

Christine Field

Department of Systems Biology
Harvard Medical School
200 Longwood Ave, WAB544A
Boston, MA 02115
christine_field@hms.harvard.edu

EDUCATION

Northeastern University, Boston, MA
B.S. in Biology, 1976

Princeton University, Princeton, NJ
M.A. in Biology/Genetics, 1978. Advisor: Tom Cline
Thesis: Sex determination in *Drosophila melanogaster*.

Harvard University, Cambridge, MA
Ph.D. in Cell and Developmental Biology, 2007. Advisor: Marc Kirschner
Thesis: Genetic and Biochemical Studies of Cytokinesis.

EMPLOYMENT

- 1978–1997: Staff Research Associate/Research Specialist, Department of Biochemistry, UCSF
Research on actin and microtubule cytoskeleton in *Drosophila melanogaster*.
- 1997–2007: Research Associate, Department of Cell Biology Harvard Medical School, Boston, MA
Cytokinetic contractile ring assembly, with a focus on the conserved cleavage furrow proteins anillin and septins.
- 2007–present: Lecturer, Department of Systems Biology, Harvard Medical School, Boston, MA
Research using *Xenopus* egg extracts as a model system for understanding the dynamics of cell cytoplasm, with a focus on how syncytial cells are organized and reconstitution of cytokinesis signaling in a cell-free system.
- 2013–2016: Adjunct Assistant Scientist. Eugene Bell Center for Regenerative Biology and Tissue Engineering, Marine Biological Labs, Woods Hole, MA
-

COMMUNITY SERVICE

- 2005–2015: Board of Reviewing Editors, Molecular Biology of the Cell.
- 2009–2012: Board member, Children's School of Science, Woods Hole, MA
- 2012–2018: Science Co-Chair, Children's School of Science, Woods Hole, MA
- 2018 – present: Ad Hoc Technology Committee Member, Children's School of Science, Woods Hole, MA
-

PROFESSIONAL MEMBERSHIPS

- 1990–present: American Society of Cell Biology.
- 2000–2013: Marine Biological Laboratory Corporation Member
- 2014–present: Marine Biological Laboratory Society Member
-

MBL SUMMER RESEARCH AWARDS

- 2010: Marine Biological Laboratory Associates Research Award.
- 2011: The Laura and Arthur Colwin Endowed Summer Research Fellowship Fund Award
- 2012: Ann E. Kammer Memorial Fellowship Fund Award and the Laura and Arthur Colwin Endowed Research Fellowship.
- 2013: Evelyn and Melvin Spiegel Fellowship Award and the Laura and Arthur Colwin Endowed Summer Research Fellowship Fund.
- 2014: The Laura and Arthur Colwin Endowed Summer Research Fellowship Fund
-

SELECTED RECENT CONFERENCE PRESENTATIONS

- 2014: International Xenopus meeting, Asilomar, CA. Co-Organizer
- 2014: ASCB Special Interest Subgroup: Frontiers of Cytokinesis. Philadelphia, PA. Invited speaker.
- 2016: ASCB Meeting, San Francisco, CA. Poster presenter.
- 2017: Gordon Research Conference: Motile and Contractile Systems. New London, NH. Invited speaker
- 2018: Cytokinesis: the final step in cell division. Les Treilles, France. Invited speaker.
- 2018: Marine Fungi Workshop (Sponsored by the Moore Foundation) Marine Biological Laboratory, Woods Hole, MA. Co-organizer and presenter.
- 2018: International Xenopus meeting. Seattle, WA. Invited speaker.
- 2018: ASCB Special Interest Subgroup: Frontiers of Cytokinesis. San Diego, CA. Invited speaker and poster presenter.
- 2019: ASCB Minisymposium: Regulation of Cytokinesis. Washington, DC. Invited speaker.
-

