

Renal Immunohistochemistry – with examples

Note: No immunopanel should be interpreted without morphology as cases can show aberrant staining

Tumour type	Examples	Positive	Negative
Clear cell RCC	CCRCC CCRCC	CK, EMA, Vimentin ,CD10, RCCm, CAIX , PAX8	CK7, CD117 , Cathepsin-K, HMB45
Multilocular cystic renal neoplasm of low malignant potential	MLCRN	CK, CK7 , EMA, Vimentin ,CD10, RCCm, CAIX , PAX8	CD117 , Cathepsin-K, HMB45, AMACR (or focal +)
MiT family translocation RCCs	MiT MiT	Cathepsin-K, TFE3/TFEB, RCCm HMB45-(t(6,11),Melan A-(t(6,11), AMACR, PAX8	CK (or weak +), EMA, CA-IX (or focal +)
Clear cell papillary renal cell tumour	CCPRCT	CK, CK7, CAIX (cup-like) , HMWCK	AMACR , CD117, Cathepsin-K
Papillary RCC	P-RCC	CK, CK7, AMACR , RCCm, Vimentin	CD117, WT1, CD57, CAIX , Cathepsin K
FH deficient RCC	FH-RCC	PAX8, Vimentin , 2 succino-cysteine, SDHB (decreased)	FH, CAIX, CK7, AMACR, HMWCK , TFE3, CK20
Mucinous tubular and spindle cell carcinoma	MTSCC	CK7, AMACR , PAX8, EMA, E-cadherin, Vim (or neg), CrGA (occasional cases +)	CAIX, RCCm ,CD10, p63, CK20, HMWCK
Chromophobe RCC	C-RCC C-RCC	CK, CK7 (diffuse) , CD117, E-Cadherin, EMA	Vimentin, CAIX, AMACR, Cathepsin-K, HMB45, RCCm
Oncocytoma	Onco	CD117, CK7 (focal + only)	Vimentin, HMB45, CAIX
Collecting duct Carcinoma	CD	CK7, HMWCK, PAX8, INI-1, EMA	CD10, RCCm, CK20, GATA3, CAIX, p63, OCT4
Medullary carcinoma	MC	HMCK, OCT4, PAX8	INI-1 , RCCm, GATA3, HMWCK, p63
Urothelial carcinoma	UC	CK, CK7, CK20, p63, GATA3 , Vimentin, HMWCK	RCCm, CD10, PAX8 (20% +)

CK = broad-spectrum cytokeratin HMWCK = high-molecular-weight cytokeratin RCC = renal cell carcinoma

Bold type denotes the most useful antibodies for inclusion in initial immunohistochemistry panels

Adapted from RCPATH Dataset - <https://www.rcpath.org/uploads/assets/32952412-75e2-4008-83cd204863373aa1/G037-Dataset-for-histopathological-reporting-of-adult-renal-parenchyma-neoplasms.pdf>

Cases from Uro pathology EQA – www.histopathologyeqa.org For more info and tutorials – www.ionoxley.com

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Succinate-dehydrogenase deficient RCC	SDH	PAX8, CK (focal) EMA	CK7, CAIX, RCC, CD117, Vimentin, SDHB
Tubulocystic RCC	TCRCC	CK, CK7, AMACR, Vimentin, EMA, PAX8, FH	CAIX, CD117,
Acquired cystic disease – associated RCC	ACDRCC	CK, CD10, AMACR, PAX8	CK7, EMA, CD117
Adult Cystic Nephroma	CN	Stroma: SMA, ER and PR Epithelium: CK, CK7, PAX8	Cathepsin K
Angiomyolipoma/epitheloid angiomyolipoma	AML E-AML	HMB45, Melan-A, SMA, Cathepsin-K	CK, EMA, CK7, CA-IX, CD10, RCCm, PAX8, CD117
Renomedullary interstitial cell tumour	RMICT	Calponin, (Amyloid)	S100, CK, Desmin CD34
Paraganglioma	No example	CG, Synaptophysin (S100 in sustentacular cells)	Inhibin, CK.
Well differentiated neuroendocrine tumour	WDNT	CK, Vimentin, Synaptophysin, CG, CD99	TTF1, WT1, PAX8
Metanephric adenoma	MA	WT1, CD57, S100	AMACR, RCCm

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EMERGING ENTITIES - Trpkov, K., Williamson, S.R., Gill, A.J. <i>et al.</i> Novel, emerging and provisional renal entities: The Genitourinary Pathology Society (GUPS) update on renal neoplasia. <i>Mod Pathol</i> (2021).			
Tumour type	Examples	Positive	Negative
Low grade oncocytic tumour (LOT)	LOT	CK7	CD117, Vimentin
High grade oncocytic tumour / Eosinophilic vacuolated tumor (EVT)	HOT/EVT	Cathepsin K, CD117, CD10, PAX8, CK, SDHB	CK7 (or rare positive), vimentin, CK20, Melan A, TFE3, HMB45
ALK rearranged RCC	ALK1	ALK1, PAX8, CK7, Vimentin	CK20, Cathepsin K, Racemase
Eosinophilic solid and cystic RCC (ESC RCC)	ESC	CK20, vimentin, cathepsin K	CK7, CD117
Thyroid-like follicular RCC	TFRCC	PAX8 CK7	TTF1, thyroglobulin
Oncocytic papillary RCC / Papillary neoplasm with reverse polarity	OncPap	CK7, Racemase, GATA3, L1CAM	Vimentin

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