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Characterization and Localization of Cysteine-Rich Secretory Protein 3 (CRISP-3) in the Human Male Reproductive Tract

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Mammalian members of the cysteine-rich secretory protein (CRISP) family are expressed predominantly in the male reproductive tract and are implicated in the process of reproduction from spermiogenesis, posttesticular sperm maturation, and capacitation to oocyte-sperm fusion, and possibly also penetration of the zona pellucida. Rodents express only 2 CRISPs (CRISP-1 and CRISP-2) in their male reproductive system, whereas humans and horses express an additional third member named CRISP-3. We have previously demonstrated that this protein is present in human seminal plasma as well as in other exocrine secretions, in blood plasma, and in neutrophilic granulocytes. To characterize the protein in seminal plasma and localize the production of CRISP-3 in the human male reproductive tract, we performed immunoblotting and enzyme-linked immunosorbent assay measurements of seminal plasma and immunohistochemistry and in situ hybridization of tissue specimens. We were able to show that human CRISP-3 is a quantitatively minor seminal plasma protein not associated with prostasomes. Furthermore, CRISP-3 expression was found in the secretory epithelium throughout the male genital tract, with particularly high expression in the cauda epididymis and ampulla vas deferens. Examination of seminal plasma from vasectomized males indicates that organs downstream of the epididymis are probably the major sources of seminal plasma CRISP-3.

Key words: CRISP-1, CRISP-2, SGP28, semen, prostate, fertilization

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