Mixed Lymphocyte Reaction Assay (MLR)

MIXED LYMPHOCYTE REACTION (MLR)

The MLR assay is a platform for testing compounds that modify the interaction between an antigen-presenting cell (APC) and T cells to activate, deactivate or repolarize the lymphocyte cell response. This assay allows testing the efficacy of immunomodulatory agents. It also provides critical information for immunological responsiveness for drug safety.

Our MLR Assay allows for the rapid identification of agents that modulate T cells, and is often used to assay biologics or small molecules as single agents or in combination *in vitro*.

Leveraging our extensive experience in ultra-sensitive and multiplex immunoassays and flow cytometric analysis, as well as our knowledge in immunology and oncology, we provide reliable analysis and interpretation of the effects of test agents on multiple endpoints using multiple allogeneic donor pairs (for example, human PBMC/ CD3+/CD4+ T/DC cells, mouse splenocytes, etc).

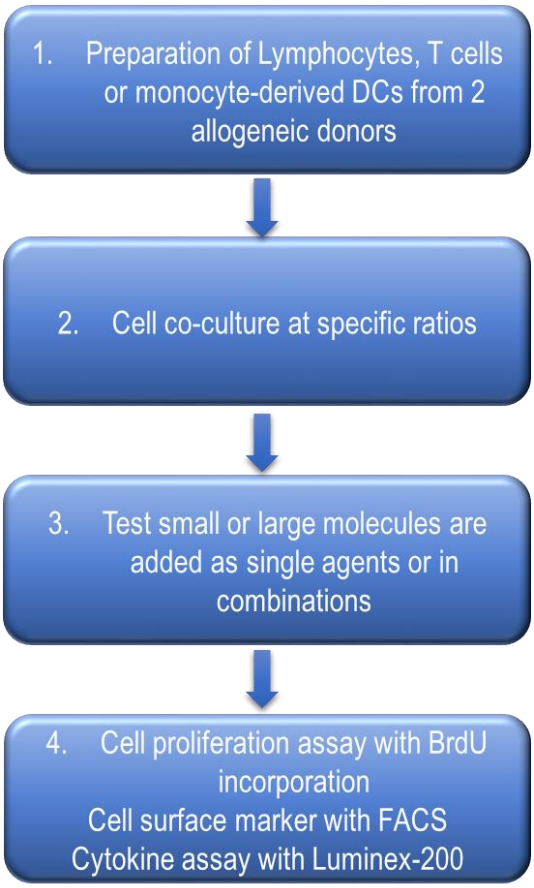
One-way MLR

One-way MLR is a lymphocyte proliferation assay, where responder lymphocytes (such as $CD4^+$ T cells) from one donor are stimulated to proliferate by stimulator lymphocytes from another donor. The stimulator cells can be pre-treated with mitomycin-c. Lymphocytes are co-cultured for several days. Secreted cytokines (such as IL-2, IFN-γ) in cell culture are quantified. Bromo-deoxyuridine (BrdU) is added to cell culture to determine proliferating T cells.

Two-way MLR

A two-way MLR differs from a one-way MLR in that both donors of lymphocytes stimulate each other and are able to proliferate.

HOW DOES MLR ASSAY WORK?



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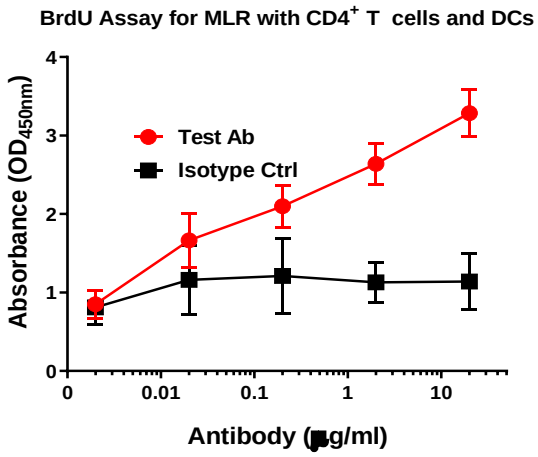
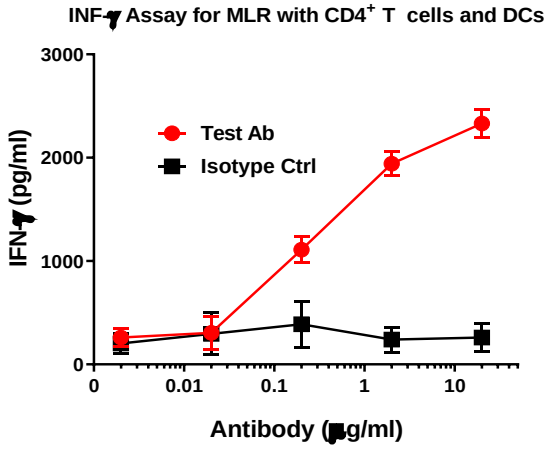
OUR SERVICE FEATURES

- **High throughput**: 96~384-well assay
- **Highly robust and reproducible** assay suitable for small to large scale screening
- **Various applications**: drug safety, immuno-oncology, and autoimmunity, immunosuppressant screening, etc
- **Single agents or combinations**: Flexible assay design to fit specific project
- **Multiple allogeneic donors**: PBMC or enriched primary T cells with various genotypes (such as FcγRIIIa 158 V/V) and monocytes derived dendritic cells (Mo-DCs) from multiple donors to address donor-to-donor variability
- **Multiple endpoints**: Surface markers, cytokines (such as IL-2, IFN-γ), and cell proliferation clearly understand the immuno-modulatory profile of test agents
- **State-of-art platforms**: well calibrated and verified **Luminex-200 or FlexMAP 3D** for multiplex cytokine analysis; **CytoFLEX S** (Flow cytometer with 4 lasers 13 colors) for cell identification and quantification.
- **Quick turn-around time**: concise and quantitative data in as little as 4 weeks
- Fully validated and quality-controlled
- Multiple concentrations in triplicate
- Positive and negative controls: isotype Ig G, inhibitor and stimulator controls
- Over 25 years of hands-on experience: Expert data analysis and interpretation, scientific and technical support
- Quality publication-style study report

Example A



BrdU incorporation in a mixed lymphocyte reaction of human Mo-DCs and CD4+ T cells in the presence of increasing concentrations of anti-PD-1 and an isotype control antibody.



