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DEVELOPMENTAL BIOLOGY PROGRAM

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Research



Alexandra Joyner, PhD
Courtney Steel Chair in Pediatric Cancer Research

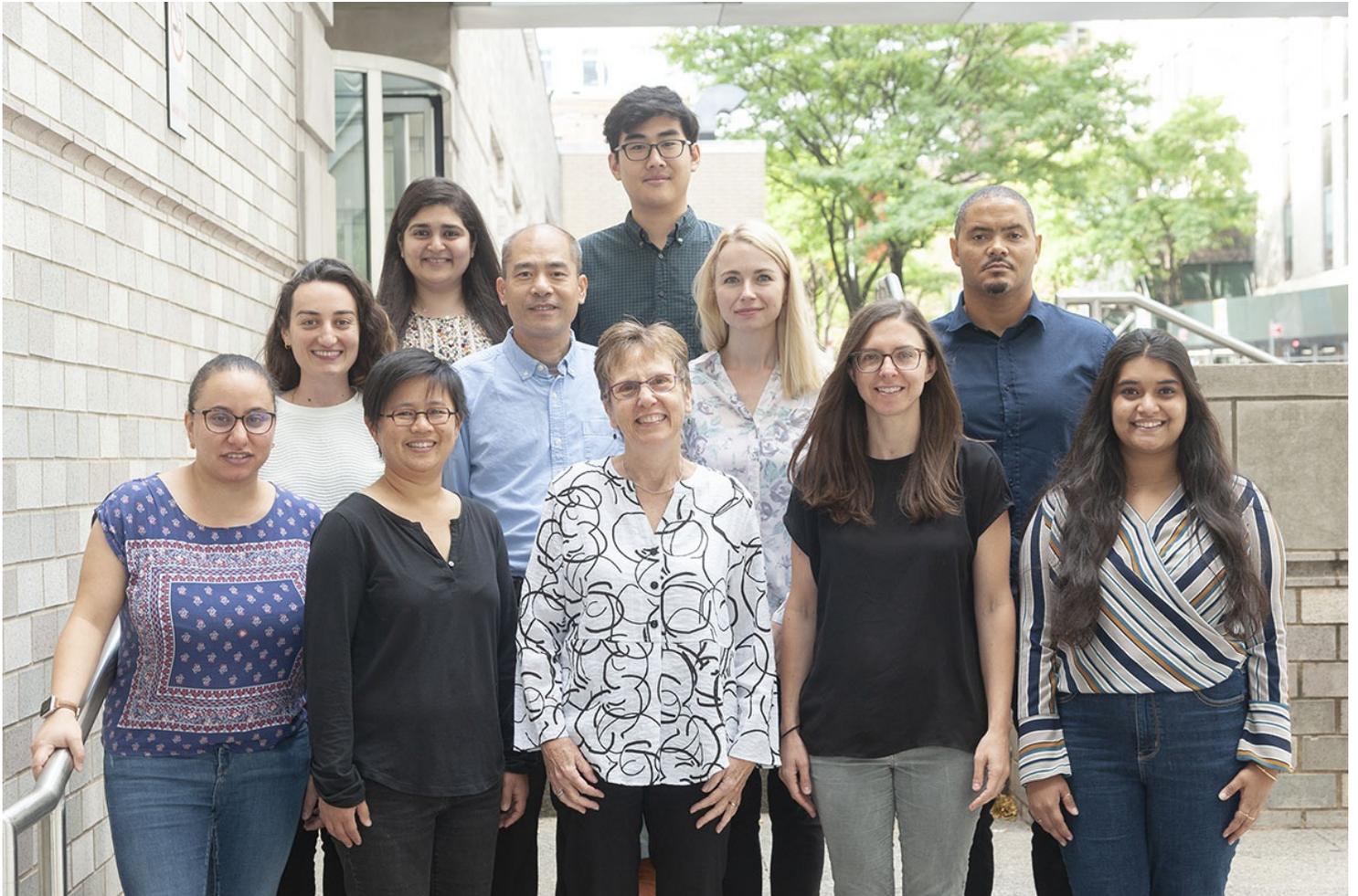
The Joyner lab studies how genes regulate the cell behaviors (proliferation, differentiation, migration) that underlie organ development, tissue repair and cancer. They focus on the brain where stem cells must produce hundreds of cell types at the right times and in the correct numbers, and the cells then migrate to the correct positions and synapse with partners. The lab uses sophisticated mouse genetics approaches to probe how cell-cell communication and cell intrinsic genetic programs determine the way by which normal cerebellar circuitry is established and regulates behaviors, or are disrupted in diseases including cancer.

