Anti-DNA-RNA hybrid [S9.6] Standard Size Ab01137-23.0

This chimeric rabbit antibody was made using the variable domain sequences of the original Mouse IgG2a format, for improved compatibility with existing reagents, assays and techniques.

Isotype and Format: Rabbit IgG, Kappa
Clone Number: S9.6
Alternative Name(s) of Target: DNA:RNA Duplex; DNA-RNA Duplex; DNA/RNA Duplex; DNA-RNA Hybrid; DNA/RNA Hybrid; DNA:RNA Hybrid; RNA-DNA Duplex; RNA/DNA Duplex; RNA:DNA Duplex; RNA-DNA Hybrid; RNA/DNA Hybrid; RNA:DNA Hybrid
UniProt Accession Number of Target Protein:
Published Application(s): ABA, CHIP, ChIP-seq, DB, EMSA, FISH, ICC, IP, SPR, IF
Published Species Reactivity: n/a
Immunogen: This antibody was generated in BALB/c mouse against S9.6 ΦX174 bacteriophage-derived synthetic DNA/RNA antigen according to the protocol by Boguslawski et al. (J. Immunol Methods. 1986).
Specificity: This antibody shows high specificity and affinity for DNA/RNA hybrids and other A-form nucleic acid hybrids. It is useful in the detection of R-loops and does not cross-react with single-stranded DNA, double-stranded DNA and RNA, and ribosomal RNA. In the original publication by Boguslawski et al. (1986), this antibody was reported to bind the DNA-RNA heteropolymer and poly(I)-poly(dC) equally, but 100-fold higher levels of poly(A)-poly(dT) were required to achieve a similar degree of binding. DNA-RNA hybrids are a natural occurrence within eukaryotic cells and their level are high at sites of high transcriptional activity. They are non-canonical nucleic acid structures with transcriptional regulatory functions. Their presence is reported to predispose a locus to chromosomal breakage. A locus forming an DNA:RNA creates a double-stranded A/B intermediate conformation, with a second target for single-stranded nucleic acid binding proteins on the complementary, displaced DNA strand. They are shown to be resistant to the activity of DNA methyltransferases. The formation of DNA:RNA hybrids has been associated with a number of neurological diseases. Mutations in the DNA:RNA helicase senataxin (SETX) are implicated in the dominant juvenile form of amyotrophic lateral sclerosis type 4 and a recessive form of ataxia oculomotor apraxia type 2.
Application Notes: DNA-RNA hybrids are a natural occurrence within eukaryotic cells, with levels of these hybrids increasing at sites with high transcriptional activity, such as during transcription initiation, repression, and elongation. Because RNA-DNA hybrids influence genomic instability, this anti-DNA-RNA hybrid (S9.6) antibody is a useful reagent to help study the consequences of R-loops and lesions formed by

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these hybrids during DNA replication or other cellular processes. In addition, this antibody is effective in recognizing RNA-DNA hybridization for microarray studies. Key applications for this antibody include: affinity binding assay (ABA), chromatin immunoprecipitation (ChIP), chromatin immunoprecipitation-sequencing (ChIP-seq), dot blot (DB), fluorescent in situ hybridization (FISH), electrophoretic mobility shift assay (EMSA), surface plasmon resonance (SPR), immunofluorescence (IF), immunocytochemistry (ICC) and immunoprecipitation (IP). For example, in an affinity binding assay (ABA), this antibody was shown to bind the DNA-RNA heteropolymer and poly(I)-poly(dC) equally, but 100-fold higher levels of poly(A)-poly(dT) were required to achieve a similar degree of binding (Boguslawski et al., 1986). In a chromatin immunoprecipitation (ChIP) analysis, a representative lot detected increased DNA-RNA hybrids at four actively transcribed genes upon shRNA-mediated knockdown of BRCA1 or BRCA2, but not PCID2 or RAD51 in HeLa cells (Bhatia et al. 2014). In a chromatin Immunoprecipitation-sequencing (ChIP-seq) analysis, a representative lot detected genome-wide distribution of DNA-RNA hybrids in budding yeast (El Hage et al. 2014). In immunocytochemistry (ICC) and immunoprecipitation (IP) analyses, a representative lot immunoprecipitated in vitro transcribed R-loop substrate (DNA-RNA hybrid), but not doouble-stranded DNA (dsDNA) (Ginno, P.A., et al. 2012).
Antibody First Published in: Boguslawski et al. Characterization of monoclonal antibody to DNA.RNA and its application to immunodetection of hybrids. J Immunol Methods. 1986 May 1;89(1):123-30. PMID:2422282
Note on publication: Describe the original generation of this antibody, its characterisation and its application to immunodetection of DNA-RNA heteropolymer hybrids.

Product Form

Size: 100 µg Purified antibody.
Purification: Protein A affinity purified
Supplied In: PBS with 0.02% Proclin 300.
Storage Recommendation: Store at 4^{o}C for up to 3 months. For longer storage, aliquot and store at -20^{o}C.
Concentration: 1 mg/ml.

Important note – This product is for research use only. It is not intended for use in therapeutic or diagnostic procedures for humans or animals.

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