

## CURRICULUM VITAE

David R. Shook

### PERSONAL INFORMATION

Address: David R. Shook  
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### EDUCATION

1993 - 1996. Ph.D. in Environmental, Population and Organismic Biology, University of Colorado, Boulder.

1987 - 1992. M.S. in Molecular, Cellular and Developmental Biology, University of Colorado, Boulder.

1979 - 1981, 1984 - 1986. AB in Molecular Biology, University of California, Berkeley.

### RESEARCH EXPERIENCE

2000 - present. Research Scientist, Dept. of Biology, University of Virginia, Charlottesville. Studying biomechanical, cellular and molecular bases of morphogenesis in several amphibian species in an evolutionary context.

1996 - 1999. NIH Postdoctoral Fellow with Dr. Ray Keller, Dept. of Biology, University of Virginia, Charlottesville. Studied comparative morphogenesis and specification of superficial mesoderm in amphibians. Also participated in the *Xenopus tropicalis* genetics project.

1993 - 1996. Graduate Student in EPO Biology University of Colorado, Boulder, with Dr. Tom Johnson of the Institute of Behavioral Genetics, University of Colorado, Boulder. Studied quantitative trait locus mapping of life history traits in *Caenorhabditis elegans*.

1988 - 1992. Graduate Student with Dr. Michael Klymkowsky, MCD Biology, University of Colorado, Boulder. Studied the role of intermediate filaments in *Xenopus laevis* gastrulation.

1986 - 1987. Life Science Technician with Dr. Peter Parham, Dept. of Cell Biology, Stanford University. Sub-cloned and sequenced several HLA alleles.

### TEACHING EXPERIENCE

2001. Taught Developmental Biology Lecture class, Dept. of Biology, University of Virginia.

1999. Taught Developmental Biology Laboratory class, Dept. of Biology, University of Virginia.

1990. Teaching Assistant, MCD Biology, University of Colorado, Boulder. Taught Developmental Biology Lab.

1989 & 1992. Teaching Assistant, MCD Biology, University of Colorado, Boulder. Taught Introduction to Cell Biology Lab.

### Funding & Awards

NIH RO1 grant, "Cellular Mechanisms and Mechanics of Subduction", to examine mechanisms of force generation and patterning of subduction in *Ambystoma*. Initially submitted Oct. 1, 2004; in revision for resubmission Nov. 1, 2005.

1998 Travelling Fellowship from Development, Company of Biologists, to initiate a collaboration with Dr. Eugenia del Pino, Quito, Ecuador, on the marsupial frog *Gastrotheca riobambae*

1996 NIH Postdoctoral Fellowship

1995 University of Colorado at Boulder Graduate School Dean's Small Grant Award. "Mapping Genes for Life History Traits in *C. elegans*"

1988 NSF Graduate Fellowship Award

## PUBLICATIONS

### Peer-Reviewed Journal Articles

- (1) Klymkowsky, M. W., D. R. Shook, and L. A. Maynell. 1992. Evidence that the deep keratin filament systems of the *Xenopus* embryo act to ensure successful gastrulation. *PNAS* 89: 8736-8740.
- (2) Shook, D. R., A. Brooks, T. E. Johnson. 1996. Mapping quantitative trait loci affecting life history traits in the nematode *Caenorhabditis elegans*. *Genetics* 142: 801-817.
- (3) van Swinderen, B., Shook, D. R., Ebert, R. H., Cherkasova, V. A., Johnson, T. E., Shmookler-Reis, R. J. and Crowder, C. M. 1997. Quantitative trait loci controlling Halothane sensitivity in *Caenorhabditis elegans*. *P.N.A.S.* 94: 8232-8237.
- (4) Shook, D. R., and Johnson, T. E. 1999. Quantitative trait loci affecting survival and fertility-related traits in *Caenorhabditis elegans* show genotype-environment interactions, pleiotropy and epistasis. *Genetics* 153: 1233-1243.
- (5) Keller, R., Davidson, L., Edlund, A., Elul, T., Ezin, M., Shook, D. and Skoglund, P. 2000. Mechanisms of convergence and extension by cell intercalation. *Phil. Trans. R. Soc. Lond. B* 355: 897-922.
- (6) Shook, D. R., Majer, C. and Keller, R. 2002. Urodeles remove mesoderm from the superficial layer by subduction through a bilateral primitive streak. *Developmental Biology* 248: 220-239
- (7) Keller, R., Davidson, L. A., and Shook, D. R. 2003. How We Are Shaped: The Biomechanics of Gastrulation. *Differentiation* 71: 171-205.
- (8) Shook, D. R., and R. Keller. 2003. Mechanisms, mechanics and function of epithelial mesenchymal transitions in early development. *Mechanisms of Development* 120: 1351-1383.
- (9) Shook, D. R., Majer, C., and Keller, R. 2004. Pattern and morphogenesis of presumptive superficial mesoderm in two closely related species, *Xenopus laevis* and *X. tropicalis*. *Developmental Biology* 270: 163-185.

