ProBioGen
Intelligent Biopharmaceutical Solutions

Cell-Based Bioactivity Assays

Our Cell and Tissue Services Department analyzes and compares various substances for their potency and mode-of-action in cell-based activity assays also as stand-alone services.

A cell-based assay is an analytical procedure to measure the biological activity of a test substance based on a specific, functional, biological response of a cellular test system.

The use of *in vivo* bioassays is diminishing, given disadvantages associated with cost, low throughput, practical, and ethical considerations.

Cell-based assays are pivotal tools for activity testing in batch release and for mode-of-action analysis of drug candidates and new compounds.

Our services comprise:

- Cell-based assays using primary cells & cell lines
- Cell line development for new cell-based assays
- Establishment of fully characterized target cell banks according to Good Cell Culture Practice ("GCCP") principles
- Optimization of cell based assays for mode-of-action analysis and batch release testing
- Generation of full dose-response curve or potency estimation in high throughput assays
- Establishment and validation of international standard derived internal standard banks
- Validation of batch release assays according to international guidelines
- Standardized FMEA-based risk assessment
- Statistical data analysis

Our assay portfolio covers:

- Anti-viral assays (AVA), according to the European Pharmacopoeia
- Anti-proliferation assays (e.g. for Interferons and other cytokines)
- Cell proliferation assays (e.g. growth factors)
- MHC-I up-regulation assays for immuno-modulating substances
- Commercial and proprietary reporter gene assays for type I Interferons
- Antibody-dependent cellular cytotoxicity assays (ADCC)
- Complement-dependent cytotoxicity assays (CDC)
- Antibody-dependent cellular phagocytosis assays (ADCP)
- Dendritic cell (DC) assays
- T cell assays
- Induced lymphocyte assays (ILA) to investigate cytokine responses (bead array) and expression of cellular markers (flow cytometry)
- Cell-based assay for follicle-stimulation hormone (FSH) activity
- Apoptose assays
- Cell cycle analysis
- Human Artificial Lymph Node (HuALN) model to predict drug-related effects on the human immune system in vitro

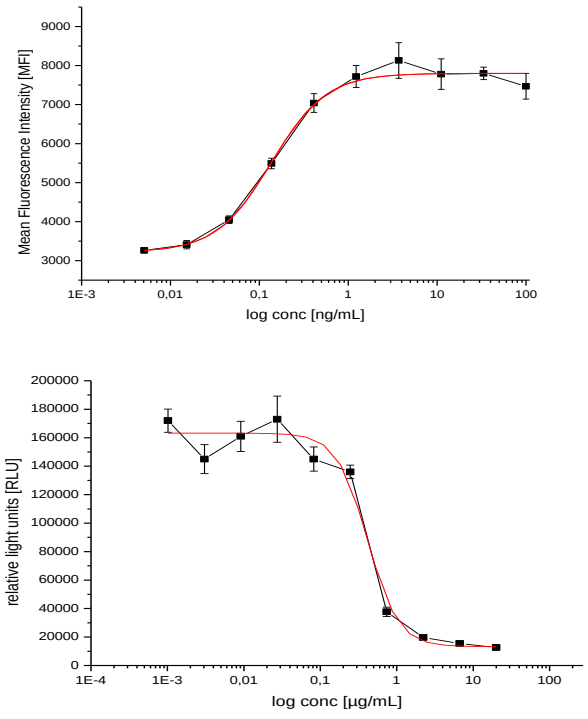

Figure 1: Proliferation / anti-proliferation assays. GM-CSF proliferation (top diagram) and antibody-induced inhibition (bottom diagram) of TF-1 cell line.

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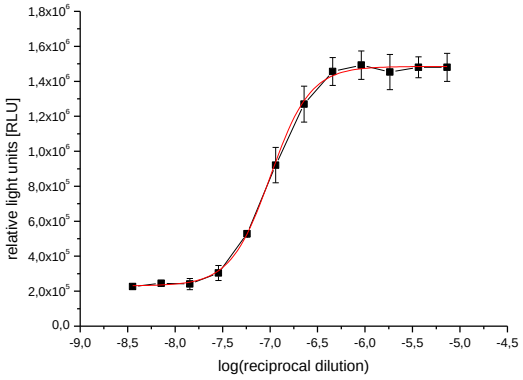

