## عنوان مقاله:

Bioconversion of genistein to orobol by spore display tyrosinase


## محل انتشار:

بیستمین کنگره بین المللی میکروب شناسی ایران (سال: 1398)

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## خلاصه مقاله:

Introduction and Objectives: Flavonoids are compounds with low molecular weight, which consist of 15 carbons with a structure of C6-C3-C6, and two benzene rings that are bonded together by carbon chain. Isoflavones are a group of flavonoids with a limited distribution in plants, especially in Papilionoideae subfamily. Soybeans are the main source of isoflavones. Genistein is the simplest isoflavone and Soybean is a rich source of this compound. Genistein (4´,5,7-trihydroxyisoflavone) comprises two phenolic rings linked to a three-carbon bridge, which in this case is an oxygenated heterocyclic ring with three hydroxyl groups at carbons 4´, 5, and 7. Genistein has a wide range of biological activities such as antioxidant, anti-inflammatory, anticancer and antimicrobial effects. Bioconversion is a process which transforms a molecule into another molecule with new features. In this paper, we transformed genistein to orobol by spore displayed tyrosinase. Tyrosinase is an oxidoreductase enzyme which catalyze hydroxylation of a monophenol to diphenol and oxidation of diphenol to the corresponding quinone. Materials and Methods: Genetically modified Bacillus subtilis DB104 (pSDJH-cotE-tyr) was used for bioconversion of genistein to orobol. The production of orobol from genistein was confirmed by TLC and HPLC. The different concentrations effect of genistein and orobol were investigated on MCF-7 cancer cell line and the anticancer effect was determined by flow cytometry and MTT tests. Results: MTT test demonstrated concentrations of 300 to 500 µM of orobol had more inhibitory effect on MCF-7 cells than genistein in the same concentrations. Flow cytometry analysis showed genistein and orobol in 500 µM had 80 and 87 percent inhibitory effect respectively. Conclusion: In contrast to genistein, orobol is not a natural compound found in nature. Spore displayed tyrosinase converts genistein (4´,5,7-trihydroxyisoflavone) to orobol (3´,4´,5,7-tetrahydroxyisoflavone) with more anticancer effect by adding a hydroxyl group on 3´ carbon.



## کلمات کلیدی:

Orobol, Genistein, Spore displayed tyrosinase, MCF-7 cells