

Yuchuan Miao, Ph.D.

Postdoctoral Fellow

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EDUCATION

Doctor of Philosophy, Biochemistry and Cell Biology

January 2019, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

Bachelor of Science, Chemistry

June 2011, Nankai University, Tianjin, China

RESEARCH

Postdoc research fellow. February 2019 – present, Harvard Medical School and Brigham and Women's Hospital, Boston, Massachusetts, USA

I use pluripotent stem cells to develop organoid models of human development and dissect mechanisms of patterning during embryonic somite formation.

Mentor: Dr. Olivier Pourquié

Visiting student. October 2017 – March 2018, Institut Curie, Paris, France

I used micro-fabricated devices to study the roles of mechanics in cell migration.

Mentor: Dr. Matthieu Piel

Graduate student. September 2011 – January 2019, Department of Cell Biology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA

My research focused on the molecular basis of signaling waves found at the cortex of single cells and their roles in cell migration.

Mentors: Dr. Peter Devreotes and Dr. Takanari Inoue

Undergraduate student. June 2009 – June 2011, State Key Laboratory of Elemento-organic Chemistry, Nankai University, Tianjin, China

I studied the interactions between subunits of *E. coli* acetohydroxyacid synthase.

Mentor: Dr. Zhen Xi

HONORS AND AWARDS

- 2023 Development Journal's **Pathway to Independence programme**
- 2023 **NIH Pathway to Independence K99/R00** Award
- 2022 **Rising Stars in Engineering in Health**, Columbia & Johns Hopkins University
- 2022 **Top three trainee award**, Harvard Stem Cell Institute (HSCI)
- 2022 Travel and Merit award, International Society for Stem Cell Research (ISSCR)
- 2018 Travel award, FASEB Research Conference on Phospholipids
- 2018 **Michael A. Shanoff Research Award**, Johns Hopkins University
- 2014 Lewis Travel Award, Dept of Cell Biology, Johns Hopkins School of Medicine
- 2009 1st class scholarship, Nankai University

PUBLICATIONS

- First-author manuscripts:

[1] **Miao Y**, Djeflal Y, De Simone A, Zhu K, Lee JG, Lu Z, Silberfeld A, Rao J, Tarazona OA, Mongera A, Rigoni P, Diaz-Cuadros M, Song L, Di Talia S, Pourquié O. *Reconstruction and deconstruction of human somitogenesis in vitro*.

Nature (2022). PMID: PMC10018515

[2] **Miao Y**, Bhattacharya S, Banerjee T, Abubaker-Sharif B, Long Y, Inoue T, Iglesias P, Devreotes P.

Wave patterns organize cellular protrusions and control cortical dynamics.

Molecular Systems Biology (2019). PMID: PMC6413885

[3] **Miao Y**, Bhattacharya S, Edwards M, Cai H, Inoue T, Iglesias P, Devreotes P.

Altering the threshold of an excitable signal transduction network changes cell migratory modes. **Nature Cell Biology** (2017). PMID: PMC5394931

- Other contributions:

[4] Yang Q, **Miao Y**, Banerjee P, Hourwitz M, Hu M, Qing Q, Iglesias P, Fourkas J, Losert W, Devreotes P. *Nanotopography modulates intracellular excitable systems through cytoskeleton actuation*. **PNAS** (2023). PMID: 37126708

[5] Banerjee T, Biswas D, Pal D, **Miao Y**, Iglesias P, Devreotes P. *Spatiotemporal dynamics of membrane surface charge regulates cell polarity and migration*.

