

综述

植物ABC转运蛋白与次生代谢产物的跨膜转运

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摘要:

ABC (ATP-Binding Cassette) 转运蛋白是目前已知最大、功能最广泛的蛋白家族,参与生物体内多种物质的转运,因其在生物体内与肿瘤细胞耐药性等一些重要的生理过程密切相关而引起了人们的广泛关注。研究发现,在完成全基因组测序的生物中,ABC转运蛋白在拟南芥和水稻中数量最多,推测与植物次生代谢产物的跨膜转运相关。植物产生生物碱、萜类化合物、酚类等大量次生代谢产物,保护植物体免受环境中生物和非生物胁迫的损伤。这些化合物的累积和排泌被高度调节,ABC转运蛋白在其中起着重要的作用。本综述介绍了植物ABC转运蛋白及其在植物次生代谢产物累积和跨膜转运中的研究进展。

关键词: 次生代谢产物 植物ABC转运蛋白 萜类 生物碱 酚

Plant ABC Transporters and Their Roles in the Transmembrane |Transport of Secondary Metabolites

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Abstract:

ABC (ATP-Binding Cassette) transporters constitute the largest protein family with the most variety of functions. Most of them are involved in transporting many kinds of substrates in living organisms. Because they are closely related to some important biological processes, such as multidrug resistance (MDR) and etc, ABC transporters have attracted more and more researchers' attention. ABC transporters are most abundant in Arabidopsis and rice among current sequenced organisms, leading to the hypothesis that plant ABC transporters largely contribute to membrane transport of endogenous secondary metabolites in the plants. Plants produce a large number of secondary metabolites, such as alkaloids, terpenoids and phenols, which can protect plants from being harmed by biotic and abiotic stresses. The accumulation and secretion of these metabolites are highly regulated and ABC transporters play a significant role in the process. In this review, we summarize the related background information and the advances of plant ABC transporters involving in the accumulation and the transmembrane transport of plant secondary metabolites.

Keywords: secondary metabolites plant ABC transporter terpenoid alkaloid phenol ABC

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