CURRICULUM VITAE

Personal Information

William C. Smith
Department of Molecular, Cellular and Developmental Biology
University of California, Santa Barbara
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Current Appointments

Professor of Biology
Chair, Department of Molecular, Cellular and Developmental Biology

Education and Training

B. A., 1985 University of California, Santa Cruz, Biochemistry
Ph.D., 1989 University of California, Santa Cruz, Biochemistry
Postdoctoral Studies, 9/89-3/90, Laboratoire de Genetique Moleculare des Eucaryotes, Strasbourg, France
Postdoctoral Studies, 4/90-12/94 University of California, Berkeley

Professional Experience

Position	Institution	Dates
Assistant Professor	UC Santa Barbara	1995-200
Associate Professor	UC Santa Barbara	2000-2004
Professor	UC Santa Barbara	2004-present
Vice-Chair, MCDB	UC Santa Barbara	2009-2012

Fellowships, Awards

University of California Delphasus Award - 1986

CNRS-NIH Postdoctoral Fellowship - 1989

American Cancer Society Postdoctoral Fellowship - 1990

Beckman Young Investigator Award – 1998

Publications:

1. Smith, W. C., and Talamantes, F. (1987) Identification and characterization of a heterogeneous population of growth hormone receptors in mouse hepatic membranes. *J. Biol. Chem*. 262:2213-2219.

2. Smith, W. C., Colosi, P., and Talamantes, F. (1987) Isolation of two molecular weight variants of the mouse growth hormone receptor. *Mol. Endocrinol.* 2:108-116.

3. Harigaya, T., Smith, W. C., and Talamantes F. (1987) Hepatic placental lactogen receptors during pregnancy in the mouse. *Endocrinology* 122:1366-1372.

4. Smith, W. C. and Talamantes, F. (1988) Gestational profile and affinity cross-linking of the mouse serum growth hormone binding protein. *Endocrinology* 123:1489-1494.

5. Smith, W. C., Linzer, D.I.H., and Talamantes, F. (1988) Detection of two growth hormone receptor mRNAs and primary translation products in the mouse. *Proc. Natl. Acad. Sci., USA* 85:9576-9579.

6. Smith, W., Kuniyoshi, J., and Talamantes, F. (1989) Mouse serum growth hormone binding protein has growth hormone receptor extracellular and substituted transmembrane domains. *Mol. Endocrinol.* 3:984-990.

7. Southard, J., Do, L., Smith, W., and Talamantes, F. (1989) Hamster placental lactogen-II contains a structural feature unique among the growth hormone-prolactin-placental lactogen family. *Mol. Endocrinol*. 3:1710-1713.

8. Sanchez-Jimenez, F., Fielder, P., Martinez, R., Smith, W., and Talamantes, F. (1990) Hypophysectomy eliminates and growth hormone maintains the midpregnancy elevation in GH receptor and serum binding proteins. *Endocrinology* 126:1270-1275.

9. Smith, W. C., Nakshatri, H., Leroy, P., Rees, J. and Chambon, P. (1991) A retinoic acid response element is present in the mouse cellular retinol binding protein I (mCRBP I) promoter. *EMBO J.* 10: 2223-2230.

10. Smith, W. C. and Harland, R. M. (1991) Injected Xwnt-8 RNA acts early in Xenopus embryos to promote formation of a vegetal dorsalizing center. *Cell* 67:753-766.

11. Stred S.E., Stubbart J.R., Argetsinger L.S., Smith W.C., Shafer J.A., Talamantes F., and Carter-Su C. (1992) Stimulation by growth hormone (GH) of GH receptor-associated tyrosine kinase activity. *Endocrinology*, 130:1626-1636.

12. Smith, W. C. and Harland, R. M. (1992) Expression cloning of noggin, a new dorsalizing factor localized to the Spemann organizer in Xenopus embryos. *Cell*, 70:829-840.

13. Smith, W.C., Knecht, A., Wu, M., and Harland R.M. (1993) Secreted noggin protein mimics the Spemann organizer in dorsalizing Xenopus mesoderm. *Nature*, 361:547-549.

14. Lamb, T. M., Knecht, A., Smith, W.C., Stachel, S. E., Economides, A. N., Stahl, N., Yancopolous, G. D. and Harland R.M. (1993) Neural Induction by the Secreted Polypeptide Noggin. *Science*, 262:713-718.

