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# High value chemicals from lignin using biological processes

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## Overview

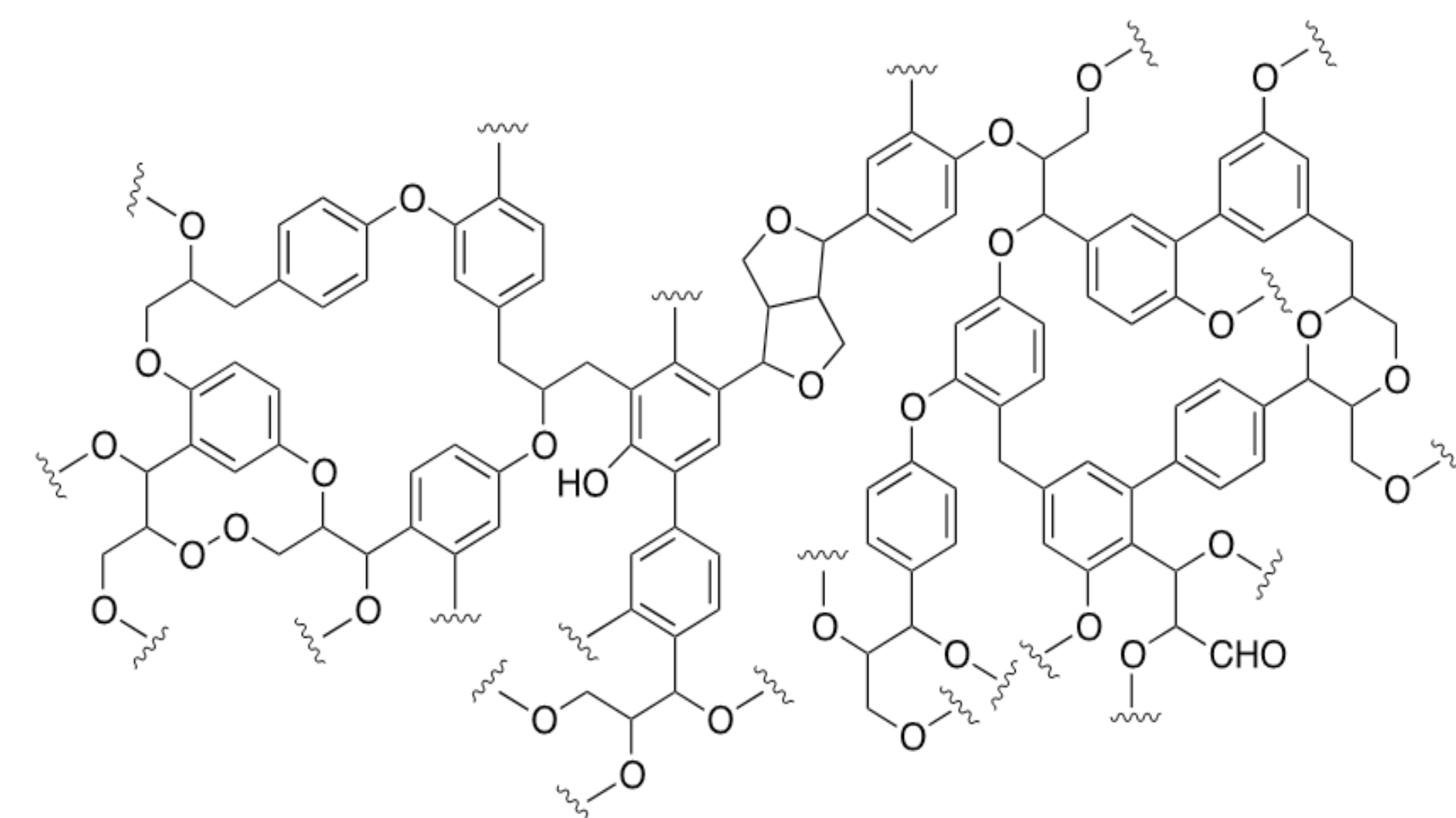
Lignin is an energy-dense and extremely heterogeneous aromatic polymer produced by plants and some algae. It is one of the most abundant biopolymers on Earth and it is highly recalcitrant to microbial degradation in nature. Its degradation is the main limiting step of the bio-geochemical carbon cycle and a major obstacle for the implementation of second-generation biofuels. Depolymerisation of lignin by different methods has the potential to produce a wide range of small phenolic compounds which can be biocatalytically upgraded. Recently, a multidisciplinary SSF-funded project has been started at Lund University, involving four research groups in three different departments, for the development of novel technologies which will enable routes for lignin valorization.



## Industrial processes

- Kraft
- Sulphite
- Organosolv
- Soda-AQ
- Alcell
- Organocell
- Organocat...

