

CONTENTS

PREFACE	vii
CONTRIBUTORS	ix
PART ONE INTRODUCTION	1
1.1 From Herbal Remedies to Cutting-Edge Science: A Historical Perspective of Plant Chemical Biology	3
<i>Michelle Q. Brown, Abel Rosado, and Natasha V. Raikhel</i>	
PART TWO SOURCES OF SMALL MOLECULES	19
2.1 Compound Collections	21
<i>Reg Richardson</i>	
2.2 Combinatorial Chemistry Library Design	40
<i>Robert Klein and Stephen D. Lindell</i>	
2.3 Natural Product-Based Libraries	64
<i>Alan L. Harvey</i>	
PART THREE IDENTIFICATION OF NEW CHEMICAL TOOLS BY HIGH-THROUGHPUT SCREENING	73
3.1 Assay Design for High-Throughput Screening	75
<i>Frank W. An and Jose R. Perez</i>	

PART FOUR	USE OF CHEMICAL BIOLOGY TO STUDY PLANT PHYSIOLOGY	93
4.1	Use of Chemical Biology to Understand Auxin Metabolism, Signaling, and Polar Transport	95
	<i>Ken-ichiro Hayashi and Paul Overvoorde</i>	
4.2	Brassinosteroids Signaling and Biosynthesis	128
	<i>Takeshi Nakano and Tadao Asami</i>	
4.3	Chemical Genetic Approaches on ABA Signal Transduction	145
	<i>Eunjoo Park and Tae-Houn Kim</i>	
4.4	Jasmonic Acid	160
	<i>Christian Meesters and Erich Kombrink</i>	
4.5	Chemical Genetics as a Tool to Study Ethylene Biology in Plants	184
	<i>Yuming Hu, Filip Vandenbussche, and Dominique Van Der Straeten</i>	
PART FIVE	USE OF CHEMICAL BIOLOGY TO STUDY PLANT CELLULAR PROCESSES	203
5.1	The Use of Small Molecules to Dissect Cell Wall Biosynthesis and Manipulate the Cortical Cytoskeleton	205
	<i>Darby Harris and Seth DeBolt</i>	
5.2	The Use of Chemical Biology to Study Plant Cellular Processes: Subcellular Trafficking	218
	<i>Ash Haeger, Malgorzata Langowska, and Stéphanie Robert</i>	
PART SIX	TARGET IDENTIFICATION	233
6.1	Target Identification of Biologically Active Small Molecules	235
	<i>Paul Overvoorde and Dominique Audenaert</i>	
PART SEVEN	TRANSLATION OF PLANT CHEMICAL BIOLOGY FROM THE LAB TO THE FIELD	247
7.1	Prospects and Challenges for Translating Emerging Insights in Plant Chemical Biology into New Agrochemicals	249
	<i>Terence A. Walsh</i>	
7.2	<i>In Vitro</i> Propagation	263
	<i>Hans Motte, Stefaan Werbrouck, and Danny Geelen</i>	
INDEX		289