

## Industrial Biocatalysis for production of functionalized molecules

CSIC, Technische Universität Darmstadt, and Sustainable Momentum SL present an aldolase active at MOLAR aldehyde concentrations. With broad substrate acceptance (aldehydes and keto-acids), many functionalized products are synthesized at high productivities for industrial production.

Industrial partners are being sought to collaborate through a patent licence agreement.

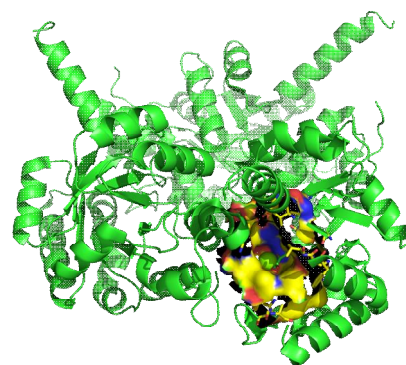
*An offer for Patent Licensing and/or R+D collaboration*

### C-C bond forming: High substrate loadings for high productivity

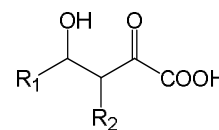
Aldolases are useful, yet largely unexplored biocatalysts for C-C bond formation. A common challenge is their rapid denaturation in the presence of aldehydes at industrially-required loadings. Herein, a new pyruvate aldolase (YfaU) accepting aldehydes at MOLAR concentrations is reported.

YfaU catalyzes C-C bond formation at high loadings and productivities (above 100 g L<sup>-1</sup> d<sup>-1</sup>). A broad range of aldehydes and ketoacids are accepted, leading to products for bulk, fine chemicals or pharmaceuticals.

An outstanding example is the combination of YfaU with transaminases to produce chiral amino acids. Remarkably high productivities (> 80 g amino acid L<sup>-1</sup> d<sup>-1</sup>) with excellent enantioselectivities (ee >99 %, R or S) can be reached.



YfaU structure



Family of hydroxy-ketoacids that can be obtained at industrial scale.

### Main advantages and applications

- Aldolase fully stable and active at high aldehyde loadings (up to 1.4M).
- The C-C bonding enzyme shows ample substrate range, leading to a broad number of potential functionalized molecules.
- Productivities higher than 100 g product L<sup>-1</sup> d<sup>-1</sup>.
- High simplicity and adaptability, with room for on-demand optimization.
- Combined with transaminases, useful for the industrial production of amino acids.
- Different markets, ranging from bulk applications to fine chemicals and pharmaceuticals.

### Patent Status

PCT patent application filed

### For further information please contact

Isabel Masip, Ph.D.  
Institute for Advanced Chemistry of Catalonia  
Deputy Vice-Presidency for Knowledge Transfer of CSIC

Tel: + 34 – 93 400 61 00  
E-mail: isabel.masip@iqac.csic.es