



Biodiagnostika
Oligonukleotide
Markierte Biomoleküle

BIOTEZ

recoveryELISA®

Companion Diagnostics Tool For Biopharmaceuticals

Innovative enzyme immunoassay for multi-parameter monitoring during treatment with monoclonal antibodies and other biologics

NEW:

The *recoveryELISA* is an innovative technology, which can basically be applied to monoclonal antibodies or to all antibody analogues and their antigens.

The *recoveryELISA* was designed as companion diagnostics for:

- biopharmaceutical development and
- laboratory medicine in support of therapies with approved antibodies.

The *recoveryELISA* offers the diagnostic solution for trouble-free measurement of samples in the presence of the therapeutic agent by means of its patented process, and provides much information for use in clinical studies.

BENEFITS:

The *recoveryELISA* delivers the following results

- Level of free antigen
- Level of therapeutic antibody
- Neutralization rate of target antigen and the
- *recovery curve*: function for the dose-related antigen-antibody interaction

In addition to these results, *recoveryELISA* provides indications of:

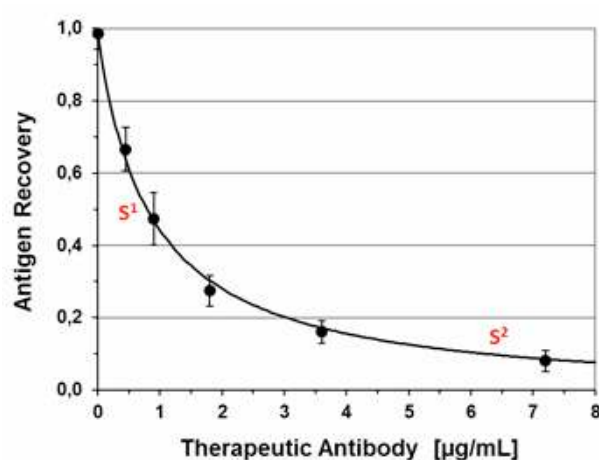
- potential non-responders
- the presence of autoantibodies.

The test can be used to validate targets and to optimise and individualise the dose.

THE *recovery*ELISA:

Diagnostic investigation significantly supports the personalisation of medication-based treatment. This also applies to modern methods of treatment with monoclonal antibodies and other biologics, which are already used successfully against many diseases. The *recovery*ELISA was developed as companion diagnostics for these biopharmaceuticals.

Initially, we focused on the measurement of therapeutic antibodies and free antigens. Later on, the great potential of *recovery*ELISA, also in terms of new pharmaceutical developments, became clear. The interaction of dose and antigen neutralisation is reflected in the so-called recovery curve. The principle of the *recovery*ELISA is based on this context, and gives an indication of the degree of antigen neutralisation by a defined active agent dose. See graphic:



The *recovery* curve as one result of the *recovery*ELISA shows the binding model between the therapeutic antibody and the antigen. Sample S1 and S2 illustrate the correlation of the specific dose-response interaction. The recovery value of sample S1 is high. That means, in this part of the curve the effect of an additional dose of the therapeutic antibody to bind further antigen is high. In contrast, the recovery value of sample S2 is low. In this part of the curve the capacity of the therapeutic antibody to bind the antigen is already high. Therefore, an additional dose would have a limited effect to bind further antigen (high reserves of the therapeutic). The level of the antigen neutralization rate can be calculated for each sample from $1 - \text{recovery value}$.

The *recovery*ELISA can be used to optimise the active agent dose in respect of the individual patient. Therefore, this gives one an easily manageable tool in pharmacokinetic studies for example. One advantage of the *recovery*ELISA lies in its universal design; i.e. the assay can be developed and implemented for a variety of biopharmaceuticals, because of a consistent principle. As a further result, the test also provides indications of treatment failure or the formation of autoantibodies against the agent. This gives the physician supporting measurement results with which he can compare clinical symptoms, etc.

In addition to the recovery curve, for each sample, the test provides

- the concentration of free antigen
- the concentration of the therapeutic antibody
- the *recovery* value.

STRATEGIC OPTIONS

The *recovery*ELISA has many uses: as an internal tool for research and studies, and to use as a companion diagnostic. A special advantage of the *recovery*ELISA is the ability to check the dosing of individual patients related to the measured recovery value (neutralisation rank). The reliability of the recovery value and the other test results can help make a repositioning in the market or to become more competitive against a rival.

PRODUCTS & SERVICES

The current list of available *recovery*ELISA test kits, for example for IgE/Omalizumab, TNF- α /Adalimumab etc., can be found on our website. With approved in-vitro Diagnostics (IVD), outcomes and the purpose of the tests depend on the respective permission. Where applicable, the scope of services has been reduced, for example of liability considerations. Refer to the respective instruction manual for more information.

BioTeZ also provides measurement of serum samples as a service.

BioTeZ can custom make applications of *recovery*ELISA for specific antigen-antibody pairs by appointment. Phases of development:

- Handover of materials (therapeutic and capture antibody, antigen)
- Test of components, labeling and set up sandwich ELISA incl. identification of the required mathematical function
- Assay optimization (samples required)
- Assay testing with clinical samples (samples required)

PRINCIPLE OF THE METHOD:

*recovery*ELISA (Enzyme-Linked Immunosorbent Assay) is an immunological quantitative detection method based on a sandwich ELISA. In comparison to a classic sandwich ELISA, a two-dimensional calibration is carried out for *recovery*ELISA obtaining various analysis results within the same assay. The following calibrations are performed:

- Antigen levels without and with additional therapeutic antibody against extinction (optical density)
- Therapeutic antibody levels against antigen *recovery*

With the aid of the two calibrations to be performed, an evaluation procedure can be carried out to determine the concentrations of free antigen and therapeutic antibody in the patient samples using the measured OD values. Determination of the therapeutic antibody is based on the principle that the presence of therapeutic antibody in patient samples leads to a systematic reduction in the recovery of antigen. The measured values are evaluated using the evaluation software for any *recovery*ELISA (Download software from homepage www.biotez.de).