



European Union  
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# NANOTECH-DRIVEN BIO-PRESERVATION OF WOOD

## RESEARCH AND DEVELOPMENT PROJECT 2016-2017

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### Wood preservation research project

Universities of Eastern Finland (UEF) and Oulu are in collaboration with the Natural Resources Institute Finland (Luke) in developing a wood preservative based on the natural protective mechanisms of trees in the project funded by Tekes, the Finnish Funding Agency for Innovation. The project started at the beginning of this year and will end on 31 May 2017.

Project involves companies that can make use of the development work. The aim is to develop products to provide with a durable protection and to ensure that they are as safe to use as untreated wood.

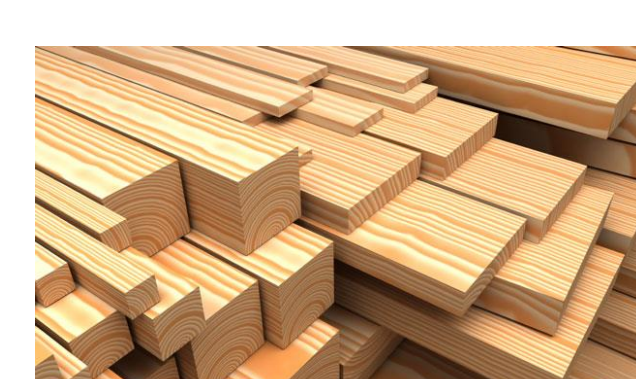
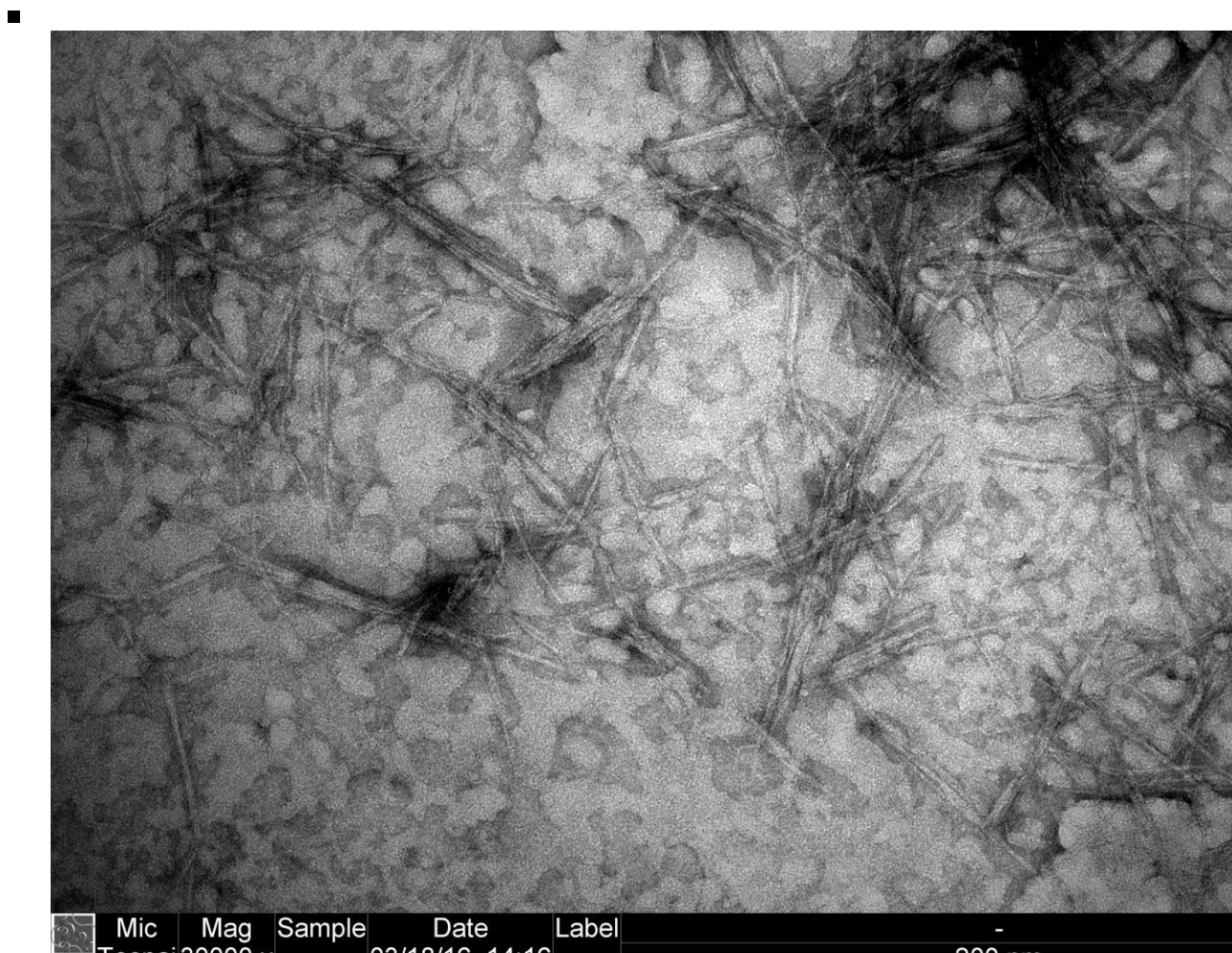


