

Ahmed A Elbassiouny, Ph.D.

Functional Genomics Scientist

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EDUCATION

Doctor of Philosophy, University of Toronto

2016-2023

Thesis: Molecular basis of metabolic adaptations in electric fishes

Highlights: 2 invited publications, 5 major awards (incl. federal-level competition)

Specialization: Genome Biology and Bioinformatics Collaborative Program

Hon. Bachelor of Science, University of Toronto

2011-2014

Specialist program in Cell and Molecular Biology

SKILLS AND TECHNIQUES

- 10X Single-cell assay sample and library preparation
- Isolation of nucleic acids and proteins from cells and tissues
- Mammalian cell culture
- Molecular cloning
- Reporter assay development using fluorescence- and luminescence-based systems
- Flow cytometry
- Confocal microscopy
- Analysis of next-generation sequencing data (ChIP-seq, RNA-seq, DNA-seq)
- Data analysis using R and UNIX tools
- CRISPR-Cas9 genome editing
- Seahorse real-time metabolic assays using mammalian cell lines
- Diagnostic assays: RT-qPCR, western blot, ELISA

WORK EXPERIENCE

Post-doctoral Research Fellow, Sorensen Lab, BC Cancer Research Centre (*Full-time*)

2024-present

- Developed cellular and biochemical assays to investigate the role of stress adaptive responses preconditioning in cancer cell metastasis and migration
- Interrogated the epigenetic role of chronic stress on cancer metastasis and aggressive behaviour
- Analyzed bulk multi-ome datasets to investigate the cellular pathways involved in stress response in clonal evolution
- Planned and experimentally constructed single-cell gene expression and chromatin accessibility libraries to investigate time-course alteration of tumour heterogeneity in response to stress

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| Graduate Research Assistant , University of Toronto (<i>Full-time</i>) | 2016-2023 |
| <ul style="list-style-type: none">▪ Developed cellular and biochemical assays to study adaptive stress responses, which led to discovery of novel protein regulatory mechanism mechanisms▪ Conducted computational analyses of large datasets to identify targets for <i>in-vitro</i> experimentation, and designed experiments to▪ Managed different projects, laboratory operation, reagent ordering, and student training, and collaborated with at least three research groups to publish three manuscripts▪ Developed a pipeline to streamline analysis of next-generation sequencing data for downstream applications, which became the gold standard in lab | |
| Teaching Assistant , University of Toronto (<i>Part-time</i>) | 2014-2022 |
| <ul style="list-style-type: none">▪ Developed new curriculum for online laboratory course during COVID-19 pandemic to teach first year biology students crucial laboratory skills remotely▪ Led instruction of laboratory courses and lecture-style courses of class sizes of 20-800 students, implementing use of various pedagogical technology▪ Led and collaborated with six course instructors, librarians and staff on a new study to improve knowledge integration across biology sub-disciplines | |
| Course Coordinator , University of Toronto Scarborough (<i>Full-time</i>) | 2016 |
| <ul style="list-style-type: none">▪ Planned, formulated and assessed goals, policies and activities designed to reach educational objectives and meet performance standards▪ Initiated new organization systems for exam material and more efficient exam numbering technique, decreasing time for exam material preparation by 60%▪ Pioneered creation of platform for training new faculty hires of department, which was adopted by many other departments and divisions on campus▪ Conferred and resolved education-related issues and problems with students, and other departments, in collaboration with student affairs' and Dean's offices | |
| Laboratory Technician , University of Toronto Scarborough (<i>Full-time</i>) | 2015-2016 |
| <ul style="list-style-type: none">▪ Performed routine lab and department maintenance to keep area clean and orderly, allowing smooth undergraduate teaching▪ Operated basic laboratory equipment such as balances, pH meter, colorimeter, spectrophotometer, autoclave and centrifuges▪ Generated laboratory Standard Operating Procedure (SOP) and protocol templates, which standardized experimental procedures, in some cases simplifying DNA extraction procedure cut down time by 70%▪ Led set up of laboratory reagents and equipment for undergraduate laboratory courses▪ Initiated course development and testing of protocols to update undergraduate laboratory curriculum | |

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Research Assistant and Lab Manager, University of Toronto Scarborough (*Full-time*) 2014-2015

- Worked both independently and collaboratively in fast-paced laboratory environment
- Generated laboratory Standard Operating Procedure (SOP) and protocol templates for other lab members to follow
- Trained ten graduate and undergraduate students on conducting research projects in laboratory, while providing support in troubleshooting, writing and analysing of results, in preparation for publications
- Purchased and set up large laboratory equipment, including a server for analysis of next-generation sequencing data, which eliminated the need to wait in queue for analysis on University-owned data clusters

