

DANAI GEORGIA TOPOUZA

PERSONAL DETAILS

Email: dtopouza@gmail.com | danai.topouza@mail.mcgill.ca
Languages: English University of Cambridge Proficiency in English (May 2011), University of Michigan Proficiency in English (May 2011), TOEFL iBT (Sept. 2012), CELPIP General (Nov. 2018), IELTS (Feb. 2021)
French DELF B1 Certification (May 2011)
Greek Native

PERSONAL STATEMENT

I am a PhD student in the Department of Human Genetics at McGill University. I am interested in studying complex human traits and biological processes using bioinformatics and data mining approaches. My previous work identified integrated gene expression networks, microRNA networks, and regulatory variants that are associated with poor response to adjuvant chemotherapy in ovarian cancer patients.

Practical skills:

Programming languages R, Python, Matlab, Linux (bash), git, Java, C
Bioinformatics Single-cell RNA-seq analysis, NGS data analysis, microarray data analysis, genomics data analysis, multi-omics data integration, bioinformatics databases, HPC environments, molecular dynamics software
Machine learning Data mining best practices, supervised and unsupervised learning algorithms

EDUCATION

Doctor of Philosophy **2021 - Present**
Department of Human Genetics, McGill University, Montreal, QC
Supervisor: Dr. Claudia Kleinman
Thesis: *Dynamic isoform regulation in the developing human brain*

Master of Science **2017 – 2019**
Experimental Medicine, Specialization in Bioinformatics
Department of Biomedical and Molecular Sciences, Queen's University, Kingston, ON
Supervisor: Dr. Qingling Duan
Thesis: *Integrated biological networks associated with platinum-based chemotherapy response in high-grade serous ovarian cancer*

Bachelor of Science (Honours) **2013 – 2017**
Biology major, Computer Science minor
Department of Biology and School of Computing, Queen's University, Kingston, ON
Supervisor: Dr. Paul G. Young
Thesis: *Copper-induced stress response and programmed cell death in Saccharomyces cerevisiae*

RESEARCH EXPERIENCE

PhD Student **Sept. 2021 – Present**
Functional Genomics Laboratory
Department of Human Genetics, McGill University, Montreal, QC
Supervisor: Dr. Claudia Kleinman
Projects: *Epigenetic regulation of isoforms in cell lineages of the developing human brain, characterizing the tumor immune microenvironment of pediatric brain tumors at single-cell resolution*

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Bioinformatics Research Associate

Jan. 2020 – May 2021

Computational Genomics Laboratory

Department of Biomedical and Molecular Sciences, Queen's University, Kingston, ON

Supervisor: Dr. Qingling Duan

Projects: *DNA methylation analysis in hepatocellular carcinoma and in circadian rhythm genes, RNA-seq analysis in chronic myeloid leukemia, phenome-wide association studies (PheWAS) in the CHILD Study Cohort*

Responsibilities: Contributing to literature review and analyses for grant applications, maintaining lab server and website

MSc Candidate

Sept. 2017 – Sept. 2019

Computational Genomics Laboratory

Department of Biomedical and Molecular Sciences, Queen's University, Kingston, ON

Supervisor: Dr. Qingling Duan

Project: *Novel regulatory and transcriptomic networks associated with chemotherapy response in ovarian cancer*

Undergraduate Research Thesis

Sept. 2016 – Apr. 2017

Department of Biology, Queen's University, Kingston, ON

Supervisor: Dr. Paul G. Young

Project (BIOL 537, undergraduate 12-unit thesis): *Characterizing transcriptomic changes during programmed cell death in S. cerevisiae*

QGEM Dry Lab Executive

May 2016 – Oct. 2016

Queen's International Genetically Engineered Machine (iGEM) Team

Department of Biomedical and Molecular Sciences, Queen's University, Kingston, ON

Head of the Dry Lab research team

Project: *Modeling the non-ribosomal peptide synthetase adenylation domain and identifying mutations that alter amino acid binding specificity*

Research Assistant

Oct. 2015 – Jul. 2016

Department of Biology, Queen's University, Kingston, ON

Supervisors: Dr. Tomas Babak (Queen's University, Kingston), Dr. Brian DeVeale (University of California, San Francisco)

Project: *Statistical analysis and data visualization for a genome-wide association study on schizophrenia*

Lab Assistant Internship

Jun. 2015 – Jul. 2015

IVF facility, Interbalkan Medical Center, Thessaloniki, Greece

Supervisor: Dr. Ioannis Tziafetas, MD

Responsibilities: Laboratory organization and maintenance

TEACHING EXPERIENCE

Guest Lecturer

12, 18 Aug. 2020

Department of Biomedical and Molecular Sciences, Queen's University, Kingston, ON

