

Structural and Functional Studies on Nattokinase and its Molecular Identification on Intestine Colonization

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ABSTRACT

Nattokinase is an extracellular enzyme from *Bacillus subtilis* var. natto, which has strong fibrinolytic activity. Our studies showed that activities of nattokinase from different strains were different. The activity of nattokinase from natto strain SJ was the highest among nine different strains in caseinolytic activity test. The activity of nattokinase from natto F was lowest and only 52% to that of strain SJ. Nattokinase genes from nine strains were cloned and sequenced. Comparative studies of their predicted primary amino acid sequences, together with the deduced secondary and tertiary structures suggested that the decline of the caseinolytic activity of nattokinase from strain F resulted from the change of serine53 to proline53. Sequences from these nine nattokinase genes and from 16S rDNA obtained from gene bank were used in designing pair of gene specific primers for detecting the presence of DNA fragments in mice 's fecal samples fed with various strains of *B.natto*. Specific bands of 16S rDNA and nattokinase from strains SJ, JD11 and SP were detected in mice 's fecal samples suggesting that nattokinases from these three strains have better chances in surviving from the digestion of gastric acid and bile. These results provided the molecular evidence in colonization of natto in mice 's intestine

Keywords : *Bacillus subtilis* var. natto ; nattokinase ; colonization ; structure and function ; molecular identification

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