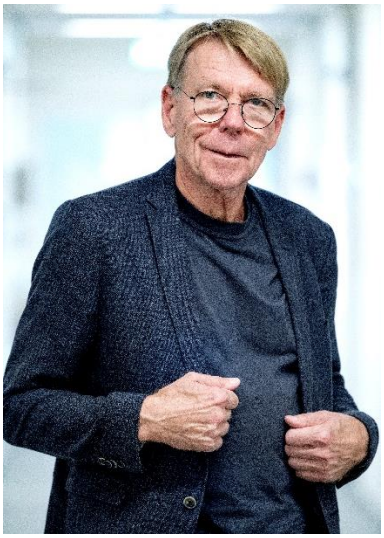
Seminars in Biotechnology BTEC 591 & BTEC 691

"Cell envelope proteases of lactic acid bacteria"



Professor Egon Bech HANSEN

Tuesday, December 12, 2023

13:30

Biotechnology Institute Amphitheatre-1

Biography

Dr Hansen obtained his M.Sc. degree from the Technical University of Denmark (DTU) where he also obtained his PH.D. degree on DNA replication in *E. coli*. He did post-doctoral research at the National Institutes of Health in Bethesda, Maryland USA on DNA replication of bacteriophage P1. From 1988 to 2010 he was engaged in industrial research and product development in two different food ingredients companies. He has been vice president for R&D, first in Chr Hansen A/S and later in Danisco A/S. Food enzymes and bacterial starter cultures are important products for both companies. In 2011, he returned to the Technical University of Denmark (DTU) where he is now Professor in microbial food and feed ingredients at the National Food Institute, DTU-Food. He is conducting research on fermented food, lactic acid bacteria, proteases, and protein and peptide functionality.

Abstract

Lactic acid bacteria (LAB) are auxotrophic for several amino acids and rely on external supply of peptides and amino acids for growth. Acidification by LAB does not only require a fermentable carbohydrate but also a suitable nitrogen source in the form of amino acids, peptides, or protein. The use of high molecular weight proteins as nitrogen source require the strain to have a proteolytic system matching the protein to be digested. A central component in the proteolytic system of LAB is a cell envelope protease, CEP. CEP enzymes of LAB are large multi domain enzymes situated on the outer surface of the bacteria. They are serine proteases with a protease domain homologous to the extracellular *Bacillus* protease subtilisin. The CEP enzymes are, unlike subtilisin, rather selective and will typically only hydrolyze some proteins and only to a limited extent. The lecture will give an overview of the proteolytic system, describe main types of CEP enzymes, different functions of CEP enzymes, and research on selectivity and specificity of CEP enzymes.