15. Smith, W. C., McKendry, R., Ribisi, S., and Harland, R. M. (1995) A nodal-related gene defines a physical and functional domain within the Spemann Organizer. *Cell,* 82: 37-46

16. Hansen, C. S., Marion, C. D., Steele, K., George, S. and Smith, W. C. (1997) Direct neural induction and selective inhibition of mesoderm and epidermis inducers by Xnr3. *Development* , 124: 483-492.

17. Kumano, G., Belluzzi, L. and Smith, W. C. (1999) Spatial and Temporal Properties of Ventral Blood Island Induction in Xenopus laevis. *Development*, 126: 5327-5337.

18. Nakatani, Y., Moody, R. and Smith, W. C. (1999) Mutations affecting tail and notochord development in the ascidian *Ciona savignyi*. *Development*, 126: 3293-3301.

19. Moody, R., Davis, S., Cubas F., and Smith, W. C. Isolation of developmental mutants of the ascidian *Ciona savignyi*. (1999) *Mol. Gen. Genetics*, 262: 199-206.

20. Lane, M. C. and Smith, W. C. (1999) The origins of primitive blood in Xenopus: implications for axial patterning. *Development*, 126: 423-434.

21. Smith WC. (1999) TGF beta inhibitors. New and unexpected requirements in vertebrate development. *Trends Genet*. 15(1):3-5. (review)

22. Ezal C.H., Marion C.D., Smith W.C. (2000) Primary structure requirements for Xenopus nodal-related 3 and a comparison with regions required by Xenopus nodal-related 2. *J. Biol. Chem.*, 275: 14124-14131.

23. Kumano G, Smith WC. (2000) FGF signaling restricts the primary blood islands to ventral mesoderm. *Dev Biol.* 228:304-14.

24. Kumano G, Ezal C, Smith WC. (2001) Boundaries and functional domains in the animal/vegetal axis of Xenopus gastrula mesoderm. *Dev. Biol.* 236:465-477.

25. Sordino, P, Belluzzi, L., De Santis, R. and Smith, W. C. (2001) Developmental genetics in primitive chordates. *Philos*. *Trans. R. Soc. London Ser. B*, 356(1414):1573-1582. (review)

26. Christiaen1, Paolo Burighel, William C. Smith, Franck Bourrat, Jean-Stéphane Joly (2002) *Pitx* genes in tunicates provide new molecular insight into the evolutionary origin of pituitary. *Gene*, 287(1-2):107-113.

27. Davis SW, Smith WC. (2002) Expression cloning in ascidians: isolation of a novel member of the asctacin protease family. *Dev. Genes. Evol.* 212(2):81-86.

28. Jiang, D. and Smith, W. C. (2002) An ascidian engrailed gene. *Dev Genes Evol.* 212(8):399-402.

29. Kumano G, Smith WC. (2002) The nodal target gene *Xmenf* is a component of an FGF-independent pathway of ventral mesoderm induction in *Xenopus*. *Mech. Dev.*, 118(1-2):45-56.

30. Kumano G, Smith WC. (2002) Revisions to the Xenopus gastrula fate map: Implications for mesoderm induction and patterning. *Dev Dyn.* 225(4):409-21 (review).

31. Deschet K, Nakatani Y, Smith WC. (2003) Generation of Ci-Brachyury-GFP stable transgenic lines in the ascidian *Ciona savignyi*. *Genesis* 2003 Apr;35(4):248-59.

32. Matthysse, A.G., Descht, K., Williams, M. and C. Smith, W. C. (2004) A Functional Cellulose Synthase Expressed in Ascidian Epidermis. P*roc Natl Acad Sci U S A.* 101(4):986-991

33. Hendrickson, C., Christiaen, L., Deschet, K., Di Jiang, D., Joly, J.S., Legendre, L., Nakatani, Y., Tresser, J. and Smith, W. C. (2004) Culture of adult ascidians and ascidian genetics. *Method. Cell Biol*., 74, 143-170.

35. Deschet, K. and Smith, W. C. (2004) Disruption of anterior neuroectoderm and palp development in the *Ciona intestinalis* mutant *frimousse*. *Current Biology*, 14, R408-R410.

