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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. Her research focuses on the development of new enzymes and enzyme-based processes 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. She is also involved in the development of new value chains for biomass feedstock, such as green biorefinery, seaweed biomass, and feather. Her research is funded by the Danish Research Council for Technology and Innovation (VILLUM FONDEN) and the Nordic Innovation program.

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