A combination of new protein biomarkers reduces unneeded prostate biopsies and improves the detection of prostate cancer: findings of a recent study

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Introduction & objectives:
Increased prostate volume due to benign disease leads to many false-positive PSA results and consequently to negative prostate biopsies. Previous research indicated that cancer-related protein biomarkers discovered by a genetic-guided approach using a PTEN knock-out mouse model (Fig. 1a), that were then tested in human samples (Fig. 2b), could improve prostate cancer diagnosis (ref. 1). The objective of this study was to validate these earlier findings and to evaluate if the protein biomarkers are capable of distinguishing benign disease from prostate cancer in men with enlarged prostates.

Materials & methods:
We conducted a retrospective study of men with a total PSA of 2-10 ng/ml, negative DRE and enlarged prostate volume (≥35 ml). Serum samples were collected from men before undergoing prostate biopsy at the Martini-Klinik Hamburg, Germany. All samples were taken between 2011 and 2016 following written patient consent. Serum concentration of CTSD, ICAM1, THBS1, OLFM4, TIMP1, and HYOU1 was measured using immunoassays. In addition, total and free PSA were analyzed to calculate %fPSA using the ADVIA Centaur immunoassay system.

Results:
Of the 474 men included in this study, 236 men had a negative biopsy and 238 were diagnosed with prostate cancer. %fPSA discriminated among biopsy-positive and negative patients with an AUC = 0.650 (P <0.001; 95% CI = 0.600-0.699). Following variable selection, logistic regression analysis revealed that the combination of the two proteins CTSD and THBS1 yielded an AUC = 0.834 (P <0.001; 95% CI = 0.797-0.871); and when combined with %fPSA, it resulted in an even higher AUC = 0.845 (P <0.001; 95% CI = 0.810-0.860) (Fig. 2).

Conclusion:
In patients with elevated PSA, negative DRE and enlarged prostate, the method presented is significantly more accurate than %fPSA alone in determining the absence of prostate cancer. The implementation of this method in clinical practice has the potential to significantly lower the rate of prostate biopsies which are negative for cancer by more than 50%.

References: