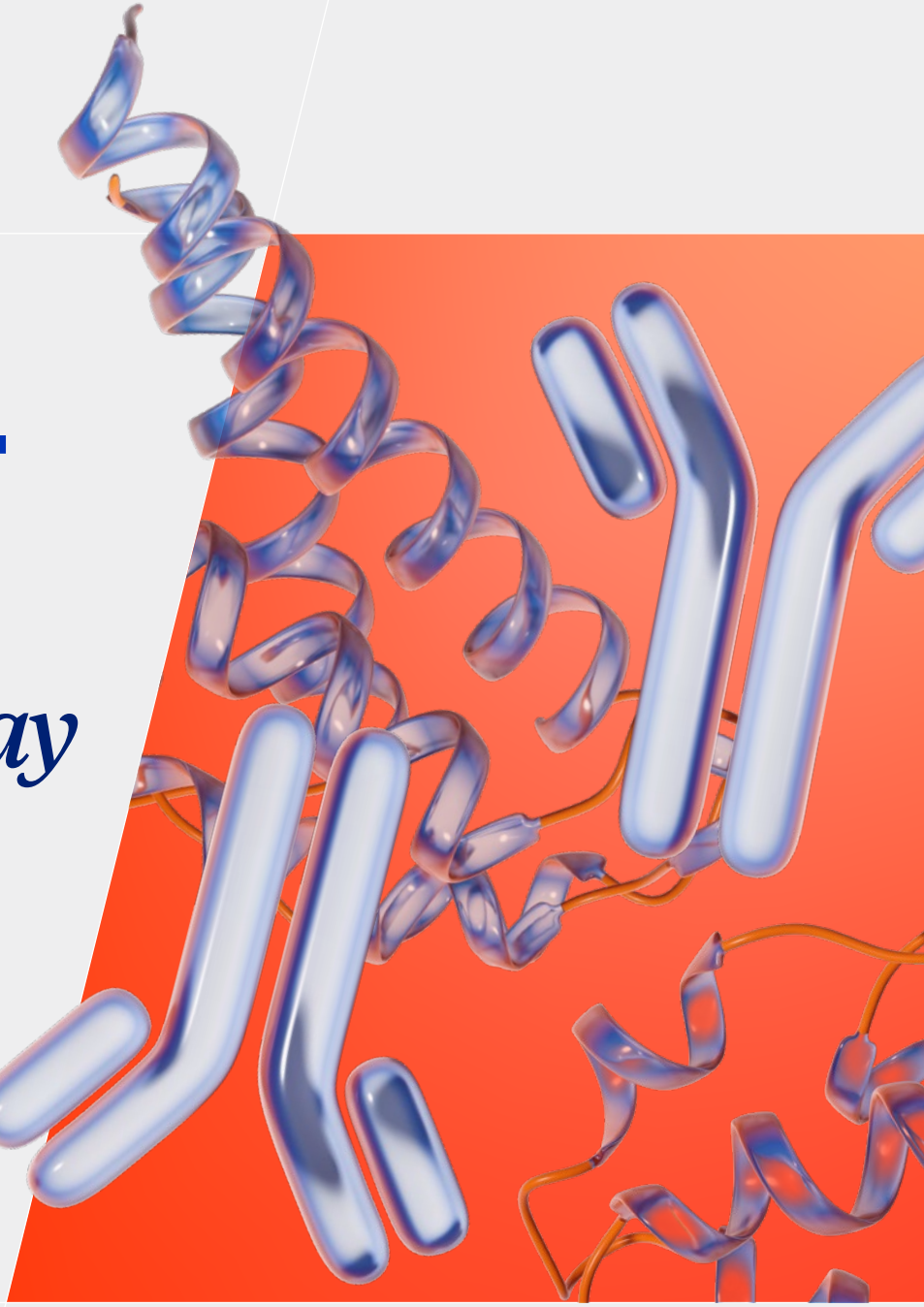
R&D systems™
by bio-techne



Assay Insider

VOLUME 2 ISSUE 2

Immunoassay Workflow: Discover. Verify. Validate.

Built to Move With You

Platforms that stay in sync, wherever research leads

Multiplexing, Made Accessible

Reliable biomarker data in a compact, affordable system

Quantifying the Unseen

Detecting biomarkers that used to fall below the line

Assay Insider

Volume 2 Issue 2

Immunoassay Workflow: Discover. Verify. Validate.

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The Right Tool *Right On Time*

Solutions built to match your research at every stage

Every research question has a lifecycle— and so does the assay behind it.

A project rarely starts with certainty. In the earliest stages, you're casting a wide net: which analytes are moving, which pathways are involved, where the signal actually lives. As candidates emerge, the work narrows—you need to confirm what you found, with numbers you can rely on. And once a target is established, the priority shifts again, this time toward speed, scale, and an assay you can run consistently, whether it's your first sample or your five-hundredth.

Three very different jobs. **One immunoassay portfolio built to do all of them.**

Feature continues →

From Broad Questions to Firm Answers

It's tempting to think of "the right assay" as a single choice made once, at the start of a project. In practice, it's a series of choices, each one suited to where your research stands.

That's the idea behind **Discover, Verify, Validate**—not a rigid pipeline, but a way of matching method to moment.



Discover

When you don't yet know which biomarkers matter, breadth is the priority. R&D Systems™ Luminex® assays include approximately 650 analytes across the Discovery, High Performance, and Fixed panels, with the Discovery assays being just over 400 analytes, pulling multiple analytes from a single, precious sample—so early-stage profiling doesn't cost you the sample volume you'll need later.

Verify

Once a shortlist starts to take shape, the question changes from what's there to how much, how reliable. R&D Systems Luminex High Performance Assays bring tighter quantitative rigor to that shortlist, while staying correlated to our gold-standard Quantikine™ ELISA Kits—so the numbers you get at this stage still mean something when you move to the next one.

Validate

With a defined target and a study that needs to scale, reproducibility and speed take over. Quantikine ELISA Kits remain the most cited single-analyte immunoassays available, while Simple Plex™ Assays on the automated Ella™ platform deliver picogram-level sensitivity in under 90 minutes—with CVs consistently under 10%, run after run, lab after lab.

	Discover	Verify	Validate
Multiplex	**Luminex Discovery Panels** 400+ Unique targets	**Luminex High Performance Panels** Confirms shortlist	**Simple Plex** Automated on Ella Handles multiplex and single-analyte paths
Single Analyte	**DuoSet ELISA** Build and customize	**Quantikine ELISA** Gold-standard kits	

Where Each Assay Plays a Role

Our immunoassay solutions are designed to meet you wherever you are in the workflow. Quantikine ELISA kits provide reproducible, single-analyte quantification for established targets and deeper investigation. R&D Systems Luminex assays expand that view, enabling multiplexed analysis when breadth and efficient use of sample are critical. And Simple Plex assays on the automated Ella platform bring sensitivity, speed, and reproducibility to studies where defined targets need to be measured consistently at scale.

Together, these platforms give you the flexibility to move from broad exploration to confident quantification and, ultimately, scalable validation—without forcing every research question into the same assay format.

Wherever your project sits today, there's a platform built for it—and a clear path to the next one.

Use the Interactive Immunoassay Selection Tool

Scan the QR code or visit
literature.bio-techne.com/find-your-ideal-immunoassay-solution





Built to Move with You

Switch platforms without losing continuity in your data

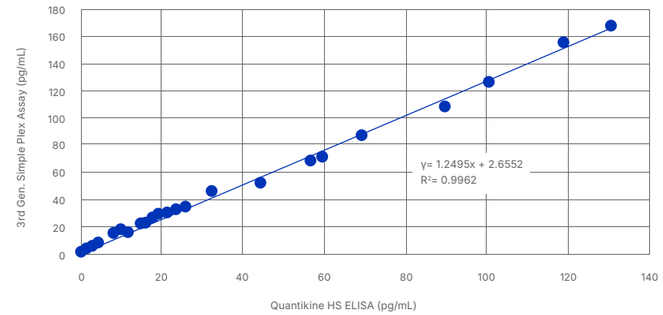
Research doesn't always move neatly from discovery to validation and stop. A validated target can reopen as a discovery question. A single study might need Luminex-level breadth for one arm and Simple Plex-level automation for another, running in parallel.

That's where a lot of workflows quietly break down—not because the science changes, but because the data doesn't travel well between platforms. A result from one assay format doesn't always mean the same thing on another.

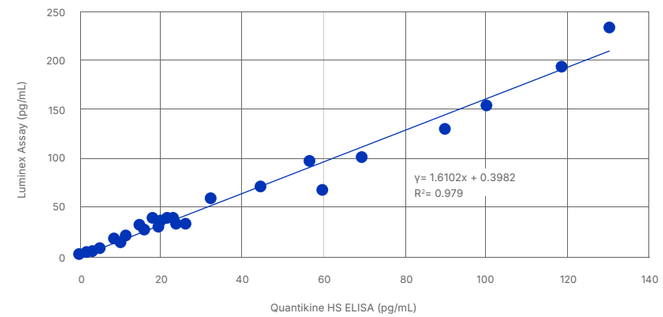
R&D Systems immunoassays are built so that switching platforms doesn't mean starting over. Luminex High Performance Assays and Simple Plex Assays are both correlated to the gold-standard Quantikine ELISA, so data generated on one platform holds up against data generated on another. And underneath all three platforms sits the same foundation: the same in-house manufactured R&D Systems antibodies, proteins, and specialized diluents, built and quality-controlled to one standard.

Serum IFN-gamma Detection is Highly Correlated Across R&D Systems Immunoassay Platforms

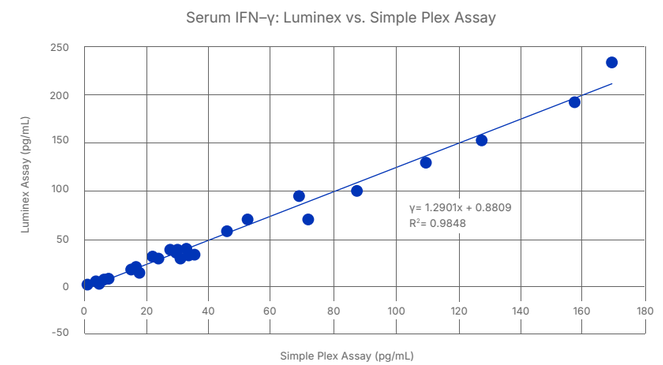
A



B



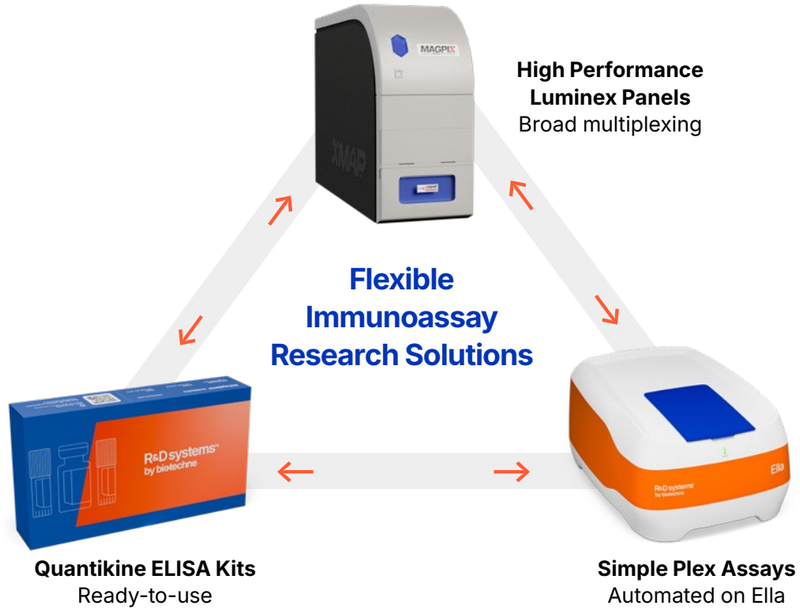
C



(A) The Quantikine HS ELISA is highly correlated with Simple Plex Assay (R^2=0.997). **(B)** Similarly, Quantikine HS ELISA data is also highly correlated with Luminex Assay data (R^2=0.97). **(C)** Finally, data collection using the Simple Plex Assay is highly correlated with Luminex Assay (R^2=0.98).