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Research Projects

[Cerebellum development and regeneration](#)

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Featured News



[At Work: Developmental Biologist Alexandra Joyner](#)

Alexandra Joyner, a global leader in mouse developmental genetics, studies how the body's natural stem cells might be harnessed to fight disease.



[Alexandra Joyner Elected to the Institute of Medicine](#)

Alexandra L. Joyner have been elected members of the Institute of Medicine.

Publications Highlights

[Bayin N, Sumru, Mizrak Dogukan, Stephen Daniel N., Lao Zhimin, Sims Peter A., Joyner Alexandra L.. Injury-induced ASCL1 expression orchestrates a transitory cell state required for repair of the neonatal cerebellum. *Science Advances*. 2021 December; 7\(50\):eabj1598. doi: 10.1126/sciadv.abj1598.](#)

[Tan IL, Arifa RDN, Rallapalli H, Kana V, Lao Z, Sanghrajka RM, Sumru Bayin N, Tanne A, Wojcinski A, Korshunov A, Bhardwaj N, Merad M, Turnbull DH, Lafaille JJ, Joyner AL. CSF1R inhibition depletes tumor-associated macrophages and attenuates tumor progression in a mouse sonic Hedgehog-Medulloblastoma model. *Oncogene*. 2020 Jan;40\(2\):396-407. doi: 10.1038/s41388-020-01536-0. Epub 2020 Nov 6. PubMed PMID: 33159168; PubMed Central PMCID: PMC7855734.](#)

[Lawton, A., Engstrom, T., Rohrbach, D., Mamou, J., Turnbull, D.H., Zhang, T., Schwarz, J. and Joyner, A.L. \(2019\) Brain folding is initiated by mechanical constraints on a fluid-like layer without a cellular pre-pattern. *eLife*, 8. pii: e45019.](#)

[Willett, R.T*, Bayin, N.S.* , Lee, A.S.* , Krishnamurthy, A.* , Wojcinski, A.* , N., N.S., Lao, Z., Stephen, D., Rosello-Diez, A., Dauber, K.L., Orvis, G.D., Wu, Z., Tessier-Lavigne, M. and Joyner, A.L. \(2019\) Cerebellar nuclei excitatory neurons regulate developmental scaling of presynaptic Purkinje cells and organ growth. *eLife*, Nov 19;8. pii: e50617](#)

[Wojcinski, A., Lawton, A., Bayin, N.S., Lao, Z., Stephen, D. and Joyner, A.L. \(2017\) Cerebellar granule cell replenishment post-injury by adaptive reprogramming of Nestin+ progenitors. *Nature Neuroscience*, 20:1361-1370.](#)

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People

Alexandra Joyner, PhD

Courtney Steel Chair in Pediatric Cancer Research

The Joyner laboratory studies the involvement of Hedgehog signaling and transcription factors in cerebellum development, regeneration and cancer.

PhD, University of Toronto

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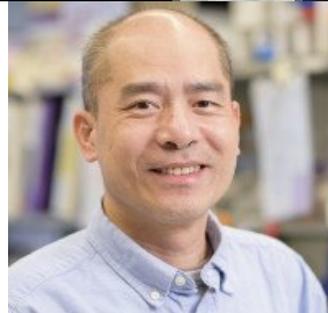
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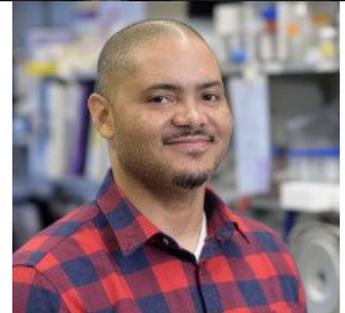
Members



Cara Monaco
SKI Lead Admin



Zhimin (Jimmy)
Lao



Daniel Stephen
Senior Research
Technician

Lab Affiliations

+

Achievements

Elected Fellow, American Academy of Arts and Science (2007)

President-elect, President, past-President Society for Developmental Biology (2009-2012)

Elected Member, National Academy of Medicine (2009)

NIMH MERIT Investigator (2014-2023)

Awarded the International Society for Transgenic Technology Prize (2020)

Read more

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Doctors and faculty members often work with pharmaceutical, device, biotechnology, and life sciences companies, and other organizations outside of MSK, to find safe and effective cancer treatments, to improve patient care, and to educate the health care community.

MSK requires doctors and faculty members to report (“disclose”) the relationships and financial interests they have with external entities. As a commitment to transparency with our community, we make that information available to the public.

Alexandra Joyner discloses the following relationships and financial interests:

American Association for the Advancement of Science (AAAS)

Professional Services and Activities

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