Yang Liu

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CURRENT POSITION

University of California — Berkeley, CA
Postdoctoral Fellow — 2021-Present

EDUCATION

University of Georgia — Athens, GA
Postdoctoral Fellow — 2020-2021

University of Georgia — Athens, GA
Ph.D., Chemistry — 2016-2020
Dissertation: Isolation and characterization of circulating tumor cells and tumor-derived exosomes using ferrohydrodynamic techniques in microfluidic systems
Dissertation Advisors: Leidong Mao, Ph.D., Jin Xie, Ph.D.

Purdue University — West Lafayette, IN
B.S., Chemistry — 2014

AWARDS AND HONORS

NSF Award # 1713746 — 2021
Measuring and Modeling How Clocks in Single Cells Communicate: an interdisciplinary apporach

Professional Development Support Fund (PDA) — 2020-2021
University of Georgia

Innovative and Interdisciplinary Research Grants — 2017,2019,2020
University of Georgia

REU Annual Award for Excellence in Mentorship — 2018,2020
CMaT Annual Retreat

W.H. Peterson Award, ACS — 2019
ACS international conference

TEACHING EXPERIENCE

Teaching Assistant, University of Georgia 2016-2017
Courses: General Chemistry, Learning Disabilities, Introduction to Chemistry Experiments

Mentor of REU University of Georgia 2017,2018
Supervision of REU participants' independent research

Advisor of CMaT, University of Georgia 2019, 2020
Teaching research skills and mentor independent research of undergraduate students

RESEARCH EXPERIENCE

University of California, Berkeley Berkeley, CA
Postdoctoral Fellow; Advisor: Amy Herr 2021-Present
Development of microfluidic techniques for single cell protein analysis.

University of Georgia Athens, GA
Postdoctoral Fellow; Advisor: Leidong Mao 2020-2021
Development of microfluidic techniques for the evaluation of CAR T-cell potency

- Design microfluidic device to study the activation status of CAR T-cell
- Evaluate the cytotoxicity of CAR T-cell of different subtypes
- Analyze the live/dead of CAR T-cells based on the cell stiffness

University of Georgia Athens, GA
Graduate Researcher; Advisor: Leidong Mao 2016-2020
Development of cancer migration models using ferrohydrodynamic microfluidic techniques

- Develop and synthesize ferrofluid, a colloid of iron oxide nanoparticles, to isolate cancer metastasis carriers from patient blood
- Design a microfluidic device (iFCS) to isolate circulating tumor cells using ferrohydrodynamic techniques, which incorporate the ferrofluid nanoparticles and magnetic beads to achieve a 99.2% recovery rate and 4.0-log WBCs depletion
- Apply ferrofluid to separate nanoscale bioparticles (e.g. exosomes) using FerroChip with a high recovery rate (94.3%) and a high purity (87.9%)
- A single-cell migration device (MChip) was developed to study the intrinsic difference in cancer cell lines in the cell responsible for chemoattractant and further purify the CTC sample isolated using iFCS device

Purdue University West Lafayette, IN
Undergraduate Research; Advisor: Mary J. Wirth 2012-2013
Use silica nanoparticle to develop sensors for biomarkers and medical test

Shandong RuZi Food Development Co., Ltd Zaozhuang, China
Director of Research 2014-2016
Development of wine and ferment using local fruit

- Improve the fermentation process to deplete the amount of methanol in wine
- Optimize the baking technique of jujube snack
- Develop a technique to store the red wine without sulfur dioxide

CONFERENCE PRESENTATIONS

Liu, Y. (2021). A Microfluidic Assay for High-Performance Characterization of Motile Circulating Tumor Cells. MicroTAS, Palm Springs, CA

Liu, Y. (2021). Simultaneous Biochemical and Functional Phenotyping of Single Circulating Tumor Cells Using Ultrahigh Throughput Microfluidic Devices. MicroTAS, Palm Springs, CA

Liu, Y. (2021). Label-Free Inertial-Ferrohydrodynamic Cell Separation With High Throughput and Resolution. MicroTAS, Palm Springs, CA

Liu, Y. (2021). Label-free ferrohydrodynamic separation of exosome-like nanoparticles. ACS, Virtual

Liu, Y. (2020). Ferromagnetic Microfluidic Device for CAR T-Cell Potency Monitoring. BMES , Virtual.