Nature Cell Biology (2022). PMID: PMC10029748

[6] Yang Q, **Miao Y**, Campanello L, Hourwitz M, Abubaker-Sharif B, Bull A, Devreotes P, Fourkas J, Losert W. *Cortical waves mediate the cellular response to electric fields*. **eLife** (2022). PMID: PMC8942472

- [7] Ghabache E, Cao Y, **Miao Y**, Groisman A, Devreotes PN, Rappel WJ. *Coupling traction force patterns and actomyosin wave dynamics reveals mechanics of cell motion*. **Molecular Systems Biology** (2021). PMID: PMC8666840
- [8] Bhattacharya S, Banerjee T, **Miao Y**, Zhan H, Devreotes P, Iglesias P. *Traveling and standing waves mediate pattern formation in cellular protrusions*. **Science Advances** (2020). PMID: PMC7413732
- [9] Li X, **Miao Y**, Pal D, Devreotes P. *Excitable networks controlling cell migration during development and disease*. **Seminars in Cell & Developmental Biology** (2020). PMID: PMC7071959
- [10] Cao Y, Ghabache E, **Miao Y**, Niman C, Hakozaki H, Reck-Peterson S, Devreotes P, Rappel W. *A minimal computational model for three-dimensional cell migration*. **Journal of The Royal Society Interface** (2019). PMID: PMC6936042
- [11] Pal DS, Li X, Banerjee T, **Miao Y**, Devreotes PN. *The excitable signal transduction networks: movers and shapers of eukaryotic cell migration*. **The International Journal of Developmental Biology** (2019). PMID: PMC6956983
- [12] Devreotes P, Bhattacharya S, Edwards M, Iglesias P, Lampert T, **Miao Y**. *Excitable Signal Transduction Networks in Directed Cell Migration*. **Annual Review of Cell and Developmental Biology** (2019). PMID: PMC5792054

- Preprints:

- [13] Banerjee T, Matsuoka S, Biswas D, **Miao Y**, Pal D, Kamimura Y, Ueda M, Devreotes P, Iglesias P. *A dynamic partitioning mechanism polarizes membrane protein distribution*. [bioRxiv] (2023) DOI: 10.1101/2023.01.03.522496

PRESENTATIONS

Talk at the Virtual Gastrulation Zoom Talks. November 3, 2022

Talk at the Santa Cruz Developmental Biology conference (SCDB). August 19, 2022

Talk at the annual conference of International Society for Stem Cell Research (ISSCR). June 17, 2022

Talk at the annual retreat of Harvard Stem Cell Institute (HSCI). May 20, 2022

Talk at the Young Embryologist Network (YEN) annual conference. May 16, 2022

Poster at FASEB Research Conference on Phospholipids. 2018

Poster at International Dictyostelium conference. 2018

Invited talk at Max-Planck-Institute for Dynamics and Self-Organization, Göttingen, Germany. 2018

Talk at the annual retreat of Department of Biological Chemistry, Johns Hopkins University School of Medicine. 2018

Poster at American Society of Cell Biology (ASCB) annual meeting. 2017

Poster at Society of General Physiologists meeting. 2017

Poster at Gordon Research Conference on directed cell migration. 2017

Poster at American Society of Cell Biology (ASCB) annual meeting. 2015

Poster at Biophysics Society annual meeting. 2015

Poster at Gordon Research Conference on directed cell migration. 2015

TEACHING AND MENTORING

Teaching assistant for Cell physiology at Johns Hopkins Medical School. Baltimore, 2015, 2016 & 2018

Teaching assistant for Metabolism at Johns Hopkins Medical School. Baltimore, 2013

Mentoring students in the lab. Graduate students: Tatsat Banerjee, Xiaoguang Li, David Zhan, Brady Goulden, Annie A. Wu, Yannis Djefal. Undergraduate/summer students: Pedro Gomez, Amine Bouchekioua.

Peer mentor for junior postdocs in the Mentoring Circles Program (MCP) of Brigham and Women's Hospital. Boston, 2022-2023.

SERVICE

Lab tutor for Hinton Scholars Program, an after-school program designed to enhance high school students' understanding of biology. Boston, 2022-2023

Volunteer for "MERIT", a non-profit preparing talented teenagers for careers in medicine. Baltimore, 2014-2015

Team leader for "Thread", a non-profit helping underperformed high school students graduate and go to college; Awarded twice as "Leader of the month". Baltimore, 2012-2013