Alex Joyner, PhD, is an emeritus member of Sloan Kettering Institute. From 2006-2025 she was a Member of the Developmental Biology Program and the Courtney Steel Chair in Pediatric Cancer Research. Her work focused on the genetic regulation of cell behaviors that underlie organ development, as well as how cell characteristics are changed during tissue repair and cancer progression. Much of her work was dedicated to understanding how the cerebellum, a brain structure that regulates motor and nonmotor behaviors, is assembled during development. Her lab used sophisticated mouse genetics approaches to define how cell-cell communication and cell intrinsic genetic programs come together to sculpt the cerebellar circuit from several neural stem cell populations present in the embryo and neonate. They generated an array of mouse models, available from Jackson labs, to study the functions of the Engrailed genes and the Hedgehog signaling pathway in organ development, regeneration and cancer.

Alex Joyner was born in Toronto Canada and received her PhD from the University of Toronto (Department of Medical Biophysics, Ontario Cancer Institute). During postdoctoral work with Gail Martin at the University of California, San Francisco she cloned the mouse Engrailed genes and began

studying their functions. As a Senior Scientist for eight years at the Samuel Lunenfeld Research Institute of Mount Sinai Hospital, Toronto, her group cloned the *Gli* genes and began developing mouse genetics techniques for studying gene functions and cell behaviors. In 1994 she was recruited to become the founding Coordinator of the Developmental Genetics Program at the Skirball Institute of Biomolecular Medicine of New York University School of Medicine.

Looking Back, Looking Ahead With MSK Developmental Biologist Alexandra Joyner

Developmental biologist Dr. Alexandra Joyner reflects on her career and talks about the new passions she looks forward to pursuing in retirement.

Learn more

Selected Recent Publications

Liang Y, Koche R, Chalamalasetty RB, Stephen DN, Kennedy MW, Lao Z, Pang Y, Kuo YY, Lee M, Lobo FP, Huang X, Hadjantonakis AK, Yamaguchi TP, Anderson KV, Joyner AL. Transcription factors SP5 and SP8 drive primary cilia formation in mammalian embryos. Science. 2025 Aug 28;389(6763):eadt5663. doi: 10.1126/science.adt5663. Epub 2025 Aug 28. PubMed PMID: 40875857

Lee, A.S., Arefin, T.M., Gubanova, A., Stephen, D., Liu, Y., Lao, Z., Krishnamurthy, De Marco García, N.V., Heck, D,H., Zhang, J., Rajadhyaksha, A.M., A. and Joyner, A.L. (2025) Cerebellar output neurons can impair non-motor behaviors by altering development of extracerebellar connectivity. *Nature Communications*, 16:1858.

Krishnamurthy, A., Lee, A.S., Bayin, N.S., Stephen, D.N., Nasef, O., Lao, Z. and Joyner, A.L. (2024) Engrailed transcription factors direct excitatory cerebellar neuron diversity and survival. *Development*, 24:dev202502.

Sanghrajka, R.M., Koche, R., Medrano, H., El Nagar, S., Stephen, D.N., Lao, Z., Bayin, N.S., Ge, K. and Joyner, A.L. (2023) KMT2D suppresses Sonic Hedgehog-driven medulloblastoma progression and metastasis. *iScience*, 26(10):107831.

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.

Review Articles

- Joyner, A.L. and Bayin, N.S (2022) Cerebellum lineage allocation, morphogenesis and repair; impact of interplay amongst cells. *Development*, 149:dev185587.
- Joyner, A.L., Ortigão-Farias3, J.R. and Kornberg, T. (2024) Conserved roles of Engrailed: patterning tissues and specifying cell types. Invited Perspective, *Development*, 151, dev204250

Honors

- Elected Fellow, American Academy of Arts and Science (2007)
- President Society for Developmental Biology (2010-2011)
- Elected Member, National Academy of Medicine (2009)
- NIMH MERIT Investigator (2014-2023)
- Awarded the International Society for Transgenic Technology Prize (2020)
- Elected Member, American Association for the Advancement of Science (2021)

View a full listing of Alexandra Joyner's publications