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POLG Antibody
Rabbit Polyclonal Antibody
Catalog # ALS13141

Specification

POLG Antibody - Product Information

Application	**WB, IHC-P, IF, ICC**
Primary Accession	P54098
Reactivity	**Human**
Host	**Rabbit**
Clonality	**Polyclonal**
Calculated MW	**140kDa KDa**
Dilution	**WB~~1:1000** **IHC-P~~N/A** **IF~~1:50~200** **ICC~~N/A**

POLG Antibody - Additional Information

Gene ID 5428

Other Names
DNA polymerase subunit gamma-1, 2.7.7.7, Mitochondrial DNA polymerase catalytic subunit, PolG-alpha, POLG, MDP1, POLG1, POLGA

Target/Specificity
Human DNA polymerase gamma. Predicted cross-reactivity based on amino acid sequence homology: mouse (91%), rat (91%).

Reconstitution & Storage
Aliquot and store at -20°C. Minimize freezing and thawing.

Precautions
POLG Antibody is for research use only and not for use in diagnostic or therapeutic procedures.

POLG Antibody - Protein Information

Name POLG {ECO:0000303|PubMed:10827171, ECO:0000312|HGNC:HGNC:9179}

Function
Catalytic subunit of DNA polymerase gamma solely responsible for replication of mitochondrial DNA (mtDNA). Replicates both heavy and light strands of the circular mtDNA genome using a single-stranded DNA template, RNA primers and the four deoxyribonucleoside triphosphates as substrates (PubMed:11477093, PubMed:11897778, PubMed:15917273, PubMed:19837034, PubMed:<a href="http://www.uniprot.org/citations/9558343"

target="_blank">9558343). Has 5' -> 3' polymerase activity. Functionally interacts with TWNK and SSBP1 at the replication fork to form a highly processive replisome, where TWNK unwinds the double- stranded DNA template prior to replication and SSBP1 covers the parental heavy strand to enable continuous replication of the entire mitochondrial genome. A single nucleotide incorporation cycle includes binding of the incoming nucleotide at the insertion site, a phosphodiester bond formation reaction that extends the 3'-end of the primer DNA, and translocation of the primer terminus to the post- insertion site. After completing replication of a mtDNA strand, mediates 3' -> 5' exonucleolytic degradation at the nick to enable proper ligation (PubMed:11477093, PubMed:11897778, PubMed:15167897, PubMed:15917273, PubMed:19837034, PubMed:26095671, PubMed:9558343). Highly accurate due to high nucleotide selectivity and 3' -> 5' exonucleolytic proofreading. Proficiently corrects base substitutions, single-base additions and deletions in non-repetitive sequences and short repeats, but displays lower proofreading activity when replicating longer homopolymeric stretches. Exerts exonuclease activity toward single-stranded DNA and double-stranded DNA containing 3'- terminal mispairs. When a misincorporation occurs, transitions from replication to a pro-nucleolytic editing mode and removes the missincorporated nucleoside in the exonuclease active site. Proceeds via an SN2 nucleolytic mechanism in which Asp-198 catalyzes phosphodiester bond hydrolysis and Glu-200 stabilizes the leaving group. As a result the primer strand becomes one nucleotide shorter and is positioned in the post-insertion site, ready to resume DNA synthesis (PubMed:10827171, PubMed:11477094, PubMed:11504725, PubMed:37202477). Exerts 5'-deoxyribose phosphate (dRP) lyase activity and mediates repair-associated mtDNA synthesis (gap filling) in base-excision repair pathway. Catalyzes the release of the 5'-terminal 2-deoxyribose-5- phosphate sugar moiety from incised apurinic/apyrimidinic (AP) sites to produce a substrate for DNA ligase. The dRP lyase reaction does not require divalent metal ions and likely proceeds via a Schiff base intermediate in a beta-elimination reaction mechanism (PubMed:9770471).

Cellular Location
Mitochondrion. Mitochondrion matrix, mitochondrion nucleoid

Volume
50 µl

POLG Antibody - Protocols

Provided below are standard protocols that you may find useful for product applications.

- Western Blot
- Blocking Peptides
- Dot Blot
- Immunohistochemistry
- Immunofluorescence
- Immunoprecipitation
- Flow Cytomety
- Cell Culture

POLG Antibody - Images

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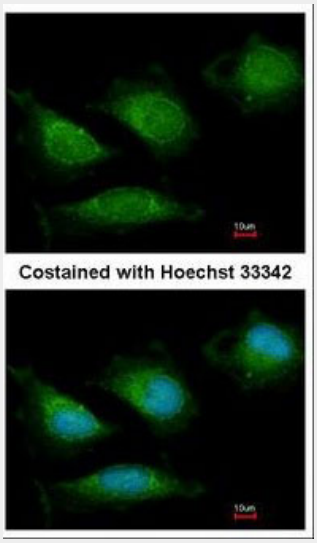
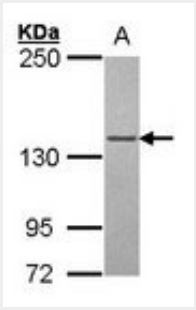
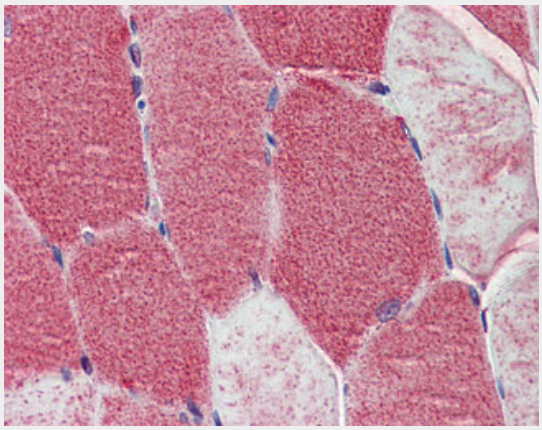


Immunofluorescence of methanol-fixed HeLa, using DNA polymerase gamma antibody at 1:200 dilution.



Sample (30 ug of whole cell lysate). A: 293T. 5% SDS PAGE. POLG antibody diluted at 1:5000.



Anti-POLG antibody IHC of human skeletal muscle.

POLG Antibody - Background

Involved in the replication of mitochondrial DNA. Associates with mitochondrial DNA.

POLG Antibody - References

Ropp P.A.,et al.Genomics 36:449-458(1996).
Lecrenier N.L.,et al.Gene 185:147-152(1997).

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Bogenhagen D.F.,et al.J. Biol. Chem. 283:3665-3675(2008).
Van Goethem G.,et al.Nat. Genet. 28:211-212(2001).