Kerner, Jacqueline A. L. MacArthur, Donna R. Maglott, Barend Mons, Heidi L. Rehm, Paul N. Schofield, Beverly A. Searle, Damian Smedley, Cynthia L. Smith, Inge Thomsen Bernstein, Andreas Zankl, **Eric Y. Zhao**.

### [Correlations between corpus callosal myelin water fraction and measures of transcallosal inhibition in multiple sclerosis patients on glatiramer acetate treatment and controls](#)

**Thesis. 2 April 2013.** For completion of degree: **Bachelor of Science in Honours Physiology** | UBC

2015

### [Scientific overview: CSCI-CITAC Annual General Meeting and Young Investigators' Forum 2014](#)

**Clinical and Investigative Medicine. 2015.** Jonathan Keow, **Eric Zhao**, Nardin Samuel, Ayan Dey, Raphael Schneider, Michael Chen, Xin Wang

### [Lessons learned from the application of whole genome analysis to the treatment of patients with advanced cancers](#)

**Molecular Case Studies. 10, October 2015.** Janessa Laskin, Steven Jones, Samuel Aparicio, Stephen Chia, Carolyn Ch'ng, Rebecca Deyell, Peter Eirew, Alexandra Fok, Karen Gelmon, Cheryl Ho, David Huntsman, Martin Jones, Katayoon Kasaian, Aly Karsan, Sreeja Leelakumari, Yvonne Li, Howard Lim, Yussanne Ma, Colin Mar, Monty Martin, Richard Moore, Andrew Mungall, Karen Mungall, Erin Pleasance, S. Rod Rassekh, Daniel Renouf, Yaoqing Shen, Jacqueline Schein, Kasmintan Schrader, Sophie Sun, Anna Tinker, **Eric Zhao**, Stephen Yip, Marco A. Marra

2016

### [Investigation of PD-L1 Biomarker Testing Methods for PD-1 Axis Inhibition in Non-squamous Non-small Cell Lung Cancer.](#)

**J Histochem Cytochem. October 2016.** Sheffield BS, Fulton R, Kalloger SE, Milne K, Geller G, Jones M, Jacquemont C, Zachara S, **Zhao E**, Pleasance E, Laskin J, Jones SJ, Marra MA, Yip S, Nelson BH, Gown AM, Ho C, Ionescu DN

## academic conferences

- 2011** Child and Family Research Institute summer student research program - *oral presentation* - *poster presentation*
- 2012** **PhenoKeeper: User-friendly, machine readable patient phenotype data storage to support clinical genetics and genomics research.** Meeting of the Human Variome Project, 6 November, 2012. San Francisco. Oral Presentation and Panelist.  
Eric Y. Zhao, Erica Tsang, Jan M. Friedman, Farah R. Zahir.
- 2013** **Corpus callosal myelin water fraction and transcallosal inhibition in multiple sclerosis patients and controls.** Meeting of the International Society for Magnetic Resonance in Medicine, 22 April, 2013. Salt Lake City. Oral Presentation.  
Eric Y. Zhao, Irene Vavasour, Marjan Zakeri, Michael Borich, Cornelia Laule, Anthony Traboulsee, David Li, Lara Boyd, Alex MacKay.
- Multidisciplinary Undergraduate Research Conference, *oral presentation*  
Neurology Resident Research Day, *oral presentation*  
endMS Research Conference, Montreal QC - *poster presentation*  
Clinician Investigator Trainee Association of Canada, 2014 annual general meeting - *poster presentation*  
Personalized Medicine Summit, Vancouver BC - *poster presentation*  
UBC Clinician Investigator Program Research Day, *poster presentation*
- 2014** **Predictive Biomarker Testing for Programmed Death 1 Inhibition in Non-Small Cell Lung Cancer.** IASLC World Conference on Lung Cancer, 6 September, 2015. Denver. Oral Presentation.  
Sheffield BS, Geller G, Pleasance E, Zachara-Szczakowski S, Milne K, Kalloger SE, Zhao EY, Bidnur S, Jones M, Nelson BH, Yip S, Marra MA, Laskin J, Ho C, Ionescu DN.
- 2015** **BRCA-Related Genomic Signature Predicts Clinical Improvement with Cisplatin.** Advances in Genome Biology and Technology, 13 February, 2016. Orlando. Oral Presentation.
- 2016** Eric Y Zhao, Yaoqing Shen, Erin Pleasance, Katayoon Kasaian, Sreeja Leelakumari, Martin Jones, Pinaki Bose, Carolyn Ch'ng, Caralyn Reisle, Peter Eirew, Richard Corbett, Karen L Mungall, Nina Thiessen, Yussanne Ma, Alexandra Fok, Jacquie Schein, Andrew J Mungall, Yongjun Zhao, Richard A Moore, Sheridan Wilson, Diego Villa, Tamara Shenkier, Caroline Lohrisch, Stephen Chia, Stephen Yip, Karen Gelmon, Howard Lim, Daniel Renouf, Sophie Sun, Kasmintan A Schrader, Robyn Roscoe, Janessa Laskin, Marco A Marra, Steven JM Jones