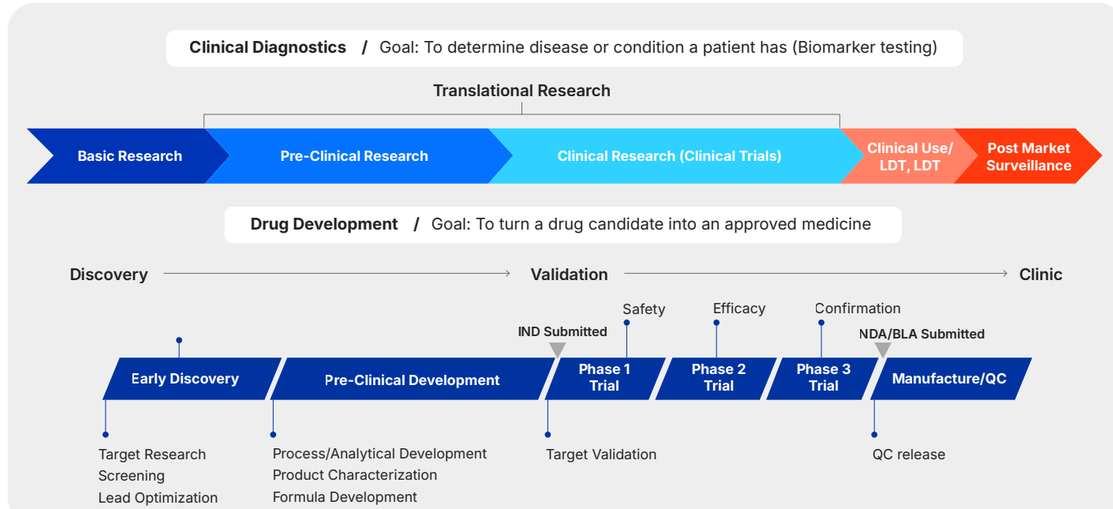
Choose the right tool for the question *not the question for the tool.*

Explore Immunoassays
Scan the QR code or visit
rndsystems.com/immunoassays



No fixed order–use any platform at any stage
All correlated to the same gold standard

With consistent performance across all three platforms, you can seamlessly follow your research wherever it leads, eliminating the need to re-establish baselines or repeat data validation.



Research and drug development span many stages, and each one asks something different of an assay.

When the Standard Menu Isn't Enough

Solutions that fit your question

Not every research question fits a catalog assay—and when yours doesn't, that shouldn't be a dead end.

Whether you're working with a novel target, an underrepresented species, or a sample type that doesn't behave like the validation panel, our scientists can build around your specific requirements rather than asking you to build around ours.

- ✓ **Assay Modification**
  Adapt an existing assay to a new sample type, species, or performance requirement
- ✓ **Species Testing & Qualification**
  Validate assay performance in a species beyond the standard menu
- ✓ **Custom Assay Development**
  Build a new assay from the ground up around your target and sample requirements
- ✓ **Custom Reagents**
  Partner on antibodies, proteins, or diluents tailored to your experiment

It's the same principle behind all of our custom products, extended one step further: when the off-the-shelf platform doesn't fit the question, the fix isn't a workaround—it's a conversation with the people who built the reagents in the first place.

Partner With Our Scientists

Scan the QR code or visit
rndsystems.com/services/assay-development

Platform Spotlight

From Broad Discovery to Focused Validation

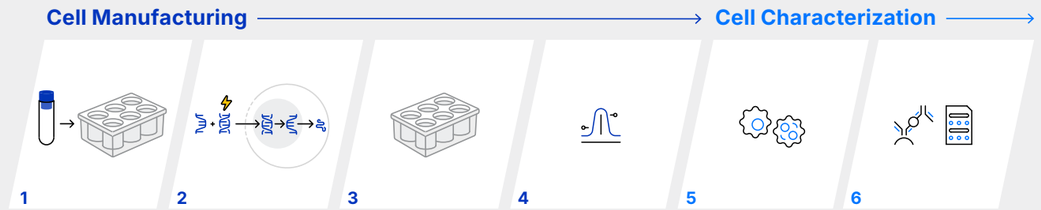
Two platforms, working the same problem

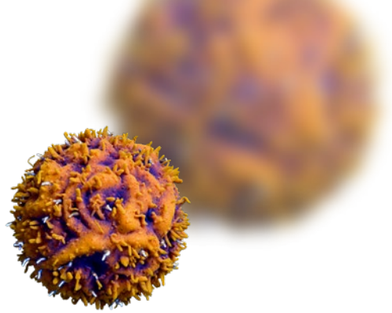
Most CAR-T potency assays still rely on a single readout—IFN-γ secretion after overnight co-culture. It's the protocol every FDA-approved CAR-T therapy uses, but regulators are increasingly asking for a fuller picture of what these engineered cells are actually doing. A new application note shows what that fuller picture looks like when two complementary platforms are put to work on the same samples.

