



## Research News

### New enzyme technologies for fibre modification

**Agrotechnology & Food Sciences Group concentrates on the development of new markets and new applications for (renewable) agro raw materials, combining fundamental and applied research.**

#### Objective

Fibre biotechnology research concentrates on the development of environmental friendly enzymatic processes to optimise fibre quality and fibre processing. Enzymatic treatment of materials such as wood chips and (recycled) wood fibres, cotton, flax and viscose textiles, is rapidly becoming more important because of

- Novel product characteristics
- Improved processing routes
- Growing consumer and industrial concern about the environment.

#### Approach

Fibre research is performed by an integrated multi-disciplinary approach ranging from molecular biology to extrusion and refining technology with both "in house" constructed and bought enzyme preparations.

New enzymes are discovered by using microbial screening. The genes of promising enzymes are isolated and characterised. If desired, the gene is altered for improving enzyme properties, such as its affinity for certain substrates. The next step is production of the protein in a microbial expression system. Application tests can be performed for a broad range of products.

Due to different chemical compositions of fibres, distinct enzymes are needed for their modification. In addition to fibre chemistry also the macrostructure of the fibre and process conditions effect the enzyme performance.

#### Deliverables

- Patented genes for the production of fibre modifying enzymes.
- Production of pure enzymes in appropriate expression organisms.
- New enzyme based technologies for fibre opening/modification in e.g. pulping, textile and beverage production
- Tailor made fibre surface characteristics

#### Market/Industries

- Pulp and paper industry:
  - Refining and dewatering
  - Bio-bleaching
  - Deinking
  - Pitch removal
- (Geo-)Textiles
  - Bioscouring of cotton
  - Stone washing
  - Bio-bleaching
  - Desizing
  - Fibre surface modification
- Detergents
  - Textile cleaning
  - Dishwashers
- Food
  - Beverages
  - Dietary fibre
- Feed
  - Feed efficiency
- New markets

#### Information

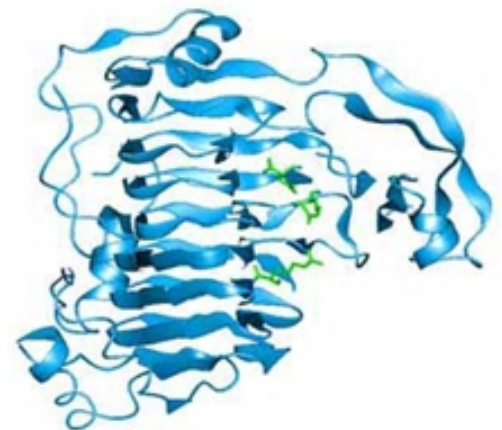
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Cotton fibre



In vitro retting of flax



3D structure of a pectin lyase, used for example in bioscouring of cotton fibres