BMIF 803: Biomedical Data Mining and Applications, part of the Masters in Biomedical Informatics diploma program

Teaching Assistant

Sept. 2015 – Dec. 2018

Queen's University, Kingston, ON

BMED 370: Genetics and Genomics (Winter 2018, Fall 2018)

BIOL 102: Introductory Biology of Cells (Fall 2017)

CISC 101: Elements of Computer Science (Fall 2015, Fall 2016)

ACADEMIC MENTORSHIP

Helia Ghazinejad, Master of Biomedical Informatics Student, Ghasemlou Lab/Duan Lab (Sept. 2020 – May 2021). Project: *Identifying genes under circadian rhythm control in murine brain tissues*

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Hanlin Chen, Master of Biomedical Informatics Student, Ghasemlou Lab/Duan Lab (Sept. 2020 – May 2021).
Project: *Identifying microRNAs under circadian rhythm control in murine brain tissues*

Lisa Flaten, Master of Epidemiology Student, Peng Lab (May – Sept. 2020).

Project: *Pre-processing and analysis of circadian gene DNA methylation data for female night shift workers*

Sorin Park, Master of Biomedical Informatics Student, Duan Lab/Abraham Lab (Sept. 2018 – May 2019).

Project: *Genes and co-expression networks associated with response to a novel combination treatment in chronic myeloid leukemia*

PUBLICATIONS

1. **Topouza DG**, Choi J, Nesdaoly S, Tarnouskaya A, Nicol CJB, Duan QL. (2022) Novel microRNA-regulated transcript networks are associated with chemotherapy response in ovarian cancer. *International Journal of Molecular Sciences*, 23, 4875 DOI: 10.3390/ijms23094875
2. Ritonja JA, Aronson KJ, Leung M, Flaten L, **Topouza DG**, Duan QL, Durocher F, Tranmer JE, Bhatti P. (2022) Investigating the relationship between melatonin patterns and methylation in circadian genes among day shift and night shift workers. *Occupational and Environmental Medicine*, DOI: 10.1136/oemed-2021-108111
3. Ahmadi SA, Tranmer JE, Ritonja JA, Flaten L, **Topouza DG**, Duan QL, Durocher F, Aronson KJ, Bhatti P. (2022). DNA methylation of circadian genes and markers of cardiometabolic risk in female hospital workers: An exploratory study. *Chronobiology International*, DOI: 10.1080/07420528.2022.2032729
4. Ritonja JA, Aronson KJ, Flaten L, **Topouza DG**, Duan QL, Durocher F, Tranmer JE, Bhatti P. (2021) Exploring the impact of night shift work on methylation of circadian genes. *Epigenetics*, DOI: 10.1080/15592294.2021.2009997
5. Choi J, **Topouza DG**, Tarnouskaya, A, Nesdaoly S, Koti M, Duan QL. (2020) Gene networks and expression quantitative trait loci associated with adjuvant chemotherapy response in high-grade serous ovarian cancer. *BMC Cancer* 20, 413, DOI: 10.1186/s12885-020-06922-1

PUBLISHED ABSTRACTS

1. Ritonja J, Bhatti P, Flaten F, **Topouza DG**, Duan QL, Leung M, Durocher F, Tranmer JE, Aronson KJ. O-225 Exploring the impact of night shift work and melatonin on methylation in circadian genes, *Occupational and Environmental Medicine* 2021, 78, A53. doi:10.1136/OEM-2021-EPI.141.
2. **Topouza DG**, Choi J, Nesdaoly S, Duan QL. Biological networks modulating chemotherapy response in ovarian cancer; (Abstract #685). *The 68th Annual Meeting of The American Society of Human Genetics* (2018).

POSTERS AND PRESENTATIONS

Oral presentations

1. **Seminar Speaker**. Characterizing the tumor immune microenvironment of pediatric high-grade gliomas. *Joint Cancer-McGill Regenerative Medicine Trainee Seminar series, Lady Davis Institute, McGill University* (20 Feb. 2023)
2. **Conference Speaker**. Characterizing the tumor immune microenvironment of pediatric high-grade gliomas. *Scriver Family Visiting Professorship & Human Genetics Research Day, Department of Human Genetics, McGill University* (31 May 2022).
3. **Conference Speaker**. Novel biological networks associated with chemotherapy response in high-grade serous ovarian cancer. *The 22nd Annual Scientific Meeting for Health Science Research, Faculty of Health Sciences, Queen's University* (4 Jun. 2019).
4. **Seminar Speaker**. Biological networks modulating chemotherapy response in ovarian cancer. *Masters Student Symposium Seminar Presentation, Department of Biomedical and Molecular Sciences, Queen's University* (26 Feb. 2019).

