

iScience, Volume 25

Supplemental information

Using deep learning to detect patients at risk for prostate cancer despite benign biopsies

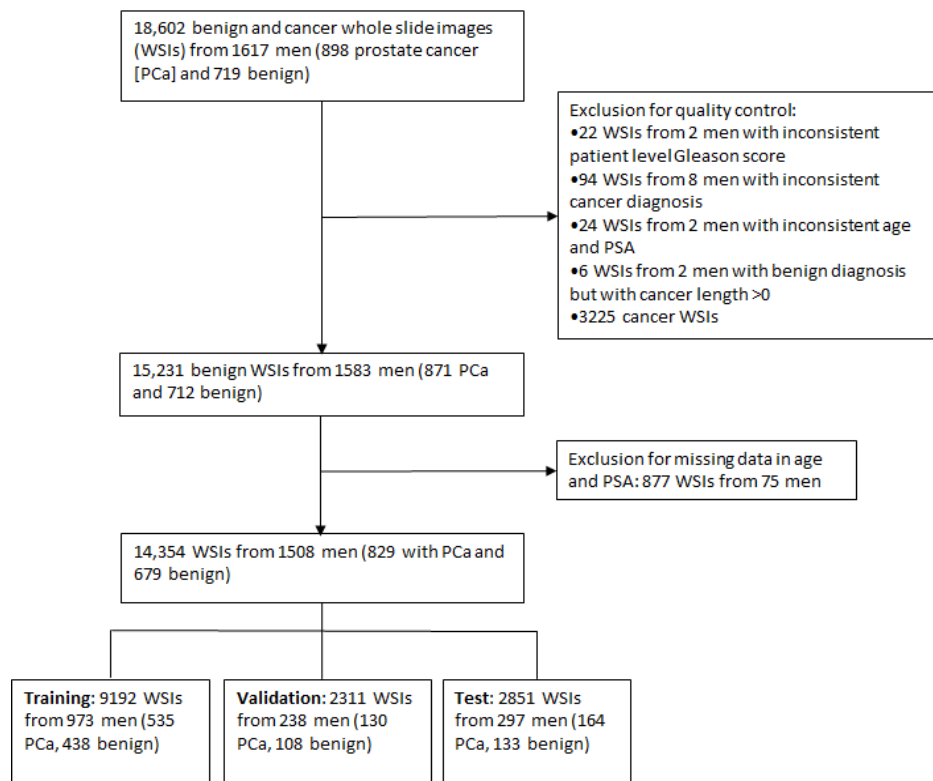
Bojing Liu, Yinxi Wang, Philippe Weitz, Johan Lindberg, Johan Hartman, Wanzhong Wang, Lars Egevad, Henrik Grönberg, Martin Eklund, and Mattias Rantalainen

Supplementary materials

Table S1. Sample distribution. Related to Figure 1.

	Training set (training and validation)	Held-out test set	p-value
Prostate cancer, N (%)			
No	546 (0.55)	133 (0.58)	
Yes	665 (0.45)	164 (0.45)	0.976 ¹
ISUP 1	325 (0.27)	78 (0.26)	
ISUP 2	121 (0.10)	32 (0.11)	
ISUP 3	51 (0.04)	12 (0.04)	
ISUP 4	127 (0.10)	32 (0.11)	
ISUP 5	41 (0.03)	10 (0.03)	0.999 ¹
Mean cancer length, mean(\pm SD)	0.43 (\pm 0.82)	0.41 (\pm 0.85)	0.434 ²
Maximum cancer length, mean(\pm SD)	2.67 (\pm 3.77)	2.58 (\pm 3.66)	0.462 ²
Age (mean\pmSD)	63.52 (\pm 5.30)	63.14 (\pm 5.37)	0.119 ²
PSA (ng/ml), N (%)			
[1,3)	361 (0.30)	91 (0.31)	
[3,5)	508 (0.42)	125 (0.42)	
[5,10)	256 (0.21)	63 (0.21)	
[10,1e+04)	86 (0.07)	18 (0.06)	0.934 ¹

1.Chisq test, 2. Mann-Whitney U test



eFigure 1. Flow-chart. Related to Figure 1.

