BACKGROUND

The winged-helix or forkhead class of transcription factors has been shown to play important roles in cell specification and lineage segregation. Foxd3 (previously published as Hfh2) is a member of forkhead-box (FOX) family transcription factors characterized by a monomeric DNA binding domain for nuclear localization and transcriptional regulation. Foxd3 was isolated in a low-stringency screen for forkhead family genes. Originally termed "Genesis," Foxd3 was reported to be expressed only in mouse ES cells and their malignant equivalents. In addition, Foxd3 expression is one of several diagnostic markers characteristic of human ES cell lines. Foxd3 is required for maintenance of multipotency and self-renewal of embryonic stem (ES) cells and trophoblast stem cells in culture, and Foxd3 null mutant embryos do not survive past early gastrulation. However, Foxd3 expression is also detected during early embryogenesis in the epiblast and later in neural crest cells. Foxd3 is one of the initial markers of the NC lineage, and when removed from the NC, most NC progenitors and derivatives are markedly affected, both in vivo and in explant cultures. In these NC-specific Foxd3 mutant embryos, many of the bones and cartilage of the developing craniofacial skeleton are absent or markedly malformed, and the face does not fuse at the midline. The peripheral nervous system and enteric nervous system (ENS) are almost completely absent, and dorsal root ganglia are reduced in size, all because of defective maintenance of the NC progenitor pool within the premigratory and early migratory NC. Moreover, FOXD3 was found to be a stemness factor that prevents the production of melanocyte progenitors from the developing neural crest. FOXD3 controls the lineage choice between neural/glial and pigment cells by repressing MITF during the early phase of neural crest migration.[1] Whereas, Foxd3 and Pax3 act together to affect survival and maintenance of cardiac NC progenitors, and loss of these progenitors catastrophically affects key aspects of later cardiovascular development.[2] In addition, Foxd3 has also been implicated in the control of differentiation in multiple systems: Overexpression of Foxd3in a myeloid cell line prevents appropriate maturation of these cells into granulocytes. Foxd3 mRNA can also induce the formation of mesoderm in Xenopus. It was also shown that Foxd3 is required for the maintenance of pluripotent cells in the preimplantation and peri-implantation stages of mouse embryogenesis.[3] It was shown that FOXD3 levels are upregulated following attenuation of B-RAF and mitogen-activated protein/extracellular signal-regulated kinase (ERK) kinase (MEK) signaling in mutant B-RAF harboring human melanoma cells. FOXD3 is suppressed by B-RAF. Additionally, FOXD3-induced cell cycle arrest was prevented by p53 depletion and, to a lesser extent, $p21^{Cip1}$ depletion.[4] Furthermore, silencing of transcription factor FOXD3 is a key event early in leukemogenesis in both mouse and human chronic lymphocytic leukemia (CLL). It was shown that loss of *Foxd3* expression due to an NF-κB p50/p50:HDAC1 repressor complex occurs in TCL1-positive B cells.[5]

References:
1. Thomsa, A.J. & Erickson, C.A.: 136:1849-58, 2009
2. Nelms, B.L. et al: Genesis49:10-23, 2011
3. Kos, R. Et al: Development 128:1467-79, 2001
4. Abel, E.V. & Aplin, A.E.: Cancer Res. 70:2891–900, 2010
5. Chen, S.S. et al: Proc. Natl. Acad. Sci. USA 106:13433-8, 2009

TECHNICAL INFORMATION

Source:
FOXD3 Antibody is a mouse monoclonal antibody raised against recombinant human FOXD3 fragments expressed in *E. coli*.

Specificity and Sensitivity:
This antibody detects endogenous FOXD3 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	1:50-200
ICC	n/d
FACS	n/d

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

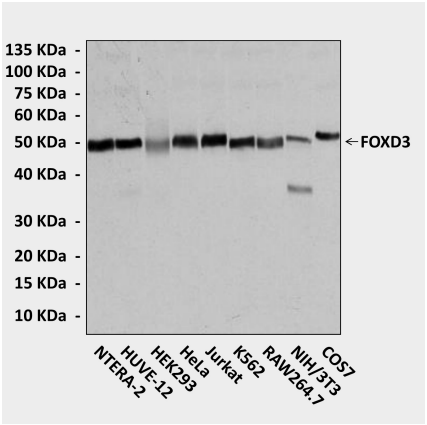
CELL APPLICATIONS, INC.

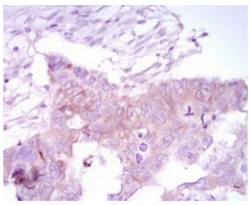
FOXD3 Antibody

Cat. No. CP10347

Applications:	**WB, IHC**
Detected MW:	**50 kDa**
Species & Reactivity:	**Human, Mouse, Rat**
Isotype:	**Mouse IgG1**

QUALITY CONTROL DATA





Top: Western Blot detection of FOXD3 proteins in various cell lysates using FOXD3 Antibody. **Bottom:** This antibody stains paraffin-embedded human ovarian cancer tissue in immunohistochemical analysis.