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2.8 Modifying Gravitational Acceleration Forces - Versatile Tools for Studying Plant Gravity Sensing Mechanisms2.9 Conclusions and Perspectives; 3 Physiological Responses of Higher Plants; 3.1 Introduction: Historical Overview; 3.2 Terminological Aspects; 3.3 Microgravity as a Tool; 3.3.1 Equipment; 3.3.2 Testable Hypotheses; 3.3.2.1 Gravisensitivity; 3.3.2.2 Stimulus Transformation: Role of the Actomyosin System; 3.3.2.3 Extracellular Matrix as Anti-gravitational Material; 3.3.2.4 Existence of Gravity (Microgravity) Related Genes; 3.3.2.5 Autonomous versus Directed Movements
3.4 Microgravity as Stress Factor3.4.1 Cellular Level; 3.4.2 Developmental Aspects; 3.5 Gravity-related Paradoxes; 3.6 Gravity and Evolution; 3.7 Conclusion and Perspectives; 4 Development and Gravitropism of Lentil Seedling Roots Grown in Microgravity; 4.1 Introduction; 4.1.1 Development of Lentil Seedlings on the Ground; 4.1.1.1 Functional Zones of the Primary Root; 4.1.1.2 Role of the Root Cap; 4.1.1.3 Meristematic Activity; 4.1.1.4 Cell Elongation; 4.1.2 Root Gravitropism on Earth; 4.1.2.1 Perception of Gravity; 4.1.2.2 The Root Statocyte; 4.1.2.3 Gravisensitivity: The Presentation Time
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4.4.1.3 Amyloplasts Positioning

Sommario/riassunto

This concise yet comprehensive treatment of the effects of spaceflight on biological systems includes issues at the forefront of life sciences research, such as gravitational biology, immune system response, bone cell formation and the effects of radiation on biosystems. Edited by a leading specialist at the European Space Agency (ESA) with contributions by internationally renowned experts, the chapters are based on the latest space laboratory experiments, including those on SPACELAB, ISS, parabolic flights and unmanned research satellites.An indispensable source for biologists, medical re