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Autore	Kapuganti Jagadis G
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Section A Physiology of plant respiration and involvement of alternative oxidase; Chapter 1 Integrating classical and alternative respiratory pathways; Introduction; Alternative oxidase (AOX); NADPH dehydogenases linked to AOX; Uncoupling proteins (UCPs); Electron transfer flavoprotein (ETF); Deploying electron dissipatory mechanisms whilst maintaining ATP production under stress situations; Conclusions; References
Chapter 2 Non-coupled pathways of plant mitochondrial electron transport and the maintenance of photorespiratory flux Introduction: Carbon fluxes through plant mitochondria in the light; Activation of glycine oxidation by malate; Oscillations of respiratory and photorespiratory fluxes; NADH and NADPH dehydrogenases in the mitochondrial membranes; Increase of the mitochondrial capacity in the light via engagement of rotenone-insensitive dehydrogenases; Physiological role of alternative oxidase; Equilibration of adenylates in the intermembrane space of mitochondria
Bicarbonate pool and refixation of photorespiratory carbon Malate and citrate valves; Conclusion; References; Chapter 3 Taxonomic distribution of alternative oxidase in plants; What is alternative oxidase?; Historical investigations of AOX in plants; Taxonomic distribution of alternative oxidase in all domains of life; Taxonomic distribution of alternative oxidase in plants; Chlorophyte algae; Streptophyte algae; Land plants; Recent functional hypotheses based on studies of AOX in multiple plants; Where should efforts be focused next?; References
Chapter 4 Alternative pathways and phosphate and nitrogen nutrition Introduction; Phosphate limitation; Nitrogen nutrition and respiratory pathways; Summary; References; Chapter 5 Structural elucidation of the alternative oxidase reveals insights into the catalytic cycle and regulation of activity; Introduction; Function and species spread of alternative oxidase; Structure of the trypanosomal alternative oxidase; Models of the alternative oxidase; Modelling the structure of plant alternative oxidase; Summary; References
Chapter 6 The role of alternative respiratory proteins in nitric oxide metabolism by plant mitochondria Introduction; Targets of NO in mitochondria; Mitochondrial NO degradation; NO degradation by external NAD(P)H dehydrogenases; Involvement of AOX in NO signalling and homeostasis; Oxidative pathways for NO synthesis; Reductive pathways for NO synthesis; Summary; Acknowledgments; References; Chapter 7 Control of mitochondrial metabolism through functional and spatial integration of mitochondria; Introduction; Functional and spatial integration: scope of the review
Mitochondria: origins and functions

Sommario/riassunto

Rapid developments in molecular and systems biology techniques have allowed researchers to unravel many new mechanisms through which plant cells switch over to alternative respiratory pathways.This book is a unique compendium of how and why higher plants evolved alternative respiratory metabolism. It offers a comprehensive review of current research in the biochemistry, physiology, classification and regulation of plant alternative respiratory pathways, from alternative oxidase diversity to functional marker development. The resource provides a broad range of perspectives on the applications