

Jongmin J. Kim, PhD

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SCIENTIFIC OVERVIEW

I am a developmental geneticist investigating chromatin mechanisms for transcriptional fidelity.

The genome has numerous sites to initiate transcription, but a cell uses only a subset of those sites. I am interested in how chromatin structure and organization are modified to prevent spurious transcription. In particular, I investigate how a burst of testis-specific transcription in spermatocytes is tightly regulated by Polycomb and Kungang (ZFP)/CHD4 complexes. My lab explores the evolutionarily conserved repressive mechanisms safeguarding germ cell fate using flies and mice as model systems.

EDUCATION

- Ph.D. in Chemical and Systems Biology 2008 – 2015
Stanford University (Advisor: Dr. Margaret Fuller)
- B.S. in Life Science 2000 – 2007
Pohang University of Science and Technology (POSTECH), South Korea (Served in the Korean army 2003 – 2005)
(Advisor: Dr. Sung Ho Ryu)

PROFESSIONAL EXPERIENCE

- Assistant Professor, Department of Biomedical Sciences 2024 – present
College of Veterinary Medicine, Cornell University
- Research fellow, Dept. of Molecular Biology, Massachusetts General Hospital and Department of Genetics, Harvard Medical School 2016 – 2024
(Advisor: Dr. Robert Kingston)
- Postdoctoral fellow, Department of Developmental Biology, Stanford University 2015 – 2016
(Advisor: Dr. Margaret Fuller)
- Research assistant, Systems Biology lab. POSTECH, South Korea 2007 – 2008
(Advisor: Dr. Daehee Hwang)

HONORS AND AWARDS

- Urology Research Scholar Award from the American Urological Association 2019 – 2021
(*\$40,000/year for two years*)
- Bruce and Elizabeth Dunlevie Stanford Interdisciplinary Graduate Fellowship 2011 – 2014
(*Full tuition and stipend for three years, total >\$160,000*)
- Anne T. and Robert M. Bass Stanford Graduate Fellowship 2008 – 2011
(*Full tuition and stipend for three years, total \$199,030*)

PUBLICATIONS

- DE Harris, **JJ Kim**, SR Stern, HM Vicars, NR Matias, L Gallicchio, CC Baker, MT Fuller (2024) An RNA binding regulatory cascade controls the switch from proliferation to differentiation in the Drosophila male germ line stem cell lineage. *BioRxiv (In revision, PNAS)*
- **JJ Kim**, ER Steinson, MS Lau, DG de Rooij, DC Page, RE Kingston (2023) Cell type-specific role of CBX2 and its disordered region in spermatogenesis. *Genes & Development* 37 (13-14), 640-660
- **JJ Kim**, RE Kingston (2022) Context-specific Polycomb mechanisms in development. *Nature Reviews Genetics* 23 (11), 680-695 (Review)
- SA Miller, M Damle, **J Kim**, RE Kingston (2021) Full methylation of H3K27 by PRC2 is dispensable for initial embryoid body formation but required to maintain differentiated cell identity. *Development* 148 (7), dev196329
- **J Kim**, RE Kingston (2020) The CBX family of proteins in transcriptional repression and memory. *Journal of biosciences* 45, 1-8 (Perspective)
- AJ Plys*, CP Davis*, **J Kim**, G Rizki, MM Keenen, SK Marr, RE Kingston (2019) Phase separation of Polycomb-repressive complex 1 is governed by a charged disordered region of CBX2. *Genes & development* 33 (13-14), 799-813
- **J Kim**, C Lu, S Srinivasan, S Awe, A Brehm, MT Fuller (2017) Blocking promiscuous activation at cryptic promoters directs cell type-specific gene expression. *Science* 356 (6339), 717-721
- CS Lee, **JM Kim**, J Ghim, PG Suh, SH Ryu (2015) GTP-dependent interaction between phospholipase D and dynamin modulates fibronectin-induced cell spreading. *Cellular Signalling* 27 (12), 2363-2370
- C Lu, **J Kim**, MT Fuller (2013) The polyubiquitin gene Ubi-p63E is essential for male meiotic cell cycle progression and germ cell differentiation in Drosophila. *Development* 140 (17), 3522-3531
- ML Insko*, AS Bailey*, **J Kim**, GH Olivares, OL Wapinski, CH Tam, MT Fuller (2012) A Self-Limiting Switch Based on Translational Control Regulates the Transition from Proliferation to Differentiation in an Adult Stem Cell Lineage. *Cell Stem Cell* 11 (5), 689-700
- P Vitorino*, M Hammer*, **J Kim**, T Meyer (2011) A steering model of endothelial sheet migration recapitulates monolayer integrity and directed collective migration. *Molecular and cellular biology* 31 (2), 342-350
- BS Hong, JH Cho, H Kim, EJ Choi, S Rho, **J Kim**, JH Kim, DS Choi, ..., D Hwang, YS Gho (2009) Colorectal cancer cell-derived microvesicles are enriched in cell cycle-related mRNAs that promote proliferation of endothelial cells. *BMC genomics* 10 (1), 556

