Minh T. Ma

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EDUCATION:

Ph.D.	Rutgers New Jersey Medical School *Disciplines:* Immunology, cancer immunotherapy, biochemistry *Department*: Pathology, Immunology, and Laboratory Medicine *Thesis Advisor:* Dr. Dongfang Liu	2019 – 2025
B.S.	University of Missouri - Columbia *Major*: Biochemistry *Minor*: Business and Management *Advisors:* Drs. Chung-Ho Lin and George Stewart	2014 – 2018

RESEARCH INTERESTS:

- Investigate the ability and mechanism of natural killer (NK) cells in infiltrating the solid tumor bed using GEMMs
- Elucidate the molecular distinctions of NK cells in hot vs cold tumor microenvironments
- Genetically engineer the next generation of chimeric antigen receptor (CAR)-NK cells using cutting-edge technology

RESEARCH EXPERIENCE:

Rutgers Presidential Postdoctoral Fellow 2025 – present
Rutgers Cancer Institute of New Jersey, New Brunswick, NJ
Mentor: Dr. Jessie Yanxiang Guo

- Conduct experimental studies to investigate the roles and mechanisms of IFN-ε in KRAS-driven lung tumorigenesis.
- Assist with the preparations of proposals, formal applications, and justification for grant applications. Assists in the development of budget proposals for the laboratory area, with specific projections regarding future equipment and manpower needs.
- Assist in writing grant applications, fellowships, annual progress reports and manuscripts
- Assist with leading the instruction, training and mentoring of residents, fellows, medical students, research assistants and laboratory technicians in laboratory technique.

Graduate Research Assistant 2019 – 2025
Rutgers New Jersey Medical School, Newark, NJ
Mentor: Dr. Dongfang Liu

- Hands-on experience with both immunocompetent and immunodeficient mice: CDX, PDX, spontaneous, and humanized models (BLT, PBMC, and CD34+ HSC). Specialized in the Sleeping Beauty Transposon system for HCC and mammary fat pad injection for breast cancer
- Designed and executed compound and/or CAR-T/CAR-NK cell administrations via i.p., i.v. (tail vein and retro-orbital), and oral gavage
- Deep understanding in immuno-oncology, such as NK cell biology and the tumor microenvironment of HCC
- 5 years of experience with human CAR-T and CAR-NK cell expansion system from PBMCs and UCBs (allo-platform) with moderate experience in mouse CAR-T cells
- Independently designed and executed in vitro assays to evaluate modulation of the tumor microenvironment using multi-color flow immunophenotyping; cytotoxicity assays such as chromium release, incucyte, and multiplex cytokine measurements; and cell proliferation

assays.
- Extensive experience with lentiviral, retroviral, AAV, and CRISPR KO/KI transduction systems
- Isolate immune cells from murine tissues for 15+ color flow cytometric evaluation: use of gentleMACS, MACS isolation, FACS sorting
- Purified in-house RetroNectin using affinity chromatography (FPLC)
- Collaborated with cross function labs in both academia and industry, such as University of Pennsylvania, Scripps Research Institute, and SentiBio
- Excellent written skills: collaborate with the PI on writing major NIH-funded grants (R01), a recipient of a predoctoral fellowship, a recipient of multiple travel awards for conferences
- Excellent verbal communication skills: frequently present posters and formal presentations to a full range of internal and external audiences
- Managed and mentored a wide range of mentees including high school level, Master's, PhD students and technicians
- Excellent soft skills including communication, collaboration, organization, time management, and attention to details resulting in a good track of publications and patents

Research Associate (Full-time) 2018 – 2019

Biochemistry R&D, Benson Hill, St. Louis, MO
Team Leader: Dr. Yu Shen
- Developed Western Blot-based immunoassays according to the ICH guidelines using Western Blotting and ELISAs
- Wrote SOPs and scientific reports for GLP preparation
- Technology transfer to Euronfins Scientific
- Assisted in elucidating the MoAs of the protein of interest using mass spectrometry, co-immunoprecipitation, and Y2H system
- Purified recombinant proteins using different protein purification techniques including size exclusion, ion exchange, and affinity chromatography (FPLC)
- Communicated research findings weekly with the Biochemistry team and quarterly in the R&D
- Mentored research technicians

Undergraduate Research Assistant 2015 – 2018

University of Missouri – Columbia
Advisor: Drs. Chung-ho Lin and George Stewart
- Performed molecular cloning
- Generated *Bacillus thuringiensis* spores that express enzymes to facilitate the degradation of dioxins
- Purified recombinant protein using affinity chromatography (gravity His-tagged columns)
- Designed and performed a gas chromatography-based assay to evaluate the spore activities
- Designed and executed colorimetric enzyme kinetic assays to test the dioxin degradation abilities
- Communicated research findings in monthly meetings and mentored junior students

Research Assistant 2016 – 2018

Tiger Energy Solutions, LLC, University of Missouri – Columbia
Advisor: Drs. Chung-ho Lin and Hsinyeh Hsieh
- Assisted in designing the polymer-based 3D prototypes for the enzymatic continues-flow system
- Purified recombinant protein using affinity chromatography (gravity His-tagged columns)
- Communicated research findings in monthly meeting

FELLOWSHIPS, AWARDS, AND HONORS:

Rutgers Presidential Postdoctoral Fellowship	2025
New Jersey Commission on Cancer Research, Rutgers New Jersey Medical School	2023 - 2025
Travel Award, SCBA, Rutgers New Jersey Medical School	2022
Undergraduate Research Day at the Capitol, University of Missouri - Columbia	2017
Ellis Foundation Fellowship, University of Missouri - Columbia	2014 - 2018
Bright Flight Scholarship, University of Missouri - Columbia	2014 - 2018
Chancellor's Award, University of Missouri - Columbia	2014 - 2018

