

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.

- 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 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
 - 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.
- 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 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*. 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 ER α -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.