

Contents

<i>In Memoriam</i>	ix
<i>Acknowledgements</i>	xiii
<i>Contributors</i>	xv
 1. <i>Introduction and Historical Background</i>	1
<i>Adrienne E. Clarke</i>	
 2. CHEMISTRY AND PHYSICO-CHEMISTRY	5
2.1 <i>Chemistry of β-Glucans</i>	5
<i>Bruce A. Stone</i>	
2.2 <i>Physico-chemistry of (1,3)-β-Glucans</i>	47
<i>Michael J. Gidley and Katsuyoshi Nishinari</i>	
 3. BIOCHEMISTRY	
3.1 <i>Plant and Microbial Enzymes Involved in the Depolymerization of (1,3)-β-D-Glucans and Related Polysaccharides</i>	119
<i>Maria Hrmova and Geoffrey B. Fincher</i>	
3.2 <i>Interactions between Proteins and (1,3)-β-Glucans and Related Polysaccharides</i>	171
<i>D. Wade Abbott and Alisdair B. Boraston</i>	
3.3 <i>Biosynthetic Enzymes</i>	
3.3.1 <i>Enzymology and Molecular Genetics of Biosynthetic Enzymes for (1,3)-β-Glucans: Prokaryotes</i>	201
<i>Vilma A. Stanisich and Bruce A. Stone</i>	
3.3.2 <i>Biosynthetic Enzymes for (1,3)-β-Glucans and (1,3;1,6)-β-Glucans in Protozoans and Chromistans: Biochemical Characterization and Molecular Biology</i>	233
<i>Vincent Bulone</i>	
3.3.3 <i>Biosynthetic Enzymes for (1-3)-β-Glucans, (1-3;1-6)-β-Glucans from Yeasts: Biochemical Properties and Molecular Biology</i>	259
<i>Satoru Nogami and Yoshikazu Ohya</i>	

3.3.4 Biochemical and Molecular Properties of Biosynthetic Enzymes for (1,3)- β -Glucans in Embryophytes, Chlorophytes and Rhodophytes.....	283
Lynette Brownfield, Monika Doblin, Geoffrey B. Fincher and Antony Bacic	

4. BIOLOGY

4.1 Functional Roles of (1,3)- β -Glucans and Related Polysaccharides: Prokaryotes	327
Vilma A. Stanisich and Bruce A. Stone	
4.2 Biology of (1,3)- β -Glucans and Related Glucans in Protozoans and Chromistans.....	353
Sverre M. Myklestad and Espen Granum	
4.3 Organization of Fungal, Oomycete and Lichen (1,3)- β -Glucans	387
Cecile Clavaud, Vishukumar Aimanianda and Jean-Paul Latge	
4.4 Rhodophytes, Chlorophytes and Embryophytes	425
4.4.1 Callose in Cell Division	425
Roy C. Brown and Betty E. Lemmon	
4.4.2 Cytology of the (1,3)- β -Glucan (Callose) in Plasmodesmata and Sieve Plate Pores	439
Amit Levy and Bernard L. Epel	
4.4.3 Callose and its Role in Pollen and Embryo Sac Development in Flowering Plants	465
Ed Newbiggin, Antony Bacic and Steve Read	
4.4.4 Callose in Abiotic Stress	499
Angelika Stass and Walter J. Horst	
4.4.5 Callose in Biotic Stress (Pathogenesis) Biology, biochemistry and molecular biology of callose in plant defence: callose deposition and turnover in plant—pathogen interactions	525
Christian A. Voigt and Shauna C. Somerville	
4.5 (1 $\rightarrow$ 3)- β -Glucans in Innate Immunity	
4.5.1 Biological and Immunological Aspects of Innate Defence Mechanisms Activated by (1,3)- β -Glucans and Related Polysaccharides in Invertebrates.....	563
Lage Cerenius, Shun-ichiro Kawabata and Kenneth Söderhäll	
4.5.2 (1,3)- β -Glucans in Innate Immunity: Mammalian Systems.....	579
Gordon D. Brown and David L. Williams	
4.6 Distribution, Fine Structure and Function of (1,3;1,4)- β -Glucans in the Grasses and Other Taxa	621
Philip J. Harris and Geoffrey B. Fincher	

