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226 STRUCTURE AND FIBRINOLYTIC PROPERTIES OF NATOKINASE

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The existence of a novel strong fibrinolytic enzyme, natokinase (NK), in the Japanese traditional food, natto, was reported by us previously (Sumi H. et al., Experientia 43: 1110, 1987; Acta Haematol 84: 1110, 1990). In this study, structure and some properties of purified NK was presented. For determination of the primary structure of NK, purified enzyme was treated with lys-peptidase and 9 peptides were separated by HPLC. NK was found to be a single polypeptide chain with 275 amino acids: AQSYPGCSIQIKAPALNSQGYTOSNKIKVIVID

SGIIGSNPQLNMRGQASVPSERHPYQDSSRTVACTIALLNNSIGV
 LGVPSASLYAKVGLDSTGSDIYSKILNGLEWASINNDVYINSLSGPT
 GSTALKTIVKLVSSQIVVAAAGNEDSSSTSTVGPAAKTPSTIAYGA
 VNSNRQASVSSVQSELDVWAPGVSTGLPGCTTGATNTSMATPHVA
 GAALLISGIPRTNAGVDRLESTATYLDKSFYKGLINVGAAQ.
 NK did not react to plasminogen, but strongly hydrolyzed fibrin and the plasmin substrate H-D-Val-Leu-Lys-pNA (S-2251). It was also proved that NK catalyze the activation of pro-urokinase to urokinase (u-PA) of essentially equal activity to that of plasmin in a colorimetric assay with pyro-Glu-Gly-Arg-pMA(S-2444).
 When NK activity was determined by fibrin clots lysis time (CLT) method, the logarithmic values of CLT and NK units (S-1251 amidolysis) showed linear relation. The determined NK titer of commercial natto was 3,000-24,000 units/100g (wet weight).

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