Special Issue

Molecular Mechanisms in Plant Stress Tolerance

Message from the Guest Editor

This Special Issue focuses on the molecular mechanisms that underpin plant stress tolerance, with an emphasis on how plants respond and adapt to a wide range of biotic and abiotic stressors, including drought, waterlogging, salinity, extreme temperatures, heavy metals, and pathogens. Plant stress tolerance involves sophisticated signaling networks mediated by phytohormones such as abscisic acid (ABA), salicylic acid (SA), jasmonic acid (JA), and ethylene, as well as reactive oxygen species (ROS) and secondary messengers like calcium ions and nitric oxide (NO). These signaling cascades orchestrate the regulation of stress-responsive genes through transcription factors (NAC, MYB, and WRKY) and non-coding RNAs (miRNAs and siRNAs). Epigenetic modifications, such as DNA methylation and histone modifications, contribute to stress memory and adaptive responses. This issue invites high-quality research, reviews, and perspectives that leverage advances in omics technologies to elucidate molecular pathways, offering innovative solutions for developing stress-resilient crops to address global climate challenges and ensure agricultural sustainability.

Guest Editor

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