

## Special Issue

# Exploring Mechanisms and Integrating Advanced Genetic Approaches in Enhancing Barley Resilience

### Message from the Guest Editors

Global climate change will increase the frequency and intensity of extreme weather events across many regions, leading to significant crop yield losses and threatening global food security. To meet the nutritional demands of a growing population by 2050, crop production must become both more abundant and more resilient under increasing climatic stress. A critical step toward developing stress-tolerant crop varieties is understanding the mechanisms that enable plants to withstand abiotic stresses. Barley (*Hordeum vulgare* L.), one of the earliest domesticated crops in human history, has been cultivated worldwide for use as livestock feed and as a key raw material in the brewing industry. Barley breeders have increasingly adopted advanced technologies, including induced mutation, transgenesis, marker-assisted selection, genomic selection, site-directed mutagenesis, and, most recently, machine learning to enhance barley traits. This Special Issue of *Plants* aims to uncover underexplored mechanisms of abiotic stress tolerance in barley and to highlight cutting-edge genetic strategies for its improvement.

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### Editor-in-Chief

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