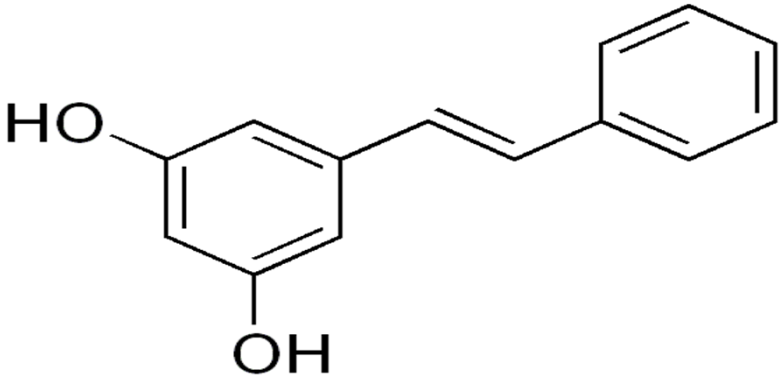
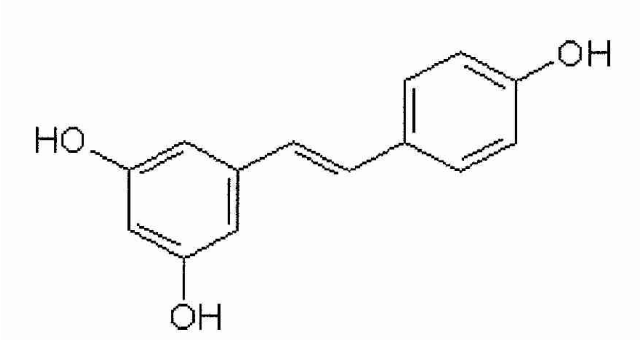
PINOBIO
Pinosylvins as novel Bioactive Agents for Food Applications

What and why?

Pinosylvin (top right) has bioactivities that very much resemble those of resveratrol (bottom right), a well known stilbene with multiple positive health effects

The aim of the project is to assess and develop pinosylvins from European pine trees (and other tree species) as bioactive prodrug, antimicrobial, and/or antidiabetic compounds in various products or porcesses in the food industry





Who?

- University of Eastern Finland (UEF)
  - Coordination, Study of the bioactivities
- University of Vigo, Spain (UVIGO)
  - Optimization of the extraction of plant phenolics from Mediterranean *Pinus*-species
- Latvian State Institute of Wood Chemsitry Latvia, (IWC)
  - Optimization of pinosylvin extraction from Baltic/Northern *Pinus*-species
- University of Ljubljana, Slovenia (UL-BF)
  - Optimization of pinosylvin extraction from high altitude *Pinus*-species
- Åbo Akademi University, Finland (AAU)
  - Coordination of the pinosylvin extraction procedures, derivatization
- Industrial platform: Six SME:s

Major achievements

- Extraction methods have been standardised and optimised
  - If crude extracts are acceptable, extraction economically superior than chemical synthesis
- Pinosylvin has been shown to be more antimicrobial than resveratrol, mono- and dimethylethers having almost similar potency as the parent compound
  - Ethyl derivatives do not have antimicrobial activity
  - The antimicrobial effects of pinosyvin dimers still under investigation
- The effects on cellular metabolism indicate a similar antidiabetic activity to that of resveratrol
- Also other potentially positive effects on the energy metabolism, not found with resveratrol, have been observed
- Safety evaluation of pinosylvin, based on observable chemical properties and available literature will be finalised this year

Lessons learnt

- Pinosylvin and pinosylvin monomethylether are potent antimicrobial compounds, and they both can be efficiently extracted from the pinewood

- Pinosylvin can be used as a lead molecule in the synthesis of novel bioactive compounds

- Pinosylvin may have similar health-promoting activities as resveratrol

- Provided that the safety aspects of pinosylvin and its derivatives can be addressed, they could have used as novel biocides for food industry or even as novel functional compounds