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JOURNAL ARTICLE

Secretory leucocyte protease inhibitor in the male genital tract: PSA-induced proteolytic processing in human semen and tissue localization

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Secretory leucocyte protease inhibitor, SLPI, is a low-molecular-weight, acid-stable protein present in the liquid part of fresh human ejaculate but not demonstrable in the gel structure. No fragmentation of SLPI occurred during gel dissolution, but a slow proteolytic cleavage of SLPI was seen on incubation of the liquified semen at 37 degrees C. The same pattern of degradation products was seen after incubation of SLPI with prostatic secretion and also with purified prostate-specific antigen, PSA. We could identify Arg 20-Tyr 21 and Met 73-Leu 74 to be the primary cleavage sites upon proteolytic modification of SLPI by purified PSA. However, we did not find any inhibition of the enzymatic activity of PSA by SLPI, even at a 100-fold molar excess of the inhibitor. The slow degradation of SLPI facilitated sampling and the reliable determination of the normal level of SLPI in seminal plasma, which was about 20 mg/L. We investigated the glandular origin of SLPI in the genital tract by immunocytochemistry. A strong immunostaining for SLPI was demonstrated in epithelial cells within the glandular lumina of the prostate gland, seminal vesicles, and epididymis but not in the stromal parts of these glands. In addition the immunostaining was also detected in the deferent ducts and the germinal epithelium of the testes. Taking into account that SLPI is a strong inhibitor of several proteases, including leukocyte elastase and cathepsin G, the results suggest that SLPI has a local protective function against proteolytic degradation of the male reproductive tract tissues during inflammation.

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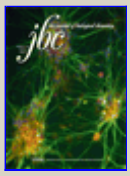

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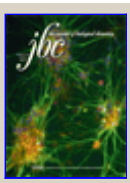

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