

Product datasheet for **KN212566RB**

DNA Polymerase theta (POLQ) Human Gene Knockout Kit (CRISPR)

Product data:

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| Product Type: | Knockout Kits (CRISPR) |
| Format: | 2 gRNA vectors, 1 RFP-BSD donor, 1 scramble control |
| Donor DNA: | RFP-BSD |
| Symbol: | DNA Polymerase theta |
| Locus ID: | 10721 |
| Components: | KN212566G1 , DNA Polymerase theta gRNA vector 1 in pCas-Guide CRISPR vector (GE100002), Target Sequence: GATTCGTTCTCGGGAAGCGG KN212566G2 , DNA Polymerase theta gRNA vector 2 in pCas-Guide CRISPR vector (GE100002), Target Sequence: AAACGGCGGCGTTCAGAATC KN212566RBD , donor DNA containing left and right homologous arms and RFP-BSD functional cassette. |

Homologous arm and RFP-BSD sequences:

pUC vector backbone in gray; **Left arm sequence in blue**; **RFP-BSD in green**; **Right arm in violet**

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AAGGCGAGTT ACATGATCCC CCATGTTGTG CAAAAAAGCG GTTAGCTCCT TCGGTCCTCC GATCGTTGTC
AGAAGTAAGT TGGCCGCAGT GTTATCACTC ATGGTTATGG CAGCACTGCA TAATTCTCTT ACTGTCATGC
CATCCGTAAG ATGCTTTTCT GTGACTGGTG AGTACTCAAC CAAGTCATTC TGAGAATAGT GTATGCCGGC
ACCGAGTTGC TCTTGCCCGG CGTCAATACG GGATAATACC GCGCCACATA GCAGAATTTT AAAAGTGCTC
ATCATTGGAA AACGTTCTTC GGGGCGAAAA CTCTCAAGGA TCTTACCGT GTTGAGATCC AGTTCGATGT
AACCCACTCG TGCACCCAAC TGATCTTCAG CATCTTTTAC TTTACCAGC GTTTCTGGGT GAGCAAAAAC
AGGAAGGCAA AATGCCGCAA AAAAGGGAAT AAGGGCGACA CGGAAATGTT GAATACTCAT ACTCTTCCTT
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CGACGGCCAG TGAATTGGAG GCTACAGTCA GTGGAGAGGA CTTTCACAGG CTGTCGCCGT GCTCATTTGA

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TAACTGCCG TTATTCATGC GACACAATCC CCAATTCCTC ATTACATATT CCTCACAATG CATGCTGGCT
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 ACCTGTCTG CCAGCTGCAT TAATGAATCG GCCAACGCG GGGGAGAGC GGTTCGCTA TTGGGCGCTC
 TTCCGCTTC TCGCTACTG ACTCGTGGC CTCGGTCTG CGGCTGCGG GAGCGTATC AGCTCACTCA
 AAGGCGGTAA TACGGTTATC CACAGAATCA GGGGATAACG CAGGAAAGAA CATGTGAGCA AAAGGCCAGC
 AAAAGGCCAG GAACCGTAAA AAGGCCGCTG TGCTGGCGTT TTTCCATAG CTCCGCCCC CTGACGAGCA
 TCACAAAAAT CGACGCTCAA GTCAGAGGTG GCGAAACCCG ACAGGACTAT AAAGATACCA GGCGTTTCCC
 CCTGGAAGCT CCCTCGTGCG CTCTCCTGTT CCGACCTGC CGCTTACCG ATACCTGTCC GCCTTCTCC
 CTTCCGGAAG CGTGGCGCTT TCTCATAGCT CACGCTGTAG GTATCTCAGT TCGGTGTAGG TCGTTCGCTC
 CAAGCTGGGC TGTGTGCACG AACCCCGT TCAGCCCGAC CGCTGCGCT TATCCGTAA CTATCGTCTT
 GAGTCCAACC CGGTAAGACA CGACTTATCG CCACTGGCAG CAGCCACTGG TAACAGGATT AGCAGAGCGA
 GGTATGTAGG CGGTGCTACA GAGTCTTGA AGTGGTGGC TAACTACGGC TACACTAGAA GAACAGTATT
 TGGTATCTGC GCTCTGCTGA AGCCAGTTAC CTTCGAAAA AGAGTTGGTA GCTCTTGATC CGGCAACAA
 ACCACCGCTG GTAGCGGTGG TTTTTTGTG TGCAAGCAGC AGATTACGCG CAGAAAAAA GGATCTCAAG
 AAGATCCTTT GATCTTTCT ACGGGGTCTG ACGCTCAGTG GAACGAAAAC TCACGTAAAG GGATTTTGGT
 CATGAGATTA TCAAAAAGGA TCTTACCTA GATCCTTTA AATTAATAA GAAGTTTAA ATCAATCTAA
 AGTATATATG AGTAAACTTG GTCTGACAGT TACCAATGCT TAATCAGTGA GGCACCTATC TCAGCGATCT
 GTCTATTCG TTCATCCATA GTTGCCTGAC TCCCGTCTG GTAGATAACT ACGATACGGG AGGGCTTACC
 ATCTGGCCCC AGTGCTGCAA TGATACCGCG AGAACACGC TCACCGGCTC CAGATTTATC AGCAATAAAC
 CAGCCAGCCG GAAGGGCCGA GCGCAGAAGT GGTCTGCAA CTTTATCCGC CTCCATCCAG TCTATTAATT
 GTTGCCGGGA AGCTAGAGTA AGTAGTTCG CAGTTAATAG TTTGCGCAAC GTTGTGCCA TTGCTACAGG
 CATCGTGTG TCACGCTCGT CGTTTGTGAT GGCTTCATTC AGCTCCGTT CCAACGATC

GE100003, scramble sequence in pCas-Guide vector

Disclaimer:

These products are manufactured and supplied by OriGene under license from ERS. The kit is designed based on the best knowledge of CRISPR technology. The system has been functionally validated for knocking-in the cassette downstream the native promoter. The efficiency of the knock-out varies due to the nature of the biology and the complexity of the experimental process.

RefSeq:

[NM_006596](#), [NM_199420](#)

UniProt ID:

[O75417](#)

Synonyms: DKFZp781A0112; DNA polymerase eta; DNA polymerase theta; POLH; POLH, PRO0327, DKFZp781A0112; polymerase (DNA directed), theta; PRO0327

Summary: DNA polymerase that promotes microhomology-mediated end-joining (MMEJ), an alternative non-homologous end-joining (NHEJ) machinery triggered in response to double-strand breaks in DNA (PubMed:25642963, PubMed:25643323). 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, PubMed:25643323). POLQ acts as an inhibitor of homology-recombination repair (HR) pathway by limiting RAD51 accumulation at resected ends (PubMed:25642963). POLQ-mediated MMEJ may be required to promote the survival of cells with a compromised HR repair pathway, thereby preventing genomic havoc by resolving unrepaired lesions (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. It then extends each strand from the base-paired region using the opposing overhang as a template. Requires partially resected DNA containing 2 to 6 base pairs of microhomology to perform MMEJ (PubMed:25643323). The polymerase activity is highly promiscuous: unlike most polymerases, promotes extension of ssDNA and partial ssDNA (pssDNA) substrates (PubMed:18503084, PubMed:21050863, PubMed:22135286). Also exhibits low-fidelity DNA synthesis, translesion synthesis and lyase activity, and it is implicated in interstrand-cross-link repair, base excision repair and DNA end-joining (PubMed:14576298, PubMed:18503084, PubMed:19188258, PubMed:24648516). 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). [UniProtKB/Swiss-Prot Function]

Product images:

