

On the Presence of "Prostatic Secretion Protein" in Different Species*

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Prostatic secretion protein (PSP) was discovered during investigations on the mechanism of action of estramustine phosphate, a drug used in the treatment of prostatic carcinoma.¹ Distribution studies on male rats using radioactive estramustine phosphate have shown that this compound is taken up and retained by the ventral prostate lobe.^{2,3} Estramustine phosphate was found to bind to a specific protein in rat ventral prostate. This protein was purified to homogeneity and antibodies were raised against it.⁴ A radioimmunoassay was developed for quantitation of the protein and using this technique it was found that PSP was present in very high amounts in ventral prostate but was also present in lower amounts in other male sex accessory glands.⁴ The findings indicated that PSP is synthesized in the prostate gland and secreted into the prostatic fluid.

The biological significance of PSP is still uncertain. In order to obtain further information about this protein and its biological role, the presence of proteins immunochemically similar to PSP was studied in tissues of different species. The presence of PSP in prostate tissue from other species than rat would strengthen the contention that this protein is necessary for normal prostatic function.

Materials and methods. Tissues from mice, rats and rabbits were collected immediately after decapitation of the animals. Tissues from boars were collected at a slaughter house. Human tissues were collected at routine operations where the tissues taken for analyses had been discarded. The human prostate tissue was removed during operations for urinary bladder carcinoma. Dunning tumours were taken from rats treated as described previously.⁵ Preparation of cytosol and performance of radioimmunoassays (RIA) were performed as described

previously.⁴ Determination of protein was carried out using bovine serum albumin as a standard.⁶

Results and discussion. PSP has previously been shown to make up about 20% of the protein content of rat ventral prostate cytosol. Much lower, but still significant amounts, were found in prostate tissues from other species as well as in the Dunning tumour (Tables 1 and 3). The lower amount found

Table 1. Amount of proteins immunochemically similar to PSP in prostate and seminal vesicles from different species,

Tissue	PSP, ng/ mg of cytosol protein
Rat prostate (ventral)	185 000
Rat seminal vesicles	360
Rabbit prostate	123
Rabbit seminal vesicles	1 300
Boar prostate	95
Boar seminal vesicles	208
Mouse prostate	2 445
Mouse seminal vesicles	8
Human prostate	98
Human seminal vesicles	35

Table 2. Amount of proteins immunochemically similar to PSP in different tissues from mouse and man.

Tissue	PSP, ng/mg of cytosol protein	
	Man	Mouse
Prostate	98	2445
Seminal vesicles	35	8
Epididymis	92	55
Testis	<1	30
Submaxillary gland	<1	40
Kidney	<1	<1
Plasma	<1	<1

Table 3. Amount of protein immunochemically similar to PSP in five Dunning tumours.

Tumour No.	PSP, ng/ mg of cytosol protein
1	15.6
2	15.5
3	22.9
4	37.5
5	18.8

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may reflect a truly smaller content or may be due to insufficient cross reactivity between the tissue protein and the rat PSP antibody resulting in a falsely low value. A reliable RIA for quantitation of human PSP cannot be obtained before PSP has been purified from man and antibodies have been raised against this protein. The important finding is, however, that a protein similar to PSP is present in all prostate tissues investigated. In the rat, PSP was almost exclusively present in the male genital tract. Table 2 shows that this is true also for man and the mouse, where PSP is found in highest concentration in prostate. As PSP is tissue specific and found in all species studied, it is tempting to suggest that PSP is necessary for normal prostate function. Since prostatic diseases decrease male fertility and PSP is secreted from the prostate and is present in the ejaculate, PSP may also be of importance for normal male fertility. Studies are now in progress to elucidate possible interactions between PSP and spermatozoa, and the effect of PSP on motility and survival of spermatozoa.

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