3-D structure of enzyme critical to creation of anticancer compounds in plants identified

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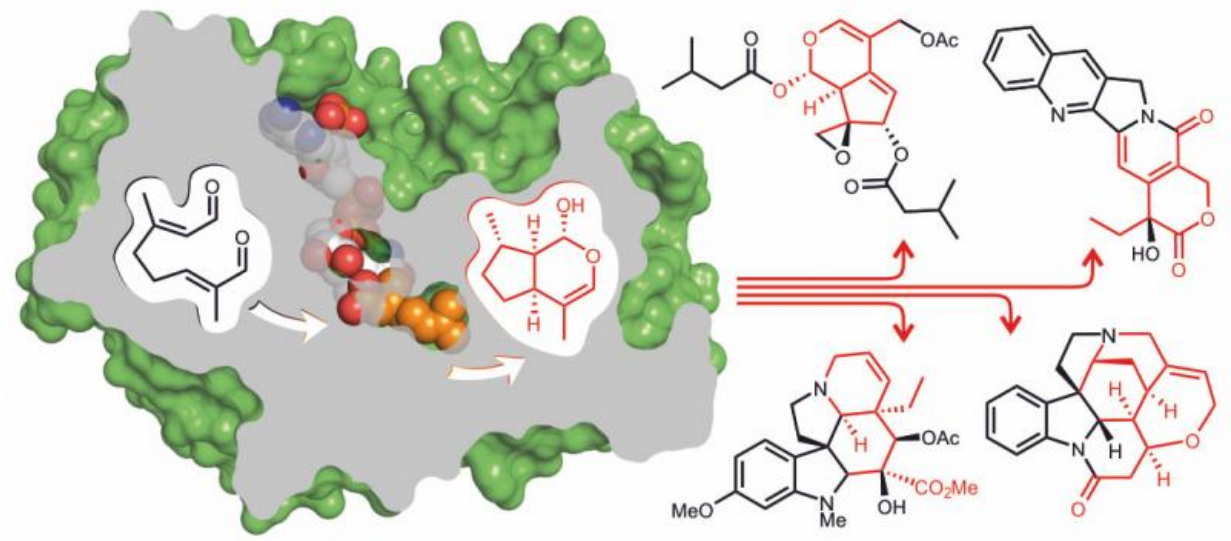

The biosynthesis of iridoids, a class of bicyclic monoterpenes, features an atypical cyclization reaction catalyzed by iridoid synthase (ISY). Crystallographic and biochemical characterization of ISY from *Catharanthus roseus* provides insights into the ISY enzymatic mechanism and highlights similarities with the homologous progesterone 5β-reductase. Credit: The John Innes Centre

Scientists identify 3D structure of enzyme critical to the creation of anticancer and antimalarial compounds in plants

In a paper published today in *Nature Chemical Biology*, Professor Sarah

O'Connor and Dr Dave Lawson have identified, for the first time, the 3D structure of the enzyme iridoid synthase responsible for a very specific form of cyclisation of monoterpenes which creates anticancer and antimalarial drugs.

The enzyme iridoid synthase plays a crucial role in the biosynthesis of a large class of plant natural products, the iridoids. Iridoids are the starting precursors for a large group of products such as the anticancer agent vinblastine, the antimalarial quinine and the active ingredient of catnip. Iridoid synthase generates the core of iridoid natural products by cyclizing a monoterpene precursor in a mode that is fundamentally different from other enzymes acting on monoterpenes.

The first gene of an iridoid synthase has only recently been discovered. In their paper they report the three-D structure of this enzyme which provides more detailed information on the mechanism of iridoid synthase.

More information: Structural determinants of reductive terpene cyclization in iridoid biosynthesis, *Nature Chemical Biology*, DOI: 10.1038/nchembio.1955

Provided by John Innes Centre