

Identification and Characterization of the Iridoid Synthase Involved in Oleuropein Biosynthesis in Olive (*Olea europaea*) Fruits.

Alagna F, Geu-Flores F, Kries H, Panara F, Baldoni L, O'Connor SE, Osbourn A (2016) Identification and Characterization of the Iridoid Synthase Involved in Oleuropein Biosynthesis in Olive (*Olea europaea*) Fruits. *J Biol Chem* 291(11), 5542-5554.

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Abstract

The secoiridoids are the main class of specialized metabolites present in olive (*Olea europaea* L.) fruit. In particular, the secoiridoid oleuropein strongly influences olive oil quality because of its bitterness, which is a desirable trait. In addition, oleuropein possesses a wide range of pharmacological properties, including antioxidant, anti-inflammatory, and anti-cancer activities. In accordance, obtaining high oleuropein varieties is a main goal of molecular breeding programs. Here we use a transcriptomic approach to identify candidate genes belonging to the secoiridoid pathway in olive. From these candidates, we have functionally characterized the olive homologue of iridoid synthase (OeISY), an unusual terpene cyclase that couples an NAD (P)H-dependent 1,4-reduction step with a subsequent cyclization, and we provide evidence that OeISY likely generates the monoterpene scaffold of oleuropein in olive fruits. OeISY, the first pathway gene characterized for this type of secoiridoid, is a potential target for breeding programs in a high value secoiridoid-accumulating species.

Beteiligte Forschungseinheiten

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Leibniz-HKI-Autor*innen



Hajo Kries

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