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Enhancement of Penzyme effects by natural products

Gunnar B. Sandholt[1,2], Ágústa Guðmundsdóttir[1,2]
[1]Zymetech, Fiskislóð 39, 101 Reykjavík
[2]Science Institue, University of iceland, Dunhagi 3, 107 Reykjavík

1. Introduction

Penzyme [1] is made from trypsin isolated from cod viscera with high activity at low temperatures compared to similar enzymes from mammals [2].

Trypsin, chymotrypsin and elastase are all proteases that belong to the S1 family of serine proteases [3]. Even though these enzymes do not have high sequence identity, their tertiary structures are highly conserved. The enzymes are endopeptidases and are found in the digestive system where they contribute to the digestion of proteins. Even though trypsin, chymotrypsin, and elastase all cleave peptide chains, have similar structures and mechanisms they display very different specificities. **Trypsin** cleaves peptides on the carboxyl side of arginine or lysine. On the other hand, **chymotrypsin** prefers to cleave on the carboxyl side of aromatic residues, (i.e. phenylalanine and tyrosine). **Elastase** is not as specific as the other two it prefers to cleave peptides at the carboxyl side of small, neutral residues.

2. Methods

The aim is to develop an activity assay for Penzyme, chymotrypsin, and elastase proteolytic activity using 96-well microtiter plates. Currently the Penzyme proteolytic activity is tested through a chromogenic substrate assay with a spectrophotometer using single cuvettes. In order to speed up the assay, to enable high throughput screening of the many natural products, Penzyme activity will be screened with, a chromogenic substrate test using a 96-well microtiter plate and a 96-well plate reader will be developed.

6. References

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