PROTEINASES AND PROTEINASE INHIBITORS IN FERTILIZATION

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The acrosome, a cape-shaped organelle at the head of the spermatozoa, contains acrosin, an enzyme with trypsin-like specificity. This enzyme was isolated from boar and human spermatozoa by acidic extraction, separation of contaminating acrosin inhibitors by gel chromatography and affinity chromatography on p-amino benzamidine Sepharose.

A zymogen precursor of acrosin could be partly purified from boar spermatozoa by acidic extraction, affinity chromatography on Con A - Sepharose and gel chromatography.

Present evidence suggests that activation of acrosin occurs by several steps of sequential proteolytic cleavages and involves the splitting of an Arginyl-X bond.

Proteinase inhibitors are present in rat testis fluid, epidydimal secretion, seminal vesicles and cervical mucus, as well as in epidydimal and ejaculated spermatozoa.

By amino acid sequence analysis, structural homology between one inhibitor from boar seminal plasma, one inhibitor from guinea pig seminal vesicles and the bovine pancreatic secretory trypsin inhibitor was established.

The two low molecular weight proteinase inhibitors from human seminal plasma differ in their inhibition specificity. Whereas human seminal plasma inhibitor II (MG 6200) is a strong inhibitor for trypsin and acrosin, human seminal plasma inhibitor I (MG 10100) inhibits trypsin, chymotrypsin, and leucocytic elastase, but not acrosin.