Table S2. Sensitivity by the International Society of Urological Pathology (ISUP) grading at different specificity levels in held-out test set. Related to Figure 2.

Specificity	Sensitivity				
	ISUP 1	ISUP 2	ISUP 3	ISUP 4	ISUP 5
0.99	0.01	0.03	0.08	0.09	0.10
0.98	0.17	0.06	0.17	0.25	0.40
0.95	0.19	0.16	0.17	0.31	0.40
0.90	0.28	0.31	0.33	0.41	0.70

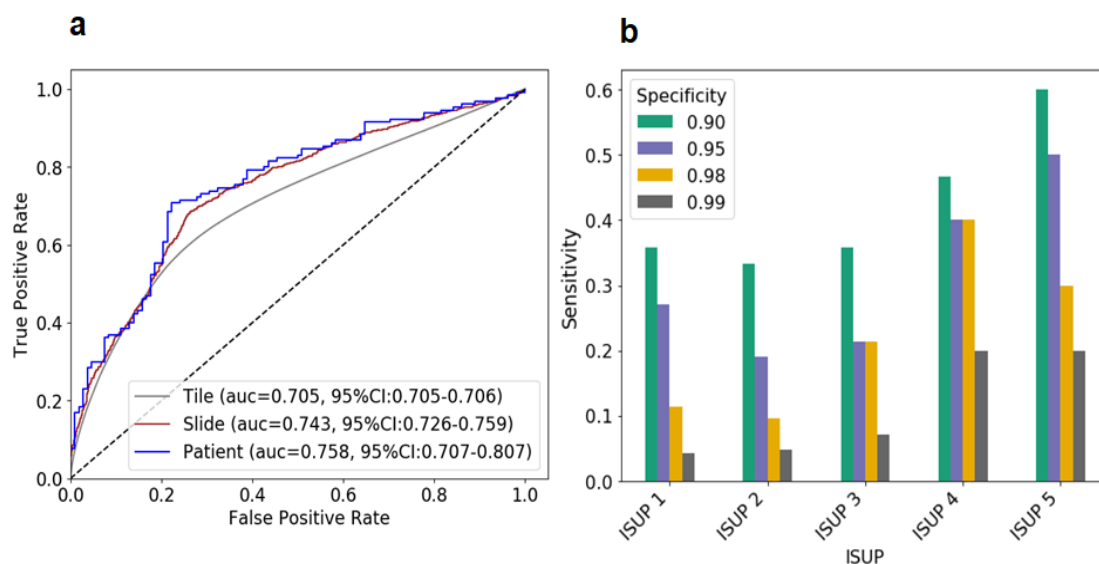


Figure S2. Prediction performance in validation set. Related to Figure 2. a) receiver operating characteristic (ROC) curves and associated area under the curve (AUC) estimates with bootstrap 95% confidence intervals in the validation set for the prediction of prostate cancer versus benign diagnosis on tile, slide, and patient level; b) corresponding sensitivity by the International Society of Urological Pathology grading groups at specificities of 0.99 (cutoff = 0.861), 0.98 (cutoff = 0.837), 0.95 (cutoff = 0.804), and 0.90 (cutoff = 0.744).

Table S3. Sensitivity by the International Society of Urological Pathology (ISUP) grading at different specificity levels in validation set. Related to Figure 2.

Specificity	Sensitivity				
	ISUP 1	ISUP 2	ISUP 3	ISUP 4	ISUP 5
0.99	0.04	0.05	0.07	0.20	0.20
0.98	0.11	0.10	0.21	0.40	0.30
0.95	0.27	0.19	0.21	0.40	0.50
0.90	0.36	0.33	0.36	0.47	0.60