

## **Developmental Biology 13e, Chapter 11 Literature Cited**

- Alford, L. M., M. M. Ng and D. R. Burgess. 2009. Cell polarity emerges at first cleavage in sea urchin embryos. *Dev. Biol.* 330: 12–20.
- Armstrong, N., J. Hardin and D. R. McClay. 1993. Cell-cell interactions regulate skeleton formation in the sea urchin embryo. *Development* 119: 833–840.
- Balinsky, B. I. 1981. *Introduction to Embryology*, 5th Ed. Saunders, Philadelphia, PA.
- Barone, V. and D. C. Lyons. 2022. Live imaging of echinoderm embryos to illuminate evo-devo. *Front. Cell Dev. Biol.* 10:1007775.
- Beane, W. S., J. M. Gross and D. R. McClay. 2006. RhoA regulates initiation of invagination, but not convergent extension, during sea urchin gastrulation. *Dev. Biol.* 292: 213–225.
- Chabry, L. M. 1888. Contribution a l’embryologie normale tératologique des ascidies simples. *J. Anat. Physiol. Norm. Pathol.* 23: 167–321.
- Cherr, G. N., R. G. Summers, J. D. Baldwin and J. B. Morrill. 1992. Preservation and visualization of the sea urchin blastocoelic extracellular matrix. *Microsc. Res. Tech.* 22: 11–22.
- Cohen, A. and N. J. Berrill, N. 1936. The development of isolated blastomeres of the ascidian egg. *J. Exp. Zool.* 74: 91–117.
- Conklin, E. G. 1905. The orientation and cell-lineage of the ascidian egg. *J. Acad. Nat. Sci. Phila.* 13: 5–119.
- Croce, J. C. and D. R. McClay. 2010. Dynamics of Delta/Notch signaling on endomesoderm segregation in the sea urchin embryo. *Development* 137: 83–91.
- Dan, K. 1960. Cytoembryology of echinoderms and amphibia. *Int. Rev. Cytol.* 9: 321–368.
- Dan, K. and K. Okazaki. 1956. Cyto-embryological studies of sea urchins. III. Role of secondary mesenchyme cells in the formation of the primitive gut in sea urchin larvae. *Biol. Bull.* 110: 29–42.
- Davidson, B. and L. Christiaen. 2006. Linking chordate gene networks to cellular behavior in ascidians. *Cell* 124: 247–250.

Davidson, E. H. and M. S. Levine. 2008. Properties of developmental gene regulatory networks. *Proc. Natl. Acad. Sci. USA* 105: 20063–20066.

Driesch, Hans. 1891. "Entwicklungsmechanische Studien: I. Der Werthe der beiden ersten Furchungszellen in der Echinodermenentwicklung. Experimentelle Erzeugung von Theil- und Doppelbildungen. II. Über die Beziehungen des Lichtez zur ersten Etappe der thierischen Formbildung." *Zeitschrift für wissenschaftliche Zoologie* 53: 160–84. Translated as "The Potency of the First Two Cleavage Cells in Echinoderm Development. Experimental Production of Partial and Double Formations." In B. H. Willier and J. M. Oppenheimer (eds.), *Foundations of Experimental Embryology*. Hafner Press, New York, 38–50.

Duloquin, L., G. Lhomond and C. Gache. 2007. Localized VEGF signaling from ectoderm to mesenchyme cells controls morphogenesis of the sea urchin embryo skeleton. *Development* 134: 2293–2302.

Erkenbrack, E. M. and E. H. Davidson. 2015. Evolutionary rewiring of gene regulatory network linkages at divergence of the echinoid subclasses. *Proc. Natl. Acad. Sci. USA* 112: 4075–4084.

Ernst, S. G. 2011. Offerings from an urchin. *Dev. Biol.* 358: 285–294.

Ettенsohn, C. A. 1985. Gastrulation in the sea urchin embryo is accompanied by the rearrangement of invaginating epithelial cells. *Dev. Biol.* 112: 383–390.

Ettенsohn, C. A. 1990. The regulation of primary mesenchyme cell patterning. *Dev. Biol.* 140: 261–271.

Ettенsohn, C. A. and D. R. McClay. 1986. The regulation of primary mesenchyme cell migration in the sea urchin embryo: Transplantations of cells and latex beads. *Dev. Biol.* 117: 380–391.

Ettенsohn, C. A. and E. P. Ingersoll. 1992. Morphogenesis of the sea urchin embryo. In E. F. Rossomondo and S. Alexander (eds.), *Morphogenesis*. Marcel Dekker, New York, 189–262.

Fink, R. D. and D. R. McClay. 1985. Three cell recognition changes accompany the ingressions of sea urchin primary mesenchyme cells. *Dev. Biol.* 107: 66–74.

Fischer, J.-L. 1991. Laurent Chabry and the beginnings of experimental embryology in France. In S. Gilbert (ed.), *A Conceptual History of Modern Embryology*. Plenum, New York, 31–41.

- Gao, F. and E. H. Davidson. 2008. Transfer of a large gene regulatory apparatus to a new developmental address in echinoid evolution. *Proc. Nat. Acad. Sci. USA* 105: 6091–6096.
- Hardin, J. D. 1988. The role of secondary mesenchyme cells during sea urchin gastrulation studied by laser ablation. *Development* 103: 317–324.
- Hardin, J. D. 1990. Context-dependent cell behaviors during gastrulation. *Semin. Dev. Biol.* 1: 335–345.
- Hardin, J. D. and D. R. McClay. 1990. Target recognition by the archenteron during sea urchin gastrulation. *Dev. Biol.* 142: 86–102.
- Hardin, J. D. and L. Y. Cheng. 1986. The mechanisms and mechanics of archenteron elongation during sea urchin gastrulation. *Dev. Biol.* 115: 490–501.
- Harkey, M. A. and A. M. Whiteley. 1980. Isolation, culture and differentiation of echinoid primary mesenchyme cells. *Wilhelm Roux Arch. Dev. Biol.* 189: 111–122.
- Hibino, T., T. Nishikata and H. Nishida. 1998. Centrosome-attracting body: A novel structure closely related to unequal cleavages in the ascidian embryo. *Dev. Growth Diff.* 40: 85–95.
- Hodor, P. G. and C. A. Ettensohn. 1998. The dynamics and regulation of mesenchymal cell fusion in the sea urchin. *Dev. Biol.* 199: 111–124.
- Hörstadius, S. 1939. The mechanics of sea urchin development studied by operative methods. *Biol. Rev.* 14: 132–179.
- Hörstadius, S. 1973. *Experimental Embryology of Echinoderms*. Clarendon Press, Oxford
- Imai, K. S., N. Satoh and Y. Satou. 2002. Early embryonic expression of *FGF4/6/9* gene and its role in the induction of mesenchyme and notochord in *Ciona savignyi* embryos. *Development* 129: 1729–1738.
- Imai, K. S., N. Takada, N. Satoh and Y. Satou. 2000. b-Catenin mediates the specification of endoderm cells in ascidian embryos. *Development* 127: 3009–3020.
- José-Edwards, D. S., I. Oda-Ishii, J. E. Kugler, Y. J. Passamaneck, L. Katikala, Y. Nibu and A. Di Gregorio. 2015. Brachyury, Foxa2 and the *cis*-regulatory origins of the notochord. *PLOS Genet.* 11: e1005730.

Katikala, L. and 9 others. 2013. Functional Brachyury binding sites establish a temporal read-out of gene expression in the *Ciona* notochord. *PLOS Biol.* 11: e1001697.

Katow, H. and M. Solursh. 1980. Ultrastructure of primary mesenchyme cell ingression in the sea urchin *Lytechinus pictus*. *J. Exp. Zool.* 213: 231–246.

Kedes, L. H., A. C. Chang, D. Houseman and S. N. Cohen. 1975. Isolation of histone genes from unfractionated sea urchin DNA by subculture cloning in *E. coli*. *Nature* 255: 533–538.

Kenny, A. P., D. W. Oleksyn, L. A. Newman, R. C. Angerer and L. M. Angerer. 2003. Tight regulation of SpSoxB factors is required for patterning and morphogenesis in sea urchin embryos. *Dev. Biol.* 261: 412–425.

Kim, G. J., A. Yamada and H. Nishida. 2000. An FGF signal from endoderm and localized factors in the posterior-vegetal egg cytoplasm pattern the mesodermal tissues in the ascidian embryo. *Development* 127: 2853–2862.

Kimberly, E. L. and J. Hardin. 1998. Bottle cells are required for the initiation of primary invagination in the sea urchin embryo. *Dev. Biol.* 204: 235–250.

Kobayashi, K., K. Sawada, H. Yamamoto, S. Wada, H. Saiga and H. Nishida. 2003. Maternal Macho-1 is an intrinsic factor that makes cell response to the same FGF signal differ between mesenchyme and notochord induction in ascidian embryos. *Development* 130: 5179–5190.

Kominami, T. and H. Takata. 2004. Gastrulation in the sea urchin embryo: A model system for analyzing the morphogenesis of a monolayered epithelium. *Dev. Growth Diff.* 46: 309–326.

Kowalevsky, A. O. 1866. Entwicklungsgeschichte der einfachen Ascidien. *Mem. Acad. Sci. St. Petersberg* 10: 1–19.

Kugler, J. E., S. Gazdoui, I. Oda-Ishii, Y. J. Passamaneck, A. J. Erives, and A. Di Gregorio. 2010. Temporal regulation of the muscle gene cascade by Macho1 and Tbx6 transcription factors in *Ciona intestinalis*. *J. Cell Sci.* 123: 453–463.

Lane, M. C., M. A. R. Koehl, F. Wilt and R. Keller. 1993. A role for regulated secretion of apical matrix during epithelial invagination in the sea urchin. *Development* 117: 1049–1060.

Lemaire, P. 2009. Unfolding a chordate developmental program, one cell at a time: Invariant lineages, short-range inductions, and evolutionary plasticity in ascidians. *Dev. Biol.* 332: 48–60.

Leonard, J. D. and C. A. Ettensohn. 2007. Analysis of dishevelled localization and function in the early sea urchin embryo. *Dev. Biol.* 306: 50–65.

Lepage, T., C. Sardet and C. Gache. 1992. Spatial expression of the hatching enzyme gene in the sea urchin embryo. *Dev. Biol.* 150: 23–32.

Logan, C. Y. and D. R. McClay. 1997. The allocation of early blastomeres to the ectoderm and endoderm is variable in the sea urchin embryo. *Development* 124: 2213–2223.

Logan, C. Y. and D. R. McClay. 1999. Lineages that give rise to endoderm and mesoderm in the sea urchin embryo. In S. A. Moody (ed.), *Cell Lineage and Determination*. Academic Press, New York, 41–58.

Logan, C. Y., J. R. Miller, M. J. Ferkowicz and D. R. McClay. 1999. Nuclear beta-catenin is required to specify vegetal cell fates in the sea urchin embryo. *Development* 126: 345–357.

Logan, M., S. M. Pagán-Westphal, D. M. Smith, L. Paganessi and C. J. Tabin. 1998. The transcription factor Pitx2 mediates situs-specific morphogenesis in response to left-right asymmetric signals. *Cell* 94: 307–317.

Lyons, D. C., M. L. Martik, L. R. Saunders, and D. R. McClay. 2014. Specification to biomineralization: following a single cell type as it constructs a skeleton. *Integr. Comp. Biol.* 54: 723–733.

Malinda, K. M. and C. A. Ettensohn. 1994. Primary mesenchyme cell migration in the sea urchin embryo: Distribution of directional cues. *Dev. Biol.* 164: 562–578.

Malinda, K. M., G. W. Fisher and C. A. Ettensohn. 1995. Four-dimensional microscopic analysis of the filopodial behavior of primary mesenchyme cells during gastrulation in the sea urchin embryo. *Dev. Biol.* 172: 552–566.

Martik, M. and D. R. McClay. 2012. Gastrulation in high-resolution: New insights into an important process of development. *Abstracts of the Society for Developmental Biology Annual Meeting 2012*. Abstract 126, p. 41.

Martins, G. G., R. G. Summers and J. B. Morrill. 1998. Cells are added to the archenteron during and following secondary invagination in the sea urchin *Lytechinus variegatus*. *Dev. Biol.* 198: 330–342.

McClay, D. R. 2011. Evolutionary crossroads in developmental biology: Sea urchins. *Development* 138: 2639–2648.

McClay, D. R. 2016. Sea urchin morphogenesis. *Curr. Top. Dev. Biol.* 117: 15–30.

McClay, D. R., J. Warner, M. Martik, E. Miranda and L. Slota. 2020. Gastrulation in the sea urchin. *Curr. Top. Dev. Biol.* 136: 195–218.

McIntyre, D. C., D. C. Lyons, M. Martik, and D. R. McClay. 2014. Branching out: origins of the sea urchin larval skeleton in development and evolution. *Genesis* 52: 173–185.

Miller, J. R., S. E. Fraser and D. R. McClay. 1995. Dynamics of thin filopodia during sea urchin gastrulation. *Development* 121: 2505–2511.

Morrill, J. B. and L. L. Santos. 1985. A scanning electron micrographical overview of cellular and extracellular patterns during blastulation and gastrulation in the sea urchin, *Lytechinus variegatus*. In R. H. Sawyer and R. M. Showman (eds.), *The Cellular and Molecular Biology of Invertebrate Development*. University of South Carolina Press, Columbia, SC, 3–33.

Nakatani, Y., H. Yasuo, N. Satoh and H. Nishida. 1996. Basic fibroblast growth factor induces notochord formation and the expression of As-T, a *Brachyury* homolog, during ascidian embryogenesis. *Development* 122: 2023–2031.

Newrock, K. M., C. R. Alfageme, R. V. Nardi and L. H. Cohen. 1978. Histone changes during chromatin remodeling in embryogenesis. *Cold Spring Harb. Symp. Quant. Biol.* 42: 421–431.

Nishida, H. 1987. Cell lineage analysis in ascidian embryos by intracellular injection of a tracer enzyme. III. Up to the tissue restricted stage. *Dev. Biol.* 121: 526–541.

Nishida, H. 1992a. Determination of developmental fates of blastomeres in ascidian embryos. *Dev. Growth Diff.* 34: 253–262.

Nishida, H. 1992b. Regionality of egg cytoplasm that promotes muscle differentiation in embryo of the ascidian *Halocynthia roretzi*. *Development* 116: 521–529.

Nishida, H. 2005. Specification of embryonic axis and mosaic development in ascidians. *Dev. Dyn.* 233: 1177–1193.

Nishida, H. and K. Sawada. 2001. *macho-1* encodes a localized mRNA in ascidian eggs that specifies muscle fate during embryogenesis. *Nature* 409: 724–729.

Nishikata, T., T. Hibino and H. Nishida. 1999. The centrosome-attracting body, microtubule system, and posterior egg cytoplasm are involved in positioning of cleavage planes in the ascidian embryo. *Dev. Biol.* 209: 72–85.

Okazaki, K. 1975. Spicule formation by isolated micromeres of the sea urchin embryo. *Am. Zool.* 15: 567–581.

Oliveri, P., D. M. Carrick and E. H. Davidson. 2002. A regulatory gene network that directs micromere specification in the sea urchin embryo. *Dev. Biol.* 246: 209–228.

Oliveri, P., Q. Tu and E. H. Davidson. 2008. Global regulatory logic for specification of an embryonic cell lineage. *Proc. Natl. Acad. Sci. USA* 105: 5955–5962.

Palmquist, K. and B. Davidson. 2017. Establishment of lateral organ asymmetries in the invertebrate chordate *Ciona intestinalis*. *EvoDevo* 8:12.

Patalano, S., G. Prulière, F. Prodon, A. Paix, P. Dru, C. Sardet and J. Chenevert. 2006. The aPKC-PAR-6-PAR-3 cell polarity complex localizes to the centrosome attracting body, a macroscopic cortical structure responsible for asymmetric divisions in the early ascidian embryo. *J. Cell Sci.* 119(Pt 8): 1592–1603.