IFN-γ production from proliferating T cells. Cell culture supernatants in MLR (left side) was collected and analyzed using a Luminex-based immunoassay.

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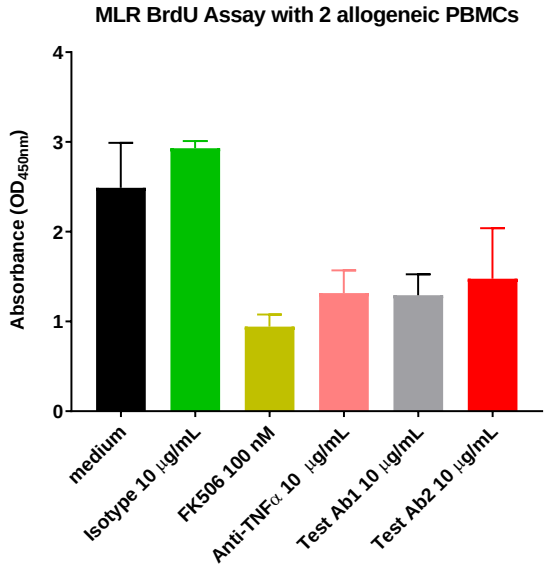
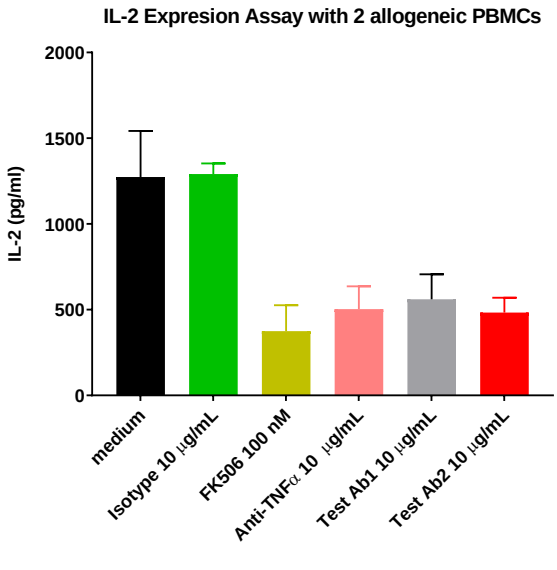
Example B

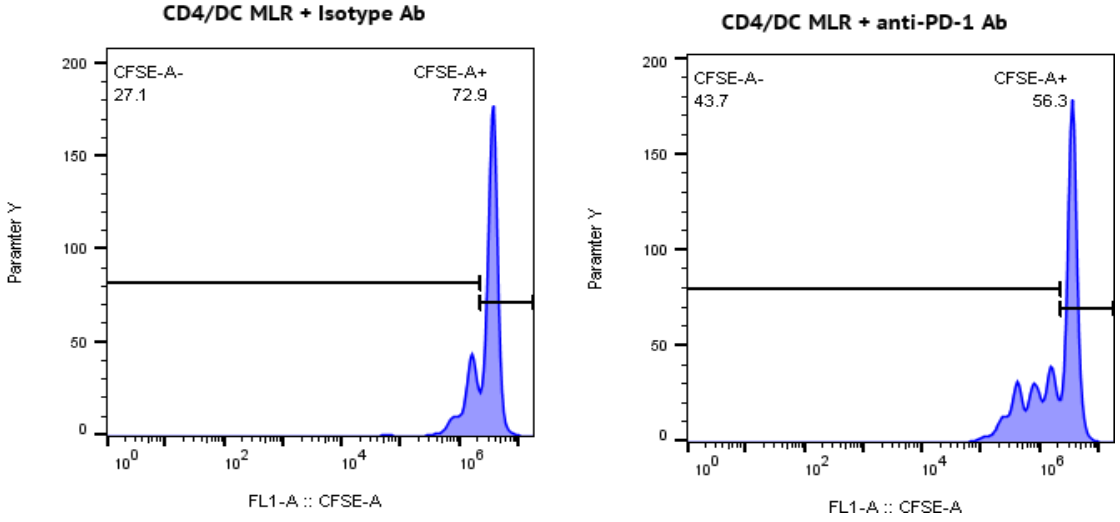


BrdU incorporation in a MLR of 3 allogeneic donors of human PBMCs in the presence of FK506, anti-TNF-α, test antibodies and isotype control antibody.



IL- 2 production in a MLR of 3 allogeneic donors of human PBMCs in the presence of FK506, anti-TNF-α, test antibodies and isotype control antibody.

Example C



Flow cytometric analysis of T-cell proliferation. Purified human CD4+ T cells were labeled with CFSE and cocultured with allogeneic Mo-DCs in the presence of anti-PD-1 antibody or isotype control. Following treatments, cells were analyzed.

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