



innovations from nature



acib Project Proposal

Synthesis of bio-based resveratrol analogues

A new reaction cascade converts inexpensive ferulic acid derivatives into highly valuable bio-based oxidants that are very promising constituents for lubricants, cosmetics/health products and polymer packaging

Background

Antioxidants are a vital constituent of a broad range of materials. The bio-based ferulic acid, cumaric acid, sinapinic acid and caffeic acids are abundant in lignocellulosic biomass. Our project aims to convert this **inexpensive starting material** into analogues of the natural antioxidant **resveratrol (Figure 1)**. Resveratrol and its analogues have received considerable attention due to their **diverse biological effects** that include **chemoprotection, anti-oxidant, anti-inflammatory, anti-diabetic, anti-thrombotic, cancer prevention and anti-aging properties**. For instance, 4,4'-dihydroxy-trans-stilbene was reported to prevent cancer invasion and metastasis and has a **four-fold higher antioxidant capacity than resveratrol**.

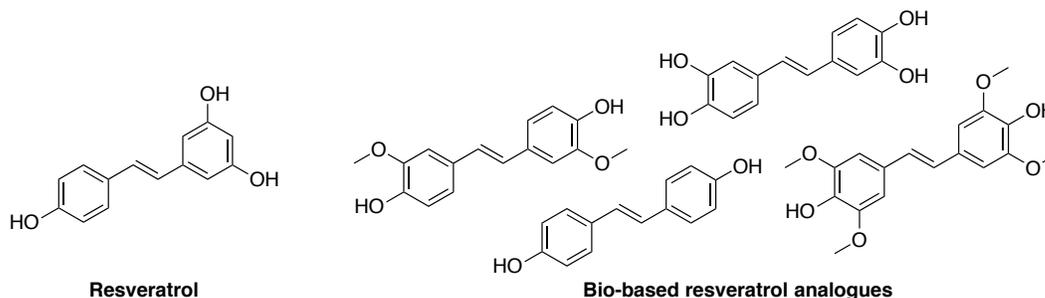


Figure 1: Bio-based Antioxidants as analogues of the natural compound resveratrol.

acib-Technology

We have **developed a new chemoenzymatic process for the production of symmetric stilbene derivatives**. The reaction combines an enzymatic decarboxylation with a subsequent metathesis reaction. While the intermediary products of the enzymatic reaction are unstable, a two-step *one-pot* process allows **90% isolated yield**. The **expertise available at acib**, combined with **freedom to operate** results in a highly interesting commercial opportunity.

acib-Offer

The acib offers expertise for the further **optimization** of the current process and **scale-up**. acib also offers to perform additional research e.g. on **glycosylation of the antioxidants** which is expected to increase the bioavailability and to give rise to potentially new products. Furthermore, metabolic engineering of the yeast *Pichia pastoris* would even allow for the **production of the antioxidants from fermentable sugars**. IP for these additional innovations can be secured **exclusively for you**.

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