36. Johnson, D. S., Davidson, B., Brown, C. D., Smith W.C., Sidow A. (2004) Noncoding regulatory sequences of Ciona exhibit strong correspondence between evolutionary constraint and functional importance. Genome Res. 14:2448-56.

37. Jiang D., Tresser, J.W., Horie, T., Tsuda, M., Smith, W.C. (2005) Pigmentation in the sensory organs of the ascidian larva is essential for normal behavior. J Exp Biol., 208: 433-438.

38. Jiang D., Munro, E.M., Smith, W.C. (2005) Ascidian prickle regulates both mediolateral and anterior-posterior cell polarity of notochord cells. *Curr Biol*., 15:79-85.

39. Jiang, D. and Smith, W. C. (2005) Self- and cross-fertilization in the solitary ascidian *Ciona savingyi*. *Biol. Bull.* 209:107-112.

40. Kourakis, M.J. and Smith W. C. (2005) Did the first chordates organize without the organizer? *Trends Genet.* 21:506-510. Review.

41. Kumano G, Ezal C, Smith WC. (2006). ADMP2 is essential for primitive blood and heart development in Xenopus. *Dev Biol*. 299(2):411-23

42. Kourakis, M. J., Smith, W. C., 2007. A conserved role for FGF signaling in chordate otic/atrial placode formation. *Dev Biol.* 312**,** 245-57.

43. Veeman, M., Nakatani, Y., Hendrickson, C., Ericson, V., Lin, C., and Smith, W. (2008) chongmague reveals an essential role for laminin-mediated boundary formation in chordate convergence and extension movements. *Development*, 135: 33-41.

44. Silva N, Smith WC. (2008) Inverse correlation of population similarity and introduction date for invasive ascidians. PLoS ONE. 3(6):e2552.

45. Hill MM, Broman KW, Stupka E, Smith WC, Jiang D, Sidow A. (2008) The C. savignyi genetic map and its integration with the reference sequence facilitates insights into chordate genome evolution. *Genome Res.* 18(8):1369-79.

46. Lemaire P, Smith WC, Nishida H.(2008) Ascidians and the plasticity of the chordate developmental program. *Curr. Biol*. 8: R620-31 (review)

47. Chiba S, Jiang D, Satoh N, Smith WC. (2009) Brachyury null mutant-induced defects in juvenile ascidian endodermal organs. *Development*, 136: 35-39.

48. Dong B, Horie T, Denker E, Kusakabe T, Tsuda M, Smith WC, Jiang D. (2009) Tube formation by complex cellular processes in Ciona intestinalis notochord. *Dev Biol.* 330(2):237-249.

49. Kourakis, M. and Smith, W. C. (2010) Key steps in the morphogenesis of a cranial placode in an invertebrate chordate, the tunicate *Ciona savignyi*. *Dev. Biol*. 340, 134-44.

50. Tresser, J., Chiba, S., Veeman, M., El-Nachef, D., Newman-Smith, E., Horie, T., Tsuda, M., Smith, W. C., (2010) doublesex/mab3 related-1 (dmrt1) is essential for development of anterior neural plate derivatives in *Ciona*. *Development*. 137, 2197-203.

51. Veeman, M. T., Newman-Smith, E., El-Nachef, D., Smith, W. C., (2010) The ascidian mouth opening is derived from the anterior neuropore: Reassessing the mouth/neural tube relationship in chordate evolution. *Dev Biol*., 44:138-149.

52. Obara, B. Veeman, M., Choi, J. H., Smith, W., and Manjunath, B.S. (2011) Segmentation of Ascidian Notochord Cells in DIC Timelapse Images. *Microscopy Res. Tech.*, 74, 727-734.

53. Abdollahian, G., Veeman, M.T., Smith, W.C. and Manjunath, B.S. (2011). A curvicylindrical coordinate system for the segmentation and visualization of the ascidian tail. IEEE Proceedings of the International Society for Biomedical Imaging 2011. Page(s): 182 – 186

54. Delibaltov, D., Ghosh, P., Veeman, M.T., Smith, W.C. and Manjunath, B.S. (2011) An automatic feature based model for cell segmentation from confocal microscopy volumes. IEEE Proceedings of the International Society for Biomedical Imaging 2011. Page(s): 199 - 203

55. Hackley, C., Mulholland, E., Kim, J.G., Newman-Smith, E., and Smith, W. C. (2013) A transiently expressed connexin is essential for anterior neural plate development in *Ciona intestinalis*. *Development*, 140(1):147-155

56. Veeman, M.T. and Smith, W.C. (2013) Whole-organ cell shape analysis reveals the developmental basis of ascidian notochord taper. *Dev. Biol.*, 373(2):281-289.

