Liqian Ma

PhD Candidate

Professional Summary

I am a highly motivated PhD student specialized in immuno-oncology. My experience lies in immunology, nuclear receptor pharmacology and genomics/transcriptomics. I have a strong interest to further develop my career in integrating immuno-oncology with genomics/transcriptomics studies.

Education

2021 **PhD, Molecular and Integrative Physiology**, *University of Illinois Urbana-Champaign*, Urbana, IL.
- GPA: 4.00/4.00

2021 **MS, Applied Statistics**, *University of Illinois Urbana-Champaign*, Urbana, IL.
- GPA: 4.00/4.00

2016 **BS, Honors in Biology**, *St. Lawrence University*, Canton, NY.
- Summa Cum Laude
- GPA: 3.88/4.00
- Phi Beta Kappa

Honors and Awards

Summer 2020 **Inaugural Julie and David Mead Graduate Student Fellowship**, *Awarded by School of Molecular and Cellular Biology*, University of Illinois Urbana-Champaign.

Fall 2019 **Departmental Travel Award**, *Awarded by Department of Molecular and Integrative Physiology*, University of Illinois Urbana-Champaign.

Spring 2019 **Best Capstone Project in Professional Skills for Careers in Biosciences Workshop Series**, *Awarded by Carl R. Woese Institute for Genomic Biology*, University of Illinois Urbana-Champaign.

Spring 2019 **Graduate College Travel Award**, *Awarded by Graduate College*, University of Illinois Urbana-Champaign.

Spring 2019 **Departmental Travel Award**, *Awarded by Department of Molecular and Integrative Physiology*, University of Illinois Urbana-Champaign.

Spring 2019 **Endocrine Society Annual Meeting 2019 Outstanding Abstract Award**, *Awarded by Endocrine Society*.

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Spring 2019 **Endocrine Society Annual Meeting 2019 Early Career Forum Travel Award**, *Awarded by Endocrine Society*.

Spring 2018 **Annual Tissue Microenvironment Symposium (TiMe) Outstanding Research Poster Award**, *Awarded by Cancer Center at Illinois*, University of Illinois Urbana-Champaign.

Spring 2018 **AACR Annual Meeting AACR-Bristol Myers Squibb Oncology Scholar-in-Training Award**, *Awarded by American Association for Cancer Research*.

Spring 2018 **Departmental Travel Award**, *Awarded by Department of Molecular and Integrative Physiology*, University of Illinois Urbana-Champaign.

Fall 2016 **Block Grant Fellowship**, *Awarded by School of Molecular and Cellular Biology*, University of Illinois Urbana-Champaign.

Spring 2016 **Summa Cum Laude**, *Awarded by St. Lawrence University*.

Spring 2016 **Phi Beta Kappa Election**, *Awarded by the St. Lawrence chapter of the Phi Beta Kappa national honor society*.

Spring 2016 **Davis Projects for Peace**, *Awarded by Davis United World College Scholars Program*.

Spring 2015 **SLU Summer Research Fellowship**, *Awarded by St. Lawrence University Fellowship Program*, St. Lawrence University.

Spring 2014 **Internship Fellowship**, *Awarded by Career Services Summer Internship Fellowship Program*, St. Lawrence University.

Spring 2014 **Travel Research Grant**, *Awarded by Center for International and Intercultural Studies*, St. Lawrence University.

Spring 2013 **Outstanding Student Beginning a Language in Japanese**, *Awarded by Department of Modern Languages*, St. Lawrence University.

2012–2016 **International Merit Scholarship**, *Awarded by St. Lawrence University*.

Research Experience

2019–Present **Research Assistant in Machine-Learning**, *High-Performance Biological Computing (HPCBio)*, Carl R. Woese Institute for Genomic Biology, University of Illinois Urbana-Champaign.

- Lead and work in teams on genome-related machine-learning projects affiliated with H3ABioNet, the bioinformatics infrastructure of the NIH-funded Human, Heredity, and Health in Africa (H3Africa) consortium
- Develop project proposals and manage project teams by organizing group meetings, assigning tasks and managing team work progress
- Selected Skills: Next-generation sequencing data analysis, Machine-learning and Cloud-computing

2016–Present **Dissertation Research in Cancer Immunology**, *Nelson Lab*, Department of Molecular and Integrative Physiology, University of Illinois Urbana-Champaign.

- Thesis: 27-Hydroxycholesterol acts on myeloid immune cells to induce T cell dysfunction, promoting breast cancer progression
- Investigate the 27-hydroxycholesterol-driven, myeloid cell-mediated immunosuppression and T cell dysfunction that contribute to tumor progression
- Selected Skills: Mouse models, Primary/mammalian cell culture, Flow cytometry, ELISA, Immunofluorescence, *In vivo* bioluminescence imaging, Quantitative PCR (qPCR), RNA sequencing analysis
- Other responsibilities: Mentor 4 undergraduate students, present research work regularly in lab meetings and in regional and national conferences, review manuscripts

Summer 2020 **Graduate Research Intern in Genomics Study**, *Genetics and Pharmacogenomics*, Merck, Boston, MA.

