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. I have a strong interest to further develop my career in integrating immuno-oncology with genomic 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

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)

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.

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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*.

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 **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**, *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
- Selected Skills: next-generation sequencing data analysis, machine learning and cloud computing

2016–Present **Dissertation Research**, *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**, *Genetics and Pharmacogenomics*, Merck, Boston, MA.

- Conduct literature review and establish work plan for pooled CRISPR screening with single-cell transcriptomic readout (CROP-seq)
- Analyze 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**, *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**, *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**, *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**, *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**, *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*. S0304-3835(20)30435-3.

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.

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.

Extracurricular Activities 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, such as Graduate Student Appreciation Week activities, to strengthen the connection of graduate student community

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

2013–2015 **Active Participant**, *A.S.I.A Club*, St. Lawrence University.
- Co-organized and co-hosted the Asia Night and other events (e.g., Chinese New Year Gala, Kaleidoscope), as well as performed in those events and other school activities
- Prepared fundraising campaigns to support events

2012–2014 **Member**, *Weave News*, St. Lawrence University.
- Reported under-reported stories after localizing them and doing research on them
- Recruited new members and promote the Weave News by talking with interested individuals and putting up posters

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 the laboratory waste and glassware

Summer 2014 **Practice Intern**, *Children's Care Hospital*, Poznan, Poland.
- Studied anti-epilepsy medication use by comparing three anti-epilepsy medicines used in hospital
- 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.
- 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

2013–2016 **Peer Tutor**, *Academic Advising*, St. Lawrence University.
- Subjects: Biology and Calculus
- 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.
- Subject: Chinese
- Designed and held Chinese lab activities to improve students' oral, listening, reading and writing skills
- Created pretests for students to review for midterm and final exams
- Introduced Chinese culture to students

Fall 2013 **Intern**, *Weave Media Project*, St. Lawrence University.
- Arranged and conducted interviews with journalists and notable figures
- Created and edited videos using Final Cut Pro
- Facilitated social-media outreach via Facebook and Twitter

Summer 2012 **New Star English Training Center**, *Changsha*, PRC.
- Subject: English
- Interacted with students in class and helped teacher with translating or role-modeling
- Graded homework and led the communication between the teacher and parents and between the teacher and students

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.