

Karrikin-like signaling pathway is involved in the perception of volatile terpenoids.

Shannon Stirling¹, Angelica Guercio⁴, Ryan Patrick^{1,3}, Ying Li^{1,3}, Nitzen Shabek⁴, and Natalia Dudareva^{2,3}

¹Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, Indiana 47907, USA; ²Department of Biochemistry, Purdue University, West Lafayette, Indiana 47907, USA.; ³Purdue Center for Plant Biology, Purdue University, West Lafayette, IN 47907, U.S.A.; ⁴Department of Plant Biology, University of California Davis, Davis, California 95616.

Recently *Petunia hybrida* has been shown to utilize natural fumigation of sesquiterpenes for the proper development of reproductive organs. While the enzyme responsible for producing the terpenes has been identified, the receptor and the pathway involved in the perception of the sesquiterpenes are still unknown. Karrikin insensitive 2 receptors are known to bind karrikins, but compelling evidence suggests the primary role is the recognition of a yet unknown endogenous plant ligand. Through genetic and biochemical approaches, Karrikin insensitive 2 intermediate (KAI2ia) has been identified as the potential sesquiterpene receptor. Transgenic KAI2ia plants act as deaf receptors to sesquiterpenes and the KAI2ia- mediated sesquiterpene signaling pathway diverges from the karrikin signaling pathway. The binding of KAI2ia is specific to (-) germacrene D and necessary for pistil development.