

PRODUCT SPECIFICATION

Recombinant anti-human pan Akt Nanobodies.

Catalogue number: sdAb-pan Akt2-Nbs.



Background

Protein kinases represent an extensive class of enzymes that phosphorylate substrates in a specific manner resulting in modification of the properties of that substrate. They use ATP as a co-enzyme and Mg^{2+} as a co-factor and transfer the gamma phosphate group from ATP to the hydroxyl group in the side chain of a serine, threonine or tyrosine residue of a protein.

Akt kinases are serine/threonine kinases and come in three highly homologous isoforms (Akt 1, 2, 3) that are non-redundant. They contain an N-terminal pleckstrin homology (PH) domain that is connected by a linker to the catalytic domain, followed by a C-terminal regulatory region. The Akt kinase is frequently over-activated in cancer and considered as a therapeutic target. However, most small molecule inhibitors are ATP analogs and as such lack sufficient specificity. Allosteric regulators were an improvement but it still remains challenging to obtain Akt isoform-specific inhibitors. In fact, to date there are no effective isoform-specific inhibitors available.

Pan Akt2 nanobodies do not discriminate between Akt1, 2 or 3 and hence interact with all three Akt isoforms. (Merckaert et al., 2020; Merckaert et al., 2021). Such nanobodies can be useful in studies where i.e. only a single isoform is expressed in the biological sample under study or when it is required to effectively pull down all isoforms that are expressed in the sample.

Two nanobodies are presented here: Akt3 Nb8 and Akt2 Nb10 (described in Merckaert et al., 2020). The first was obtained after immunization with the Akt3 PH domain whereas the second was obtained after immunization with the full length recombinant kinase expressed and purified from insect cells.

Applications: PD, IP, ELISA. Other applications have not yet been tested. This product is for R&D use only, not for drug, diagnostic, therapeutic, household, or other uses. Not suitable for Western blot.

Availability: Akt3 Nb8 and Akt2 Nb10 come with a COOH-terminal HA or Myc epitope tag. Available in 100 μ g, 500 μ g, 1000 μ g quantities. For bulk amounts, please inquire.

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

Cross reactivity: Reactivity of this nanobody with Akt isoforms from species other than human has not been tested.

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.

Product citations: /

Literature:

- Merckaert, T., O. Zwaenepoel, K. Gevaert, and J. Gettemans. 2020. Development and characterization of protein kinase B/AKT isoform-specific nanobodies. *PLoS One*. 15:e0240554.
- Merckaert, T., O. Zwaenepoel, K. Gevaert, and J. Gettemans. 2021. An AKT2-specific nanobody that targets the hydrophobic motif induces cell cycle arrest, autophagy and loss of focal adhesions in MDA-MB-231 cells. *Biomed Pharmacother*. 133:111055.