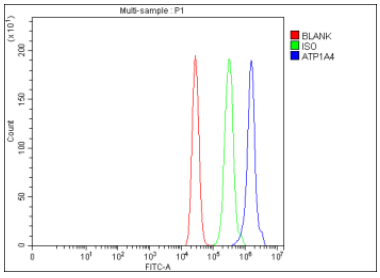
ATP1A4 Antibody / ATPase subunit alpha 4 (FY12601)

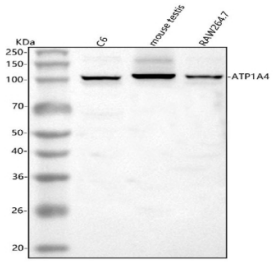
Catalog No.	Formulation	Size
FY12601	Adding 0.2 ml of distilled water will yield a concentration of 500 ug/ml	100 ug

Bulk quote request

Availability	1-2 days
Species Reactivity	Human, Mouse, Rat
Format	Lyophilized
Host	Rabbit
Clonality	Polyclonal (rabbit origin)
Isotype	Rabbit IgG
Purity	Immunogen affinity purified
Buffer	Each vial contains 4 mg Trehalose, 0.9 mg NaCl, 0.2 mg Na2HPO4.
UniProt	Q13733
Applications	Western Blot : 0.25-0.5ug/ml Flow Cytometry : 1-3ug/million cells ELISA : 0.1-0.5ug/ml
Limitations	This ATP1A4 antibody is available for research use only.



Flow Cytometry analysis of MCF-7 cells using anti-ATP1A4 antibody. Overlay histogram showing MCF-7 cells stained with (Blue line). The cells were fixed with 4% paraformaldehyde and blocked with 10% normal goat serum. And then incubated with rabbit anti-ATP1A4 antibody (1 ug/million cells) for 30 min at 20oC. DyLight 488 conjugated goat anti-rabbit IgG (5-10 ug/million cells) was used as secondary antibody for 30 minutes at 20oC. Isotype control antibody (Green line) was rabbit IgG (1 ug/million cells) used under the same conditions. Unlabelled sample (Red line) was also used as a control.



Western blot analysis of ATP1A4 using anti-ATP1A4 antibody. Lane 1: rat C6 whole cell lysates, Lane 2: mouse testis tissue lysates, Lane 3: mouse Raw264.7 whole cell lysates. After electrophoresis, proteins were transferred to a nitrocellulose membrane at 150 mA for 50-90 minutes. Blocked the membrane with 5% non-fat milk/TBS for 1.5 hour at RT. The membrane was incubated with rabbit anti-ATP1A4 antibody at 0.5 ug/ml overnight at 4oC, then washed with TBS-0.1%Tween 3 times with 5 minutes each and probed with a goat anti-rabbit IgG-HRP secondary antibody at a dilution of 1:5000 for 1.5 hour at RT. The signal was developed using enhanced chemiluminescent. Western blot probed with anti-ATP1A4 shows a dominant band at ~100 kDa, slightly below the predicted ~114 kDa, consistent with the known anomalous migration of the Na+/K+-ATPase alpha 4 subunit due to its transmembrane structure and partial deglycosylation.

Description

ATP1A4 antibody detects Sodium/potassium-transporting ATPase subunit alpha-4, a testis-enriched isoform of the Na+/K+ ATPase that maintains ionic gradients across the plasma membrane. ATP1A4 catalyzes ATP hydrolysis to drive the active transport of sodium and potassium ions, sustaining electrochemical gradients essential for cell volume regulation, signal transduction, and sperm motility. The ATP1A4 antibody is widely used in reproductive biology, membrane physiology, and enzymology research to study ion homeostasis and energy metabolism.

ATP1A4 is encoded by the ATP1A4 gene located on human chromosome 1p13.1. The protein is approximately 1,023 amino acids long and forms the catalytic alpha subunit of the Na+/K+ ATPase complex, which also includes a beta subunit and an FXYD regulatory protein. This enzyme maintains intracellular potassium and extracellular sodium concentrations by hydrolyzing ATP for ion exchange across the plasma membrane. The alpha-4 isoform is primarily expressed in spermatozoa and germ cells, where it contributes to flagellar motility and fertility.

The ATP1A4 antibody detects a 112 kilodalton band by western blot and shows membrane localization in sperm and epithelial tissues under immunofluorescence microscopy. During spermatogenesis, ATP1A4 supports sperm maturation by regulating intracellular pH and calcium signaling. It localizes predominantly to the sperm plasma membrane, particularly the midpiece and flagellum, providing energy coupling for motility. Functional studies show that loss of ATP1A4 impairs sperm motility, reduces fertility, and alters ionic homeostasis in the reproductive tract.

In somatic cells, ATP1A4 contributes to cellular polarization and signal transduction. Beyond ion transport, it functions as a signaling molecule, interacting with Src-family kinases and regulating MAPK pathways during sperm capacitation. This dual role as both a pump and signaling scaffold underscores its importance in reproductive physiology and beyond.

Because of its testis-specific expression and regulatory versatility, ATP1A4 serves as a biomarker for sperm function, male fertility, and Na+/K+ ATPase diversity. NSJ Bioreagents provides a validated ATP1A4 antibody optimized for its applications, supporting studies in ion transport, signal regulation, and reproductive biology.

Application Notes

Optimal dilution of the ATP1A4 antibody should be determined by the researcher.

Immunogen

E.coli-derived human ATP1A4 recombinant protein (Position: K45-Q680) was used as the immunogen for the ATP1A4 antibody.

Storage

After reconstitution, the ATP1A4 antibody can be stored for up to one month at 4oC. For long-term, aliquot and store at -20oC. Avoid repeated freezing and thawing.