## educational activities

### Students Supervised

- 2013**
- 2014** Nolan Shelley  
*NSERC USRA*  
*biophysics student*
- Ronald Xie, Sharon Yang, Felix Ma  
*undergraduate students*  
*REX program*
- 2015** Tariq Vira, Iris Liu  
*undergraduate students*  
*REX program*

### Presentations and Papers Supervised

- Multidisciplinary Undergraduate Research Conference, *adjudicator*
- Probing gene expression in Huntington's Disease: a gene targeted meta-analysis of microarray studies.** UBC Multidisciplinary Undergraduate Research Conference, 22 March, 2014. Vancouver. Poster. Ronald Xie, Sharon Yang, Felix Ma, Eric Y. Zhao.
- The role of BDNF in Huntington's Disease: A Targeted Analysis of 12 Microarray Studies**  
**UBC Medical Journal.** Ronald Xie, Sharon Yang, Felix Ma, Eric Y. Zhao.
- Multidisciplinary Undergraduate Research Conference, *adjudicator*
- Gene co-expression in transcription factor and protein-protein interactions.** UBC Multidisciplinary Undergraduate Research Conference, 21 March, 2015. Vancouver. Poster. Zichun Liu, Tariq Vira, Eric Y. Zhao.

## past research projects

ms + mri + tms

**TMS** enables magnetic stimulation of the brain. Motor cortex stimulation elicits inhibition via the corpus callosum.

**Advanced MRI** can quantitate myelin via  $T_2$  relaxation analysis, enabling structural assessment of myelination.

Combining measures of corpus callosal myelination (MRI) and connectivity (TMS), we hope to learn more about **MS**.

Supervised by Drs. Irene Vavasour, Cornelia Laule, David Li, Michael Borich, Anthony Traboulsee and Alex Mackay

WaP

**Next generation sequencing** is beginning to enter the genetics clinic. **Variant Viewer and Prioritizer** lies at this crossroads, a user-friendly application for handling variant data. It features an intuitive hierarchical structure, segregation analysis, pathway analysis, gene expression analysis, region of interest analysis, and intelligent links to common resources such as the UCSC Genome Browser, Unigene, Kegg, and Reactome.

Supervised by Drs. Cristina Dias and Jan Friedman

pheno**keeper**

For large genetics research work, systematic, standardized, and unambiguous phenotypic storage is key.



pheno**keeper** utilizes the **human phenotype ontology** and **semantic web standards** to unify the systematic and the flexible. It rapidly identifies patients with desired phenotypic traits using graph theory based algorithms.

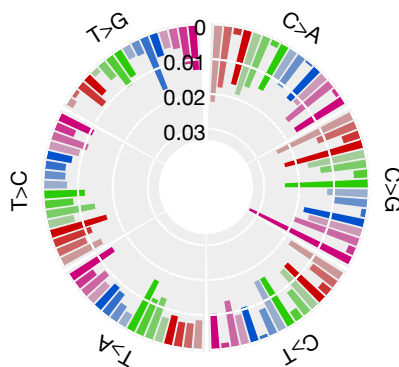
Supervised by Drs. Farah Zahir and Jan Friedman

mutation**browser**

Synthesizing data to explore non-Hodgkin's lymphoma, mutation**browser** is a platform for comprehensive display and analysis of massive parallel sequencing cancer datasets. Its web browser based interface features genome browser integration, validation tracking, automated primer design, communications with bioinformatics databases such as UniProt and Ensembl, SNP filtering, identification of recurrent mutations, and more.

Supervised by Drs. Ryan Morin and Marco Marra

## graduate project



### Actionable Mutation Signatures in Human Cancers

Cancer-causing processes produce scars in the human genome, characteristic mutation signatures which can be deciphered from the whole genome sequence. Previous studies have catalogued 27 such signatures across cancer types, arising from carcinogenic exposures such as tobacco smoke, UV radiation, and faulty DNA repair. We aim to apply this approach to the personalized analysis and treatment of cancers.

