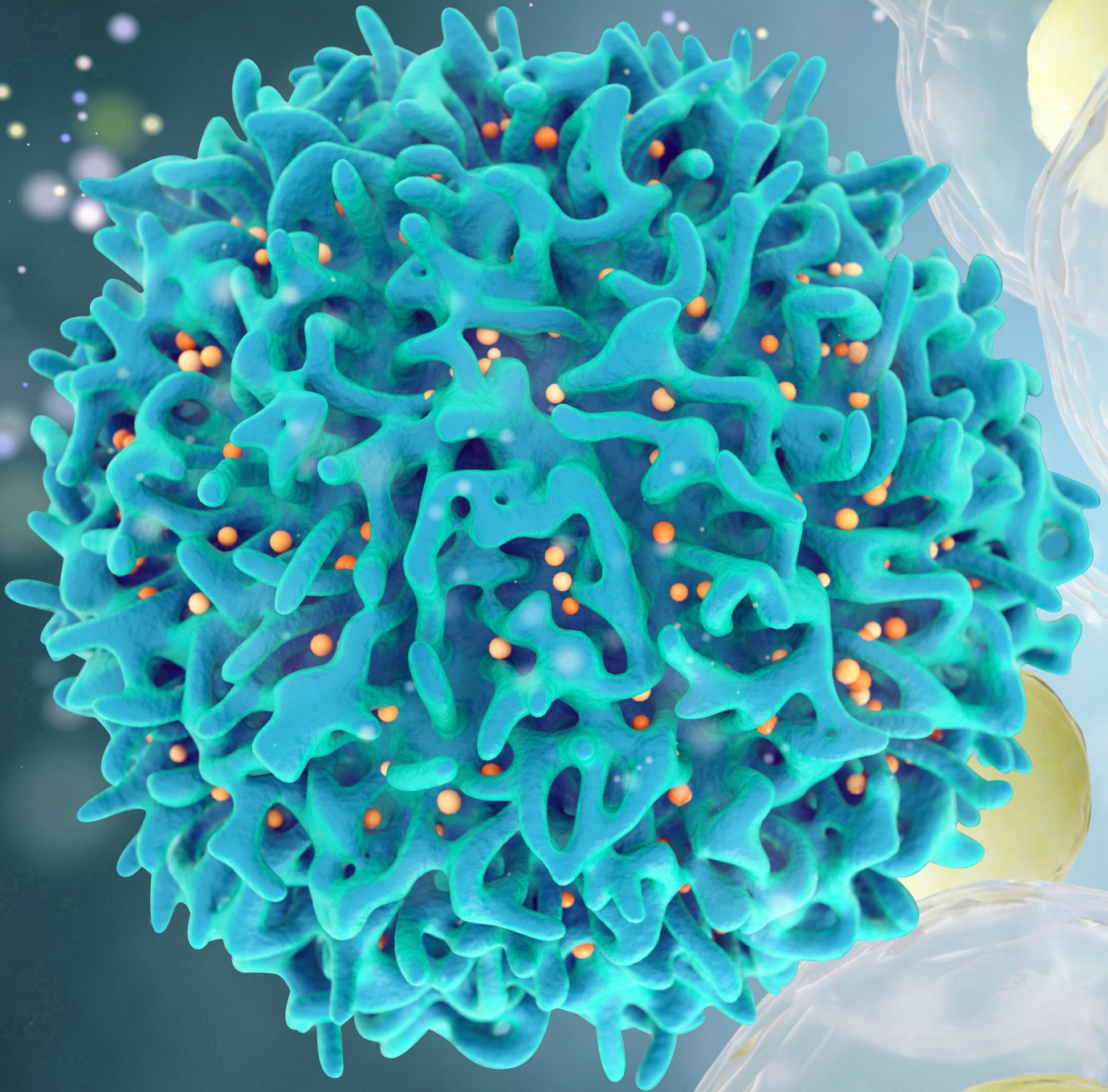


IMMUNOLOGY WORKFLOW SOLUTIONS



biotechne®

Immunology research is focused on characterizing different immune cell types, their functions, and the molecules that regulate their activities. This is essential for understanding how the immune system protects a host against invading pathogens and the mechanisms that may lead to immune cell dysfunction under pathological conditions. Bio-Techne is dedicated to providing world class reagents, assays, and instruments to help advance immunology research. From natural killer cells and macrophages to dendritic cells and T cells, we offer products for isolating, culturing, identifying, and characterizing different immune cell types and cell type-specific subsets. We also provide a wide selection of reagents for investigating the mechanisms that regulate different immune cell functions. In addition to our reagents for basic research, we continue to expand our selection of innovative tools for ex vivo cell manufacturing, making it easier for scientists to transition their research from discovery to the clinic.

