

# Table of Contents

## EDITORIAL INTRODUCTION

<b>Focus: Issues in Developmental Biology Education</b> Jeff Hardin .....	1-2
--	-----

## FEATURES

### Special Focus Features

<i>Educator Highlight</i> <b>Morris Maduro</b> Laura L. Mays Hoopes .....	3-4
<i>WWW.Life Sciences Education</i> <b>Bringing Developmental Biology to Life on the Web</b> Louisa A. Stark .....	5-9
<i>Points of View: What Are the Key Concepts in Developmental Biology?</i> <b>Teaching Concepts Versus Facts in Developmental Biology</b> William B. Wood .....	10-11
<b>All I Really Needed to Know I Learned during Gastrulation</b> Scott F. Gilbert .....	12-13
<b>The Missing Dimension in Developmental Biology Education</b> Jeff Hardin .....	13-16

### Other Features

<i>Book Review</i> <b>Brain Evolution: The Good, the Bad, and the Ugly</b> José Vázquez .....	17-19
<i>From the National Academies</i> <b>Understanding Our Audiences: The Design and Evolution of Science, Evolution, and Creationism</b> Jay B. Labov and Barbara Kline Pope .....	20-24
<i>Current Insights</i> <b>Recent Research in Science Teaching and Learning</b> Erin Dolan .....	25-26

## ESSAYS

### Special Focus Essays

<b>More than a Picture: Helping Undergraduates Learn to Communicate through Scientific Images</b> Fiona L. Watson and Barbara Lom .....	27-35
<b>“Do I Need to Know This for the Exam?” Using Popular Media, Inquiry-based Laboratories, and a Community of Scientific Practice to Motivate Students to Learn Developmental Biology</b> Marga Madhuri and Christine Broussard .....	36-44

### Other Essay

<b>Bioengineering and Bioinformatics Summer Institutes: Meeting Modern Challenges in Undergraduate Summer Research</b> Peter J. Butler, Cheng Dong, Alan J. Snyder, A. Daniel Jones, and Erin D. Sheets .....	45-53
--	-------

## ARTICLES

### Special Focus Articles

<b>Information Fluency for Undergraduate Biology Majors: Applications of Inquiry-based Learning in a Developmental Biology Course</b> Kathleen M. Gehring and Deborah A. Eastman .....	54-63
<b>Student Learning of Early Embryonic Development via the Utilization of Research Resources from the Nematode <i>Caenorhabditis elegans</i></b>	

Fong-Mei Lu, Kevin W. Eliceiri, Jayne M. Squirrell, John G. White, and James Stewart .....	64–73
<b>A Kinesthetic Model Demonstrating Molecular Interactions Involved in Anterior-Posterior Pattern Formation in <i>Drosophila</i></b>	
Kristin R. Douglas .....	74–81
<b>Alternation of Generations and Experimental Design: A Guided-Inquiry Lab Exploring the Nature of the <i>her1</i> Developmental Mutant of <i>Ceratopteris richardii</i> (C-Fern)</b>	
Mark D. Spiro and Karin I. Knisely .....	82–88
<b>Other Articles</b>	
<b>Integrating PCR Theory and Bioinformatics into a Research-oriented Primer Design Exercise</b>	
Amber L. Robertson and Allison R. Phillips .....	89–95
<b>Aligning Goals, Assessments, and Activities: An Approach to Teaching PCR and Gel Electrophoresis</b>	
Allison R. Phillips, Amber L. Robertson, Janet Batzli, Michelle Harris, and Sarah Miller .....	96–106
<b>A Western Blot-based Investigation of the Yeast Secretory Pathway Designed for an Intermediate-Level Undergraduate Cell Biology Laboratory</b>	
Jennifer K. Hood-DeGrenier .....	107–117
<b>Development of a Cross-Disciplinary Investigative Model for the Introduction of Microarray Techniques at Non-R1 Undergraduate Institutions</b>	
David E. Walker, Gary P. Lutz, and Consuelo J. Alvarez .....	118–131
<b>Experimenting with Spirituality: Analyzing <i>The God Gene</i> in a Nonmajors Laboratory Course</b>	
Linda A. Silveira .....	132–145
<b>Using Clickers in Nonmajors- and Majors-Level Biology Courses: Student Opinion, Learning, and Long-Term Retention of Course Material</b>	
Kirsten Crossgrove and Kristen L. Curran .....	146–154
<b>Bioinformatics in High School Biology Curricula: A Study of State Science Standards</b>	
Stephen H. Wefer and Keith Sheppard .....	155–162

*On the Cover*

Different aspects of sea urchin development from images available at Jeff Hardin's Dynamics of Development website (<http://worms.zoology.wisc.edu/dd2/>). See the article by Stark in this issue (pp. 5–9) for more information. (Top) Nomarski microscopy montage of early development in *L. variegatus*, from fertilized egg (upper left) to blastula (lower right). (Bottom left) *L. variegatus* embryo immunostained for the Snail protein (red) and a skeletogenic mesenchyme-specific antigen (green). (Bottom right) A *L. variegatus* pluteus larva (Nomarski microscopy).