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TOPIC(s) : Industrial biocatalysis / Enzyme engineering & Discovery

Biocatalysis - A Bio-logical Approach to Catalysis in the Pharmaceutical Industry

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PURPOSE OF THE ABSTRACT

Biocatalysis has become a routine tool for the manufacturing of pharmaceuticals allowing to increase capital efficiency while lowering the carbon dioxide footprint. Having started this journey with well-established commercial enzymes in non-GMP steps, Novartis nowadays applies engineered enzymes across all scales (see Figure 1). [1,2] Showcases like the transaminase applied in the synthesis of sacubitril [3] or a phenylalanine ammonia lyase (PAL) for EMA401 [4], clearly shows the power of biocatalysis in shortening synthesis routes.

FIGURES

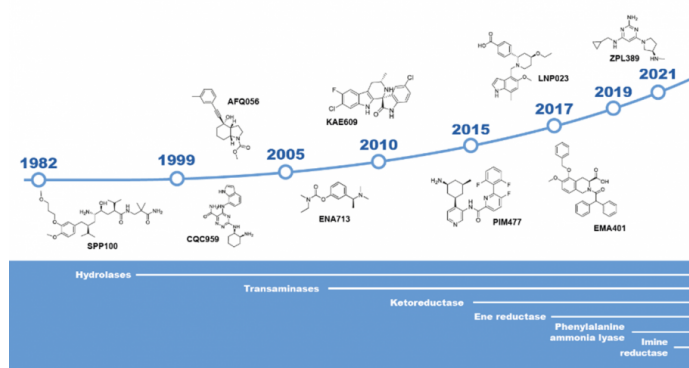


FIGURE 1

Fig. 1:

Evolution of the enzymatic toolbox over the past 4 decades at Novartis. [2]

FIGURE 2

KEYWORDS

Proteinengineering | Enzyme Immobilization | Pharmaceutical industry

BIBLIOGRAPHY

References

- [1] G. Mann and F. V. Stanger, A Bio-logical Approach to Catalysis in the Pharmaceutical Industry, *Chimia* (2020) 407-417.
- [2] E. Siirola et al., Evolution of Biocatalysis at Novartis over Last 40 Years, submitted
- [3] WO2017/098430; WO2018/231462; *J. Org. Chem.* 2020, 85, 6844-6853
- [4] L. A. Hardegger et al., Toward a Scalable Synthesis and Process for EMA401, Part III: Using an Engineered Phenylalanine Ammonia Lyase Enzyme to Synthesize a Non-natural Phenylalanine Derivative, *Org. Process Res. Dev.* (2020), 24, 9, 1763-1771