Protein Purification/Immobilization through negPeps

Reference No: B76080

CHALLENGE

Affinity Tags, like **His Tag, Flag Tag** or **Strep Tag,** which mediate the selective binding to a ligand, are widely used for the purification of recombinant proteins or for binding to functionalized chip carriers. **At present, a suitably functionalized surface is necessary for the use of affinity tags.**

INNOVATION

Here **magnetic particle binding peptides (negPeps),** which **bind** to **magnetic nanoparticles (MNPs)** in a controlled manner **without a specific surface functionalization** have been identified. By altering the buffering conditions the negPeps can be separated from MNPs again. Furthermore, a **plasmid system** was developed, which enables the expression of target proteins as negPep-fusion proteins in *E. coli.*

The novel negPep-technology offers major advantages:

- no functionalization of surfaces is necessary (easy to handle)
- reversible binding of negPeps to MNPs: MNPs are reusable (cost-effective)
- no denaturation of biomolecules

The application fields of the negPep-technology include:

- protein purification
- use of negPep-tagged proteins as ligands for magnetic separation
- use of negPep-tags for the immobilization of enzymes

COMMERCIAL OPPORTUNITIES

A very lucrative commercial opportunity is to offer kits containing the magnetic beads, the expression plasmid and the required buffers for binding and separation of the beads. The use of the negPep technology for protein purification, which is one possible application option is shown below:

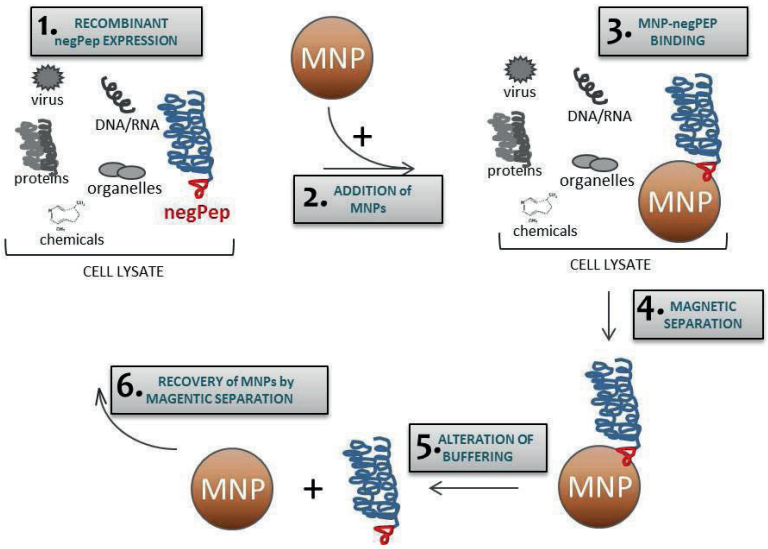

Figure: Schematic description of a protein purification process from cell lysate using the negPep-technology. **1.**The negPep-fusion protein of interest is expressed in *E.Coli.* **2.** After cell lysis MNPs are added under the respective buffering conditions. **3.** MNPs bind to the negPep-fusion protein using the respective binding buffer. **4.** Magnetic sepation of the negPep-MNP complexes from the cell debris. **5.** Alteration of the buffering conditions lead to the separation of MNPs from the negPep-fusion proteins. **6.** The released MNPs can be recovered by magnetic separation and reused.

DEVELOPMENT STATUS

Proof of concept.

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