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ISOLATE AND CULTURE

Immune cell selection and culture are necessary for both basic research aimed at investigating the functions of different immune cell types and expanding specific immune cell populations for therapeutic purposes. Our portfolio of immune cell isolation and cell culture products provides both a strong commitment to quality and exceptional product value.

Browse products for isolating, culturing, differentiating, and expanding specific immune cell types: rndsystems.com/immune-cell-culture

Get a quote for bulk protein pricing: rndsystems.com/services/bulk-quote-request

Browse our selection of GMP proteins for ex vivo cell manufacturing: rndsystems.com/gmp

Explore our custom services for cell culture media, proteins, and antibodies: rndsystems.com/custom



CELL SELECTION

- Utilize our MagCollect™ Cell Selection Kits and Reagents to enrich for specific immune cell populations by positive or negative selection
- Purify mouse CD3⁺, CD4⁺, or CD8⁺ T cells by negative selection using our T Cell Enrichment Columns

CELL CULTURE

- Optimize your cell culture workflow with high-quality cell culture media including both RPMI 1640 and DMEM, media supplements, antibiotics, and antifungals
- Improve your differentiation of CD14⁺ monocytes into monocyte-derived dendritic cells using our Human Serum-Free Dendritic Cell Base Media
- Utilize our specialized ExCelerate™ Human T Cell or B Cell Expansion Media for robust ex vivo T cell or B cell expansion under xeno-free conditions
- Ensure happy, healthy cells with our selection of Fetal Bovine Serum
- Optimize your immune cell media with the addition of R&D Systems® recombinant cytokines or ProDots® proteins

CELL, DIFFERENTIATION, EXPANSION, AND ACTIVATION

- Differentiate or expand specific immune cell types using our CellXVivo™ Immune Cell Differentiation and Expansion Kits
- Easily expand human natural killer cells or regulatory T cells using Cloudz™ dissolvable microsphere technology
- Differentiate your immune cells with R&D Systems™ recombinant proteins
- Simplify your cell culture media preparation by using ProDots® proteins
- Use R&D Systems antibodies or Novus Biologicals™ antibodies for immune cell activation or differentiation
- Use Tocris™ phorbol 12-myristate 13-acetate (PMA)/ionomycin or Cell Activation Cocktail to stimulate your immune cells

ISOLATE AND CULTURE *CONTINUED*

Browse products for isolating, culturing, differentiating, and expanding specific immune cell types: rndsystems.com/immune-cell-culture

Get a quote for bulk protein pricing: rndsystems.com/services/bulk-quote-request

Browse our selection of GMP proteins for ex vivo cell manufacturing: rndsystems.com/gmp

Explore our custom services for cell culture media, proteins, and antibodies: rndsystems.com/custom

CELL VIABILITY AND PROLIFERATION

- Accurately measure cell viability using our Calcein AM Cell Viability Assay
- Obtain reproducible cell proliferation results using the non-radioactive TACS® MTT and XTT Assays
- Analyze cell death using our Polarity Sensitive Indicator of Viability (pSIVA™) Detection Kits

GMP-GRADE REAGENTS

- Take advantage of GMP-grade recombinant proteins and small molecules that are manufactured under guidelines that allow for their use as ancillary materials in cell therapy or further manufacturing processes
- Seamlessly switch from traditional grade research material, as our GMP-grade proteins often originate from the same clone, sequence, and expression system
- Enjoy the lowest endotoxin specification on the market (<0.1 EU/μg)
- All GMP-grade proteins are manufactured in an ISO 9001:2015, ISO 13485:2016-certified facility
- Activate your T cells with Cloudz™ T Cell Activation Kit - CD3/CD28, consisting of CD3/CD28-conjugated, non-magnetic, dissolvable microparticles manufactured under GMP controls



ExCellerate™ Your T Cell Expansion

A photograph of a bottle of ExCellerate Human T Cell Expansion Media, Xeno-Free. The bottle is clear plastic with a blue cap and contains a red liquid. The label includes the following information: ExCellerate™, Human T Cell Expansion Media, Xeno-Free, Lot 1234567, Store at 2 - 8 °C, Catalog No. CCM030, FOR RESEARCH USE ONLY, NOT FOR USE IN DIAGNOSTIC PROCEDURES, Part No. 390440, R&D SYSTEMS a biotechne brand, Minneapolis, MN 55413, (612) 343-7475, Made in the USA.

