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## ENZYMOMOLOGY AND MOLECULAR BIOLOGY

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### Developing the bio-economy: Fast track discovery of new enzymes for efficient and value added biomass conversion

A new fast track enzyme discovery technology platform has been developed. It differentiates from existing approaches as it is non-alignment based and facilitates prediction of function of the enzyme directly from the (genome) sequence. New enzymes and enzyme-based processes are being developed for producing biomass-based food ingredients, feed additives, health-promoting products, components for skincare and wound healing as well as fertilizer, fibers and building blocks for chemicals. Enzyme discoveries of relevance for the following types of biomass feed stock have recently been made: The green biorefinery, making value added products from green grass, clover, etc. Seaweed biomass, from species of brown algae, growing meters high in temperate/colder waters, have already now been documented to hold several components with potentials for being developed into new value chains. Feather is composed of the proteinaceous, highly recalcitrant keratin. It has been shown that a blend composed of three specific types of fungal enzymes can be used for decomposing the keratin into peptides and amino acids. Interestingly, the keratin-degrading fungi in these studies showed four different *LPMO* genes, (Lytic Polysaccharide Monooxygenases) which may be directly involved in breaking down the keratin. Enzymes of relevance for improved processing of fish skin collagen are being studied in the project Collagen Hydrolysate funded as a Nordic Innovation program.

#### Biography

Lene Lange is a Professor at the Center for Bioprocess Engineering, DTU Chemical Engineering, Denmark. She has held Research Director Positions in both industry and academia. Currently, she holds advisory positions at: The Danish National Bio-economy Panel, the Nordic Bio-economy Panel, Scientific Committee for the BBI JU and IAB BIOTEC Thailand. Her fields of research are discovery of novel enzymes for improved biomass conversion and biorefinery processes, with specific focus on generating value from agro-industrial side streams and waste products; development of the new enzyme discovery platform, PPR, a non-alignment based sequence analysis method, predicting function directly from sequence and using PPR analysis, combined with MS, phylogenetic analysis.

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#### Notes: