

unit 29

Plant Cells: Growth and Differentiation

Contents

Table A Scientific terms and principles used in Unit 29	4
Study guide for Unit 29	5
1 Flexibility in the development of plant cells	5
2 The location and activity of dividing cells	8
2.1 Division in apical meristems	9
2.1.1 Growth at the root apex	10
2.1.2 Growth at the shoot apex	11
2.2 Intercalary meristems	12
2.3 Secondary growth	12
Summary of Section 2	15
Objectives and SAQs for Section 2	15
3 Cell walls in expansion and differentiation	16
3.1 The molecular architecture of cell walls	17
3.2 Forces and cell expansion	18
3.3 Wall synthesis and cell expansion	20
3.4 Wall synthesis and cell differentiation	21
Summary of Section 3	23
Objectives and SAQs for Section 3	23
4 Plant hormones	24
4.1 Growth-regulating molecules	26
4.2 Are hormones really involved?	28
4.3 How do hormones act on plant cells?	29
4.3.1 Second messenger systems	31
4.3.2 The acid growth hypothesis	32
Summary of Section 4	34
Objectives and SAQs for Section 4	34
5 Plant hormones and development	35
5.1 Tissue cultures	35
5.2 Hormones and cambial activity	38
5.3 Other hormonal interactions	41
Summary of Section 5	42
Objectives and SAQs for Section 5	42
Objectives for Unit 29	43
SAQ answers and comments	44
References and further reading	45