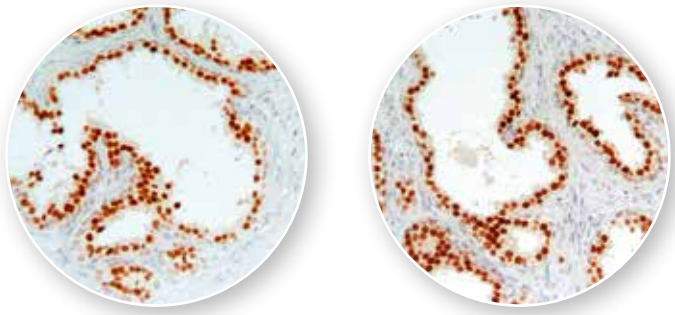
NKX3-1 – A new sensitive and specific marker of prostate origin

The diagnosis of metastatic carcinoma from uncertain primaries or poorly differentiated high-grade neoplasms involving the prostate and adjacent organs can be challenging, especially in the setting of limited cancer foci on a needle biopsy. In practice the histologic distinction between high-grade prostate cancer and infiltrating high-grade urothelial cancer has significant implications because both tumor entities require different treatments (i.e. hormone therapy for prostate cancer and chemotherapy for urothelial cancer).
Although PSA and PSAP are highly selective markers for prostate, they have been shown to be only focally or weakly expressed in poorly differentiated prostatic carcinomas and prostate metastases [1].
On the other hand specific urothelial markers like Uroplakin III and Thrombomodulin are characterized by a low sensitivity especially in the metastatic setting [2].

NKX3-1 protein is a transcription factor encoded by the NK3 homeobox 1 gene located on chromosome 8. NKX3-1 is androgen-regulated and its expression is predominantly localized to the epithelium of normal prostate glands and prostate tumors. Nuclear staining of NKX3-1 provides a distinct signal that is easy-to-interpret, similar to other transcription factors.
Gurel *et al.* showed that the sensitivity in identifying metastatic prostatic adenocarcinomas was 98.6 % for NKX3-1 whereas the sensitivity of PSA staining was only 94.2 % [3]. Specificity reported by Gurel *et al.* was 99.7 % (n = 349).
Chuang *et al.* described NKX3-1 as a useful marker when high-grade prostate cancer is suspected but PSA staining is negative or equivocal [1].
The International Society of Urological Pathology recommends to add NKX3-1 to an antibody panel for the differential diagnosis of urothelial versus prostate carcinomas [4].



NKX3-1 on prostate carcinoma

Product information

Description	Reactivity	Status	Pre-treatment	Dilution	Volume	Cat. No.
NKX3-1 Clone: polyclonal Host: Rabbit	Human	CE/IVD	HIER in Citrate pH 6.0	Ready-to-use	6 ml	RBG062
				1:50-1:100	0.5 ml	RBK062-05

Bibliography

[1] Chuang A *et al.* Immunohistochemical differentiation of high-grade prostate carcinoma from urothelia carcinoma. AmJ Clin Pathol 31:1246-1255, 2007

[2] Chang A *et al.* Utility of GATA3 immunohistochemistry in differentiating urothelial carcinoma from prostate adenocarcinoma and squamous cell carcinomas of the uterine cervix, anus, and lung. Am J Surg Pathol 36:1472-1476, 2012

[3] Gurel B *et al.* NKX3.1 as a marker of prostatic origin in metastatic tumors. Am J Surg Pathol 34:1097-1105, 2010

[4] Epstein JI *et al.* Best practices recommendations in the application of immunohistochemistry in the prostate: report from the International Society of Urologic Pathology consensus conference. Am J Surg Pathol 38:e6-e19, 2014

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