



ABSTRACT

“Strigolactones are regulators of root development”

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Strigolactones (SLs) or associated molecules were defined as a new group of plant hormones that suppress lateral shoot branching. Recently, we have demonstrated that SLs are regulators of root development: they regulate lateral root formation and root hair elongation. Moreover, the epistatic relations between SLs, auxin and ethylene were determined in the wild type and hormone-signaling mutants. In tomato SLs were shown to interfere with the activity of auxin-efflux carriers in the presence of exogenously applied auxin, thereby affecting primary root growth, cell elongation and root hair elongation in tomato. In Arabidopsis SLs and ethylene were found to regulate root hair elongation via a common regulatory pathway, in which ethylene is epistatic to SLs, whereas SLs' effect on root hair elongation requires ethylene synthesis. SL signaling was not needed for the auxin root hair-response. Auxin signaling, on the other hand, was not necessary, but enhanced the root hair response to SLs. The results suggest that the SL, ethylene and auxin hormonal pathways converge for regulation of root hair elongation. Moreover, SL regulation of root growth suggests that these hormones are mediators of plant responses to nutritional conditions and coordinators of shoot and root development. However, SLs are also signal molecules that facilitate hyphal branching of the symbiotic arbuscular mycorrhizal fungi and thus, plant-symbiotic interactions. The two roles played by SLs, in plant development and symbiotic communication, may imply their evolution as either modulators of plant development or enhancers of beneficial plant associations.