



Positive prostate 68GaPSMA-PET/CT correlates with detection of CD45-/PSMA+ non-sperm epithelial cells obtained by liquid biopsy of seminal fluid in patients with prostate cancer

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Background

Prostate Specific Membrane Antigen (PSMA) presents high expression in PCa cells and has been considered an attractive target for molecular imaging. 68GaPSMA-PET/CT showed high detection rate of nodal and bone metastases and, recently, was tested for diagnosis of primary PCa. Seminal fluid (SF) might contain prostate-derived PSMA positive tumour cells in men with PCa and serve as diagnosis.

Aim

To investigate the clinical reliability of 68GaPSMA-PET/CT for identification of primary PCa we tested the hypothesis that it correlates with detection of CD45-/PSMA+ non-sperm epithelial cells obtained by liquid biopsy of SF in patients with PCa.

Results

Seven patients over 59, who had received a diagnosis of PCa by 68GaPSMA-PET/CT software assisted fusion biopsy and were scheduled for radical prostatectomy (RP), collected their SF. The FACS procedure sorted non-sperm epithelial cells and CD45-/PSMA+ cell, as well, in SF of all those PSMA PET positive patients. The same patients presented PSMA+ cells in SF and in post-ejaculatory urine (Fig. 2 and 3a-b)

Material and Methods

The current analysis results from combining data of two observational, longitudinal, prospective studies. Patients with primary PCa detected by 68GaPSMA-PET/CT software assisted fusion biopsy (Protocol ICH/382/2016), who received an indication to radical prostatectomy (RP) (Fig 1), had a sample of SF one month after the biopsy and just before the RP (Protocol ICH/1791/2017). SF samples were processed according to previously described method (Lazzeri et al., The Journal of Urology, Vol. 199, Issue 4, e155) and the following reagents were used: Syto-16 (nuclear staining), CD45 (leucocyte antigen), PSMA (prostate specific antigen), and EpCAM (epithelial specific antigen). The primary endpoint was to determine the relationship between 68GaPSMA-PET/CT results, PCa and detection of CD45-/PSMA+ non-sperm epithelial cells in SF.