- Conducted literature review and established work plan for pooled CRISPR screening with single-cell transcriptomic readout (CROP-seq)
- Analyzed multi-omics datasets (REAP-Seq, CITE-Seq, Proteomics) to identify novel therapeutic targets by applying statistical modeling and machine-learning
- Selected Skills: Pooled CRISPR screening, RNA sequencing analysis, Single-cell RNA sequencing analysis, Proteomics analysis

2015–2016 **Senior Year Research in Immunology**, *Heckman Lab*, Department of Biology, St. Lawrence University.

- Thesis: Investigation of the anti-inflammatory potential ability of chaga (*Inonotus obliquus*) in macrophages
- Selected Skills: Primary/mammalian cell culture, Preparation of chaga extract by rotatory evaporation and lyophilization, Flow cytometry, ELISA

Summer 2015 **Summer Research Fellowship in Immunology**, *Heckman Lab*, Department of Biology, St. Lawrence University.

- Topic: Investigation of the immunomodulatory properties of cerium oxide nanoparticles
- Selected Skills: T cell purification, Co-culture of bone marrow-derived dendritic cells with primary T cells to examine the T cell activation, Development of protocols for the lab activities of Cancer Biology, using B16 cell line

Spring 2015 **Independent Study in Immunology**, *Heckman Lab*, Department of Biology, St. Lawrence University.

- Topic: Investigation of the immunomodulatory properties of Cerium Oxide Nanoparticles using bone marrow-derived dendritic cells
- Selected Skills: Primary extraction and differentiation of dendritic cells, Flow cytometry

Summer 2014 **Research Internship in Nanobiotechnology**, *NanoBioMedical Centre*, Adam Mickiewicz University, Poznan, Poland.

- Topics: Nanoparticle cytotoxicity in vitro and Cell-penetrating peptides as nanocarriers for drug delivery
- Selected Skills: Grew cell lines, SDS PAGE, Confocal microscopy, BioImaging, Analysis of cell activities using Muse® Cell Analyzer

2012–2013 **Research Assistant in Ecology**, *Pai Lab*, Department of Biology, St. Lawrence University.

- Topic: Identify bees from two forage crops and determine which forage supports greater species diversity
- Selected Skills: Preparation of bee samples, identification of bees using dissecting microscopy

Publications

Peer-Reviewed Publications

4 **Ma L**, Wang L, Nelson AT, et al. (2020). 27-Hydroxycholesterol acts on myeloid immune cells to induce T cell dysfunction, promoting breast cancer progression. *Cancer Letters*. 493: 266–283.

3 He S, **Ma L**, Baek AE, Vardanyan A, et al. (2019). Host CYP27A1 expression is essential for ovarian cancer progression. *Endocrine-Related Cancer*. 26(7): 659–675.

2 Shahoei SH, Kim YC, Cler SC, **Ma L**, et al. (2019). Small Heterodimer Partner regulates dichotomous T cell expansion by macrophages. *Endocrinology*. 160(7): 1573–1589.

1 **Ma L** and Nelson ER. (2019). Oxysterols and nuclear receptors. *Molecular and Cellular Endocrinology*. 484: 42-51.

Pre-print

1 Hutchinson AS, Websdale A, Lianto L, et al. (2020). Liver x receptor alpha drives chemoresistance in response to side-chain hydroxycholesterols in triple negative breast cancer. *bioRχiv*.

Abstracts Presented at Conferences

11 **Ma L**, Wang L, Nelson AT, Han C, et al. (2020). 27-Hydroxycholesterol acts on myeloid immune cells to induce T cell dysfunction, promoting breast cancer progression. AACR Tumor Immunology and Immunotherapy Conference (Virtual Meeting).*Selected for short talk presentation*.

10 Duraki D, Boudreau MW, Wang L, Mao C, Tang B, **Ma L**, et al. (2020). Lethal ERα-Dependent Hyperactivation of the Unfolded Protein Response Induces Complete Regression Without Recurrence of Primary and Metastatic Breast Cancer. The Endocrine Society Annual Meeting 2020 (Virtual Meeting).

9 **Ma L**, Han C, Wang L, Baek AE, et al. (2019). 27-hydroxycholesterol acts on myeloid cells to inhibit both T cell expansion and cytotoxic activity. AACR Tumor Immunology and Immunotherapy Conference. Boston, MA.

8 Chen JJ, **Ma L**, Wendt MK and Nelson ER. (2019). A cholesterol metabolite promotes reemergence of breast cancer cells from dormancy. 5th annual Midwest Tumor Microenvironment Meeting. Notre Dame, IN.

7 Chen C, Chen JJ, **Ma L**, Helferich WG, et al. (2019). Consumption of oil derived from frying bacon increases breast cancer metastasis. The American Association for Cancer Research Annual Meeting 2019. Atlanta, GA.

6 **Ma L**, Baek AE and Nelson ER. (2019). 27-hydroxycholesterol acts on myeloid cells to inhibit T cell expansion. The Endocrine Society Annual Meeting 2019. New Orleans, LA. Abstract #5466. *Selected for Featured Poster and Outstanding Abstract Award*.

