

proteinases & inhibitors

SEMINAL AND CERVICAL ACID STABLE PROTEINASE INHIBITORS AND SPERM ACROSIN

15

H. Fritz, W. D. Schleuning, W. B. Schill, O. Wallner, H. Schiessler, E. Fink & N. Heimbürger. *Institute of Clinical Chemistry & Clinical Biochemistry; Department of Dermatology & Department of Obstetrics-Gynecology, University of Munich; and Behringwerke AG, Marburg, W. Germany*

Proteinase inhibitors are present in rete testes fluid, epididymal and seminal vesicles secretions and in epididymal and ejaculated spermatozoa. We isolated the trypsin inhibitors from guinea pig seminal vesicles and boar and human seminal plasma. All the multiple forms of inhibitors from the guinea pig and boar are potent acrosin inhibitors whereas human seminal plasma contains besides the acrosin inhibitor HUSI - II (M.W. near 11,000) which does not inhibit acrosin at all. However, HUSI - I strongly inhibits neutral leukocytic proteinases. Further properties of the inhibitors will be discussed including amino acid compositions of the multiple forms and the localization of some of the inhibitors in tissues and spermatozoa elucidated by immunofluorescence. Human cervical mucus contains no acid stable acrosin inhibitor but an inhibitor which is similar to HUSI - I in respect to the inhibition characteristics and antigenicity. A procedure was developed for the isolation of acid stable acrosins from spermatozoa irrespective of the species. Important properties of both acrosins will be discussed including molecular weights of multiple forms, amino acid composition, glycoprotein nature as well as the localization of boar acrosin in boar spermatozoa. The increase in sperm acrosin activity under various conditions is caused by both membrane factors and proacrosin activation.

ACROSIN ACTIVITY IN EJACULATED AND FROZEN/ THAWED HUMAN SEMEN

16

W. B. Schill & H. H. Wolff. *Department of Dermatology, University of Munich, W. Germany*

Determination of acrosin in human ejaculates may provide a biochemical parameter of fertilizing capacity of spermatozoa. Activity of sperm acrosin was measured in 0.25 ml of semen using acetic acid extraction (pH 2.4) of washed spermatozoa in combination with a sensitive test system (BAEE-hydrolysis followed in the presence of ADH/NAD). Sperm acrosin activity was correlated with sperm count. Significant differences were found in sperm acrosin activity of semen of normozoospermia and oligozoospermia. No acrosin activity was measurable in 100% round-headed spermatozoa. A correlation to other semen parameters was not established. Repeated washings, pretreatment with glycerol and *in vitro* aging caused an increase of acid extractable acrosin activity (1.5-4 fold); due to improvement of the extraction conditions or the activation of a proenzyme. Acrosin activity of cryo-preserved human spermatozoa was well protected in 77% of semen samples. Considerable decrease or even a complete loss of acrosin activity occurred in 23% of samples. Combined biochemical and electron microscopical studies in cryo-preserved spermatozoa indicated an association of the acrosin molecules with the inner acrosomal membrane and/or the equatorial segment.