



Textbook  
Series

# Plant Cell Biology

Mark Harper

# Plant Cell Biology

Edited by  
**Mark Harper**



Plant Cell Biology  
Edited by Mark Harper  
ISBN: 978-1-63549-769-4 (Paperback)

© 2018 Larsen & Keller

 **Larsen & Keller**

Published by Larsen and Keller Education,  
5 Penn Plaza,  
19th Floor,  
New York, NY 10001, USA

### **Cataloging-in-Publication Data**

Plant cell biology / edited by Mark Harper.

p. cm.

Includes bibliographical references and index.

ISBN 978-1-63549-769-4

1. Plants--Cytology. 2. Plant cells and tissues. 3. Plant cell biotechnology. 4. Cytology.

I. Harper, Mark.

QK725 .P53 2018

571.6--dc23

This book contains information obtained from authentic and highly regarded sources. All chapters are published with permission under the Creative Commons Attribution Share Alike License or equivalent. A wide variety of references are listed. Permissions and sources are indicated; for detailed attributions, please refer to the permissions page. Reasonable efforts have been made to publish reliable data and information, but the authors, editors and publisher cannot assume any responsibility for the validity of all materials or the consequences of their use.

**Trademark Notice:** All trademarks used herein are the property of their respective owners. The use of any trademark in this text does not vest in the author or publisher any trademark ownership rights in such trademarks, nor does the use of such trademarks imply any affiliation with or endorsement of this book by such owners.

The publisher's policy is to use permanent paper from mills that operate a sustainable forestry policy. Furthermore, the publisher ensures that the text paper and cover boards used have met acceptable environmental accreditation standards.

Printed and bound in China.

For more information regarding Larsen and Keller Education and its products, please visit the publisher's website [www.larsen-keller.com](http://www.larsen-keller.com)

# Table of Contents

<b>Preface</b>	<b>VII</b>
<b>Chapter 1 An Introduction to Plant Cell</b>	<b>1</b>
<b>Chapter 2 Types of Plant Cells and Tissues</b>	<b>12</b>
• Pavement Cells	12
• Guard Cell	13
• Megaspore Mother Cell	16
• Statocyte	17
• Sieve Tube Element	18
• Ground Tissue	19
• Plant Cell Culture	24
• Vascular Cambium	35
• Transfer Cell	37
• Sclereid	37
• Aerenchyma	37
• Vascular Tissue	39
• Meristem	41
• Phloem	50
• Xylem	54
• Cork Cambium	67
<b>Chapter 3 An Overview of Plant Cell Wall</b>	<b>70</b>
• Cell Wall	70
• Cellulose	81
• Pectin	90
• Lignin	96
• Plasmodesma	102
<b>Chapter 4 Plastids: An Integrated Study</b>	<b>107</b>
• Plastid	107
• Chloroplast	111
• Gerontoplast	152
• Chromoplast	153
• Leucoplast	156
• Proteinoplast	158
<b>Chapter 5 Essential Aspects of Plant Cell Biology</b>	<b>160</b>
• Plasmolysis	160
• Turgor Pressure	162
• Oleosin	169

## VI Contents

• Stoma	170
• Cytokinesis	178
• Cell Plate	180
• Phragmosome	181
• Amyloplast	183
• Tobacco BY-2 Cells	184

### **Permissions**

### **Index**



# Plant Cell Biology

Plant cells are types of eukaryotic cells. They have cell walls, plastids, cell plate, central vacuole, etc. They have various cell types, and tissue types. Plant cells can primarily be categorized into parenchyma cells and collenchyma cells. This book will provide the readers in-depth knowledge about the characteristics of plant cells. Some of the diverse topics covered in it address the varied branches that fall under this category. This textbook attempts to assist those with a goal of delving into the field of plant cell biology.

**Mark Harper** received his M.S. in Plant Biology from Ohio University, United States of America. His primary areas of scholarly and research interests lie in the fields of plant molecular and cellular biology. He has won several awards for his knowledge and contributions to this field. Harper is a distinguished professor of undergraduate education and currently serves as guest faculty for several universities across United States.

*New Century Books*

4/F, Rm. 400, 407 & 408 Topaz Bldg.  
# 101 Kamias Rd., Quezon City 1102 Phils  
Tel # (02) 434-1983/ 359-5612/281-7093  
CP # 0927-910-1263/ Fax (02)435-7172  
Email : centurybooksph@yahoo.com

ISBN 978-1-63549-769-4



 **Larsen & Keller**  
www.larsen-keller.com