PUBLICATIONS

1. Miller KG, **Field CM**, Alberts BM. (1989) Actin-binding proteins from *Drosophila* embryos: a complex network of interacting proteins detected by F-actin affinity chromatography. *J Cell Biol.* 109(6 Pt 1):2963-75.
 2. Kellogg DR, **Field CM**, Alberts BM. (1989) Identification of microtubule-associated proteins in the centrosome, spindle, and kinetochore of the early *Drosophila* embryo. *J Cell Biol.* 109 (6 Pt1):2977-91
 3. **Field CM**, Alberts BM. (1995) Anillin, a contractile ring protein that cycles from the nucleus to the cell cortex. *J Cell Biol.* 131(1):165-78.
 4. **Field CM**, al-Awar O, Rosenblatt J, Wong ML, Alberts B, Mitchison TJ. (1996) A purified *Drosophila* septin complex forms filaments and exhibits GTPase activity. *J Cell Biol.* 133(3):605-16 PMID: PMC2120824
 5. Aroian R, **Field CM**, Pruliere G, Kenyon C, Alberts B. (1997) Isolation of actin associated proteins from *Caenorhabditis elegans* oocytes and their localization in the early embryo. *EMBO J.* 16:1541-1549.
 6. Frazier JA, Wong ML, Longtine MS, Pringle JR, Mann M, Mitchison TJ, **Field CM**. (1998) Polymerization of purified yeast septins: evidence that organized filament arrays may not be required for septin function. *J Cell Biol.* 143(3):737-49.
 7. Rothwell WF, Fogarty P, **Field CM**, Sullivan W. (1998) Nuclear-fallout, a *Drosophila* protein that cycles from the cytoplasm to the centrosomes, regulates cortical microfilament organization. *Development.* 125(7):1295-303.
 8. Li MG, Serr M, Edwards K, Ludmann S, Yamamoto D, Tilney LG, **Field CM**, Hays TS. (1999) Filamin is required for ring canal assembly and actin organization during *Drosophila* oogenesis. *J Cell Biol.* 146(5):1061-74.
 9. Sisson JC, **Field CM**, Ventura R, Sullivan W. (2000) A novel peripheral golgi protein associates with spectrins and CLIP190 and is required for *Drosophila* cellularization. *J. Cell Biol.* 151:905-918.
 10. Oegema K, Savoian MS, Mitchison TJ, **Field CM**. (2000) Functional analysis of a human homologue of the *Drosophila* actin binding protein anillin suggests a role in cytokinesis. *J Cell Biol.* 150(3):539-52.
 11. Foe VE, **Field CM**, Odell GM. (2000) Microtubules and mitotic cycle phase modulate spatiotemporal distributions of F-actin and myosin II in *Drosophila* syncytial blastoderm embryos. *Development* 127(9):1767-87.
 12. Kinoshita M, **Field CM**, Coughlin ML, Straight AF, Mitchison TJ. (2002) Self- and actin-templated assembly of Mammalian septins. *Dev Cell.* 3(6):791-802.
 13. Eggert US, Kiger AA, Richter C, Perlman ZE, Perrimon N, Mitchison TJ, **Field CM**. (2004) Parallel chemical genetic and
-

- genome-wide RNAi screens identify cytokinesis inhibitors and targets. *PLoS Biol.* 2(12).
14. Vrabioiu AM, Gerber SA, Gygi SP, **Field CM**, Mitchison TJ. (2004) The majority of the *Saccharomyces cerevisiae* septin complexes do not exchange guanine nucleotides. *J Biol Chem.* 279 (4):3111-8.
 15. Royou, A, **Field, CM**, Sisson, JC, Sullivan, W, and Karess, R. (2004) Reassessing the role and dynamics of nonmuscle myosin II during furrow formation in early *Drosophila* embryos. *Mol Biol Cell*, 15:838-50.
 16. **Field CM**, Coughlin M, Doberstein S, Marty T, Sullivan W. (2005) Characterization of anillin mutants reveals essential roles in septin localization and plasma membrane integrity. *Development* 132(12):2849-60.
 17. Straight AF, **Field CM**, Mitchison TJ. (2005) Anillin binds nonmuscle myosin II and regulates the contractile ring. *Mol Biol Cell.* 16(1):193-201.
 18. Monzo P, Gauthier NC, Keslair F, Loubat A, **Field CM**, Le Marchand-Brustel Y, Cormont M. (2005) Clues to CD2-associated protein involvement in cytokinesis. *Mol Biol Cell* 16(6):2891-902.
 19. Bendix, PM, Koenderink, GH, Cuvelier, D, Dogie, Z., Koeleman, BN, Briehar, WM, **Field, CM**, Mahadevan, L., Weitz, DA. (2008) A quantitative analysis of contractility in active cytoskeleton protein networks. *Biophys. J.* 94:3126-3136.
 20. Hu CK, Coughlin, M, **Field, CM**, Mitchison TJ. (2008) Cell polarization during monopolar cytokinesis. *J Cell Biol.* 181(2):195-202.
 21. Cao J, Albertson, R, Riggs, B, **Field CM**, Sullivan, W. (2008) Nuf, a Rab11 effector, maintains cytokinetic furrow integrity by promoting local actin polymerization. *J Cell Biol.* 182(2):301-13.
 22. Maloney KN, Fujita M, Eggert US, Schroeder FC, **Field CM**, Mitchison TJ, Clardy J. (2008) Actin-aggregating cucurbitacins from *Physocarpus capitatus*. *J Nat Prod.* 71(11):1927-9.
 23. Ozlu, N., Monigatti, F., Renard, BY, **Field, CM**, Stein, H., Mitchison, TJ, Steen, JJ. (2010) Binding partner switching on microtubules and Aurora-B in the mitosis to cytokinesis transition. *Molec. Cell. Prot.* 9(2):336-50.
 24. Hu CK, Coughlin M, **Field CM** and Mitchison TJ. (2011) KIF4 regulates midzone length during cytokinesis. *Curr Biol.* 21:815-824.
 25. **Field, CM**, Wuhr, M, Anderson, GA, Kueh, HY, Strickland, D and Mitchison, TJ. (2011) Actin behavior in bulk cytoplasm is cell cycle regulated in early vertebrate embryos. *J. Cell Sci.* 124:2086-2095.
 26. **Field, CM** and Lenart, P. (2011) Bulk cytoplasmic actin and its function in meiosis and mitosis. *Curr Biol.*, 21:R825-830. Invited, peer reviewed mini-review.
 27. Mitchison, TJ, Wuhr, M, Nguyen, P, Ishihara K, Groen, A, **Field, CM**. (2012) Growth, interaction and positioning of microtubule asters in extremely large vertebrate embryo cells. *Cytoskeleton* 69, 738-750.
 28. Wang, S, Romano, FB, **Field, CM**, Mitchison, TJ and Rapoport, TA. (2013). Mechanisms determining ER network morphology during the cell cycle in *Xenopus* egg extracts. *J Cell Biol.* 203(5):801-14.
 29. Nguyen, PA, Groen, AC, Loose, M, Ishihara, K, Wuhr, M, **Field, CM**, Mitchison, TJ. (2014) Spatial organization of cytokinesis signaling reconstituted in a cell-free system. *Science* 346:244-247.
 30. Ishihara, K, Nguyen, PA, Groen, AC, **Field, CM**, Mitchison, TJ. (2014) Microtubule nucleation remote from centrosomes may explain how asters span large cells. *Proc. Natl. Acad. Sci.* 111(50):17715-22.
 31. **Field, C. M.**, Groen, A. C., Nguyen, P. A. and Mitchison, T. J. (2015) Spindle to cortex communication in cleaving, polyspermic *Xenopus* eggs. *Mol Biol Cell* 26:3628-3640.
 32. Nguyen, P. A., **Field, CM** and Mitchison, T. J. (2017) Prc1E and Kif4A control microtubule organization within and between large *Xenopus* egg asters. *Mol Biol Cell* 29:304-316.
 33. **Field, CM**, Pelletier, JF and Mitchison, TJ. (2019) Disassembly of actin and keratin networks by Aurora B Kinase at the midplane of cleaving *Xenopus* eggs. *Curr Biol.* 29:1999-2008.
 34. Mitchison-Field, LMY, Vargas-Muñiz, JM, Stormo, BM, Vogt, EJD, Van Dierdonck, S, Pelletier, FP, Ehrlich, C, Lew, DJ, **Field, CM** and Gladfelter, AS. (2019) Unconventional cell division cycles from marine-derived yeasts. *Curr Biol* 29(20):3439-3456

REVIEWS AND METHODS PAPERS:

1. Sanders SL, **Field CM**. (1994) Cell division. Septins in common? *Curr Biol.* 4(10):907-8.
2. Sanders SL, **Field CM**. (1995) Cell division. Bud-site selection is only skin deep. *Curr Biol.* 5(11):1213-5.
3. Frazier JA, **Field CM**. (1997) Actin cytoskeleton: are FH proteins local organizers? *Curr Biol.* 7(7):R414-7.
4. **Field CM**, Li R, Oegema KF. (1999) Cytokinesis in eukaryotes: a mechanistic comparison. *Current Opinions in Cell Biology.* 11:68-80.