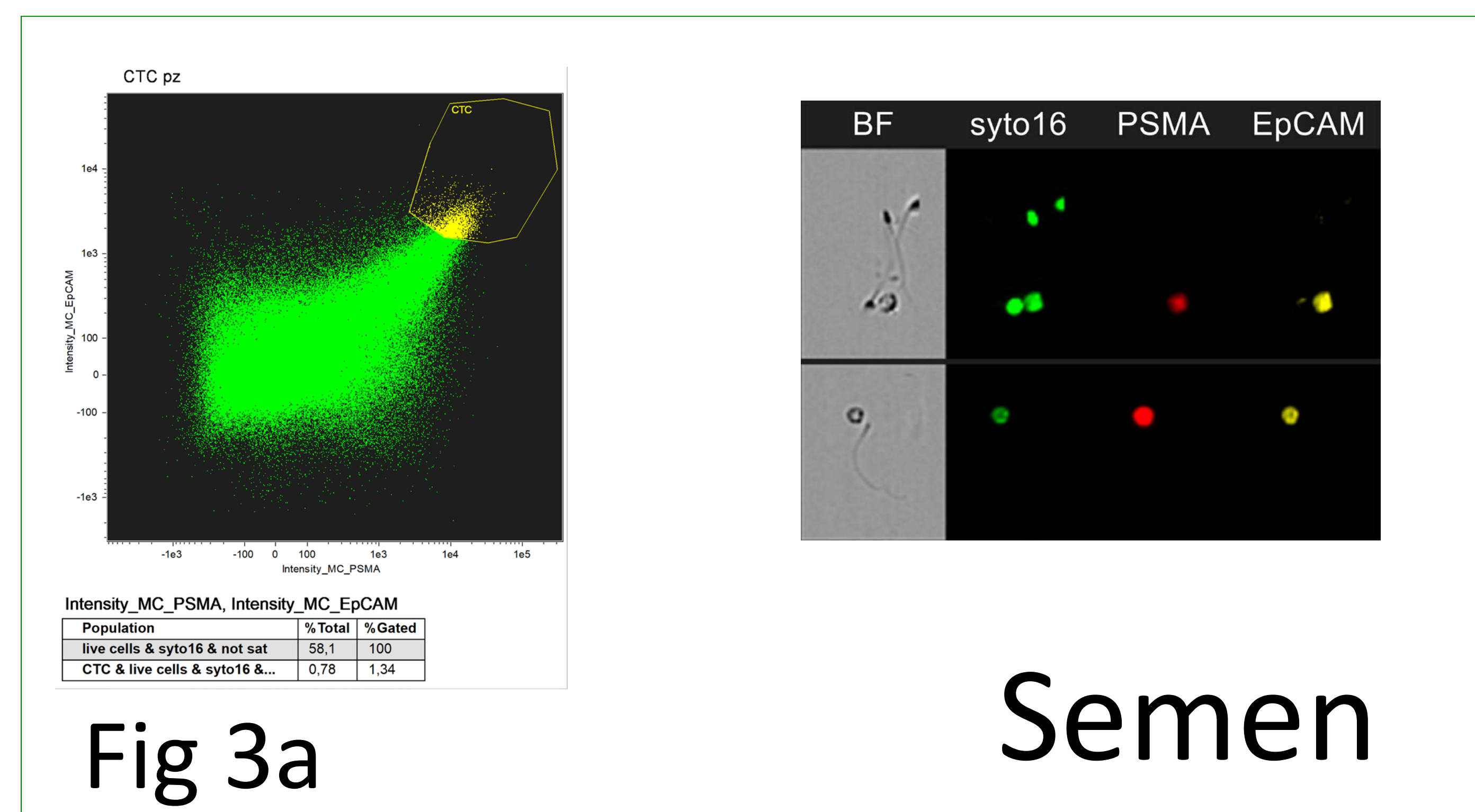


Fig 3a

Semen

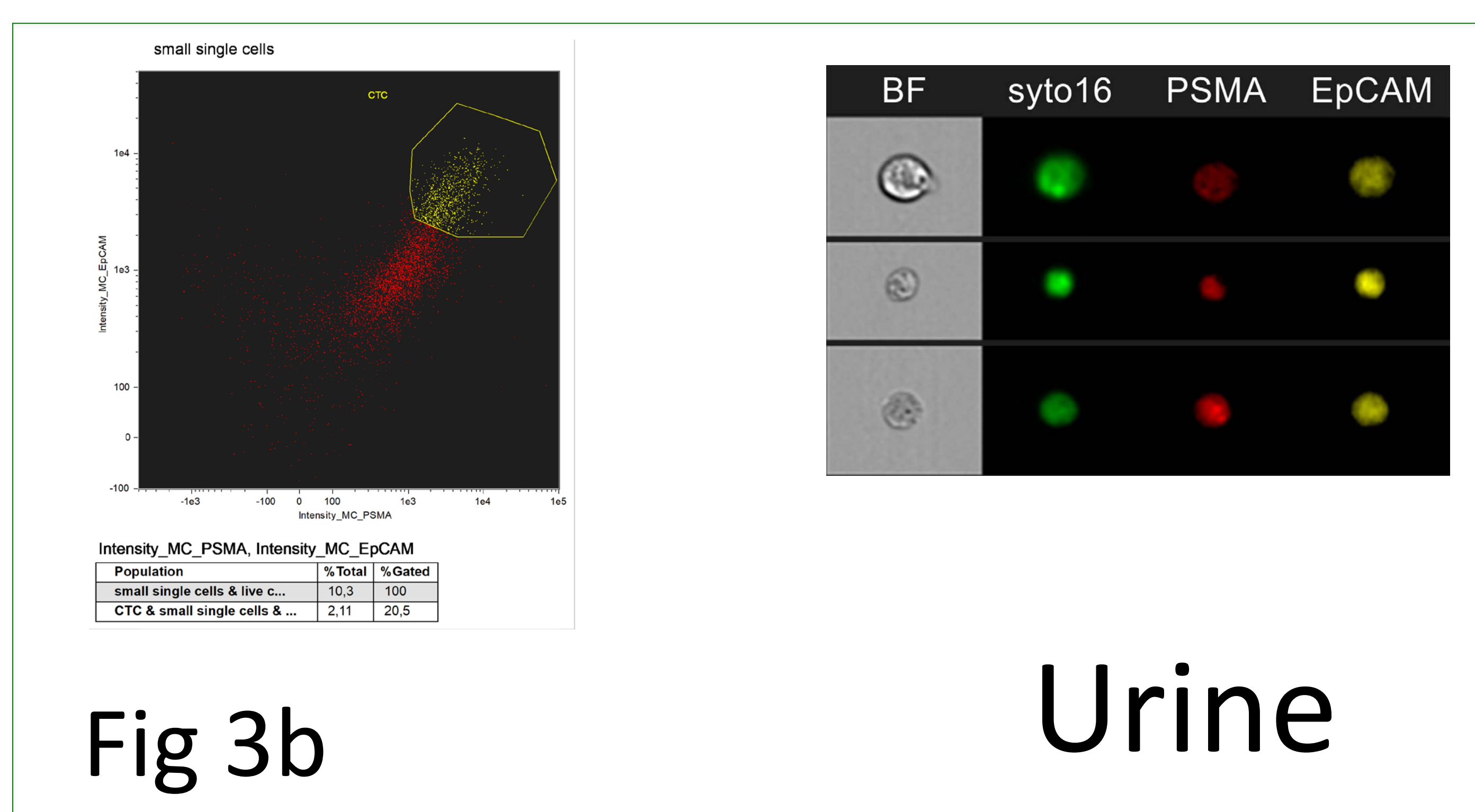
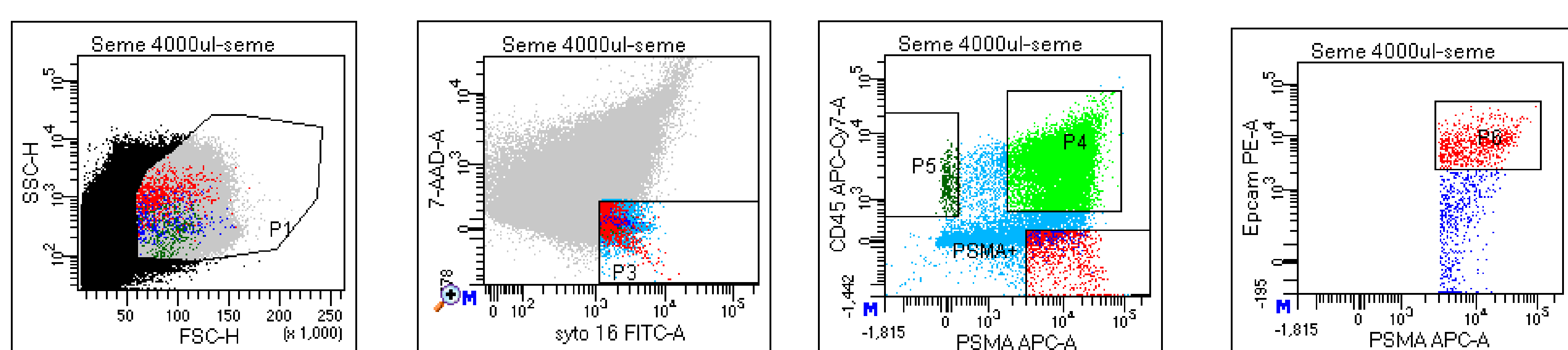


Fig 3b

Urine

Fig. 2

Semen



Population	#Events	%Parent	%Total
All Events	2,184,344	###	100.0
P1	361,480	16.5	16.5
P2	343,311	95.0	15.7
P3	31,957	9.3	1.5
PSMA+	1,165	3.6	0.1
P6	669	57.4	0.0
P5	361	1.1	0.0
P4	12,765	39.9	0.6