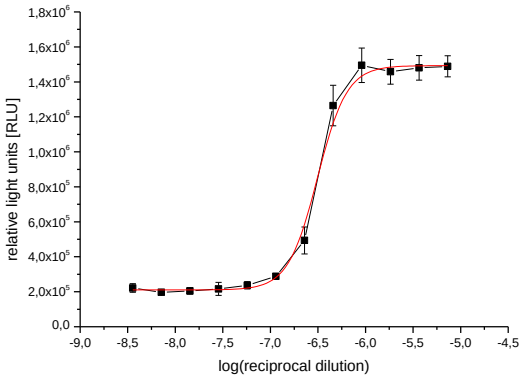

Figure 2: Anti-viral assay (AVA). The assay was conducted according to the EP using EMC virus in combination with the cell line A549 (survival of cells, luminescence based ATP detection). Comparison of a second generation IFN-ß with a commercial IFN-ß product. The decreased slope in the inflexion point (top diagram) shows lower IFNAR1 affinity of the second generation IFN-ß.

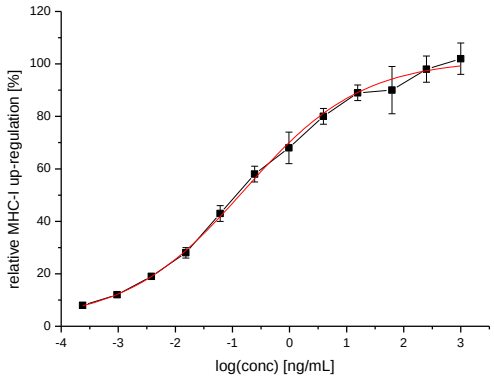

Figure 3: Immuno-modulating effect (MHC-I up-regulation) of a commercial IFN-ß product analyzed by flow cytometry.

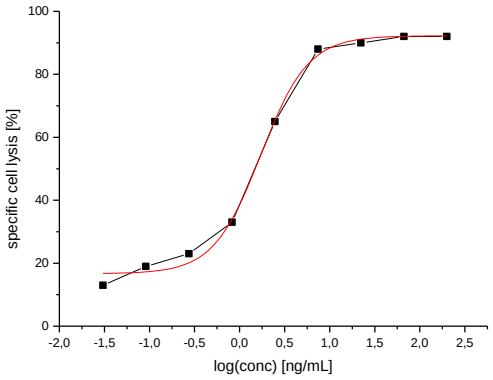

Figure 4: Antibody-dependent cytotoxicity assay (ADCC) of Adalizumab (MabCampath®, Genzyme) using primary NK cells in combination with CD52 positive target cells.

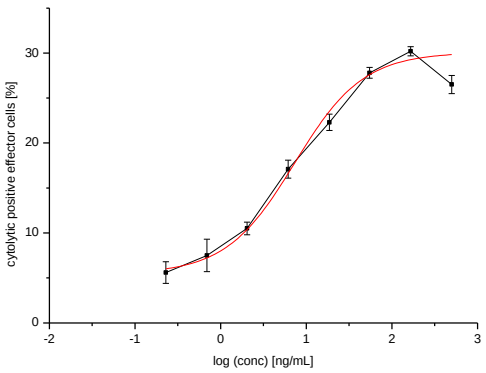

Figure 5: Antibody-dependent cellular phagocytosis assay (ADCP). For this assay, SK-BR-3 cells were treated with Trastuzumab and stained with PKH26. The labelled target cells were then exposed to in vitro *differentiated macrophages for phagocytosis. Phagocytotic frequency was quantified by double positive macrophages (CD14- and PKH26) (FACS).*

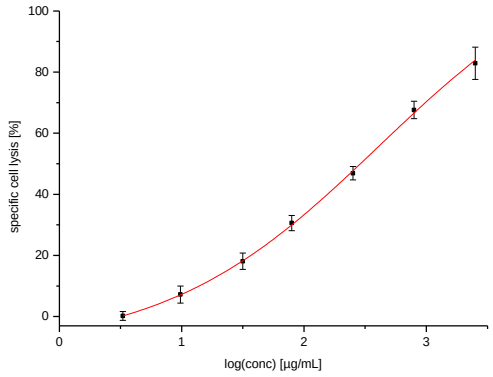

Figure 6: Complement-dependent cytotoxicity assay (CDC). Human complement serum induced cytotoxicity of Alemtuzumab treated CD52 positive target cells.