5. **Field CM**, Kellogg D. (1999) Septins: cytoskeletal polymers or signalling GTPases? *Trends Cell Biol.* 9(10):387-94.
6. Macara IG, Baldarelli R, **Field CM**, Glotzer M, Hayashi Y, Hsu SC, Kennedy MB, Kinoshita M, Longtine M, Low C, Maltais LJ, McKenzie L, Mitchison TJ, Nishikawa T, Noda M, Petty EM, Peifer M, Pringle JR, Robinson PJ, Roth D, Russell SE, Stuhlmann H, Tanaka M, Tanaka T, Trimble WS, Ware J, Zeleznik-Le NJ, Zieger B. (2002) Mammalian septins nomenclature. *Mol Biol Cell.* 13(12):4111-3.
7. Straight AF, **Field CM**. (2000) Microtubules, membranes and cytokinesis. *Curr Biol.* 10(20):R760-70.
8. Mitchison TJ, **Field CM**. (2002) Cytoskeleton: what does GTP do for septins? *Curr Biol.* 12(22):R788-90.
9. Eggert US, **Field CM**, Mitchison TJ. (2006) Small molecules in an RNAi world. *Mol Biosyst.* 2(2):93-6.
10. Eggert US, Mitchison TJ, **Field CM**. (2006) Animal cytokinesis: from parts list to mechanisms. *Annu Rev Biochem.* 75:543-66.
11. Wuhr M, Mitchison TJ, **Field CM**. (2008) Mitosis: new roles for Myosin-x and actin at the spindle. *Curr Biol.* 18(19):R912-4.
12. Wuhr M, Mitchison TJ, **Field CM**. (2009) Size and speed go hand in hand in cytokinesis. *Cell* 137(5):798-800.
13. **Field, CM**, Nguyen, PA, Keisuke, I, Groen, AC, and Mitchison, TJ. (2014) Xenopus cytoplasm with intact actin: in Vale, R, editor. *Guide to Cytoskeletal Structure*, Methods in Enzymology (Elsevier). 540:399-415.
14. Groen AA, Nguyen P, **Field CM**, Ishihara K, Mitchison TJ (2014) Glycogen-supplemented mitotic cytosol for analyzing Xenopus egg microtubule organization: in Vale, R, editor. *Guide to Cytoskeletal Structure*, Methods in Enzymology (Elsevier) 540:417-433.
15. Ishihara, K, Nguyen, P, Wuhr, M, Groen, A, **Field, CM**, Mitchison, TJ. (2014) Organization of early frog embryos by chemical waves emanating from centrosomes. *Phil Trans R Soc Lond B: Centrosome Renaissance issue.* 369(1650):20130454.
16. Nguyen, PA, **Field, CM**, Groen AC, Mitchison, TJ, Loose, M (2015) Using supported lipid bilayers to study the spatiotemporal organization of membrane bound proteins. *Meth Cell Biol.* 128:223-244.
17. **Field, CM**, Pelletier, J, Mitchison TJ (2017) Xenopus extract approaches to studying microtubule organization and signaling in cytokinesis. *Methods Cell Biol.* 137:395-435.
18. Mitchison, TJ, **Field, CM** (2017) Spindle-to-cortex communication in cleaving frog eggs. *Cold Spring Harbor Symposia on Quantitative Biology*, 82:165-171.
19. **Field, CM**, Mitchison, TJ (2018) Assembly of spindles and aster in Xenopus egg extracts *Cold Spring Harbor Protoc*, (6). doi: 10.1101/pdb.prot099796.

BOOK CHAPTERS:

1. Oegema K, Desai A, Wong ML, Mitchison TJ, **Field CM**. (1998) Purification and assay of a septin complex from *Drosophila* embryos. *Methods Enzymol.* 298:279-95.
2. **Field CM**, Oegema K, Zheng Y, Mitchison TJ, Walczak CE. (1998) Purification of cytoskeletal proteins using peptide antibodies. *Methods Enzymol.* 298:525-41.
3. Kinoshita, M and **Field, CM**. (2004) "Septins and Cytokinesis". In *Encyclopedia of Biological Chemistry*, ed Lennarz, WJ. (Elsevier).
4. **Field, CM**, Maddox, AS, Pringle, JR and Oegema, K. (2008) Septins in the metazoan model systems *Drosophila melanogaster* and *Caenorhabditis elegans*. In *Septin Biology*, eds: John Pringle, Hilary Russell and Peter Hall. (John Wiley & Sons) pp. 147-168.
5. Maddox, AS and **Field, CM**. (2013) Septins and cytokinesis. In *Encyclopedia of Biological Chemistry, 2nd Edition*, eds: M. Daniel Lane and William J Lennarz (Elsevier).
6. **Field, CM**, Mitchison, TJ (2018). Assembly of spindles and asters in Xenopus egg extracts. In *Cold Spring Harb Protoc*. doi: 10.1101/pdb.prot099796