BACKGROUND

Paired domain–containing transcription factors (PAX) are encoded by a developmental gene family, classified into four subgroups according to the presence or absence of an octapeptide region and the presence, absence, or truncation of a homeodomain. *PAX* genes of the same subgroup are also expressed in similar patterns during development. *PAX2, PAX5*, and *PAX8* belong to the same subgroup containing an octapeptide domain and a truncated homeodomain. They are expressed in the midbrain-hindbrain junction during brain development. The deregulation of *PAX* genes has been linked with many types of cancer, such as astrocytoma, medulloblastoma, lymphoma, and Wilms' tumor.[1]

PAX8 is a nephric-lineage transcription factor and is a crucial transcription factor for organogenesis of the thyroid gland, kidney, and Mullerian system. Loss of function mice models demonstrated that PAX8 is required for the morphogenesis of the thyroid gland. Experiments in thyroid cell lines have shown that PAX8 is involved in the maintenance of thyrocyte cell type and is essential for the thyrocyte-specific promoter activation of the FoxE1/TITF2, thyroglobulin (TG), thyroperoxidase (TPO), and the sodium/iodide symporter (NIS) genes. It was shown that Pax8 is part of the cAMP signaling pathway and mediates thyrotropin-dependent gene activation in thyroid cells. Moreover, activation of Ras oncogene in thyroid cells causes' loss of activity of the transcription factor Pax8 that can be rescued by overexpression of the PKA catalytic subunit.[2] The PAX8/PPAR-gamma fusion gene appears to be an oncogene. It is most often expressed in thyroid follicular carcinomas and exerts a dominant-negative effect on wild-type PAX8/PPAR-gamma, and stimulates transcription of PAX8-responsive promoters. In addition, PAX8 might be associated with telomere maintenance, by possibly facilitating survival and immortalization of cells. It was reported that PAX8 activates the *hTERT* and *hTR* promoters, which in turn activate telomerase.[3] PAX8 was found to be closely involved in various tumor development. PAX8 is expressed in a high percentage of kidney and ovarian carcinomas. It was demonstrated that PAX8 is a sensitive and relatively specific marker for Müllerian tumors. PAX8 staining is highly specific for ovarian serous tumors when compared with malignant mesotheliomas of the peritoneum and pleura.[4] Furthermore investigation of the PAX8 expression in a panel of Wilms' tumors shows a striking correlation between the expression of PAX8 and another transcription factor, WT1, indicating that these two genes may interact *in vivo*.[5] finally, it was demonstrated that the TSH regulates Pax8 transcriptional activity. Moreover, Pax8 is sumoylated by the addition of a single small ubiquitin-like modifier (SUMO) molecule on its lysine residue 309. It was shown that the protein inhibitor of activated signal transducers and activators of transcription (PIASy), a member of the PIAS STAT family of proteins, could function as a SUMO ligase. Sumoylation affects the protein stability of Pax8.[6]

References:
1. Chi, N. et al: Trends Genet. 18:41-7, 2002
2. Baratta, M.G. et al: Mol. Endocrinol. 23:838-48, 2009
3. Chen, Y.J. et al: Cancer Res. 68:5724-32, 2008
4. Laury, A.R. et al: Am. J. Surg. Pathol. 34:627-35, 2010
5. Poleev, A. et al: FEBS J. 247:860-9, 1997
6. de Cristofaro, T. et al: J. Mol. Endocrinol.42:35-46, 2009

TECHNICAL INFORMATION

Source:
PAX8 Antibody is a mouse monoclonal antibody raised against recombinant human PAX8 fragments expressed in *E. coli*.

Specificity and Sensitivity:
This antibody detects endogenous PAX8 proteins without cross-reactivity with other family members.

Storage Buffer: PBS and 30% glycerol

Storage:
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

APPLICATIONS

Application:	*Dilution:
WB	1:1000
IP	n/d
IHC	n/d
ICC	n/d
FACS	n/d

**Optimal dilutions must be determined by end user.*

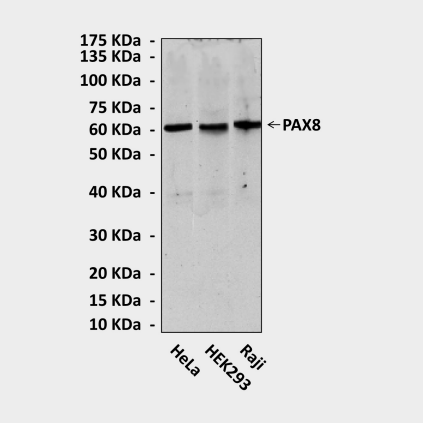
CELL APPLICATIONS, INC.

PAX8 Antibody

Cat. No. CP10352

Applications:	**WB**
Detected MW:	**60 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Mouse IgG1**

QUALITY CONTROL DATA



Western Blot detection of PAX8 proteins in various cell lysates using PAX8 Antibody.