Researchers engineered CD19-CAR-T and CAR-NK cells using the non-viral TcBuster™ transposon system, then co-cultured them with target cells to trigger antigen-specific killing. From there, the workflow split into two connected steps. First, R&D Systems Luminex Assays screened the supernatants broadly—123 analytes across cytokines, chemokines, growth factors, and cytotoxic granule proteins—to map the full secretion profile without knowing in advance which markers would matter.

Continue reading for results →

R&D Systems Pipeline for Editing and Characterizing Cells to Be Used in Immune Cell Therapies

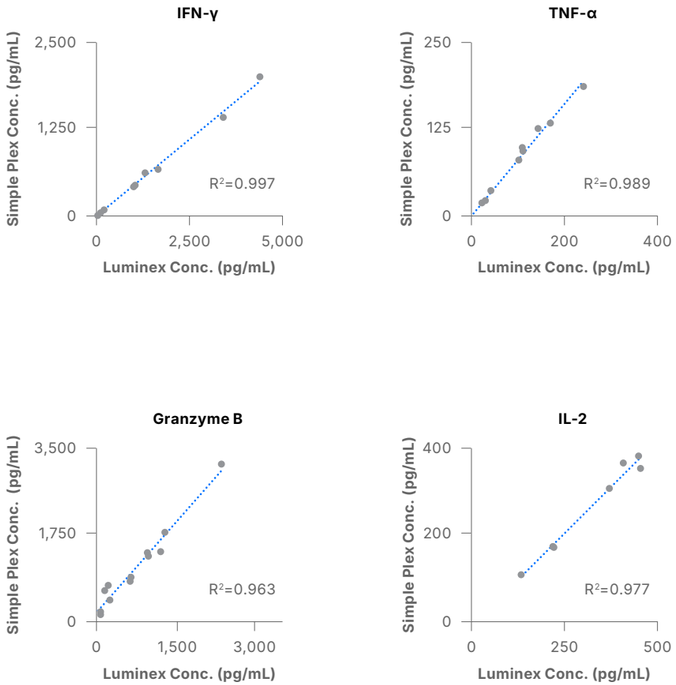


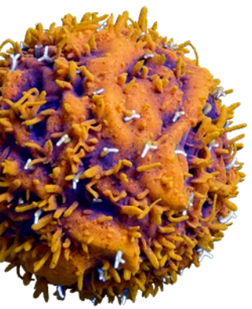


That screen surfaced real biology: CAR-T cells leaned on IFN-γ, Granzyme B, and GM-CSF, while CAR-NK cells were dominated by granulysin—a distinction a single-analyte assay would have completely missed, along with clear donor-to-donor variability worth tracking in any potency workflow.

With the relevant markers identified, the same samples moved to Simple Plex Assays on Ella for the second step—fast, automated, high-sensitivity confirmation. Twenty-five analytes were validated this way, with 17 showing strong cross-platform correlation ($R^2 \geq 0.92$) and Simple Plex's added sensitivity picking up low-abundance proteins like Perforin that were harder to resolve on the discovery screen alone.

Luminex Assay Screening Correlated with Automated Simple Plex Assays





This subset of correlation data showcases the exceptional translatability between the four analytes in the Simple Plex Activation Panel 1 and the R&D Systems Human Discovery Assay. That's the handoff in practice: Luminex casts the wide net and finds the signal worth chasing; Simple Plex confirms it fast, automated, and reproducibly enough to build into an actual release-testing workflow. Neither step replaces the other—together, they turn a single-marker potency check into a multi-analyte, mechanism-aware one, without slowing the process down.

R^2 between Simple Plex and Luminex sample values (n≥3 samples)

Analyte	Discovery	XL Cytokine	IO
CCL3/MIP-1α	0.93	0.97	
CCL4/MIP-1β	0.92	0.99	
CD25/IL-2Rα	*		1.00
CD27/TNFRSF7	*		0.80
CXCL10/IP-10/CRG-2	1.00	1.00	
CXCL13/BLC/BCA-1	0.95		
Fas Ligand/TNFSF6	0.38†		
GM-CSF	0.97	1.00	
Granzyme A	0.97		
Granzyme B	0.96	0.96	
IFN-γ	1.00	1.00	1.00
IL-2	0.98	1.00	
IL-4	–	0.99	
IL-5	1.00	1.00	
IL-8/CXCL8	–	0.95	
IL-13	–	0.97	
M-CSF	0.95		
RANTES	0.95	*	
TNF-α	0.99	1.00	

Sample values from CD19-CAR-T and -NK supernatants measured using Simple Plex Assays revealed an excellent degree of correlation with results from the Human Discovery, XL Cytokine, and Immuno-Oncology (IO) Assays. Six analytes (CCL17, IL-6, IL-10, IL-15, IL-18/IL-1F4, and Perforin; not shown) were also confirmed to be low abundance, with sample concentrations falling near or below the limits of quantitation in both immunoassay platforms.