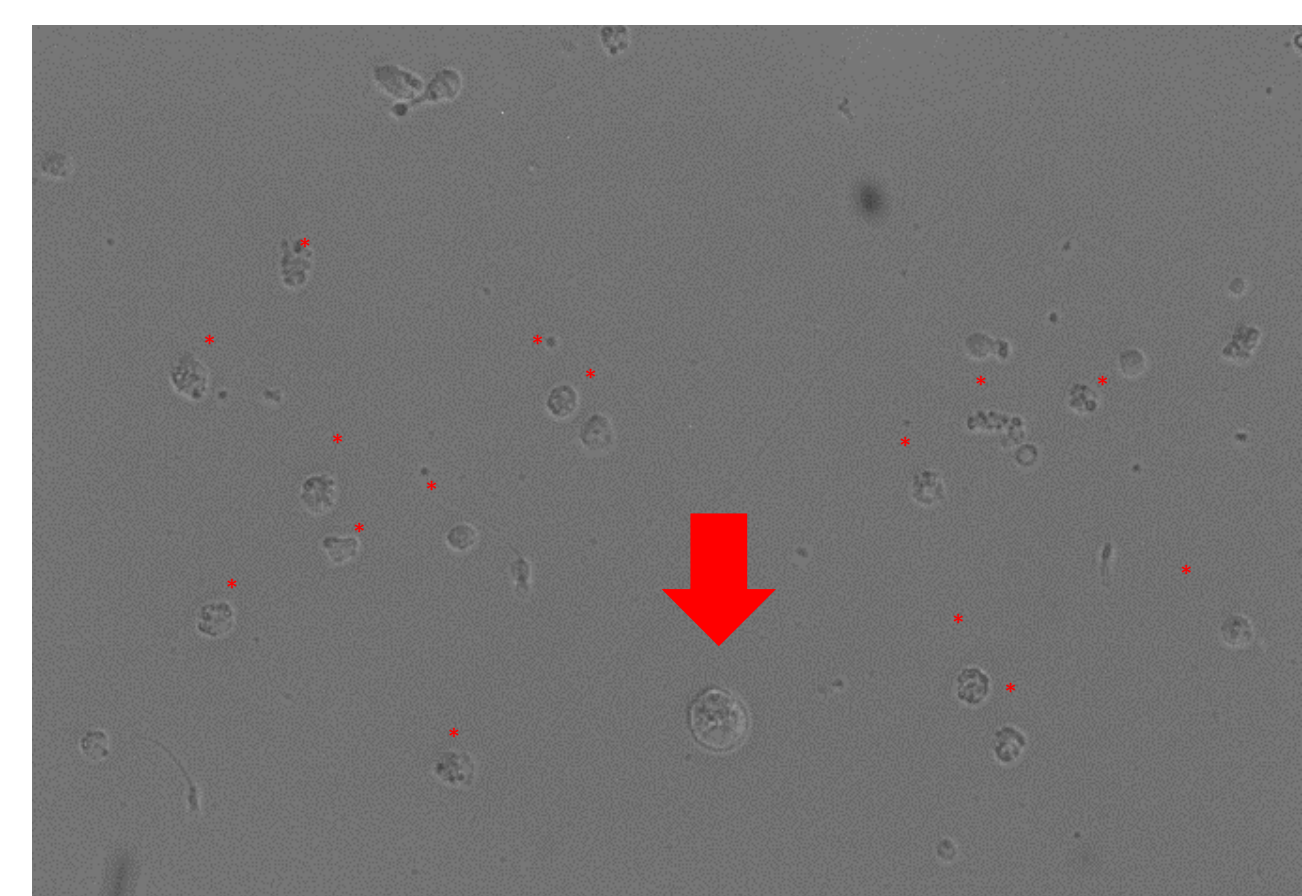
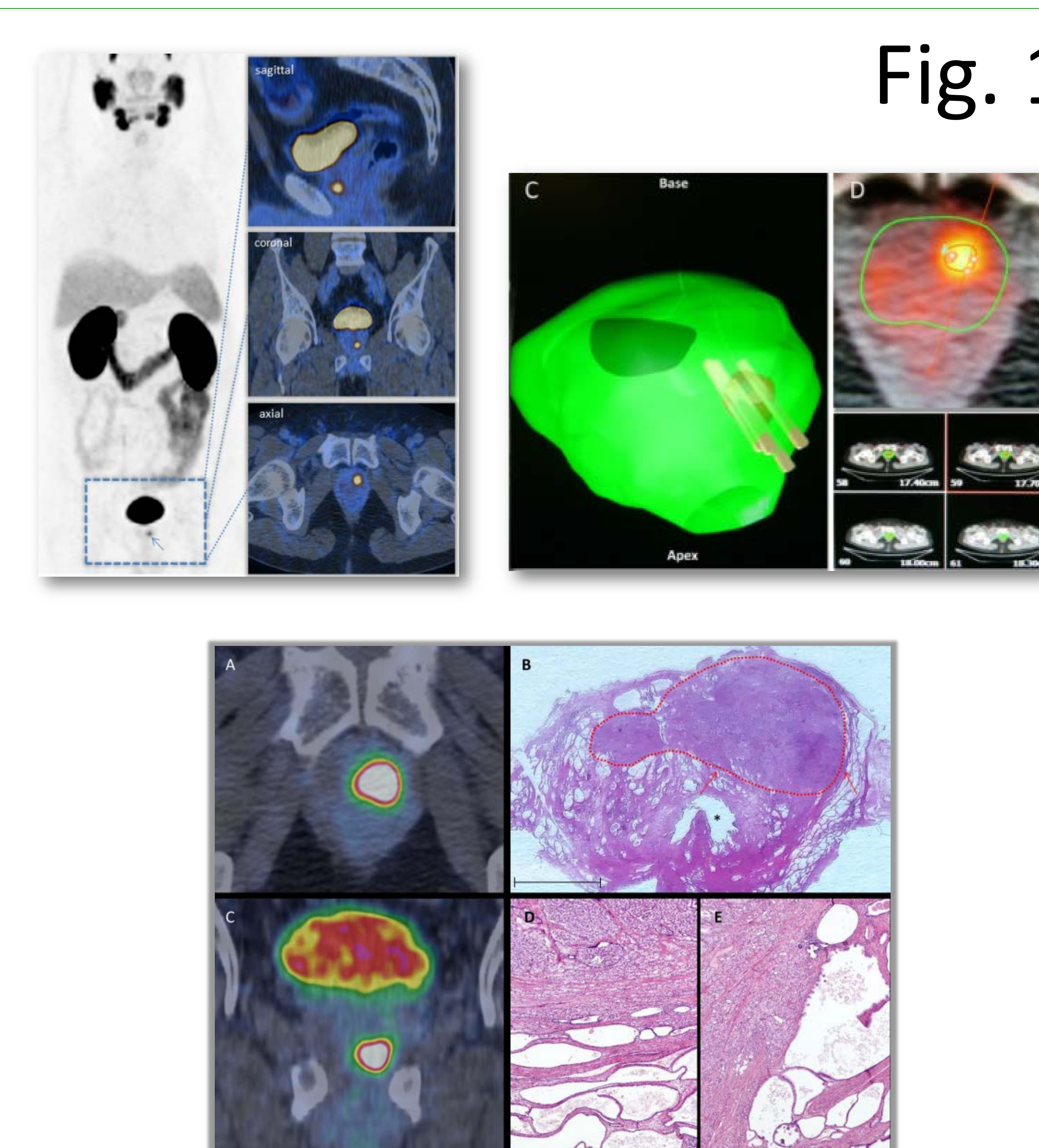


Fig. 1



Conclusion

Our findings, by the first, showed a potential correlation between the 68GaPSMA-PET/CT, PCa and cancer-specific markers detected by SF liquid biopsy. These findings may represent the proof-of-concept to improve the role of 68GaPSMA-PET/CT for primary PCa diagnosis in a selected population and to further investigate the prostate cancer tumor elements by liquid biopsy of the SF.