## Lignin complex



## Depolymerisation

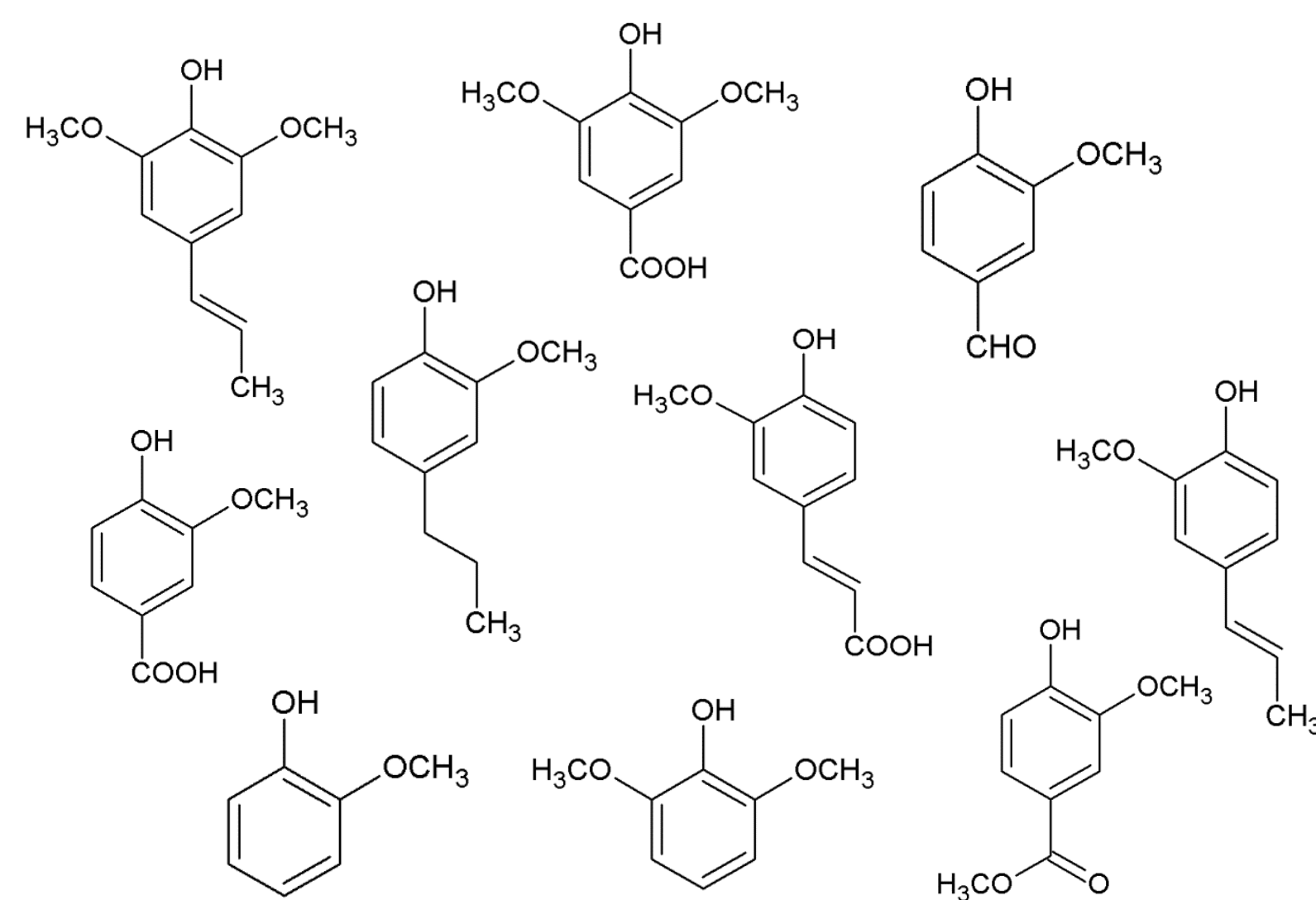
Depolymerisation strategies are adopted in order to convert the complex lignin compound into small molecules suitable for further biological conversion

### Deconstruction pathways

- Chemical
- Enzymatic



## Small phenolic compounds



## Analytical techniques

Specially developed chromatographic techniques coupled with Mass Spectrometry for detection and analysis of heterogeneous mixtures of small phenolic compounds



## Screening

- With lignin sources
- With model compounds

## Selected microorganisms

## Metabolic Engineering



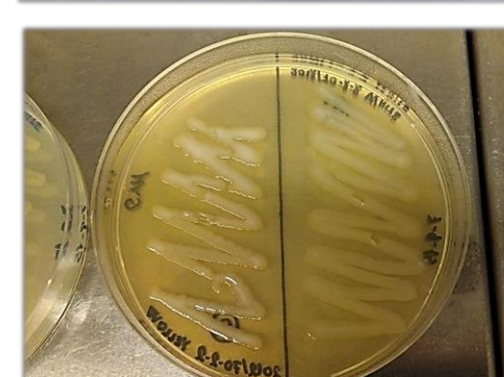
## Biocatalysis

## Fine speciality chemicals

Microorganisms from culture collections



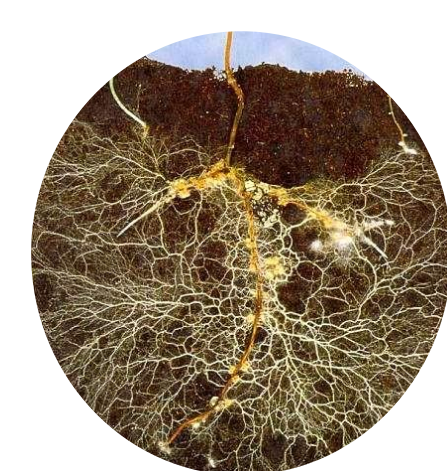
Microorganisms isolated from environment



Vegetal compost



Rhizospheres



Pulp and paper mills



## Our Team



## Acknowledgements

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For more information and contact: [www.lignin.lu.se](http://www.lignin.lu.se)