

BACKGROUND

The MSX family genes are one of the most highly conserved homeobox-containing genes that are identified in several animal species. The three mammalian members, *MSX1*, *MSX2* and *MSX3*, share 98% homology in their protein domain. They play important roles in inductive tissue interactions during vertebrate organogenesis, and their differential expression mediates patterning, morphogenesis and tissue formation. They encode closely related homeoproteins that function as transcriptional repressors through interacting with the components of the core transcription complex as well as other homeoproteins, and promote apoptosis in developing limbs and cephalic neural crest. Although it is expressed in diverse tissues, *MSX1* gene expression is mainly associated with multi-potent progenitor cell. It is strongly expressed in a region of highly proliferative, multipotent cells that give rise to chondrogenic and osteogenic derivatives of the limb but absent in regions where cells stopped to proliferate and begun to undergo differentiation. *MSX1* is also expressed at high levels in adult mouse uterine epithelium and decreases during pregnancy following embryonic implantation to regulate various aspects of uterine epithelial morphology and maintain the adult uterus in a morphogenetically and developmentally responsive state. It is detected at lower level in endometrium and placentomes particularly after 60 days of gestation in cows. *Msx1* gene expression can be regulated by a bidirectional transcription generating long noncoding antisense (AS) RNA the expression which is linked to the *Msx1* sense (S) RNA level.¹ Moreover, it was shown that *MSX1* plays important role in the development of preimplantation bovine embryos especially in regulating the expression of developmentally important genes by suppressing its transcript during bovine oocyte maturation and cleavage stage embryo development. In addition, it was shown that *MSX1* is a major upstream regulator of the dopaminergic neuronal subtype specification. The *MSX1* was found to be a downstream target of *PHOX2B* and activates the Delta-Notch pathway in neuroblastoma.² *MSX1* can coordinate with other transcriptional factors to regulate different pathways. It was shown that *MSX1* and *Pax9* interact synergistically throughout lower incisor development and affect multiple signaling pathways that influence incisor size and symmetry.³ Furthermore, *Osr2* was shown to act downstream of *Pax9* and patterns the mesenchymal odontogenic field through protein-protein interactions with *Msx1* and *Pax9* during early tooth development.⁴

References:

1. Babajko, S. et al: Cells Tissues Organs (DOI: 10.1159/000324466), 2011
2. Revet, I. et al: Exp. Cell Res. 314:707-19, 2008
3. Nakatomi, M. et al: Develop. Biol. 340:438-49, 2010
4. Zhou, J. et al: Develop. Biol. 353:344-53, 2011

TECHNICAL INFORMATION

Source:

MSX1 Antibody is a mouse monoclonal antibody raised against recombinant human *MSX1* fragments expressed in *E. coli*.

Specificity and Sensitivity:

This antibody detects *MSX1* proteins in various cell lysate.

Storage Buffer: PBS and 30% glycerol

Storage:

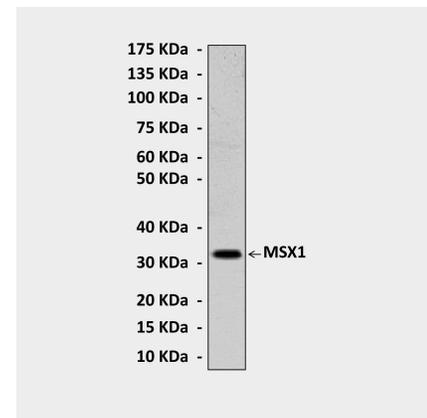
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

APPLICATIONS

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

*Optimal dilutions must be determined by end user.

QUALITY CONTROL DATA



Western blot detection of *MSX1* proteins in NTERA-2 cell lysate using *MSX1* Antibody.