Peter, I. S. and E. H. Davidson. 2015. *Genomic Control Process: Development and Evolution*. Academic Press, New York.

Peter, I. S. and E. H. Davidson. 2016. Implications of developmental gene regulatory networks inside and outside developmental biology. *Curr. Top. Dev. Biol.* 117: 237–252.

Peter, I. S., E. Faure and E. H. Davidson. 2012. Predictive computation of genomic logic processing functions in embryonic development. *Proc. Natl. Acad. Sci. USA* 109: 16434–16442.

Peterson, R. E. and D. R. McClay. 2003. Primary mesenchyme cell patterning during the early stages following ingressation. *Dev. Biol.* 254: 68–78.

Prodon, F., C. Sardet and H. Nishida. 2008. Cortical and cytoplasmic flows driven by actin microfilaments polarize the cortical ER-mRNA domain along the a-v axis in ascidian oocytes. *Dev. Biol.* 313: 682–699.

Prodon, F., P. Dru, F. Roegiers and C. Sardet. 2005. Polarity of the ascidian egg cortex and relocalization of cER and mRNAs in the early embryo. *J. Cell Sci.* 118: 2393–2404.

Ransick, A. and E. H. Davidson. 1993. A complete second gut induced by transplanted micromeres in the sea urchin embryo. *Science* 259: 1134–1138.

Ransick, A. and E. H. Davidson. 1995. Micromeres are required for normal vegetal plate specification in sea urchin embryos. *Development* 121: 3215–3222.

Reverberi, G. and A. Minganti. 1946. Fenomeni di evocazione nello sviluppo dell'uovo di Ascidie. Risultati dell'indagine sperimentale sull'ouvo di *Ascidia aspersa* e di *Ascidia malaca* allo stadio di 8 blastomeric. *Pubbl. Staz. Zool. Napoli* 20: 199–252.

Revilla-i-Domingo, R., P. Oliveri and E. H. Davidson. 2007. A missing link in the sea urchin embryo gene regulatory network: *hesC* and the double-negative specification of micromeres. *Proc. Natl. Acad. Sci. USA* 104: 12383–12388.

Roegiers, F., A. McDougall and C. Sardet. 1995. The sperm entry point defines the orientation of the calcium-induced contraction wave that directs the first phase of cytoplasmic reorganization in the ascidian egg. *Development* 121: 3457–3466.

Röttinger, E., A. Saudemont, V. Duboc, L. Besnardieu, D. McClay and T. Lepage. 2008. FGF signals guide migration of mesenchymal cells, control skeletal morphogenesis and regulate gastrulation during sea urchin development. *Development* 135: 353–365.

Ruffins, S. W. and C. A. Ettensohn. 1996. A fate map of the vegetal plate of the sea urchin (*Lytechinus variegatus*) mesenchyme blastula. *Development* 122: 253–263.

Sardet, C., A. Paix, F. Prodon, P. Dru and J. Chenevert. 2007. From oocyte to 16-cell stage: Cytoplasmic and cortical reorganizations that pattern the ascidian embryo. *Dev. Dyn.* 236: 1716–1731.

Sardet, C., P. Dru and F. Prodon. 2005. Maternal determinants and mRNAs in the cortex of ascidian oocytes, zygotes, and embryos. *Biol. Cell* 97: 35–49.

Satoh, N., K. Tagawa and H. Takahashi. 2012. How was the notochord born? *Evol. Dev.* 14: 56–75.

Satou, Y., K. S. Imai and N. Satoh. 2001. Early embryonic expression of a LIM-homeobox gene *Cs-lhx3* is downstream of b-catenin and responsible for the endoderm differentiation in *Ciona savignyi* embryos. *Development* 128: 3559–3570.

Saunders, L. R. and D. R. McClay. 2014. Sub-circuits of a gene regulatory network control a developmental epithelial-mesenchymal transition. *Development* 141: 1503–1513.

Sawada, K., Y. Fukushima and H. Nishida. 2005. Macho-1 functions as a transcriptional activator for muscle formation in embryos of the ascidian *Halocynthia roretzi*. *Gene Exp. Patterns* 5: 429–437.

