

Technology Transfer Opportunity

Generation of an improved biocatalyst

OPPORTUNITY:

Generation of an improved biocatalyst

Description of Technology:

The invention provides an improved enzyme for the biocatalytic synthesis of compounds such as styrene oxide, indene oxide and the widely used dye indigo.

Value Proposition:

Styrene oxide is a large-volume, commodity petrochemical product but the optically pure (*S*)-styrene oxide is a lower volume, higher valued intermediate for the synthesis of more complex specialty chemicals including pharmaceuticals.

(1S-2R)-Indene oxide is another commercially highly attractive compound. It is a pharmaceutical intermediate in the synthesis of indinavir sulphate, a protease inhibitor currently used in the treatment of AIDS.

Biocatalytical synthesis of these stereospecific oxides is advantageous over chemical production since the relevant enzymes, oxygenases and associated oxidoreductases, offer a degree of stereoselectivity and catalyse the reactions under mild conditions. The un-modified enzymes show a natural degree of stereospecificity but the products are not enantiopure.

The present improved enzyme system produces the highest known rate of (*S*)-styrene oxide and of (1S-2R) indene oxide production by a biocatalyst. Between 88.2% and 94.5% of the indene substrate is converted into indene oxide with an improved 97% enantiomeric excess of (1S,2R)-indene oxide.

Besides indene and styrene a series of other substrates including benzothiophene, thioanisole, naphthalene are converted at increased rates by this enhanced biocatalyst.

This improved enzyme system allows for:

- Enatiopure or greatly enantioenriched production of valuable pharmaceutical intermediates which would allow manufacturers to curtail costly chiral purification,
- And an extremely efficient production of these intermediates (up to 35-fold increased conversion rate compared to the un-modified enzymes)
- under mild conditions.

Market:

Pharmaceutical/ specialty chemicals

Inventor:

Dr Kevin O'Connor, UCD School of Biomolecular and Biomedical Science.

Status:

UK priority applications UK0812468.7, progressed to PCT stage

Opportunity Sought:

Available for licensing and/or collaborative opportunities.

Contact:

Dr Claudia Wietek, Project Manager Technology Transfer, NovaUCD, Belfield Innovation Park, UCD, Belfield, Dublin 4.

t: 00-353-(0)1-716 3722 e: claudia.wietek@ucd.ie w: <u>www.ucd.ie/nova</u>