

DNA polymerase theta Antibody (internal region)
Peptide-affinity purified goat antibody
Catalog # AF2748a**Specification**

DNA polymerase theta Antibody (internal region) - Product Information

Application	E
Primary Accession	O75417
Other Accession	NP_955452.3 , 10721
Predicted	Human
Host	Goat
Clonality	Polyclonal
Concentration	0.5 mg/ml
Isotype	IgG
Calculated MW	289619

DNA polymerase theta Antibody (internal region) - Additional Information**Gene ID** 10721**Other Names**

DNA polymerase theta, 2.7.7.7, DNA polymerase eta, POLQ, POLH

Dilution

E~~N/A

Format

0.5 mg/ml in Tris saline, 0.02% sodium azide, pH7.3 with 0.5% bovine serum albumin

Storage

Maintain refrigerated at 2-8°C for up to 6 months. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.

Precautions

DNA polymerase theta Antibody (internal region) is for research use only and not for use in diagnostic or therapeutic procedures.

DNA polymerase theta Antibody (internal region) - Protein Information**Name** DPOLQ**Function**

Low-fidelity DNA polymerase with a helicase activity that promotes microhomology-mediated end-joining (MMEJ), an alternative non-homologous end-joining (NHEJ) machinery required to repair double-strand breaks in DNA during mitosis (PubMed:14576298, PubMed:18503084, PubMed:18503084).

[24648516](http://www.uniprot.org/citations/24648516), PubMed: [25642963](http://www.uniprot.org/citations/25642963), PubMed: [25643323](http://www.uniprot.org/citations/25643323), PubMed: [25775267](http://www.uniprot.org/citations/25775267), PubMed: [26636256](http://www.uniprot.org/citations/26636256), PubMed: [27311885](http://www.uniprot.org/citations/27311885), PubMed: [27591252](http://www.uniprot.org/citations/27591252), PubMed: [30655289](http://www.uniprot.org/citations/30655289), PubMed: [31562312](http://www.uniprot.org/citations/31562312), PubMed: [32873648](http://www.uniprot.org/citations/32873648), PubMed: [34140467](http://www.uniprot.org/citations/34140467), PubMed: [34179826](http://www.uniprot.org/citations/34179826), PubMed: [36455556](http://www.uniprot.org/citations/36455556), PubMed: [37440612](http://www.uniprot.org/citations/37440612), PubMed: [37674080](http://www.uniprot.org/citations/37674080)). MMEJ is an error-prone repair pathway that produces deletions of sequences from the strand being repaired and promotes genomic rearrangements, such as telomere fusions, some of them leading to cellular transformation (PubMed: [25642963](http://www.uniprot.org/citations/25642963), PubMed: [25643323](http://www.uniprot.org/citations/25643323), PubMed: [25775267](http://www.uniprot.org/citations/25775267), PubMed: [27311885](http://www.uniprot.org/citations/27311885), PubMed: [27591252](http://www.uniprot.org/citations/27591252), PubMed: [31562312](http://www.uniprot.org/citations/31562312), PubMed: [32873648](http://www.uniprot.org/citations/32873648)). MMEJ is required during mitosis to repair persistent double-strand breaks that originate in S-phase (PubMed: [37440612](http://www.uniprot.org/citations/37440612), PubMed: [37674080](http://www.uniprot.org/citations/37674080)). Although error-prone, MMEJ protects against chromosomal instability and tumorigenesis (By similarity). The polymerase acts by binding directly the 2 ends of resected double-strand breaks, allowing microhomologous sequences in the overhangs to form base pairs (PubMed: [25643323](http://www.uniprot.org/citations/25643323), PubMed: [25775267](http://www.uniprot.org/citations/25775267), PubMed: [27311885](http://www.uniprot.org/citations/27311885), PubMed: [27591252](http://www.uniprot.org/citations/27591252)). It then extends each strand from the base-paired region using the opposing overhang as a template (PubMed: [25643323](http://www.uniprot.org/citations/25643323), PubMed: [25775267](http://www.uniprot.org/citations/25775267), PubMed: [27311885](http://www.uniprot.org/citations/27311885), PubMed: [27591252](http://www.uniprot.org/citations/27591252)). Requires partially resected DNA containing 2 to 6 base pairs of microhomology to perform MMEJ (PubMed: [25643323](http://www.uniprot.org/citations/25643323), PubMed: [25775267](http://www.uniprot.org/citations/25775267), PubMed: [27311885](http://www.uniprot.org/citations/27311885), PubMed: [27591252](http://www.uniprot.org/citations/27591252)). The polymerase lacks proofreading activity and is highly promiscuous: unlike most polymerases, promotes extension of ssDNA and partial ssDNA (pssDNA) substrates (PubMed: [18503084](http://www.uniprot.org/citations/18503084), PubMed: [21050863](http://www.uniprot.org/citations/21050863), PubMed: [22135286](http://www.uniprot.org/citations/22135286)). When the ends of a break do not contain terminal microhomology must identify embedded complementary sequences through a scanning step (PubMed: [32234782](http://www.uniprot.org/citations/32234782)). Also acts as a DNA helicase, promoting dissociation of the replication protein A complex (RPA/RP-A), composed of RPA1, RPA2 and RPA3, from resected double-strand breaks to allow their annealing and subsequent joining by MMEJ (PubMed: [36455556](http://www.uniprot.org/citations/36455556)). Removal of RPA/RP-A complex proteins prevents RAD51 accumulation at resected ends, thereby inhibiting

homology-recombination repair (HR) pathway (PubMed:25642963, PubMed:28695890). Also shows RNA-directed DNA polymerase activity to mediate DNA repair in vitro; however this activity needs additional evidence in vivo (PubMed:34117057). May also have lyase activity (PubMed:19188258). Involved in somatic hypermutation of immunoglobulin genes, a process that requires the activity of DNA polymerases to ultimately introduce mutations at both A/T and C/G base pairs (By similarity). POLQ-mediated end joining activity is involved in random integration of exogenous DNA hampers (PubMed:28695890).

Cellular Location

Nucleus {ECO:0000250|UniProtKB:O18475}. Chromosome Note=Enriched in chromatin in response to ultraviolet (UV) light (PubMed:25642963, PubMed:34179826). Binds to chromatin during early G1 (PubMed:24989122). Recruited to DNA damage sites, such as double-stranded breaks (DSBs), following interaction with TOPBP1 and RHNO1 (PubMed:37440612, PubMed:37674080).

Tissue Location

Highly expressed in testis.

DNA polymerase theta Antibody (internal region) - Protocols

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

- [Western Blot](#)
- [Blocking Peptides](#)
- [Dot Blot](#)
- [Immunohistochemistry](#)
- [Immunofluorescence](#)
- [Immunoprecipitation](#)
- [Flow Cytometry](#)
- [Cell Culture](#)

DNA polymerase theta Antibody (internal region) - Images

DNA polymerase theta Antibody (internal region) - References

DNA polymerase theta is preferentially expressed in lymphoid tissues and upregulated in human cancers. Kawamura K, Bahar R, Seimiya M, Chiyo M, Wada A, Okada S, Hatano M, Tokuhisa T, Kimura H, Watanabe S, Honda I, Sakiyama S, Tagawa M, O-Wang J. Int J Cancer. 2004 Mar;109(1):9-16. PMID: 14735462