Sawada, T. and G. Schatten. 1989. Effects of cytoskeletal inhibitors on ooplasmic segregation and microtubule organization during fertilization and early development in the ascidian *Molgula occidentalis*. *Dev. Biol.* 132: 331–342.

Sawyer, J. M., J. R. Harrell, G. Shemer, J. Sullivan-Brown, M. Roh-Johnson, and B. Goldstein. 2010. Apical constriction: a cell shape change that can drive morphogenesis. *Dev. Biol.* 341: 5–19.

Schroeder, T. E. 1981. Development of a “primitive” sea urchin (*Eucidaris tribuloides*): Irregularities in the hyaline layer, micromeres, and primary mesenchyme. *Biol. Bull.* 161: 141–151.

Sethi, A. J., R. C. Angerer and L. M. Angerer. 2009. Gene regulatory network interactions in sea urchin endomesoderm induction. *PLOS Biol.* 7: e1000029.

Sherrard, K., F. Robin, P. Lemaire and E. Munro. 2010. Sequential activation of apical and basolateral contractility drives ascidian endoderm invagination. *Curr. Biol.* 20: 1499–1510.

Sherwood, D. R. and D. R. McClay. 1999. LvNotch signaling mediates secondary mesenchyme specification in the sea urchin embryo. *Development* 126: 1703–1713.

Speksnijder, J. E., C. Sardet and L. F. Jaffe. 1990. The activation wave of calcium in the ascidian egg and its role in ooplasmic segregation. *J. Cell Biol.* 110: 1589–1598.

Sweet, H. C., P. G. Hodor and C. A. Ettensohn. 1999. The role of micromere signaling in *Notch* activation and mesoderm specification during sea urchin embryogenesis. *Development* 126: 5255–5265.

Weitzel, H. E., M. R. Illies, C. A. Byrum, R. Xu, A. H. Wikramanayake and C. A. Ettensohn. 2004. Differential stability of b-catenin along the animal-vegetal axis of the sea urchin embryo mediated by *dishevelled*. *Development* 131: 2947–2956.

Whittaker, J. R. 1982. Muscle lineage cytoplasm can change the developmental expression in epidermal lineage cells of ascidian embryos. *Dev. Biol.* 93: 463–470.

Wikramanayake, A. H., L. Huang and W. H. Klein. 1998. b-catenin is essential for patterning the maternally specified animal-vegetal axis in the sea urchin embryo. *Proc. Natl. Acad. Sci. USA* 95: 9343–9348.

Wilson, E. B. 1895. *An Atlas of the Fertilization and Karyogenesis of the Ovum*. Macmillan, London.

Winkley, K. M., M. J. Kourakis, A. W. DeTomaso, M. T. Veeman and W. C. Smith. 2020. Tunicate gastrulation. *Curr. Top. Dev. Biol.* 136: 219–242.

Wolpert, L. and T. Gustafson. 1961. Studies in the cellular basis of morphogenesis of the sea urchin embryo: The formation of the blastula. *Exp. Cell Res.* 25: 374–382.

Wray, G. A. 1999. Introduction to sea urchins. In S. A. Moody (ed.), *Cell Lineage and Determination*. Academic Press, New York, 3–9.

Wu, S. Y., M. Ferkowicz and D. R. McClay. 2007. Ingression of primary mesenchyme cells of the sea urchin embryo: A precisely timed epithelial-mesenchymal transition. *Birth Def. Res. C Embryol. Today* 81: 241–252.

Yagi, K., N. Satoh and Y. Satou. 2004. Identification of downstream genes of the ascidian muscle determinant gene *Ci-machol*. *Dev. Biol.* 274: 478–489.

Yagi, K., N. Takatori, Y. Satou and N. Satoh. 2005. *Ci-Tbx6b* and *Ci-Tbx6c* are key mediators of the maternal effect gene *Ci-machol* in muscle cell differentiation in *Ciona intestinalis* embryos. *Dev. Biol.* 282: 535–549.

Yajima, M. and G. M. Wessel. 2011. Small micromeres contribute to the germline in the sea urchin. *Development* 138: 237–243.