

BACKGROUND

MuSK is a receptor tyrosine kinase that initiates the formation of neuromuscular junctions in response to agrin. The ectodomain of this molecule is composed of four Ig-like domains. MuSK is required for the formation of the neuromuscular junction (NMJ) where MuSK becomes phosphorylated when exposed to neuronally synthesized isoforms of agrin. Dok7, a cytoplasmic adaptor protein plays important role in MuSK signaling. Dok7 comprises a pleckstrin-homology (PH) domain, a phosphotyrosine-binding (PTB) domain, and C-terminal sites of tyrosine phosphorylation. Unique among adaptor proteins recruited to RTKs, Dok7 is not only a substrate of MuSK, but also an activator of MuSK's kinase activity.¹ In addition, agrin-MuSK interaction in the muscle membrane can mediate the aggregation of acetylcholine receptors (AChRs) and other subsynaptic components at the synaptic site.² In fetal muscles, both MuSK and AChRs are expressed constitutively, and synaptic-like local AChR synthesis and clustering occur in the absence of the nerve and agrin but require MuSK. Later in development, however, expression of MuSK and AChRs is down-regulated by electrical impulse activity except in subsynaptic nuclei, where they are maintained by neural signals such as agrin and neuregulin-1 (NRG-1). An isoform of NRG-1 derived from motor neurones is thought to maintain synaptic AChR expression by activating ErbB receptor tyrosine kinases clustered in the subsynaptic membrane. In contrast, the neural signal maintaining MuSK expression is not known. It was known that MuSK expression is highly regulated by innervation, muscle activity, and agrin, while the distribution of MuSK is precisely coordinated with that of the AChR.³ In addition, It was demonstrated that agrin-activated MuSK induce the synapse-specific expression of *muskl*, *erbB2*, and *erbB3* genes and can regulate the expression of *AChR* genes via the induction of a secondary NRG/ErbB signaling loop. In this way, agrin/MuSK signaling sets up multiple loops feeding back to maintain an elevated synapse-specific expression of their own components as well as of AChRs in electrically active muscle fibers.⁴

References:

1. Bergamin, E. et al: Mol. Cell 39:100-9, 2010
2. DeChiara, T.M. et al: Cell 85:501-12, 1996
3. Bowen, D.C. et al: Dev. Biol. 199:309-39, 1998
4. Moore, C. et al: Proc. Natl. Acad. Sci. USA 98:14655-60, 2001

TECHNICAL INFORMATION

Source:

MuSK Antibody is a mouse monoclonal antibody raised against purified recombinant human MuSK fragments expressed in 293 cells.

Specificity and Sensitivity:

This antibody detects MuSK proteins without cross-reactivity with other family members.

Storage Buffer: PBS and 30% glycerol

Storage:

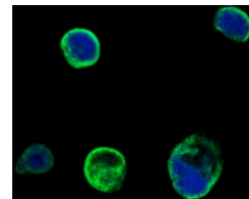
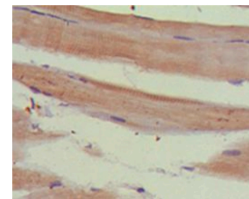
Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

APPLICATIONS

Application:	*Dilution:
WB	1:1000
IP	1:50
IHC	1:200
ICC	1:200
FACS	n/d

*Optimal dilutions must be determined by end user.

QUALITY CONTROL DATA



Top: MuSK Antibody stains paraffin-embedded human muscle tissue in IHC. **Bottom:** 293 cells were transfected with human MuSK expression vector and stained with MuSK antibody in confocal immunofluorescent analysis (MuSK antibody: Green; DRAQ5 DNA dye: blue).