PEER-REVIEWED PUBLICATIONS

A. Research stream publications:

1. **Elbassiouny, A.A.**, Buck, L.T., Abatti, L.E., Mitchell, J.A., Crampton, W.G.R., Lovejoy, N.R., Chang, B.S.W., 2024. Evolution of a novel regulatory mechanism of hypoxia inducible factor (HIF1 α) in hypoxia tolerant electric fishes. *Journal of Biological Chemistry*, 300(3) (doi.org/10.1016/j.jbc.2024.105727)
 - a. Media coverage: [ASBMB Today](#), [University of Toronto News](#)
2. **Elbassiouny, A.A.**, Lovejoy, N.R., Chang, B.S.W., 2020. Convergent patterns of evolution of mitochondrial OXPHOS genes in electric fishes. *Phil Trans. R. Soc. B* (doi.org/10.1098/rstb.2019.0179). [Invited contribution to “Linking the mitochondrial genotype to phenotype: a complex endeavour”]

B. Collaborations and side-projects:

3. Suganthan, H., Le, H., **Elbassiouny, A.A.**, Rajkumar, A., Raveendran, V.A., Pressey, J.C., Woodin, M.A., Chang, B.S.W., Buck, L.T. 2025. Increased GABAA receptor open probability: adaptive mechanisms to cope with anoxia in the painted turtle. *Neuroscience*. (doi.org/10.1016/j.neuroscience.2025.05.032)
4. Hauser, F.E., Xiao, D., Van Nynatten, A., Brochu-DeLuca, K.K., Rajakulendran, T., **Elbassiouny, A.A.**, Sivanesan, H., Sivananthan, P., Crampton, W.G.R., Lovejoy, N.R. 2024. Ecologically mediated differences in electric organ discharge drive evolution of a sodium channel gene in South American electric fishes. *Biol Lett*. (doi.org/10.1098/rsbl.2023.0480)
5. **Elbassiouny, A.A.**, Fontenelle, J.P., Kočovský, P.M., Mandrak, N.E., Lovejoy, N.R., 2023. Genetic structure of the Silver Chub indicates distinctiveness of Lake Erie population. *N Am J Fish Manage* (<https://doi.org/10.1002/nafm.10888>). [Invited contribution to “Avoiding a Macabre Future for *Macrhybopsis* – Improving Management and Conservation of Chubs”]
6. **Elbassiouny, A.A.**, DiSordi, P., Guay, S., Hamilton, A., King, S., Brown, J., Molnar, P., Andrade, M.C.B., Riggs, C.D., Stehlik, I., Ashok, A., 2020. The whole is greater than the sum of parts: a research poster project provides an integrative framework for learning across foundation courses in biology. *Bioscene*.
7. Hauser, F.E., Fontenelle, J.P., **Elbassiouny, A.A.**, Mandrak, N.E., Lovejoy, N.R., 2019. Genetic structure of endangered lake chubsucker (*Erimyzon sucetta*) in Canada reveals a differentiated population in a precarious habitat. *J. Fish Biol.* (doi.org/10.1111/jfb.14155).
8. Lehmberg, E.S., **Elbassiouny, A.A.**, Lopez-Fernandez, H., Crampton, W.G.R., Bloom, D.D., Lovejoy, N.R., 2018. Fish biogeography in the "Lost World" of the Guiana Shield: Phylogeography of the weakly electric knifefish *Gymnotus carapo* (Teleostei: Gymnotidae). *J. Biogeogr.* (doi.org/10.1111/jbi.13177).
9. Kolmann, M.A., **Elbassiouny, A.A.**, Liverpool, E.A. and Lovejoy, N.R., 2017. DNA barcoding reveals the diversity of sharks in Guyana coastal markets. *Neotrop. Ichthyol.*, 15(4). (doi.org/10.1590/1982-0224-20170097).

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10. **Elbassiouny, A.A.**, Schott, R.K., Waddell, J.C., Kolmann, M.A., Lehmberg, E.S., Van Nynatten, A., Crampton, W.G., Chang, B.S. and Lovejoy, N.R., 2016. Mitochondrial genomes of the South American electric knifefishes (Order Gymnotiformes). *Mitochondrial DNA Part B*, 1(1), pp.401-403. (doi.org/10.1080/23802359.2016.1174090)

