



PRODUCT SPECIFICATION

Recombinant anti-human Epidermal Growth Factor Receptor (EGFR) nanobody 7D12.

Catalogue number: sdAb-EGFR-Nb 7D12

Background

EGFR (epidermal growth factor receptor) is a well-known transmembrane receptor tyrosine kinase that is activated by its ligand, EGF. Ligand interaction causes dimerization of the receptor and concomitant activation of its tyrosine kinase activity. EGFR is at the top of a signal transduction cascade that has been intensively studied during the past years. In fact, this signal transduction cascade was used as a model for many other similar signal transduction mechanisms that operate via a transmembrane receptor. Mutations in the EGF receptor (leading to amino acid substitutions at specific positions in its primary structure) are associated with several types of cancer (head and neck, lung, brain). Part of the oncogenic effect resides in loss of its normal physiologic regulation. The receptor becomes constitutively active, leading to constant intracellular signalling resulting in uncontrolled cell growth.

Nanobody 7D12 sterically inhibits EGF binding to its receptor.

Applications: Suitable for immunoprecipitation, ELISA. This product is for R&D use only, not for drug, diagnostic, therapeutic, household, or other uses.

Source and properties: Raised in llama using human EGFR as antigen 7D12 was shown to recognize domain III of the extracellular region of EGFR (<https://www.rcsb.org/structure/4krl>).

7D12 interacts with an affinity of ~14 nM, measured by binding of ¹²⁵I-labeled nanobody to EGFR-expressing mammalian cells. It inhibits the growth of A431 cells. The nanobody blocks Y1068 phosphorylation of EGFR and it competes for binding with cetuximab, a chimeric monoclonal IgG1 antibody directed against EGFR and used in clinical treatment of metastatic colorectal cancer and head and neck cancer.

Availability: 7D12 nanobody comes with a COOH-terminal HA epitope tag. Available in 100 µg, 500 µg, 1000 µg quantities. For bulk amounts, please inquire.

Expression host: VHH single domain antibody purified from *E. coli*.

Storage buffer: 20 mM Tris-HCl pH 8.0, 150 mM NaCl, 1mM DTT, 60 % glycerol. Store at -20°C. The sample will not freeze. Maintain sample in cold environment during transport to increase longevity.

Stability: Store at -20°C upon arrival. For long term storage, aliquot and store at -80°C. Avoid repeated freeze/thaw cycles.

Sources:

Roovers et al. (2011). A biparatopic anti-EGFR sdAb efficiently inhibits solid tumour growth. *International journal of cancer*, 129(8), 2013-2024.

Protein data bank (PDB) <https://www.rcsb.org/>

Wikipedia.

Citations:

*Tintelnot et al. Nanobody Targeting of Epidermal Growth Factor, Receptor (EGFR) Ectodomain Variants Overcomes Resistance to Therapeutic EGFR Antibodies. *Mol Cancer Ther*, 2019 Apr;18(4):823-833. DOI: 10.1158/1535-7163.MCT-18-0849.

*Hong et al. Universal endogenous antibody recruiting nanobodies capable of triggering immune effectors for targeted cancer immunotherapy. DOI: 10.1039/D0SC05332E (Edge Article) *Chem. Sci.*, 2021, **12**, 4623-4630.

*Noor et al. Production of a mono-biotinylated EGFR nanobody in the E. coli periplasm using the pET22b vector. *BMC Res Notes* (2018) 11:751. <https://doi.org/10.1186/s13104-018-3852-1>.

* van Driel et al. EGFR targeted nanobody–photosensitizer conjugates for photodynamic therapy in a pre-clinical model of head and neck cancer. *Journal of Controlled Release* 229 (2016) 93–105