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## **Biotransformation of industrial terpenes**

Terpenes (terpenoids) are isoprenoids and form the most versatile natural product group. Terpenes have many biological activities, such as anti-cancer, analgesic, spasmolytic, anti-inflammatory, anti-microbial and insecticidal effects. Terpenes are also important ingredients for flavours and fragrances. Industrial terpene products are often chemically modified from starting compounds derived from plant materials. Concern of environmental factors and sustainability has resulted in development of cleaner processes and much attention is paid on reusability and recycling. In this context, biotransformation, i.e. the use of biological systems to produce chemical changes on synthetic or natural compounds, is an attractive alternative compared to traditional chemical methods. Biotransformation takes place in mild conditions and does not result in generation of toxic wastes. Eukaryotic cells such as fungal and plant cells have been widely applied in various biotransformation processes, because they contain various unique enzymes. These cells exhibit a vast biochemical potential being able to transform various substances, such as industrial by-products, into rare and expensive products. In addition, the cells can carry out catalytic reactions in a stereospecific and regiospecific manner.

The goal of this PhD thesis is to study the terpene pathways of *Aspergillus nidulans* to better understand the properties of filamentous fungi to carry on enzymatic modifications on terpenes. During the study we aim to:

- Study the secondary metabolism of *Aspergillus nidulans*.
- Characterize biosynthetic enzymes that are potentially useful in biotransformation.
- Evaluate the possibility to use fungal cells/enzymes in modification of existing biomass compounds.
- Evaluate the possibility to engineer terpene metabolism of *Aspergillus nidulans*.