PUBLICATIONS:

1. **Ma MT**, Fu K, Zhang X, Cho JH, Byrne M, Wang X, Tripathi Sushil, Shen J, Zong WX, and Liu D. Understanding the mTOR axis to improve the therapeutic efficacy of CD147-CAR-NK cells in hepatocellular carcinoma (*Manuscript in submission*)
2. **Ma MT**, Jiang Q, Chen C, Badeti S, Wang X, Zeng C, Evans D, Bodnar B, Marras SAE, Tyagi S, Bharaj P, Yehia G, Romanienko P, Hu W, Liu S, Shi L, Liu D. 2024. S309-CAR-NK cells bind the Omicron variants *in vitro* and reduce SARS-CoV-2 viral loads in humanized ACE2-NSG mice. J Virol 98:e00038-24.
3. Wang X, Byrne ME, Liu C, **Ma MT**, Liu D. Scalable process development of NK and CAR-NK expansion in a closed bioreactor. Front Immunol. 2024 Jul 24;15:1412378. doi: 10.3389/fimmu.2024.1412378. PMID: 39114666; PMCID: PMC11303211.
4. Lubin JH, Markosian C, Balamurugan D, **Ma MT**, Chen CH, Liu D, et al. Modeling of ACE2 and antibodies bound to SARS-CoV-2 provides insights into infectivity and immune evasion. JCI Insight. 2023;8(13).
5. **Ma M,** Badeti S, Kim J K, Liu D. Natural Killer (NK) and CAR-NK Cell Expansion Method using Membrane Bound-IL-21-Modified B Cell Line. *J. Vis. Exp.* (180), e62336, doi:10.3791/62336 (2022).
6. **Ma MT**, Badeti S, Chen CH, Kim J, Choudhary A, Honnen B, Reichman C, Calianese D, Pinter A, Jiang Q, Shi L, Zhou R, Xu H, Li Q, Gause W, Liu D. CAR-NK Cells Effectively Target SARS-CoV-2-Spike-Expressing Cell Lines *In Vitro*. Front Immunol. 2021 Jul 23;12:652223. doi: 10.3389/fimmu.2021.652223. PMID: 34367128; PMCID: PMC8343231.
7. Yang Y, Badeti S, Tseng HC, **Ma MT**, Liu T, Jiang JG, Liu C, Liu D. Superior Expansion and Cytotoxicity of Human Primary NK and CAR-NK Cells from Various Sources via Enriched Metabolic Pathways. Mol Ther Methods Clin Dev. 2020 Jun 24;18:428-445. doi: 10.1016/j.omtm.2020.06.014. PMID: 32695845; PMCID: PMC7364029.
8. Tseng HC, Xiong W, Badeti S, Yang Y, **Ma M**, Liu T, Ramos CA, Dotti G, Fritzky L, Jiang JG, Yi Q, Guarrera J, Zong WX, Liu C, Liu D. Efficacy of anti-CD147 chimeric antigen receptors targeting hepatocellular carcinoma. Nat Commun. 2020 Sep 23;11(1):4810. doi: 10.1038/s41467-020-18444-2. PMID: 32968061; PMCID: PMC7511348.
9. **Ma M**, Rodriguez A, Sugimoto K. Activation of ATR-related protein kinase upon DNA damage recognition. Curr Genet. 2020 Apr;66(2):327-333. doi: 10.1007/s00294-019-01039-w. Epub 2019 Oct 17. PMID: 31624858; PMCID: PMC7073305.

PATENTS:

1. S309 chimeric antigen receptors and methods of use. US RU Docket 2021-053. Issued Dec 15, 2020.
2. CR3022 chimeric antigen receptor natural killer cells and method of use. US RU Docket 2021-014. Issued Jul 1, 2020.
3. mTOR AGONISTS AND THERAPEUTIC COMPOSITIONS AND METHODS. U.S. Provisional Application 63/825,256 on June 17, 2025.

SELECTED PRESENTATIONS:

Oral Presentations:

1. **Ma MT**, Jiang Q, Badeti S, Chen CH, Zeng C, Evans D, Liu SL, Shi L, and Liu D. Chimeric Antigen Receptor (CAR)-Natural Killer (CAR-NK) Cells for Treatment of COVID Patients with Cancer. Society of Chinese Bioscientists in America 18th Annual Meeting, Boston, MA. July 2021

Poster Presentations:

1. **Ma MT**, Fu K, Byrne M, Zhang X, Cho JH, Wang X, Tseng HC, Chen CH, Shen J, Tripathi S, Zong WX, and Liu D. Evaluation of combination mTOR agonist and CD147-IL15-CAR-NK cell therapy in transgenic human CD147 Hepatocellular Carcinoma models. American Association of Immunologists, Chicago, IL. May 2024
2. **Ma MT**, Jiang Q, Badeti S, Chen CH, Zeng C, Evans D, Liu SL, Shi L, and Liu D. Chimeric Antigen Receptor (CAR)-Natural Killer (CAR-NK) Cells for Treatment of COVID Patients with Cancer. American Society of Gene and Cell Therapy, Los Angeles, CA. May 2022
3. **Ma MT**, Jiang Q, Badeti S, Chen CH, Zeng C, Evans D, Liu SL, Shi L, and Liu D. Chimeric Antigen Receptor (CAR)-Natural Killer (CAR-NK) Cells for Treatment of COVID Patients with Cancer. Society of Chinese Bioscientists in America 18th Annual Meeting, Boston, MA. July 2021
4. **Ma MT**, Hsieh H, Lin CH, and Stewart G. Degrading Chlorinated Dioxins Using a *Bacillus thuringiensis* Spore Expression System. Undergraduate Research Day at the Capitol, Jefferson City, MO. April 2017