* denotes co-first authors.

<https://www.ncbi.nlm.nih.gov/myncbi/browse/collection/44193130/?sort=date&direction=descending>

TALKS (selected)

- Cornell Reproductive Sciences Center Seminar Series (Ithaca, NY) 2024
 - *Gene silencing mechanisms safeguarding germ cell fate*
- New England American Urological Association meeting (Burlington, VT / Virtual) 2021
 - *Chromatin Compaction by the Polycomb Group Protein CBX2 in the Male Germ Line*
- California DREAM complex meeting (Stanford, CA) 2015
 - *Stage-specific transcriptional repression directs selective gene upregulation by preventing promiscuous activity of tMAC*
- Drosophila research conference (Chicago, IL) 2015
 - *A cell type specific transcriptional repressor directs selective upregulation of terminal differentiation program*
- Cold Spring Harbor meeting, Stem cell biology (CSH, NY) 2013
 - *A cell type specific transcriptional repressor directs proper differentiation in an adult stem cell lineage*

RESEARCH SUPPORT

CURRENT

- Cornell startup fund 2024 - present
- Center for Vertebrate Genomics (CVG) Seed Grant (Role: PI; Direct \$20,000) 2024
(Collaborator: Charles Danko)
- Cornell Reproductive Sciences Center (CoRe) P50 NCTRI Seed Grant 2024
(Role: PI; Direct \$50,000 x 2 years)

SUBMITTED

TEACHING AND MENTORING

CURRENT LAB MEMBERS

- Jingzhi Zhang (Postbac Technician) 2024 – present
- Erin Brown (Postbac Technician) 2024 – present

ROTATION STUDENTS

- Helen Scanlon (Genetics, Genomics and Development) 2024
- Hongjiang Liu (Biochemistry, Molecular and Cell Biology) 2025

THESIS COMMITTEE

- Saloni Dhopte (Paula Cohen and Charles Danko labs) 2024 - present

PRIOR TO CORNELL

- Mentored one postbac student: Emma Steinson (Kingston lab) 2020 – 2022
- Mentored four rotation students (Kingston lab) 2017, 18, 21, 23

- Volunteer tutor at Enroot (<http://www.enrooteducation.org>) 2016 – 2018
(Tutored chemistry, organic chemistry, and anatomy once per week for immigrant students at Cambridge Rindge and Latin School.)
- Teaching assistant, Stanford University (Stanford, CA) Spring quarter, 2013
HumBio157 – the biology of stem cells
(Course directors: Dr. Margaret Fuller and Dr. Roel Nusse)
- Mentored two rotation students (Fuller lab) 2013, 2014

SERVICE

JOURNAL SERVICE – *ad hoc* reviewer
PNAS, Molecular Cell

COMMITTEE

- Admissions committee for the Biomedical & Biological Sciences (BBS) PhD Program 2024 – 2025

SCIENCE COMMUNITY

- Organizer – MGH Epigenetics Journal Club 2023 – 2024
(<https://genetics.mgh.harvard.edu/epigenetics/>)