

Frontiers in Biological Sciences: Recent Advances and Innovations-Vol I

Editors

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PREFACE

This book presents a collection of research articles spanning diverse areas within the life and environmental sciences. Several studies focus on cancer, exploring the role of heat shock protein 90 in cell death pathways and investigating the therapeutic potential of *Withania somnifera* and other natural inhibitors. The book also covers advancements in green nanotechnology, detailing the synthesis and antimicrobial applications of silver nanoparticles, with a specific examination of green tea catechins. Sustainable practices are addressed through research on biofuel production from agricultural waste and the use of edible coatings for preserving fruits and vegetables. Plant biology is represented by studies on the role of phytohormones in secondary metabolite synthesis and the effects of drought stress. Finally, the book introduces virus-induced gene silencing (VIGS) as a valuable tool for plant genetic research. The collection highlights current research trends and potential applications in medicine, environmental science, agriculture, and biotechnology. This compilation aims to serve as a valuable resource for researchers, educators, and students, offering insights that are both profound and practical.

We extend our sincere gratitude to all the authors who have contributed their expertise and insights to this volume. Their dedication and passion for advancing the frontiers of biological science have made this publication possible. The book will not only enhance the scientific community's knowledge base but also inspire future generations of biologists to push the boundaries.

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Drought Stress Tolerance: An Insight into Resistance Mechanism and Adaptation strategies in Plants

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ABSTRACT

Water is essentially required by all the living systems including plants to maintain normal function of growth and metabolism. Drought stress in plants may affect several activities like cell elongation, morphology, nutrient availability due to the production of ROS and photo oxidation. Present study discusses various aspects of drought stress in plants and possible solutions to improve the tolerance. Stresses, resulting in the non-normal physiological processes that influence one or a combination of biological and environmental factors. Plant production is limited by environmental stresses, according to different scholar's estimates, only 10 percent of the world's arable land is free from stress, in general, a major factor in the difference between yield and potential performance, environmental stresses. Drought is the most important abiotic factor limiting growth, adversely affect plant growth thus, reduces crop production. It is the most common environmental stresses that almost 25 percent of agricultural lands for agricultural