Supervised by Dr. Steven Jones

# leader

- event
- | past activities
- | ongoing activities

## Dedication to UBC Educational Advocacy

- 2010
  - UBC Orientations  
*squad leader*
  - Science Peer Academic Coaches  
*co-chair, first year science coaching initiative*
- 2013
  - UBC Physics Society  
*vp academic*
  - UBC Medical Undergraduate Society  
*vp administration*
- 2015
  - UBC AMS Education Committee  
*member at large*
  - UBC Vancouver Senate → 1  
*vice chair*
  - UBC Medical Undergraduate Society → 2  
*president*

## Combating Stigma Against Mental Illness

- 2014
  - Student Senate Caucus Working Group on Mental Health & Wellbeing
- 2015
  - UBC Senate Ad Hoc Committee on Mental Health & Wellbeing  
*chair*
  - UBC Senate Ad Hoc Committee on Mental Health & Wellbeing  
*committee member*
  - UBC Med MIND  
*A founding member of "UBC Speaks Up"*

## Healthcare Innovation

- 2013
  - Health Technology Forum  
*co-organizer, vancouver chapter*
- 2016
  - INTERFACE Health Tech Summit  
*volunteer and participant*

## Service in Compassionate End of Life Care

- 2012
  - VGH Palliative Care Unit
- 2014
  - VGH Palliative Care Unit  
*bedside visitation volunteer*
- 2015
  - Vancouver Hospice Society  
*bedside visitation volunteer*

## Provincial and National Advocacy

- 2014
  - CITAC  
*chair, special projects committee*
  - 2014 Provincial Medical Student Lobby  
Meetings with MLAs and provincial ministers
- 2015
  - 2014 CFMS Annual Meeting, Kingston ON  
*UBC political advocacy representative*
  - CITAC  
*vp internal elect*
  - CIHR → 3  
*working group on health research training*
  - 2015 CFMS Spring Meeting, Vancouver BC  
*UBC medsoc president*
  - 2015 Provincial Medical Student Lobby  
Meetings with MLAs and provincial ministers
- 2016
  - 2015 CFMS Annual Meeting, Windsor ON  
*UBC medsoc president*
  - CITAC → 4  
*vp internal*
  - 2016 Provincial Medical Student Lobby  
Meetings with MLAs and provincial ministers
  - 2016 CFMS Spring Meeting, Montreal QC  
*UBC medsoc past president*
  - 2016 Cnd Medical Assoc General Council  
*Doctors of BC delegate*
  - 2016 CFMS Annual Meeting, Montreal QC  
*UBC medsoc past president*

## Teaching and Educational Engagement

- 2011
  - Canadian Undergrad Physics Conference  
*director of publications*
- 2013
  - Undergraduate Research Opportunities  
*research experience program mentor*
- 2015
  - University Transition Program  
*associate, musical director*
- 2016
  - UBC BIOF 520 - Student Instructor  
Taught a problem-based learning session

## summary of key leadership activities

### 1 UBC Vancouver Senate

*vice chair*

The Senate is the highest academic decision making body at UBC Vancouver. Student senators at large are chosen annually by a campus-wide election process. I was further elected by Senate to serve as vice chair, and chair Senate meetings in the absence of the UBC President.

### 3 Canadian Institutes of Health Research

*working group on health research training*

The CIHR is the Government of Canada's health research investment agency under the Ministry of Health. In 2015-2016, CIHR sought consultation regarding a new strategic direction on health research training. I serve as the student voice on the working group providing representative input.

### 4 Clinician Investigator Trainee Association

*vp internal*

CITAC is Canada's national student body representing the interests of MD+ and clinician-investigator trainees. As its VP Internal, I provide leadership and oversight on matters of member engagement, organizational sustainability, and publications.

Major accomplishments include

1. Helping to coordinate CITAC's joint efforts to publish an alumnus survey of Canada's MD/PhD programs
2. Publication of the 2015 Annual Scientific Meeting Review in CIM
3. Development and launch of the **new CITAC-ACCFC Website** in November, 2016

### 2 UBC Medical Undergraduate Society

*president*

I served voice of the society representing the over 1000 medical students enrolled in the MD Undergraduate Program at the University of British Columbia. This role involves substantial leadership, advocacy, and interaction with health & educational policy.

Major accomplishments include

1. Establishment of the **Medical Education Committee**, a structured body for coordinating student academic initiatives and advocacy
2. An overhaul of established **communications mechanisms** to substantially reduce student email burden and improve council accountability
3. Established **single transferrable vote** for all Medical Undergraduate Society elections
4. Performed a major review of the society's **constitution & bylaws**.