Liqian Ma

liqian-ma   liqian-ma.github.io | *Updated:* May 11, 2022

Skills

- **Research Methods**: Primary (Immune) Cell and Cell Line Culture, Animal 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

Education

PhD. Molecular and Integrative Physiology   2021
Molecular and Integrative Physiology, University of Illinois Urbana-Champaign
- GPA: 4.0/4.0

MS. Statistics   2021
Statistics, University of Illinois Urbana-Champaign
- GPA: 4.0/4.0

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

Selected Work and Research Experience

Transnational Scientist in Immuno-Oncology   Sept 2021 - May 2022
Tempus Labs, Chicago, IL

- Leverage large clinical and molecular (genomic, transcriptomic) datasets for therapeutic target discovery and biomarker characterization using statistical modeling, data visualization and data interpretation
- Selected Skills: Molecular data (RNA, DNA) analysis, clinical data cleaning and analysis, survival analysis, cloud computing

Research Assistant (PhD Candidate) in Cancer Immunology   Sept 2016 - Aug 2021
Nelson Lab, University of Illinois Urbana-Champaign, Urbana, IL

- Thesis: 27-hydroxycholesterol promotes breast cancer metastasis through the modulation of myeloid immune cells
- Investigated the 27-hydroxycholesterol-driven, myeloid cell-mediated immunosuppression and T cell dysfunction that contribute to tumor progression
- Developed bulk RNA and single-cell RNA sequencing analysis pipelines and foundational experimental protocols, such as primary immune cell culture/cocultures and setting up experiment for RNAseq/single-cell RNAseq, for the entire laboratory
- Presented research work regularly in regional and national conferences, such as AACR and ENDO
- Reviewed manuscripts submitted to peer-review journals
- Mentored 4 undergraduate students, supervising them in experimental research and helping them contribute meaningfully to projects
- Selected Skills: Mouse models, Primary immune/mammalian cell culture, Flow cytometry, ELISA, Immunofluorescence, *in vivo* bioluminescence imaging, qPCR, RNA sequencing analysis, Single-cell RNA sequencing analysis

Research Assistant in High-Performance Biological Computing (HPCBio)   Nov 2019 - May 2021
Carl R. Woese Institute for Genomic Biology, University of Illinois Urbana-Champaign, Urbana, IL

- Led and worked in teams on three machine-learning projects with H3ABioNet, the bioinformatics infrastructure of the NIH-funded Human, Heredity, and Health in Africa consortium

- Developed project proposals to use genotype information to predict disease outcome and manage project teams by organizing group meetings, assigning tasks and managing teamwork progress
- Reviewed RNAseq node accreditation reports
- Independently analyzed RNAseq data for the research groups in the University of Illinois Urbana-Champaign as a part of HPCBio
- Supported HPCBio workshops (e.g. RNAseq analysis, using R and Bioconductor) as teaching assistant
- Selected Skills: RNA sequencing analysis, Machine-learning and Cloud-computing

Intern in Genetics and Pharmacogenomics   May 2020 - August 2020
Merck Research Laboratories, Merck, Boston, MA

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

Undergraduate Research Assistant in Immunology   Jan 2015 - May 2016
Heckman Lab, St. Lawrence University, Canton, NY

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

Selected Awards and Honors

- Outstanding Thesis Award   2022
- Inaugural Julie and David Mead Graduate Student Fellowship   2020
- Departmental Travel Award   2019
- Best Capstone Project in Professional Skills for Careers in Biosciences Workshop Series 2019
- Graduate College Travel Award   2019
- Endocrine Society Annual Meeting 2019 Outstanding Abstract Award   2019
- Annual Tissue Microenvironment Symposium (TiMe) Outstanding Research Poster Award 2018
- AACR Annual Meeting AACR-Bristol Myers Squibb Oncology Scholar-in-Training Award 2018
- Block Grant Fellowship   2016
- Davis Projects for Peace   2016

Leadership and Service

Student Advising on Graduate Education Board Member   Aug 2018 - May 2021
Graduate College, University of Illinois Urbana-Champaign, Urbana, IL

Student Committee Member   Jan 2018 - Aug 2021
Department of Molecular and Integrative Physiology, University of Illinois Urbana-Champaign, Urbana, IL

Certificates

- Professional Skills for Careers in Biosciences (PSCB)   2019
- Completion of Computational Genomics Courses   2017

Publications

Peer-Reviewed:

1. **Ma L**, Epa Vidana Gamage H, Tiwari S, et al. (2022) The liver x receptor is selectively modulated by different ligands to differentially alter breast cancer metastasis-associated myeloid immune cells. Endocrinology. Accepted.

2. **Ma L**, Cho W and Nelson ER. (2021). Our evolving understanding of how 27-hydroxycholesterol influences Cancer. Biochemical Pharmacology. 196: 114621.

3. Baek AE, Krawczynska N, Das Gupta A, et al. (2021). The cholesterol metabolite, 27-hydroxycholesterol promotes the secretion of extracellular vesicles which promote breast cancer progression. Endocrinology. 162(7): bqab095.

4. Hutchinson AS, Websdale A, Lianto L, et al. (2021). Liver x receptor alpha driveschemoresistance in response to side-chain hydroxycholesterols in triple negative breastcancer. Oncogene. 40(16): 2872-2883.

5. **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.

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

7. 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.

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

Submitted and Pre-prints:

1. Nelczyk AT, **Ma L**, Epa Vidana Gamage H, et al. The nuclear receptor TLX (NR2E1) inhibits growth and progression of triple negative breast cancer. Under Review.

2. Huang L, Xu L, Chu H, et al. Macrophage cyp27a1 promotes atherosclerosis by instigating hypercholesterolemia-related vascular inflammation. Under Revision.

Abstracts Presented at Conferences:

1. Nelson AT, Wang Y, **Ma L**, et al. (2021). Functional Characterization of the Orphan Nuclear Receptor TLX in Triple Negative Breast Cancer. The Endocrine Society Annual Meeting 2021 (Virtual Meeting).

2. Duraki D, Boudreau MW, Wang L, Mao C, Tang B, **Ma L**, et al. (2021). ERα-Dependent Lethal Hyperactivation of the Anticipatory Unfolded Protein Response Induces Complete Regression Without Recurrence of Advanced Breast Cancer. The Endocrine Society Annual Meeting 2021 (Virtual Meeting).

3. **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.*

4. 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).

5. **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.

6. 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. AACR Annual Meeting 2019. Atlanta, GA.

8. **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.*

9. **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.*

10. **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.*

11. **Ma L** and Heckman KL. (2016). Effects of Inonotus obliquus on LPS stimulated M1macrophages: can Inonotus obliquus drive an M2 transition?". Festival of Science. Canton, NY.

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