

The Inter- α -Trypsin Inhibitor as Precursor of the Acid-Stable Proteinase Inhibitors in Human Serum and Urine

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Summary: A small amount of antitryptic activity is detectable in the supernatant of deproteinized human serum. Preincubation of serum with trypsin causes an increase in acid-stable antitryptic activity. This rise in activity depends on the inter- α -trypsin inhibitor concentration. The native inhibitor present in normal sera, and in higher concentrations in sera of patients with nephropathies, and the trypsin-liberated inhibitor show immunological cross reaction with antibodies to the serum inter- α -trypsin inhibitor. The two inhibitors differ in molecular weight and electrophoretic mobility. The physiological inhibitor (I-34), with a molecular weight of 34 000 and a high carbohydrate content, can be transformed by trypsin into an inhibitor (I-17) with a molecular weight of

17 000. This inhibitor is identical with the inhibitors liberated by trypsin from serum or from purified inter- α -trypsin inhibitor. The acid-stable inhibitor from urine is identical with the physiological serum inhibitor. Analogously, this inhibitor is transformed by trypsin into the inhibitor with a molecular weight of 17 000. We conclude that the inter- α -trypsin inhibitor is the precursor of both the physiological and the trypsin-liberated inhibitor. By a mechanism as yet unknown, but most likely a limited proteolysis, the secreted inhibitor is liberated from the high molecular weight precursor. In contrast to the monospecific trypsin-inhibiting precursor, the physiological and artificially liberated inhibitors are trypsin/chymotrypsin/plasmin inhibitors.

Der Inter- α -Trypsininhibitor als Vorstufe der säurestabilen Proteaseninhibitoren im menschlichen Serum und Harn

Zusammenfassung: Nach Enteiweißung von menschlichem Serum verbleibt im Überstand eine geringe antitryptische Aktivität. Diese Ak-

tivität erhöht sich nach Inkubation des Serums mit Trypsin. Die Höhe der so freilegbaren Aktivität hängt von der Inter- α -Trypsininhibitor-

Enzymes:

Neuraminidase, acylneuraminyl hydrolase (EC 3.2.1.18);
Trypsin (EC 3.4.21.4).

Abbreviations:

I-17 = The inhibitor liberated by trypsin with an $M_r = 17\ 000$.
I-34 = The physiological inhibitor in serum and urine; $M_r = 34\ 000$.
TI-17, TI-34 = The trypsin complexes of I-17 and I-34, respectively.