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Biocatalytic asymmetric hydroamination by native and engineered carbon-nitrogen lyases

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Stellingen

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Biocatalytic asymmetric hydroamination by native and engineered carbon-nitrogen lyases

New enzymes to prepare amino acid precursors to pharmaceuticals and food additives

van Jielin Zhang

1. Biocatalysis provides solutions for developing sustainable and step-economic synthesis of pharmaceuticals and fine chemicals by enabling new chemical reactions and offering desired reaction selectivity. (This thesis)
2. Carbon-nitrogen lyases are “molecule-building” enzymes with strict selectivity, serving as promising biocatalysts to introduce nitrogen-containing functionalities into organic molecules via asymmetric hydroamination. So far, only a few carbon-nitrogen lyases have been explored for their biocatalytic applications. (This thesis)
3. EDDS lyase has a broad nucleophile substrate scope, excellent stereo- and regioselectivity, and good adaptability, showing great potential as biocatalyst for synthesis of amino acids. (This thesis)
4. Developing a good library screening method is often time-consuming, yet is crucial for successful enzyme engineering. You will get what you screen for. (This thesis)
5. Incorporation of stabilizing cosolvents in screening assays is an attractive strategy to identify highly active yet unstable mutants in enzyme evolution. (This thesis)
6. When hitting a dead end in research, knowing when to stop and move forward is a good trait. (My view)
7. We must believe that we are gifted for something, and that this thing, at whatever cost, must be attained. (Marie Curie)
8. Pursuing perfection is the longest way to achieve a goal. Done is better than perfect. (My view)
9. EDDS lyase is like a hero who saved two of my PhD projects back from death. In return, I engineered it to an even better enzyme. (This thesis)
10. 精诚所至，金石为开 (Do whatever is put in front of you with all your heart. Even the metal and the stone will open a way for you, Chuang Tzu)