

Isaac Wong

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PROFESSIONAL GOALS

- I am a highly driven student seeking a full-time position in bioinformatics where I can utilize my experience in computer science and biology to develop strategies for data analysis of genomic datasets.

EDUCATION

University of Rochester	Anticipated May 2019
• <i>Bachelor of Arts in Computer Science</i>	GPA 3.54 out of 4.00
• <i>Bachelor of Science in Computational Biology</i>	

RESEARCH EXPERIENCE

University of Rochester – Department of Biology	Rochester, New York
<i>Independent Research under Dr. Amanda Larracuente</i>	<i>August 2018 – Present</i>

- Used Java to develop a model for the evolution of satellite DNA arrays to infer how recombination rates and fitness functions affect the expansion and collapse of individual arrays across large timescales. Using empirical population data in *Drosophila*, I found ranges of recombination rates and population sizes which would explain variation in recombinant lines.
- Used Python and R to develop tools to measure the age of satellite arrays in order to elucidate factors driving the evolution of satellite DNA. With data on the ages and sequences of satellites, I shed light on how satellites expand and contract dynamically within a population.

Freie Universität – Department of Biochemistry	Berlin, Germany
<i>Independent Research under Dr. Helge Ewers, DAAD RISE Fellowship</i>	<i>May 2018 – August 2018</i>

- Used Java, Python, R, and FEMM to develop computational tools to measure, analyze, and simulate the movement of and forces acting on magnetic nanoparticles which were bound to cell membrane proteins and which were manipulated by an external magnet. From my single particle tracking data, I illuminated aspects of the fluid yet highly ordered three-dimensional structure of the cell membrane.
- Developed molecular protocols to bind magnetic nanoparticles to cell membrane proteins and image the movement of the particles using super resolution microscopy.

University of Rochester – Department of Biology	Rochester, New York
<i>Independent Research under Dr. Amanda Larracuente</i>	<i>January 2017 – May 2018</i>

- Used Java and R to develop computational tools for predicting individual satellite DNA array size from whole genome shotgun sequencing reads in order to shed light on factors driving evolution of satellite DNA. From my data, I highlighted challenges in aligning repetitive DNA sequences and demonstrated possible solutions.
- Used Java and R to develop computational tools for the quantification of *Drosophila* satellite DNA copy number variation for all loci of a repeat family in a genome across a population. From my data, I showed how different complex satellite families vary within a population in size and location.
- Assisted in computational analysis, construction of genome assembly, and genome annotation of multiple firefly species with a focus on repetitive elements using common bioinformatic and NGS sequencing tools.
- Developed the first molecular protocol for Fluorescent *in Situ* Hybridization to firefly chromosomes and imaged the first karyotype showing probe hybridization to canonical telomere sequence.

POSTER PRESENTATIONS

- (Anticipated March 2019) Isaac Wong, “Dynamic evolution of euchromatic satellites on the X chromosome in *Drosophila melanogaster* and the simulans clade,” 60th Annual Drosophila Research Conference, Dallas, TX, 2019.
- Isaac Wong, “Complex Satellite DNA variation within and between populations of *Drosophila melanogaster*,” 59th Annual Drosophila Research Conference, Philadelphia, PA, 2018.

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POSTER PRESENTATIONS

- Isaac Wong, “Canonical Telomeres in *Photinus pyralis*,” 59th Annual Drosophila Research Conference, Philadelphia, PA, 2018.
- Isaac Wong, “A Method for Fluorescence *in Situ* Hybridization to Firefly Chromosomes.” Annual Undergraduate Program in Biology & Medicine Poster Session. Rochester, New York, 2017.

PEER REVIEWED PAPERS

- Fallon, Timothy R et al. “Firefly Genomes Illuminate Parallel Origins of Bioluminescence in Beetles” *eLife* vol. 7 e36495. 16 Oct. 2018, doi:10.7554/eLife.36495

CO-CURRICULAR AND LEADERSHIP EXPERIENCE

Hult Prize, Singapore Regional Finalist

November 2017 – March 2018

- Developing a social enterprise to improve the lives and health outcomes of older adults by creating a unified digital platform which facilitates access to social events, volunteering opportunities, and community resources.

SKILLS

- Fluorescent *in situ* hybridization, fluorescence microscopy, super resolution microscopy, single particle tracking, common molecular biology techniques, cell culture.
- Strong in Java and R. Problem solving experience with Python, C, Perl. Familiar with MATLAB.

AWARDS

- GSA Victoria Finnerty Undergraduate Award. Dallas, Texas *March 2019*
- DAAD RISE Fellowship. Berlin, Germany *May 2018 – August 2018*
- Hult Prize. Singapore Regional Finalist *November 2017 – March 2018*

RELEVANT COURSES AND LABS

- Organic Chemistry with Lab, Genetics with Lab, Biostatistics with Lab, Molecular Biology, Quantitative Genomics with Lab, Computational Biology with Lab, Applied Genomics with Lab
- Data Structures & Algorithms, Computational & Formal Systems, Artificial Intelligence, Linear Algebra with Differential Equations, Computational Statistics, Data Mining