SELECTED CONFERENCE PRESENTATIONS

1. **Elbassiouny, A.A.**, Kumar, A., Lee, J.S., Bennewith, K., Hirst, M., Sorensen, P. Cancer Genetics and Epigenetics, Gordon Research Conferences. May 2025. Lucca, Italy ([Poster](#))
2. **Elbassiouny, A.A.**, Kumar, A., Lee, J.S., Bennewith, K., Hirst, M., Sorensen, P. 10th Annual Terry Fox Meeting, Terry Fox Research Institute. May 2024. Toronto, ON ([Poster](#))
3. **Elbassiouny, A.A.**, Lovejoy, N.R., Chang, B.S.W. #DiscoverBMB, American Society for Biochemistry and Molecular Biology Annual Meeting. March 2023. Seattle, WA ([Poster](#))
4. **Elbassiouny, A.A.** Great Lakes Annual Meeting of Evolutionary Genomics (GLAM EvoGen). August 2022. Buffalo, NY ([Talk](#))
5. **Elbassiouny, A.A.**, Lovejoy, N.R., Chang, B.S.W. Society for the study of Evolution annual meeting. June 2021. Online ([Talk](#))
6. **Elbassiouny, A.A.**, Kočovský, P., Fontenelle, J.P., Mandrak, N.E., Lovejoy, N.R. American Fisheries Society Annual Meeting. September 2020. Online ([Talk](#))
7. **Elbassiouny, A.A.**, Lovejoy, N.R., Chang, B.S.W. International Congress for Comparative Physiology and Biochemistry. August 2019. Ottawa, ON ([Talk](#))
8. DiSordi, P., **Elbassiouny, A.A.**, Guay, S., Hamilton, A., King, S., Brown, J., Molnar, P., Stehlik, I., Andrade, M.C.B., Riggs, C.D., Ashok, A. American Society for Cell Biology Annual Meeting. December 2018. San Diego, CA, USA ([Poster](#))
9. **Elbassiouny, A.A.**, Chang, B.S.W., Lovejoy, N.R. Society for Molecular Biology and Evolution Annual Meeting. July 2018. Yokohama, Japan ([Poster](#))
10. **Elbassiouny, A.A.**, Chang, B. S. W., Lovejoy, N. R. Canadian Society for Molecular Biosciences. May 2017. Ottawa, ON ([Poster](#))
11. Bansal, A., **Elbassiouny, A.**, Ashok, A. International Summer Institute on Students as Partners. May 2017. Hamilton, ON ([Poster](#))
12. **Elbassiouny, A.A.**, Schott, R. K., Chang, B. S. W., Lovejoy, N. R. Great Lakes Bioinformatics and Canadian Computational Biology Conference. May 2016. Toronto, ON ([Poster](#))
13. **Elbassiouny, A.A.**, Schott, R. K., Chang, B. S. W., Lovejoy, N. R. Compute Ontario Research Day. May 2015. Cambridge, ON ([Poster](#))
14. **Elbassiouny, A.A.**, Lovejoy, N. R. Third Annual Interdisciplinary Research and Discovery Symposium. October 2014. Scarborough, ON ([Talk](#))
15. **Elbassiouny, A.A.**, Tan, H. H., Bloom, D. D., Lovejoy, N. R. Ontario Ecology, Ethology and Evolution Colloquium (OE3C). May 2014. Guelph, ON ([Poster](#))

GRANTS AND AWARDS

Mitacs Accelerate , Mitacs and Vancouver General Hospital (CA\$706,666.66)	2024-present
Graduate Student Researcher Award , American Society for Biochemistry and Molecular Biology (US\$1,000)	2023
Canada Graduate Scholarship Doctoral Program , Natural Sciences and Engineering Research Council (CA\$63,000)	2020-2023
Kenneth C. Fisher Fellowship , University of Toronto (CA\$600)	2020

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Ontario Graduate Scholarship , Ontario Government (CA\$15,000)	2019-2020
Cold Spring Harbor Laboratory Scholarship , Howard Hughes Medical Institute (US\$1,000)*	2017
International Zoology Scholarship , University of Toronto (CA\$1,250)	2016
Brilliance Award , University of Cambridge International Examinations (no value)	2008

*Awards declined

COURSE DEVELOPMENT

Molecular and Cell Biology laboratory curriculum , <i>University of Toronto</i>	2020
- Developed a complete curriculum for teaching introductory laboratory to incoming first year biology students - Curriculum covered essential cell and molecular biology topics, and semester-long assignment integrating the skills acquired throughout the term - Generated assignments, answer guides, slides and training for teaching assistants of the course - Class size: 2,000+ students	
Molecular Evolution and Genomics , <i>University of Toronto</i>	2019, 2021, 2022
- Modified and revised the curriculum for computer labs for advanced biology course - Class size: 40 students	
Integrative Poster Project , <i>University of Toronto Scarborough</i>	2017-2018
- Working with 6+ instructors of core biology courses, developed a project course to enable teamwork and information literacy among biology students in foundation programs - Organized the first-ever conference-style research poster day as part of the student assignments, while collaborating with department heads, instructional assistants, librarians, and academic staff - Class size: 800+ students	
Biology of Humans , <i>University of Toronto Scarborough</i>	2017
- Developed tutorial teaching material, assignments and quizzes for a new biology course for non-major students - Developed content and material for evaluating the science behind claims in advertisement research project, including marking scheme	

ACTIVITIES

Service to profession:	
Co-chair, St. George CSB Wellness Committee , University of Toronto	2020-2022
Manuscript reviewer: Frontiers in Microbiology, Genomics, Molecular Biology Reports, Molecular Ecology, Scientific Reports	2018-Present
Speaker, Cell and Systems Biology Graduate Union Executive Committee	2019-2020
Outreach Associate, Integrative Organismal Biology Journal	2019

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Workshops and courses:

- Advanced graphics in R, University of Toronto 2021
- Fundamentals of genomic data science, University of Toronto 2018
- Methods in genomics and proteomics, University of Toronto 2017
- Scientific computing with python, Scinet High Performance Computing Consortium 2015
- Data science in R, Scinet High Performance Computing Consortium 2015
- High Performance Computing Summer School, Compute Ontario 2015