### Book Chapters

- (1) Johnson, T. E., Lithgow, G. J., Murakami, S., Duhon, S. A., Shook, D. R. 1996. Genetics of Aging and Longevity in Lower Organisms. pp. 1-17 In: *Cellular Aging and Cell Death*, Holbrook, N., G. R. Martin and R. A. Lockshin (Eds.), John Wiley and Sons, NY.
- (2) Johnson, T. E., G. J. Lithgow, S. Murakami, D. R. Shook. 1996. Genetics. in *Encyclopedia of Gerontology*, Birren, J. E. (Ed.), Academic Press, San Diego.
- (3) Johnson, T. E. and D. R. Shook. 1997 Identification and mapping of genes determining longevity. pp. 108-126 In: *Between Zeus and the Salmon: Biodemography of Longevity*, K. W. Wachter and C. E. Finch (Eds.), National Academy Press, Washington D.C.
- (4) Johnson, T. E., S. Murakami, D. R. Shook S. A. Duhon and P. M. Tedesco. 1997. Identifying and cloning longevity determining genes in the nematode. pp. 155-163 In: *Longevity: To the Limits and Beyond*, J.-M. Robine *et al.* (Eds.), Springer-Verlag Berlin Heidelberg, NY.
- (5) Johnson, T.E. Shook, D., Murakami S. and Cypser, J. 1999. Increased resistance to stress is a marker for gerontogenes leading to increased health and longevity in nematodes. In *Molecular Biology of Aging*, Alfred Benzon Symposium 44, pp. 25-34.
- (6) Keller, R. and Shook D.R. 2004. Gastrulation in Amphibians. pp. 171-203. In: *Gastrulation: From Cells to Embryo*, C. Stern (Ed.) Cold Spring Harbor Laboratory Press.

### Presented Papers & Published Abstracts

- (1) Shook, D., Maynell, L., Klymkowsky, M., Bachant, J., and Domingo, A. 1991. Experimental evidence that cytokeratin filaments are necessary for normal gastrulation in *Xenopus*. *J Cell Biol.* 115:162a. (poster abstract)
- (2) Shook, D. R., Hinerfeld, D. A. and Johnson, T. E. 1996. QTL mapping of life history traits in *C. elegans*. West Coast Regional *C. elegans* meeting, Vancouver, B.C., July 25-28. (platform talk).
- (3) Shook, D. R., Hinerfeld, D. A. and Johnson, T. E. 1996. QTL mapping of life history traits in *C. elegans*. *The Gerontologist* 36:203. Gerontol. Soc. Meeting, Wash. D.C., November 18-22. (platform talk).

- (4) Zimmerman, L., Shook, D., Hirsch, N., Offield, M., Curran, K., Keller, R. and Grainger, R. 1998. *Silurana (Xenopus) tropicalis*: A new amphibian model for vertebrate developmental genetics. Society for Developmental Biology 57<sup>th</sup> Annual meeting, June 20-25, Stanford, CA. (poster abstract #94)
- (5) Shook, D. R. and Keller, R. 1998. Morphogenesis of surface mesoderm in amphibians. NICHD Postdoctoral Fellows' Workshop, September 2-4, NIH Campus, Bethesda Maryland. (platform talk)
- (6) Shook, D. R., Majer, C., and Keller, R. 1998. Morphogenesis of superficial mesoderm in amphibians. University of Richmond, Department of Biology, September 28. (Invited Departmental Seminar)
- (7) Shook, D. R., and Keller, R. 1999. Embryology of *Xenopus tropicalis*. Moving into *Xenopus tropicalis* (satellite seminar for 1999 SDB meeting) June 12, Charlottesville, VA (shared platform talk)
- (8) Shook, D. R., Majer, C., and Keller, R. 1999. Time-lapse video microscopy of gastrulation and surface mesoderm morphogenesis in amphibians. Pontificia Universidad Catolica del Ecuador, September 29. (Invited Departmental Seminar)
- (9) Shook, D. R., Majer, C., and Keller, R. 2000. Superficial Mesoderm Morphogenesis. 8<sup>th</sup> International *Xenopus* Conference, August 16-20, Estes Park, CO. (Platform Talk.)
- (10) Shook, D. R. and Keller, R. 2002. Comparison of urodele and anuran gastrulation; same mechanics, different cell behaviors. Cold Spring Harbor Laboratory meeting: Evolution of Developmental Diversity. (Platform Talk.)
- (11) Shook, D. R. and Keller, R. 2004. Variation among Amphibians of Morphogenetic Mechanisms Driving Gastrulation. SICB Meeting, New Orleans. (Platform Talk.)
- (12) Shook, D. R. 2004. Comparative Analysis of Amphibian Gastrulation; Different Cell Behaviors Produce the Same Biomechanical Forces. Friday Harbor Labs Centennial Celebration: Comparative Developmental Biology. (Platform Talk.)
- (13) Shook, D. R. 2004. Mechanisms and Mechanics of Gastrulation in Amphibians. James Madison University, Harrisonburg, VA, December 3<sup>rd</sup>. (Invited Departmental Seminar)
- (14) Shook, D. 2006. Evolution of Vertebrate Mesoderm Morphogenesis. SICB meetings, Orlando, FL, Jan. 6th. (Invited Symposium Talk).

Research Papers in Preparation

- (1) Shook, D. R., Davidson, L., and Keller, R. (A) Force measurements in *Xenopus laevis* reveal the timing and location of cell behaviors generating force during gastrulation and neurulation.
- (2) Shook, D. R., Skoglund, P., Rolo, A., Davidson, L., and Keller, R. Different isoforms of Myosin II play different roles in producing tension for blastopore closure in *Xenopus laevis*.
- (3) Shook, D. R., Davidson, L., and Keller, R. (B) An actin-myosin based apical constriction associated with subduction produce tension that helps to close the blastopore in the urodele *Ambystoma mexicanum*.

**EXTRACURRICULAR ACTIVITIES / PUBLIC SERVICE**

Chairman, Organizational Committee of 1992 MCD Biology Graduate Student Symposium, *Evolution from the Inside: The Influence of Cellular and Developmental Processes on Evolution*. Keynote Speaker: Stephen Jay Gould.

Organization of and participation in various Development, Evolution, and/or Life History Traits journal clubs.

Reading tutor, 1998, Johnson Elementary school, Charlottesville, VA.

Early frog development demonstrations, 1998-2005, at several elementary schools, Charlottesville, VA.

Refereed papers for Proceedings. Section B, Biological sciences / The Royal Society of Edinburgh (1996), Journal of Experimental Zoology (1998) and Annals of Biomedical Engineering (2004).

Reviewed grant applications for NSF (2002—2005)

Created & Organized the Morphogenesis Supergroup at UVA, a cross campus research discussion group of faculty, postdocs and graduate students from several departments. (2002—2004)

**REFEREES:**

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