5 **Ma L**, Baek AE and Nelson ER. (2018). Mechanisms by which 27-hydroxycholesterol promotes breast cancer metastasis. The American Association for Cancer Research Annual Meeting 2018. Chicago, IL. Abstract #2133. *Selected for AACR-Bristol Myers Squibb Oncology Scholar-in-Training Award*.

4 **Ma L**, Baek AE and Nelson ER. (2018). Mechanisms by which 27-hydroxycholesterol promotes breast cancer metastasis. Annual Tissue Microenvironment (TiMe) Day 2018. Urbana, IL. *Selected for Outstanding Research Poster Award*.

3 **Ma L**, Baek AE and Nelson ER. (2017). Mechanisms by which 27-hydroxycholesterol promotes breast cancer metastasis. Life Science Symposium. Notre Dame, IN. Abstract #31.

2 **Ma L** and Heckman KL. (2016). Effects of Inonotus obliquus on LPS stimulated M1 macrophages: can Inonotus obliquus drive an M2 transition?". Festival of Science. Canton, NY.

1 **Ma L** and Heckman KL. (2015). Investigation of immunomodulatory properties of cerium oxide nanoparticles. NY6 Undergraduate Research Conference. Hamilton, NY.

Work Experience

Spring and Fall 2018 **Teaching Assistant**, *Molecular and Cellular Biology*, University of Illinois Urbana-Champaign.
- Courses: MCB 402 (Systems and Integrative Physiology), MCB 244 (Human Anatomy and Physiology I)
- Graded exams and assignments
- Host tutorial sessions to teach the contents of assigned journal articles to students

2015–2016 **Lab Assistant**, *Biology Preparatory Laboratory*, St. Lawrence University.
- Tested safety equipment, such as eyewash station and emergency shower
- Prepared laboratory materials for biology classes and research groups on campus
- Cleaned up and autoclaved the laboratory waste and glassware

2013–2016 **Peer Tutor**, *Academic Advising*, St. Lawrence University.
- Courses: BIO 101 (General Biology I), BIO 102 (General Biology II), MATH 135 (Calculus I), MATH 136 (Calculus II)
- Coached tutees on a weekly basis on their understanding of calculus materials, including integrals, derivatives and limits
- Tutored up to seven students per semester to understand General Biology materials
- Prepared pretests and keep up with tutees' performances

2013–2014 **Teaching Assistant**, *Department of Modern Languages*, St. Lawrence University.
- Courses: CHIN 101 (Elementary Chinese I), CHIN 102 (Elementary Chinese II)
- Designed and held Chinese lab activities to improve students' oral, listening, reading and writing skills
- Designed practice exams for students to review for the midterm and final exams
- Introduced Chinese culture to students

Leadership and Services

2018–Present **Board Member**, *Student Advising on Graduate Education (SAGE)*, Graduate College, University of Illinois Urbana-Champaign.
- Provide varied perspectives that enhance the academic, professional, and social experience of graduate students at the university
- Provide valuable input for Graduate College programs, including Graduate Student Appreciation Week, to strengthen the connection of graduate student community, GradMAP, to enhance the first year graduate students' experience and Graduate Student Career Development.

2018–Present **Committee Member**, *Departmental Student Committee*, Department of Molecular and Integrative Physiology, University of Illinois Urbana-Champaign.
- Organize Molecular and Integrative Physiology departmental functions and activities, such as the departmental annual retreat, graduate student mixers and the departmental Halloween party

Fall 2018 **Consultant**, *Illinois Business Consulting*, University of Illinois Urbana-Champaign.
- Facilitated the improvement of operational efficiency in a governmental organization

Summer 2014 **Volunteer**, *Children's Care Hospital*, Poznan, Poland.
- Supported the daily life of the patients in the hospital by feeding them and administering medicine
- Took care of the patients by facilitating them with basic therapies, including respiratory equipment

2013–2014 **Program Coordinator**, *Liberal Arts Project in China*, Sanmen, China and St. Lawrence University, Canton, NY.
- This project was in collaboration with the Asian Programs in St. Lawrence University
- Coordinated meetings, delegated the tasks, and supervised the progress of three individuals
- Assisted with preparing courses on Global Studies and materials
- Facilitated the communication and cooperation with the instructor, students and the library
- Promoted the program by presenting informational meetings and recruited members

Professional Skills and Languages

Research Primary Cell and Cell Line Culture, Mouse Models, Flow Cytometry, Multiplex Luminex ELISA, Immunofluorescence, PCR

Data Analysis Single-cell and Bulk RNA Sequencing Analysis, Proteomics Analysis, Survival Analysis, Machine-Learning, Advanced Data Analysis and Visualization

Programming R, SAS, Python, Git, LaTeX, Html

Software GraphPad Prism

Languages English (fluent), Chinese-Mandarin (native), Japanese (basic)

Certificates

2019 **Professional Skills for Careers in Biosciences (PSCB)**, *Carl R. Woese Institute for Genomic Biology*, University of Illinois Urbana-Champaign.

2017 **Completion of Computational Genomics Courses**, *Mayo Clinic and Illinois Alliance*, University of Illinois Urbana-Champaign.

References

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