

FLOW CYTOMETRY FOR IMMUNOMODULATION STUDIES



Immunomodulatory drug development is evolving toward more complex modalities to deliver safer, more effective therapies. This shift demands a move away from "bulk" analysis toward a more granular understanding of cellular behavior. By understanding how cells communicate and respond to treatment, we can help you navigate the delicate balance between efficacy and safety in the development of treatments for systemic diseases.

Learn more about our flow capabilities [here](#).

Flow Cytometry: A Sophisticated Bioanalytical Approach

Flow cytometry is a powerful single-cell analysis tool used in nonclinical and clinical immunomodulation studies to measure immune cell types, activation states, receptor occupancy and functional responses. This detailed, multi-parameter technique helps us detect small, unintended changes in the immune system and understand how specific cell types respond – things that traditional assays might miss. Flow cytometry provides a clearer understanding of how a drug works, helping reduce risks when developing complex immune-targeting treatments.

Here is a step-by-step guide explaining the approach:

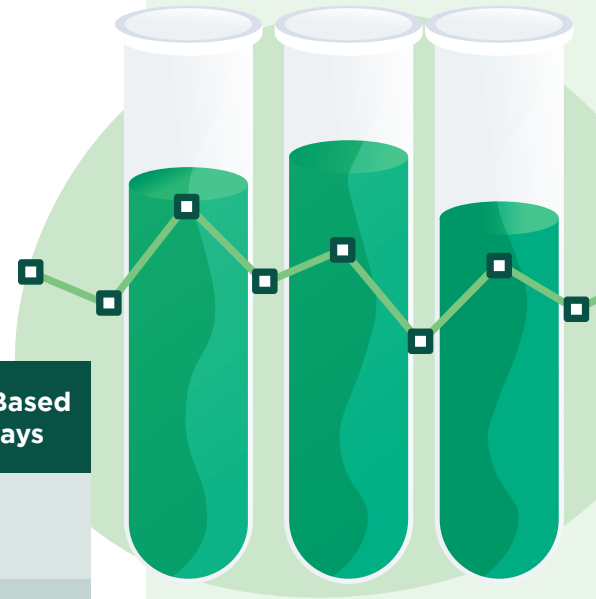
Steps	Procedures	Our Approach
Sample Collection	Blood and tissue samples (blood, spleen, lymph nodes, bone marrow) are collected while preserving cell integrity	We follow best practices for sample collection in nonclinical and clinical studies to ensure accurate downstream analysis
Staining	A cocktail of fluorochrome-labeled antibodies binds specific markers on cells to identify types and functions	We design optimized staining panels for precise identification of immune cell subsets as per the objective of the study
Acquisition	Single cells pass through our calibrated cytometers; detectors capture emitted fluorescent signals for each marker	We use advanced cytometers to generate high-quality multiparametric single-cell data
Data Analysis	Cell populations are identified, and functional responses (activation, proliferation, cytokine production) are quantified	We perform expert data analysis with our validated software and generate the dataset necessary to perform interpretation
Interpretation and Reporting	Data is interpreted in the context of immunomodulatory studies, summarizing key findings and trends	We deliver detailed reports and insights to support drug development decisions and regulatory submissions

Bioanalytical Platforms For Immunomodulatory Drugs

We use state-of-the-art bioanalytical platforms to assess multiple facets of immunomodulation across species with high sensitivity and specificity. Key biomarkers and endpoints include cytokines, complement factors, immune cell phenotyping, and functional assays evaluating cytokine release and cellular proliferation, all of which can be tailored to your specific drug.

Below, we highlight the features of commonly used platforms for monitoring intended immunomodulatory responses.

Characteristics	Flow Cytometry	ELISA/ Multiplexed Assays	ELISpot	Cell-Based Assays
Single-cell resolution	✓		✓	
Cell population phenotyping	✓			✓
Functional immune readout	✓		✓	✓
Quantification of cytokines and complement factors	Intracellular cytokine staining	✓		✓
Multiplexing/multiple analytes	✓	✓	✓	
Detection of rare cell populations	✓		✓	



Our laboratories are designed to handle pathogens and infectious samples in support of vaccine development programs. Validated panels for nonhuman primate (NHP), minipig, and human samples are available for rapid deployment, with guidance on optimal species, tissues, and marker selection.

AN INTEGRATED SOLUTION

Altasciences supports immunomodulatory programs through an integrated [nonclinical](#), [clinical](#), and [bioanalytical](#) service offering designed to advance development from early research through clinical phases. With co-located flow cytometry laboratories and aligned scientific teams, sponsors benefit from seamless data continuity, smoother phase transitions, and efficient translation of nonclinical findings into clinical strategies.

By proactively adapting and validating assays for both nonclinical and clinical use, potential challenges can be addressed early to help reduce delays and support informed decision-making. Whether delivered as part of an integrated program or a stand-alone initiative, our [flow cytometry services](#) provide the scientific and operational support needed to help accelerate timelines and move your program forward efficiently.

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