Liu, Y. (2020). Label-free Isolation of T-cells Using Ferrohydrodynamic Microfluidic Technique. BMES, Virtual.

Liu, Y. (2020). Label-Free Ferrohydrodynamic Separation of Exosome-Like Nanoparticles. CMat meeting, Virtual.

Liu, Y. (2020). Microfluidic Chamber Device to Test Quorum Sensing Theory. MicroTAS 2020, Virtual.

Liu, Y. (2020). Ferrohydrodynamic Cell Separation on a Microfluidic Chip. Analytical Seminar, Athens, GA.

Liu, Y. (2019). Cell Size Variation-Inclusive, Tumor Antigen-Independent Enrichment of Viable Circulating Tumor Cells. American Chemical Society 257, Orlando, FL

Liu, Y. (2019). A Microfluidic-based device for study of circulating tumor cells migration under Chemoattractant Effect. Riverbend Research Highlight Series, Athens, GA

Liu, Y. (2019). Cell Size Variation-Inclusive, Tumor Antigen-Independent Enrichment of Viable Circulating Tumor Cells. RBC Research Collective 2019, Athens, GA

Liu, Y., KL Logun M, (2019). Novel Flow-Based Microfluidic Platform and Endotheliazation. CMaT meeting, Atlanta, GA.

Liu, Y., KL Logun M, Zhao W, Mao L (2019). Microfluidics Platform for Evaluating CAR-T cell Potency. CMaT meeting, Atlanta, GA.

Liu, Y., R Fitzgerald, M. Logun, C. Tondepu, Mao L (2019). Optimization of a 3-Dimensional Microfluidic Platform Modeling GBM Immune Evasion. CMat meeting, Atlanta, GA

Liu, Y., K. Forouhesh, M. Hedlund, D. Henson, Mao L (2018). Portable Low-Cost Blood Flow Monitor Using Laser Speckle Contrast Imaging. BMES, Atlanta, GA.

PEER-REVIEWED PUBLICATIONS

Liu, Y., and Mao, L (2021). Fundamentals of integrated ferrohydrodynamic cell separation in circulating tumor cells isolation. **Lab on a Chip.**

Liu, Y., and Mao, L (2021). Label-free inertial-ferrohydrodynamic cell separation with high throughput and resolution. **Lab on a Chip**

Liu, Y., and Mao, L (2021). A microfluidic assay for high-performance isolation and characterization of circulating tumor cells. **In preparation.**

Liu, Y., and Mao, L (2021). Simultaneous biochemical and functional phenotyping of single circulating tumor cells using ultrahigh throughput and recovery microfluidic devices**. Lab on a Chip**

Liu, Y., Zhao, W., and Mao, L (2020). Label-free ferrohydrodynamic separation of exosome. **Lab on a Chip.**

Zhao, W., **Liu, Y.**, Cheng, R., and Mao, L (2019). Tumor antigen-independent and cell size variation-inclusive enrichment of viable circulating tumor cells. **Lab on a Chip**.

S Herrlinger, Q Shao, M Yang, Q Chang, **Y Liu**, X Pan, H Yin, LW Xie (2019). Lin28-mediated temporal promotion of protein synthesis is crucial for neural progenitor cell maintenance and brain development in mice

Ghuman, A., Zhou, Y., **Liu, Y.**, and Mao, L (2018). Bacteriophage-Assisted Magnetic Separation and Electrochemical Detection of Pathogenic Bacteria from Food Matrix. **ECS Transactions**.

RELEVANT SKILLS

- Biological sample manipulation: cancer cell isolation from blood, exosome enrichment, study of cell invasive properties
- MEMS techniques: microfluidic device design, fabrication, simulation, and optimization
- Photolithography and soft lithography, using MA-6, Spin-coater, Plasma, E-beam
- Nanoparticle synthesis: ferrofluid
- Engineering software, including AutoCAD, Solidworks, Origin, COMSOL, and Python
- Data collection and analysis with MATLAB