EXCELLERATE

Xeno-free Human T Cell Media
Now Available

IDENTIFY AND CHARACTERIZE

Browse R&D Systems or Novus Biologicals antibodies qualified for flow cytometry:
rndsystems.com/products/antibodies
or novusbio.com/flow

Find cell surface and intracellular markers used to identify different immune cell types:
rndsystems.com/cellmarkers

Easily design your next multicolor flow cytometry experiment:
novusbio.com/novusknowsflow

Inquire about custom conjugation:
novusbio.com/custom

Explore different applications for single-cell Westerns on Milo:
proteinsimple.com/milo

Learn about RNAscope assays:
acdbio.com/science/applications

Immune cells in heterogeneous samples are frequently identified based on the expression of specific cell surface and intracellular markers. Bio-Techne offers a versatile and innovative set of tools for identifying and characterizing different immune cell types and cell type-specific subsets based on the analysis of protein or RNA marker expression.

FLOW CYTOMETRY

- Select from hundreds of unique, world-renowned clones, many of which have been used to establish CD nomenclature through HLDA workshops in our catalog of R&D Systems fluorochrome-conjugated antibodies
- Choose from an expansive collection of both proprietary antibodies and some of the most highly referenced antibody clones on the market with Novus Biologicals flow cytometry antibodies
- Simultaneously label cells with multiple fluorescently labeled primary antibodies, including Alexa Fluor®, DyLight®, and Janelia Fluor® conjugates
- Find the right secondary antibodies and isotype controls for your experiment
- Personalize your research with Novus Biologicals custom conjugation services
- Use R&D Systems Cell Markers Resource Tool to find the right markers to identify your cell type of interest
- Use the Novus Biologicals multicolor panel builder tool to simplify the process of designing your next flow cytometry panel

MASS CYTOMETRY

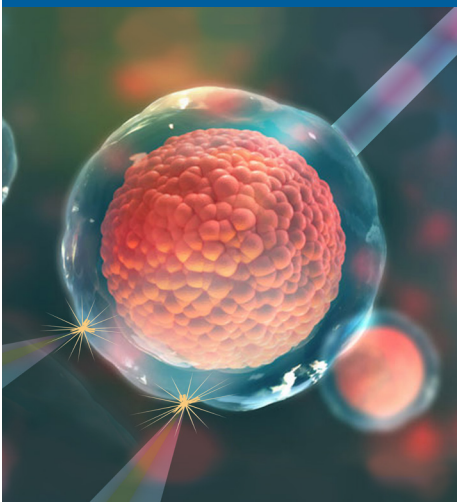
- Utilize R&D Systems and Novus Biologicals CyTOF-reported and CyTOF-ready antibodies for multiparameter immune cell profiling by mass cytometry.
- Detect over 30 cellular targets simultaneously on a single cell without the need for fluorescence compensation

SINGLE-CELL WESTERNS

- Measure protein expression in thousands of single cells in a single run, for up to 12 targets per cell using single-cell Westerns on Milo™
- Eliminate the need to fix and permeabilize cells, making it easier to detect intracellular proteins
- Enjoy increased assay flexibility by using conventional Western blot antibodies
- Confirm single-cell RNA sequencing data at the protein level
- Analyze your data with Scout™ software and get quantitative results in <5 hours

IN SITU HYBRIDIZATION ASSAYS

- Spatially map and quantify specific RNAs in individual intact cells and tissues using RNAscope™ *In Situ* Hybridization (ISH) Assays
- Proprietary probe design ensures target specific binding while preventing signal amplification from non-specific hybridization
- Combine this technique with immunohistochemistry to investigate mRNA and protein co-expression



MODULATE

Immune responses involve the coordinated actions of different immune cell types, which are regulated by a vast array of receptors, intracellular signaling molecules, and secreted factors. In order to investigate the functions of these molecules, immunologists need a toolbox of reagents that they can use to specifically activate or inactivate the function of a specific protein and look at the downstream effects. We offer a large portfolio of unique, high performance reagents for investigating molecules that regulate immune cell functions.