57. Abdul-Wajid S, Veeman MT, Chiba S, Turner TL, Smith WC. (2014) Exploiting the extraordinary genetic polymorphism of *Ciona* for developmental genetics with whole genome sequencing. *Genetics*, 197 (1):49-59.

58. Kourakis, M., Reeves, W., Newman-Smith, E., Maury, B., Abdul-Wajid, S., Smith, W. C. (2014) A one-dimensional model of PCP signaling: Polarized cell behavior in the notochord of the ascidian *Ciona*. *Developmental Biology*. *In press*.

Current Research Group

Staff Research Scientists:

Erin Newman-Smith (Ph.D., UC San Francisco)
Mathew Kourakis (PhD, University of Chicago

Post-doctoral Fellows:

Otto C. Guedelhoefer (Ph.D., University of Utah)
Wang Hao (Ph.D., Hong Kong University of Science and Technology)
Efrat Oron (Ph.D., Tel Aviv University)
Heidi Morales (Ph.D., University of Rochester)

Graduate Students:

Sarah Abdul-Wajid
Elijah Spina

Visiting Professor:

Gil Jung Kim (Gangneung-Wonju National University)

Undergraduate Researchers:

Iris To
Nkem Ujuagu
Nareh Avanesian
Ryan Luevanos

Current Support

research grants:

R01 HD059217-01A1 07/2008-04/30/2017
P.I.: Smith, W. and Manjunath, B.
Morphomic Analysis of a Simple Chordate
This is a Bioengineering Partnership between my lab and a computer engineering lab that aims to combine advanced imaging and computer vision techniques for further our understanding chordate morphogenesis.

R01 HD038701-11 4/1/2000-3/31/2016
P.I.: Smith, W.
Mutational Analysis of Tunicate Development
The aims of this project are to characterize recently isolated developmental mutants in the ascidian *Ciona savignyi*, and to conduct a new and expanded mutation screen.

R01 GM088997-01A1 08/01/2010 – 07/31/2014
P.I.: Smith, W.
Exploring Planar Cell Polarity in A Novel Invertebrate Chordate System
The project focuses on the mechanism establishing and propagating anterior/posterior polarity on the ascidian notochord. Particular emphasis is on establishing the role of planar cell polarity gene products as the polarity of the notochord shifts from medio-lateral to anterior-posterior following intercalation of the notochord cells.
Role: PI

fellowships:

California Institute for Regenerative Medicine (CIRM)
postdoctoral scholarship.
To: Otto Gudelhoeffer
9/1/12-8/30/14

NIH Research Supplements (postdoctoral) to Promote Diversity in Health-Related Research
To: Heidi Morales
11/1/12-10/31/14

Recent Reviewing and Refereeing Activity

Grants:

Member of the Development-1 (DEV-1) Study Section for National Institutes of Health. (2006-2011)

Ad Hoc Reviewer for:

National Science Foundation; Austrian Science Foundation, Association Francaise contre les Myopathies (France); Weissman Institute, Israel, University of Cyprus

Manuscripts:
Ad Hoc Reviewer for:

Development, Nature Methods, Developmental Dynamics, FEBS, Genes Development and Evolution, Genome Biology, Biological Bulletin, Journal of

Experimental Zoology, PloS One, Current Biology, Science, Developmental Cell, PNAS,

Recent Seminars:

69th Annual Meeting of Society for Developmental Biology, Albuquerque (invited speaker). "Regulation of fate and morphogenesis in the ascidian brain, mouth and palp". 8/9/10

University of Utah. "Tunicates and the Chordate Body Plan". 11/3/10.

Sars Research Institute, Bergen Norway. "Investigating ascidian development with induced and natural mutations". 9/9/11

University of Virginia. "Developmental genetics and morphogenesis of the ascidian Ciona". 9/16/11

Janelia Farm Research Campus (HHMI). "Four dimensional image capture and analysis of chordate embryos" 9/19/11