

Enzyme discovery & engineering to create biocatalysts suitable for organic synthesis and plastic recycling

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This lecture will cover recent achievements in the discovery, protein engineering and application of enzymes in biocatalysis [1].

Examples for the creation of enzymes for biocatalytic applications include the asymmetric synthesis of chiral amines for which we created (S)-selective amine transaminases for the acceptance of bulky ketones [2] using more recently also machine learning tools to improve them [3].

To address the global problem of plastic waste, we have performed extensive research for the recycling of PET, for which we have improved different esterases [4] and also recently established a protocol enabling a fair comparison PETases reported in literature [5]. Most recently, we have identified the first urethanases in a metagenomic library able to degrade polyurethanes [7] and elucidated their structures by X-ray analysis [8]. We also designed an enzyme cascade to degrade poly(vinylalcohols) [8] and low molecular weight polyethylene [9].

References

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