

Domain Food and Agriculture



COST Action 928

Control and exploitation of enzymes for added-value products

Chair: Prof. Johanna Buchert

Vice-chair: Dr. Craig Faulds

The Action develops novel enzymes and tailored bioprocessing technologies for different food raw materials to obtain higher-quality food products and new natural ingredients. The objectives of the Action will be achieved combining scientific and technological expertise within enzyme-aided food processing to a coherent Action.

European food industry must continuously increase its competitiveness by implementing more advanced technologies for processing and creation of added value to the final products. Enzymes offer a sustainable, specific processing tools to food industry. Due to the specificity of enzymes, a variety of chemistries can be obtained by controlled action of these bio-tools in the food matrix. As a result of rapid development of biotechnological methods, novel enzymes and activity types can be isolated from nature for subsequent exploitation in different process stages. The full exploitation of these novel biotools in processing requires thorough understanding of the reaction mechanisms involved in both micro- and macroscale.

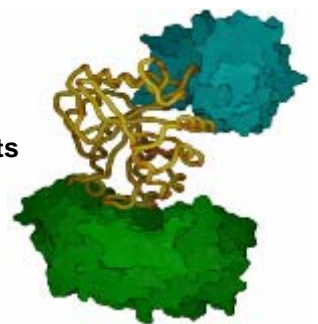
Enzymes are natural biotools for food and ingredients processing



Nature is full of enzymes

Enzyme discovery

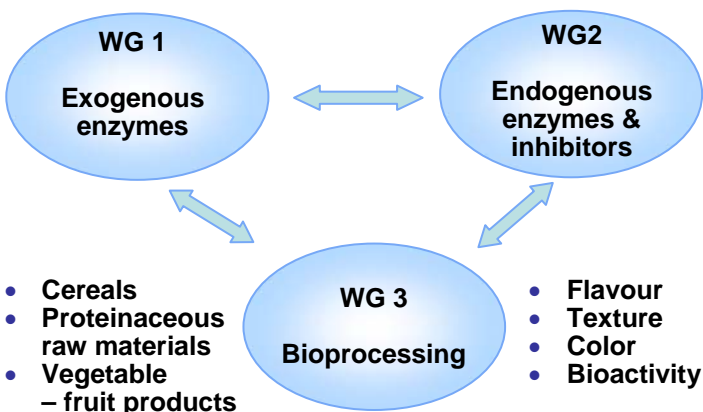
- mode of action
- technological benefits



Enzymes as tailored tools in food processing



COST 928 Action is divided into three working groups



WG 1: Development and mode of action of novel biotools (Exogenous enzymes)

WG-leader:

Dr. Henk Schols (henk.schols@wur.nl)

Deputy leader:

Dr. Peter Biely (chempbsa@savba.sk)

Objectives

- To develop novel exogenous enzyme tools from microbial or plant sources
- To investigate the mode of action of the enzymes using model substrates.

Deliverables

- Novel hydrolytic enzymes (glycosidases, proteases, peptidases) being able to alter the flavour characteristics of food raw materials
- Novel crosslinking enzymes (oxidative and transferase type enzymes) affecting the rheology of food biopolymers
- Understanding the mode of action of the enzymes on simple and complex substrates
- Understanding the mechanisms involved in synergistic enzyme activities



WG 2: Tailoring and control of the endogenous enzyme machinery in food matrix (Endogenous enzymes)

WG-leader:

Dr. Nathalie Juge (nathalie.juge@bbsrc.ak.uk)

Deputy leader:

Dr. Birte Svensson (bis@biocentrum.dtu.dk)

Objectives

- To develop methods for tailored activation or inhibition of the endogenous enzymes present in the food matrix.
- To understand the chemistry of endogenous enzyme inhibitors and their role in enzyme catalysis.

Deliverables

- Prevention of action of endogenous enzymes negatively affecting food quality
- Activation of beneficial endogenous enzymes to improve processability, flavour and texture
- Understanding of the role of proteinaceous inhibitors on the action of microbial and endogenous enzymes
- Investigating the effect of selective binding of inhibitors on simple and complex substrates

WG 3: Improved food quality via bioprocesses (Bioprocessing)

WG-leader:

Prof. Anne Meyer (am@kt.dtu.dk)

Deputy leader:

Dr. Vural Gökmen (vgokmen@hacettepe.edu.tr)

Objectives

- To exploit enzymatic catalysis in the manufacture of food products with improved quality
- To improve the raw material utilization
- To decrease the need for added chemical ingredients in the processes by tailored bioprocesses
- To develop bio-based by-product valorisation processes.

Deliverables

- Novel enzymatic structure engineering concepts
- Novel methods to boost food flavour, colour or healthiness
- Novel fruit and vegetable bioprocessing concepts
- Enzyme-aided processing concepts for meat and fish raw materials
- Enzyme-aided cereal processing methods
- New enzyme-aided processes for by-product valorization

Participating countries



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