NEUROTRANSMITTERS IN PLANTS

Perspectives and Applications

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13 GABA/BABA Priming Causes Signaling of Defense Pathways Related to Abiotic Stress Tolerance in Plants

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13.1 INTRODUCTION

biotic stresses are the most significant factors leading to extensive and erratic loss in agricultura productivity across the world. Owing to the sessile nature of plants, they must cope with adverse nvironmental conditions, and therefore they must possess a variety of responses to cope with var us environmental stresses (Gao et al. 2007). In plants, these stresses adversely affect the growth nd productivity by triggering a series of morphological, biochemical, and molecular mechanism Wang et al. 2001). Even though the plants have developed specific mechanisms during the cours f evolution to sense the subtle changes of growth conditions that trigger many signal transductio ascades (Gao et al. 2007), certain treatments activate stress responsive genes and finally leads t changes at the physiological and biochemical levels in plants.

The quick signaling for inducing the defense mechanism against the adverse environmental conditions requires a stress signal, which gets transduced like a neurotransmitter. Major neurotransmitters found in plants include acetylcholine, epinephrine, γ-aminobutyric acid (GABA), dopamine, levodopa, melatonin, serotonin, and so on (Fait et al. 2006). Later, it was discovered at GABA is largely and rapidly produced in plants in response to various biotic and abiotic stres ctors. For example, when insects walk across a leaf, rapid accumulation of GABA was monitore within seconds (Scholz et al. 2015). In addition, β-aminobutyric acid (BABA) a close structural

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