### Tree bark – raw material for wood preservative

The natural protective mechanisms of a tree are based on extractives, some of which protect the tree against pests, fungi and bacteria. High levels of usable extractives to protecting trees can be found in bark residue – these include tannins, lignans, flavonoids and stilbenes. These can be separated in pyrolysis or using green extraction methods.

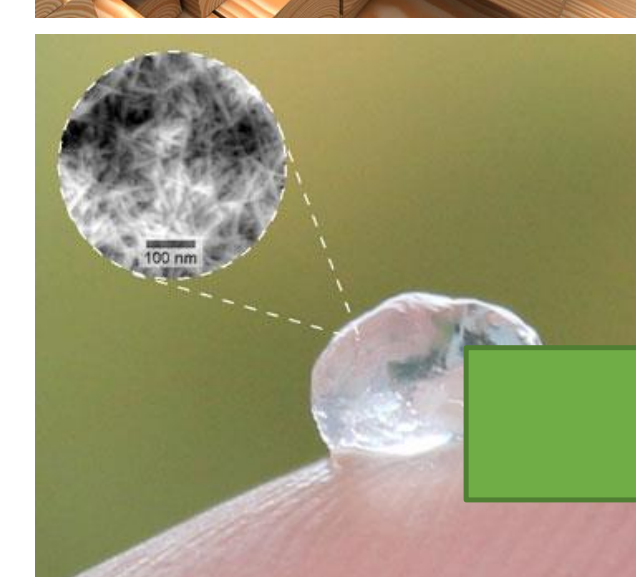
### Nanocelluloses – chemical fixing agent

Nanocellulose can be prepared from many cellulosic source materials. Project focuses on developing new chemical manufacturing processes for nanocellulose based on deep eutectic solvents (DES). These solvents are based on green chemicals, such as urea and choline chloride. They are very competitive in terms of costs and availability.



#### 1. Tannin and pyrolysis oil extraction and modification (Luke, UEF)

- ✓ Separation tech.
- ✓ Analyses



#### 2. Nanocellulose manufacture and modification (Uni. Oulu)

- ✓ Particle analysis
- ✓ Adhesion chemistry



#### Key tasks and responsibilities in the research project

#### 3. Formulation and impregnation tests (UEF)

- ✓ Trials for wood treatment aid usage

#### 4. Product test (Luke)

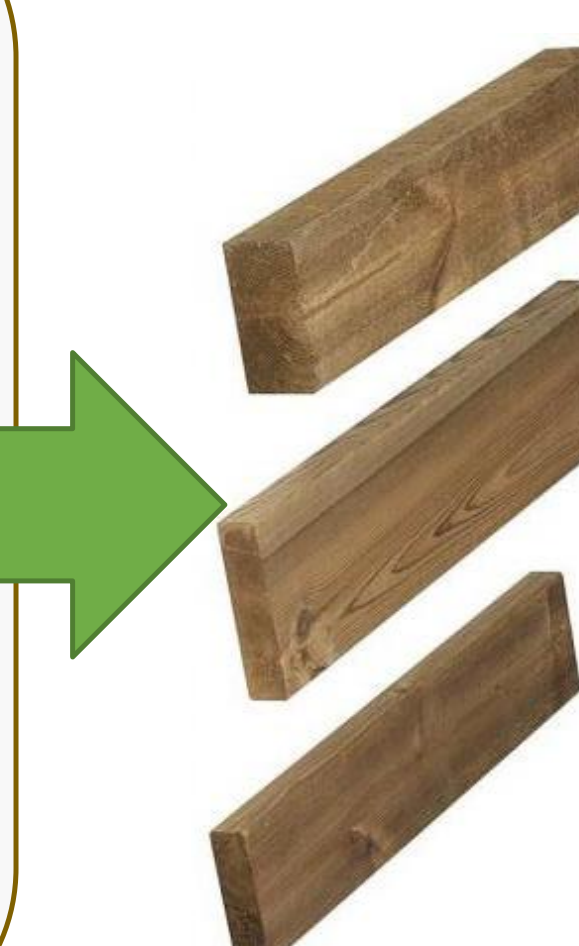
- ✓ Laboratory and field tests of preserving efficiency for moulds and fungi

New concept of green preservation of wood

- ✓ Penetration
- ✓ Stability under UVA
- ✓ Product properties

- ✓ Long and short term
- ✓ Economic potential

#### 5. Project management



# Tekes