Browse our collection of recombinant proteins: rndsystems.com/proteins

Learn more about R&D Systems blocking/neutralization antibodies: rndsystems.com/products/rnd-systems-blocking-neutralizing-antibodies

Explore our selection of small molecules for immunology research: tocris.com/research-area/immunology-research

Identify agonists and inhibitors of molecules involved in different signaling pathways: rndsystems.com/pathways/immunology

RECOMBINANT PROTEINS

- Utilize R&D Systems recombinant proteins to investigate the effects of a specific protein on different immune cell types, its binding properties, or protein-protein interactions

BLOCKING/NEUTRALIZATION ANTIBODIES

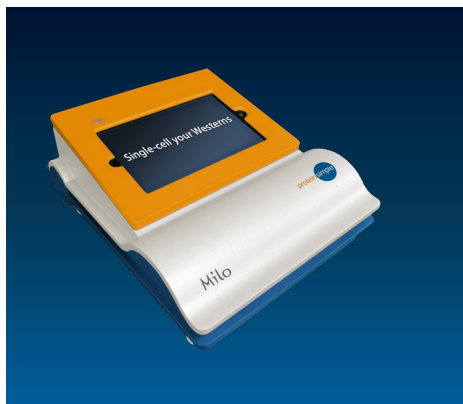
- Explore our extensive collection of blocking/neutralization antibodies to investigate protein functions

TOCRIS SMALL MOLECULES

- Study the functions of immune regulatory molecules with small molecule agonists or inhibitors

INVESTIGATE AND QUANTIFY

For investigating and monitoring immune responses, we offer a wide range of solutions for high sensitivity sample analysis. Our portfolio includes antibodies for traditional protein analysis by Western blot, capillary-based Simple Western™ assays that use a completely automated protein separation and detection process, and gold-standard single and multianalyte immunoassays to support your protein detection and analysis needs.



WESTERN BLOT

- Choose from thousands of antibodies qualified for Western blot, immunoprecipitation, chromatin immunoprecipitation (ChIP), and Simple Western™
- Analyze your Western blot results using FluorChem™ and Alphamager® systems, followed by analysis with AlphaView® software
- Utilize our collection of Simple Western-certified antibodies and simplify your Western blot experiments using fully automated Simple Western immunoassays on Jess™ and Wes™, followed by automated data analysis using Compass software for Simple Western
- Measure protein expression heterogeneity in thousands of single cells using single-cell Westerns on Milo

INVESTIGATE AND QUANTIFY *CONTINUED*

Find the right ELISA kit for your experiment:
rndsystems.com/elisas

See how you can automate Western blotting with Jess:
proteinsimple.com/jess

View the menu of available Simple Plex assays for Ella, your next generation ELISA:
proteinsimple.com/simple_plex_assays

Browse our selection of Luminex Assay analytes:
rndsystems.com/luminex/analytes



SINGLE-CELL ANALYSIS

- Conjugate an assortment of fluorescent dyes to flow cytometry-qualified R&D Systems or Novus Biologicals antibodies
- Utilize single-cell Westerns on Milo to characterize highly enriched, low abundance, FACS-sorted cell populations
- Validate single-cell RNA sequencing data using RNAscope technology, which now includes the RNAscope HiPlex assay, allowing up to 12 RNA targets to be detected simultaneously
- Confirm single-cell RNA sequencing data at the protein level using single-cell Westerns on Milo
- Acquire the spatial signature of single-cell transcriptomes in tissue using RNAscope technology
- Analyze single cell cytokine secretion with our highly sensitive ELISpot and FluoroSpot Kits

SINGLE ANALYTE IMMUNOASSAYS

- For single analyte immunoassays, use the industry's gold-standard Quantikine® ELISA Kits, which are fully validated, ready-to-run kits that are rigorously tested to ensure specificity, accuracy, precision, sensitivity, and reproducibility in your experiments
- For a more flexible alternative to our Quantikine Kits, try our single-analyte DuoSet® ELISA Development Systems, which contain all of the components necessary to develop your own working assay

MULTIANALYTE IMMUNOASSAYS

- Detect changes in up to 119 analytes in one sample using our Proteome Profiler™ Antibody Arrays, which can be analyzed using FluorChem imagers and AlphaView® software
- Select up to 50 target analytes from over 450 available analytes to simultaneously profile using our bead-based Luminex® Assays
- Select a pre-configured analyte panel that has been optimized and tested together to ensure maximum performance and accuracy for up to 45 analytes using our Luminex High Performance Assays
- Automate your multianalyte immunoassay experiments to maximize speed, sensitivity, and reproducibility by using Simple Plex™ assays on Ella



WHERE SCIENCE INTERSECTS INNOVATION™

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R&D SYSTEMS

**NOVUS
BIOLOGICALS**

TOCRIS

**protein
simple**

A&D

exosome_d

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