Licensee offer

Antibody mimetics – a new class of small peptides that target proteins with ultrahigh affinity and specificity
The Opportunity

The University of Copenhagen is seeking an industrial partner for a new class of antibody mimetics.

The technology will enable a licensee to provide customized antibody equivalents designed to recognize almost any surface of a protein. Being small peptides, the antibody mimetics can be produced using standard peptide synthesis methods. Due to the high affinity and specificity of the antibody mimetics, they have versatile use in detection, diagnosis and therapy. We coined the term β-bodies for this class of antibody mimetics.

The problem

Traditional antibodies can be used in a variety of methods involving biomolecular recognizing, such as in detection and diagnosis, and as therapeutic agents. The disadvantage of antibodies is that they cannot be designed and are obtained as a polyclonal response. Lengthy and time-consuming processes of generation monoclonal antibodies are usually required. Moreover, the specific binding site for antibodies cannot be specified up-front. In addition, antibodies for detection often show batch-to-batch variations that can influence the test results.

The Invention/technology

The technology is a new class of peptides functioning as non-Ig antibody mimetics. They can bind target compounds with high affinity and high specificity. Typically, the antibody mimetic is a peptide of up to 26 amino acids equal to less than 3 kDa. The unique peptide sequence gives the antibody mimetic a very stable 3D structure.

The antibody mimetic can bind to its target compound with a $K_d$ of down to $10^{-9}$-$10^{-10}$.

If the 3D structure of the target protein is known, computer based methods can be used for identifying antibody mimetics which are structurally fitting a site on the protein of interest. Molecular dynamics calculations can be used to select the antibody mimetic with optimal complementarity.

For detecting the presence of a target compound in a sample, the antibody mimetic may be linked to a detectable label or it may be used in a sandwich assay.

Molecular libraries of antibody mimetics can be produced by combinational synthesis. Such libraries can be useful for target proteins with no known 3D structure.

Key Selling points

- Antibody mimetics with ultrahigh affinity and specificity
- Small peptides smaller than 3kDa which can be synthesized using standard peptide chemical methods
- Simple and fast generation, selection and synthesis
- The peptide sequence of the antibody mimetic can be generated by computer-based methods for target proteins with a known 3D structure
Development status

Antibody mimetics have been designed and tested for a number of interleukins, enzymes and receptors by computer-based methods. Work on selectivity and on other target proteins is on-going. The technology is ready for any target protein with a known 3D structure. It is also feasible to use combinatorial selection of these antibody mimetics towards proteins for which the structure is unknown.

Intellectual property rights

A Danish patent application covering the invention was filed on 11th November 2016. University of Copenhagen holds all rights to the invention.

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