

## 活性氧调控植物生长发育的研究进展

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## Research Progress in the Control and Regulation of Plant Growth and Development by Reactive Oxygen Species

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摘要

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**摘要** 活性氧(ROS)是植物有氧代谢过程中的副产物,它在植物的许多生命过程中均具有有害和有利的双重功能。ROS对细胞的氧化损伤作用和信号转导诱导植物防卫反应已有详尽的研究。近年来,越来越多的关于ROS调控植物生长发育的证据开始引起了人们的广泛关注。细胞的生长是植物发育的重要部分,ROS通过直接或间接调节细胞的生长来控制植物的发育,成为植物发育的重要调节剂。该文综述了羟自由基( $\cdot\text{OH}$ )及其前体超氧阴离子自由基( $\text{O}_2^{\cdot-}$ )和过氧化氢( $\text{H}_2\text{O}_2$ )调控植物生长发育的研究进展,包括ROS调控植物不同器官生长的证据和机理、ROS产生的途径及其检测方法,同时对今后的研究进行了展望。

**关键词:** 胞壁松弛 NADPH氧化酶 过氧化物酶 质膜 活性氧

**Abstract:** Reactive oxygen species (ROS) are the byproducts of plant aerobic metabolism. ROS are considered to have double functions (harmful and beneficial) in many plant processes. Oxidative damage to cells and signal transduction in the induced protection response by ROS have been investigated intensively. ROS are increasingly thought to control plant growth and development in particular. Cell growth is the important component of plant development, and control of plant development by ROS is by regulating cell growth, so ROS is an important regulator of plant growth and development. Here, we review the research progress in the control and regulation of plant growth and development by hydroxyl radicals and their precursors, superoxide radical and hydrogen peroxide, and the mechanism, the generation pathway of ROS, the methods for detecting ROS, and prospects for future study.

**Keywords:** cell wall loosening NADPH oxidase peroxidase plastic membrane reactive oxygen species

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