Quantitative release and recovery of biotinylated molecules from streptavidin complexes (P-1208)

Facts

- very fast and simple method for quantitative release and recovery of biotinylated molecules
- suitable for e.g. biotinylated proteins, peptides, DNA, RNA and PNA
- the method dissociates streptavidin – biotin complexes without affecting covalent bonds
- the elution substance SX is well-known, low priced (< 0.5$ per ml), save, and easy to handle

Abstract

Due to the extraordinary stability of the biotin-streptavidin complex, biotin labeling of organic and inorganic molecules has emerged to a commonly used technique for numerous applications. The interaction is unaffected by wide extremes of pH, temperature, organic solvents and other denaturing agents.

The extraordinary stability of the biotin-streptavidin complex poses a major problem when biotinylated molecules need to be recovered from such complexes. Harsh elution conditions are required to dissociate the complex using heat and chemical reagents like SDS which are not compatible with subsequent analytical techniques especially mass spectrometry.

To circumvent these restrictions DKFZ inventors have developed a simple and mild method for complete dissociation of biotin-streptavidin complexes.

The Technology

The biotinylated molecules, like proteins or peptides, DNA, RNA and PNA are quantitatively released from streptavidin complexes by simply adding a mixture of SX (a well-known, low priced, save, and easy to handle liquid substance). After elution and removal of SX, e.g. by evaporation, the biotinylated molecules can be used for subsequent applications and analyses.

Development Stage

The method is ready to use and reduced to practice at DKFZ.

Applications and Commercial Opportunity

Due to the sublime performance with respect to simplicity, cost-effectiveness, and quantitative recovery of purified biotinylated molecules, the method is suitable for the elution of all sorts of biotin-streptavidin complexes.

Inventors

The inventors are: Uwe Warnken, Eva Linder, and Martina Schnölzer, DKFZ Heidelberg.

Intellectual Property

The patent application “Methods for a quantitative release of biotinylated peptides and proteins from streptavidin complexes” was filed January 26, 2015 at the EPO.

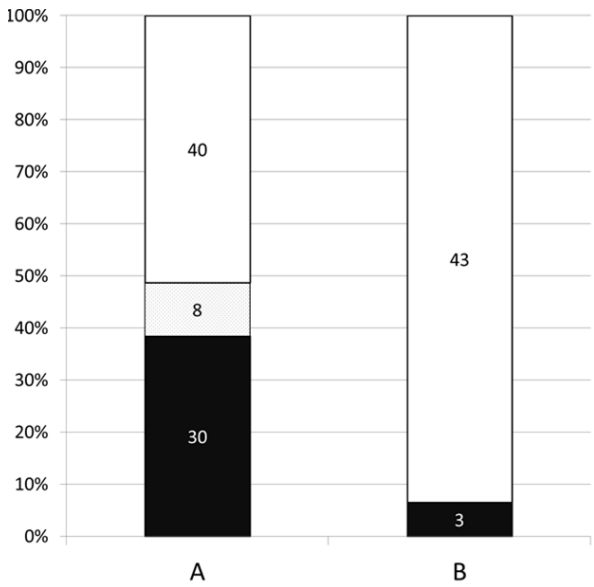

Figure: Mass spectrometry analysis of in vitro biotinylated BSA digested with trypsin. Number of detected biotinylated and non-biotinylated peptides before (A) and after (B) capture and release with SX from streptavidin silica gel. Singly and doubly biotinylated peptides are highly enriched after streptavidin silica gel capture and SX release. Black=non-biotinylated peptides; gray=biotinylated and non-biotinylated peptides; white=biotinylated peptides

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