

# Table of Contents

## LETTER TO THE EDITOR

- Putting the Upper-Division Cart before the Introductory Horse**  
Daniel J. Klionsky.....155–156

## FEATURES

### *From the National Academies*

- Effective Practices in Undergraduate STEM Education Part 1: Examining the Evidence**  
Jay B. Labov, Susan R. Singer, Melvin D. George, Heidi A. Schweingruber, and Margaret L. Hilton.....157–161

### *Current Insights*

- Recent Research in Science Teaching and Learning**  
Erin Dolan.....162–164

### *Educator Highlight*

- Jo Handelsman**  
Interviewed by Laura L. Mays Hoopes.....165–166

### *Book Review*

- Hello Old Friend, My How You've Changed!**  
Elisa M. Konieczko.....167–168

### *Book Review*

- Success in Only 10,000 Hours**  
Desiree O. Abu-Odeh, David M. Rittenhouse, Natashay J. Bailey, Yodit A. Tesfaye, and Robin Wright.....169–171

## ESSAY

- Teaching Creativity and Inventive Problem Solving in Science**  
Robert L. DeHaan.....172–181

## ARTICLES

- Replacing Lecture with Peer-led Workshops Improves Student Learning**  
Ralph W. Preszler.....182–192

- Development, Implementation, and Assessment of a Lecture Course on Cancer for Undergraduates**  
Michèle Shuster and Karen Peterson.....193–202

- Active Learning and Student-centered Pedagogy Improve Student Attitudes and Performance in Introductory Biology**  
Peter Armbruster, Maya Patel, Erika Johnson, and Martha Weiss.....203–213

- Using Affinity Chromatography to Investigate Novel Protein–Protein Interactions in an Undergraduate Cell and Molecular Biology Lab Course**  
Kenneth D. Belanger.....214–225

- Analysis of Students' Aptitude to Provide Meaning to Images that Represent Cellular Components at the Molecular Level**  
Hassen-Reda Dahmani, Patricia Schneeberger, and IJsbrand M. Kramer.....226–238

- Providing Undergraduate Science Partners for Elementary Teachers: Benefits and Challenges**  
Camille A. Goebel, Aminata Umoja, and Robert L. DeHaan.....239–251

- Cloning the Professor, an Alternative to Ineffective Teaching in a Large Course**  
Jennifer Nelson, Diane F. Robison, John D. Bell, and William S. Bradshaw.....252–263

## CORRECTION

- Minimal Impact of Organic Chemistry Prerequisite on Student Performance in Introductory Biochemistry**  
Robin Wright, Sehoya Cotner, and Amy Winkel.....264

### *On the Cover*

Modern day cell biology illustrations are a compilation of facts and fancy: “real” structures obtained from pdb coordinates and represented in “ribbon” or in “surface” combined with quick-freeze, deep-etch microscopy-determined structures of clathrin and styled cellular organelles. The cover graphic illustrates LDL-receptor-mediated uptake of cholesterol and lipids bound to apolipoprotein-B. It nicely shows what students have to deal with in a modern cell biology course: They have to recognize the detailed ribbon representation of the AP2 complex, the LDL-receptor and apolipoprotein-B, as well as a computer-model representation of clathrin triskelions, a schematic representation of the cell basolateral membrane, and finally an electron microscopy picture of a clathrin-coated pit. See article by Dahmani *et al.* on p. 226.