Enzymatic Synthesis of Valuable Bioactive Compounds

Ivan Bassanini$^{1,2}$, Daniela Monti$^{2}$, Jana Krejzová$^{3}$, Vladimir Křen$^{3}$, Sergio Riva$^{2}$

$^{1}$Università degli Studi di Milano, Dipartimento di Scienze Farmaceutiche, via Mangiagalli 25, Milano, 20133 (IT)
$^{2}$Istituto di Chimica del Riconoscimento Molecolare, CNR, via Mario Bianco 9 20133 (IT)
$^{3}$Institute of Microbiology, Laboratory of Biotransformation, AVCR, Videnska 1083, 142 20, Prague (CZ)

e-mail: ivan.bassanini@unimi.it

A sustainable and convenient, one-pot two-enzyme method for the glucosylation of arylalkyl alcohols was developed (Scheme 1). The reaction scheme was based on a transrutinosylation catalyzed by a rutinosidase from A. niger using the cheap and commercially available flavonoid rutin as glycosyl donor, followed by a selective ‘trimming’ of the rutinoside unit, catalyzed by a rhamnosidase from A. terreus. Both these enzymes were available to us as heterologous proteins produced by a recombinant strain of P. pastoris.

This process allowed the facile preparation of several natural bioactive glucosides, which could be isolated in up to 80% yield without the need of silica-gel chromatography.$^{1}$

Scheme 1: Enzymatic one-pot glucosylation