Functional analyses of oxygenases in jadomycin biosynthesis and identification of JadH as a bifunctional oxygenase/dehydrase.

Chen YH, Wang CC, Greenwell L, Rix U, Hoffmeister D, Vining LC, Rohr J, Yang KQ (2005) Functional analyses of oxygenases in jadomycin biosynthesis and identification of JadH as a bifunctional oxygenase/dehydrase. *J Biol Chem* 280, 22508-22514.

Abstract

A novel angucycline metabolite, 2,3-dehydro-UWM6, was identified in a jadH mutant of Streptomyces venezuelae ISP5230. Both UWM6 and 2,3-dehydro-UWM6 could be converted to jadomycin A or B by a ketosynthase alpha (jadA) mutant of S. venezuelae. These angucycline intermediates were also converted to jadomycin A by transformant of the heterologous host Streptomyces lividans expressing the jadFGH oxygenases in vivo and by its cell-free extracts in vitro; thus the three gene products JadFGH are implicated in catalysis of the post-polyketide synthase biosynthetic reactions converting UWM6 to jadomycin aglycone. Genetic and biochemical analyses indicate that JadH possesses dehydrase activity, not previously associated with polyketide-modifying oxygenase. Since the formation of aromatic polyketides often requires multiple dehydration steps, bifunctionality of oxygenases modifying aromatic polyketides may be a general phenomenon.

Beteiligte Forschungseinheiten

Pharmazeutische Mikrobiologie Dirk Hoffmeister Mehr erfahren

Leibniz-HKI-Autor*innen

Dirk Hoffmeister

Details

Identifier

PMID: 15817470