



Dr. Swati Sharma

Dr. Swati Sharma is an Assistant Professor in the Department of Biosciences at Integral University, Lucknow, with over a decade of research experience in biological sciences. Her expertise focuses on plant-microbe interactions and postharvest management. She completed her doctoral research at CSIR-National Botanical Research Institute and the Department of Botany, University of Lucknow. Dr. Sharma has a strong publication record, including 24 research papers in international journals, one edited book, 12 book chapters, and two patents. She has successfully supervised nine Ph.D. scholars in microbiology and biotechnology, making significant contributions to research and academic mentorship.

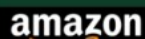
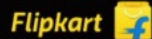


Dr. Amita Dubey

Dr. Amita Dubey is an Assistant Professor in the Department of Biosciences at Integral University, Lucknow. She earned her Ph.D. from CSIR-Central Institute of Medicinal and Aromatic Plants and served as a Women Scientist at CSIR-National Botanical Research Institute. With over a decade of experience in research and teaching, her work focuses on cytochrome P450 monooxygenases and their role in the biosynthesis of therapeutically important secondary metabolites. Her research has advanced the understanding of metabolite pathways in medicinal plants and their application in pathway engineering. She has also contributed to studies on histone acetylation in improving cotton fiber yield and quality. Dr. Dubey has led two projects funded by the


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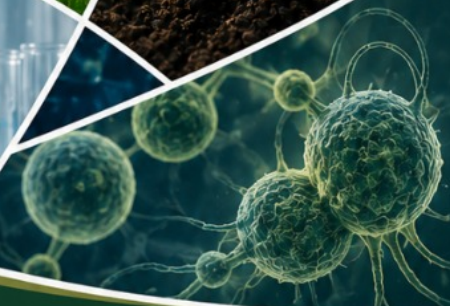


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FRONTIERS IN BIOLOGICAL SCIENCES: RECENT ADVANCES AND INNOVATIONS-VOL I

Frontiers in Biological Sciences: Recent Advances and Innovations

— Vol I —



Dr. Swati Sharma
Dr. Amita Dubey

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

Editors

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The Role of Heat Shock Protein 90 in Cancer Cell Death Pathways: Implications for Natural Inhibitors in Therapeutic Strategies

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Abstract:

Heat shock proteins (HSPs) are crucial in regulating cell death pathways, particularly in cancer cells. These highly conserved proteins function as molecular chaperones, protecting critical client proteins from misfolding and degradation, thus maintaining intracellular integrity under stressed conditions. Interestingly, HSPs play a dual role in cancer: they help cancer cells survive stress and resist treatment, but they can also contribute to cell death under certain conditions. This contradictory behavior illustrates the complexity of HSP functions in cellular processes. HSPs especially, HSP90 a pivotal molecular chaperone that regulates cellular homeostasis and plays a critical role in cancer progression. Frequently overexpressed in various malignancies, HSP90 contributes to enhanced tumorigenicity, metastasis, and resistance to chemotherapy by stabilizing key client proteins involved in survival signaling pathways. HSP90 exhibits a dual role in cell death pathways, primarily inhibiting apoptosis and necrosis while also modulating autophagic processes. Under stress conditions, such as exposure to chemotherapeutic agents or oxidative stress, HSP90 helps cancer cells evade cell death, underscoring its importance in