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5. **Seminar Speaker.** A pharmacogenomics analysis of biological networks regulating chemotherapy response among ovarian cancer patients. *Masters Student Symposium Seminar Presentation, Department of Biomedical and Molecular Sciences, Queen's University* (24 Apr. 2018).
6. **Seminar Speaker.** Programmed cell death in the unicellular eukaryote *Saccharomyces cerevisiae*. *Undergraduate Thesis Seminar Presentation, Department of Biology, Queen's University* (11 Nov. 2016).

Poster presentations

1. **Topouza DG**, Choi J, Nesdaoly S, Duan QL. Biological networks modulating chemotherapy response in ovarian cancer; (Abstract #685). *American Society of Human Genetics Meeting, San Diego Convention Center, San Diego, CA* (16 - 20 Oct. 2018).
2. **Topouza DG**, Choi J, Nesdaoly S, Duan QL. Gene expression networks modulating chemotherapy response in ovarian cancer. *Toronto RNA Enthusiast's Day (TREN D), Peter Gilgan Centre for Research and Learning, Toronto, ON* (31 Jul. 2018).
3. **Topouza DG**, Choi J, Nesdaoly S, Duan QL. Biological networks modulating chemotherapy response in ovarian cancer. *The 21st Annual Scientific Meeting for Health Science Research, Faculty of Health Sciences, Queen's University, Kingston, ON* (13 Jun. 2018).
4. **Topouza DG**, Young PG. Programmed cell death in the unicellular eukaryote *Saccharomyces cerevisiae*. *Undergraduate Thesis Poster Presentations, Department of Biology, Queen's University, Kingston, ON* (10 Mar. 2017).
5. Nowak S, Thomsen C, **Topouza DG**. The role of mycorrhizal community assemblages in agricultural productivity. *Scinapse Undergraduate Science Case Competition (Finalist), Western University, London, ON* (19 Mar. 2016).

AWARDS

Human Genetics Graduate Excellence Fellowship Funding Agency: McGill University, Department of Human Genetics. Amount: \$ 14,396 (CAD)	2022 – 2023
Inaugural Dr. Mark Wainberg Memorial Graduate Fellowship Fund Award <i>Awarded to the top ranked application in the Lady Davis Institute Scholarships competition.</i> Funding Agency: Lady Davis Institute, Jewish General Hospital. Amount: \$ 10,000 (CAD)	2022 – 2023
Human Genetics Graduate Excellence Fellowship Funding Agency: McGill University, Department of Human Genetics. Amount: \$ 14,025 (CAD)	2021 – 2022
Conference Travel Award Funding Agency: Queen's University, Department of Biomedical and Molecular Sciences. Amount: \$ 250 (CAD)	22 Oct. 2018
International Tuition Award Funding Agency: Queen's University, Department of Biomedical and Molecular Sciences. Amount: \$ 5,000 (CAD)	2017 – 2018
Queen' University Principal's Scholarship Funding Agency: Queen's University. Amount: \$ 6,000 (CAD)	2013 – 2014

PROFESSIONAL ACTIVITIES

Professional Extension

CSHL Conference: Single Cell Analyses (Virtual) Cold Spring Harbor Laboratory, Laurel Hollow, NY	10 – 12 Nov. 2021
KHSC/QU Innovation Workshop on Digital Health, Machine Learning, and AI Donald Gordon Hotel and Conference Centre, Kingston, ON	3 Feb. 2020
Graduate Management Consulting Association (GMCA) mini-MBA	Nov. 2017 – Dec. 2019

DANAI GEORGIA TOPOUZA

Queen's University, Kingston, ON

Research Adjudicator for the Canadian Undergraduate Conference on Healthcare (CUCOH) 9 Nov. 2019

Biosciences Complex, Queen's University, Kingston, ON

PATH 828: Bioinformatics for Cancer Research (Audit) 13 – 17 Mar. 2019

Richardson Laboratory, Queen's University, Kingston, ON

CISC 859: Pattern Recognition (Audit) Jan. – Apr. 2019

Goodwin Hall, Queen's University, Kingston, ON

ASHG/IGES/ISCB Joint Symposium: 16 Oct. 2018

Working with Big Data in the Cloud--Research and Privacy

San Diego Convention Center, San Diego, CA

HPC Summer School 2018: Bioinformatics Workflows 3 Aug. 2018

Chernoff Hall, Queen's University, Kingston, ON

The High Performance Computing Symposium (HPCS) 6 - 9 Jun. 2017

Queen's University, Kingston, Ontario