Gray indicates analytes that were not tested in the designated Luminex Assay.

* Analytes were available in the designated Luminex assay, but not tested due to already being included in another panel; Analytes were not detectable in a sufficient quantity of samples for the designated Luminex Assay to reliably calculate R^2.

† Fas Ligand was a low abundance analyte with narrow distribution in sample concentrations.

Read the Full Paper

Watch Webinar



Hot Off the Press

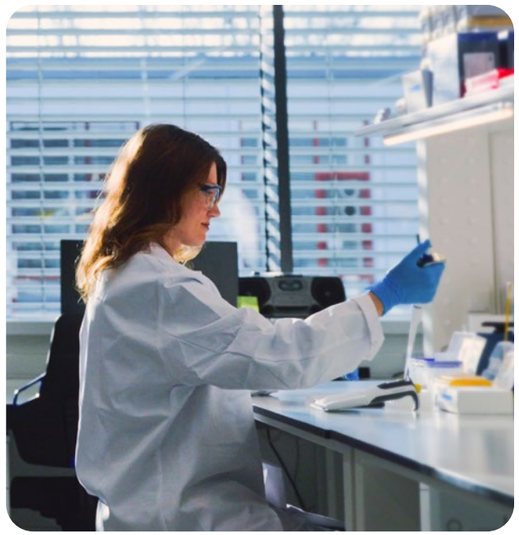
Detecting the Undetectable

Ultra-Sensitive Neuro Biomarkers, Now in Blood

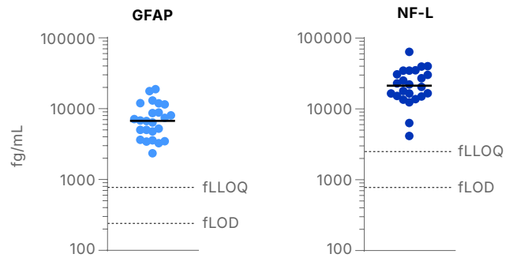
For neurodegenerative diseases like Alzheimer's, ALS, and MS, some of the most clinically meaningful biomarkers—NF-L, GFAP, pTau217, and amyloid beta—circulate in blood at concentrations so low they've traditionally required CSF instead. A new application note shows how Ultra-Sensitive Simple Plex Assays on the Ella System close that gap, quantifying all four biomarkers in plasma and serum well under 1 pg/mL—into the femtogram range.

Across validation studies, the assays delivered single-digit intra-assay CVs, strong agreement with an independent bead-based platform (Spearman r = 0.91–0.92), and clear separation between healthy donors and Alzheimer's patients, with NF-L and GFAP each reaching an AUC of 0.90. All four biomarkers were detected in 100% of plasma samples tested, including a pilot Alzheimer's cohort.

The result: a fully automated, benchtop workflow that brings this level of sensitivity to blood-based neuro biomarker research, without sacrificing the reproducibility Ella is known for.



High Detectability of Neurodegenerative Biomarkers in Healthy Plasma at Ultra-Low Concentrations



Simple Plex Ultra-Sensitive Assays demonstrate femtogram-level analytical sensitivity, enabling robust detection of neurodegenerative biomarkers in healthy adults even at ultra low physiological concentrations.

Explore the Full Data

Technical Corner

More Signals, Clearer Answers

Multiplexing Cytotoxic Immune Activity

Cytotoxic lymphocytes—CD8⁺ T cells and NK cells—kill through a coordinated release of granzymes, perforin, and granulysin alongside inflammatory cytokines like IFN-γ. But which of these mediators shows up, and how much, depends heavily on cell type and activation context—which is exactly what a single-analyte readout can't resolve.

A new application note puts a custom 15-plex R&D Systems Human Luminex Discovery Assay to the test across PBMCs, purified CD8⁺ T cells, and NK cells, comparing resting versus activated states and benchmarking head-to-head against a competitor Luminex platform run on the same samples, same day.

The multiplex panel resolved distinct, biologically consistent signatures across populations: PBMCs showed broad induction of both cytokines and cytotoxic effectors, CD8⁺ T cells produced a more focused cytotoxic/inflammatory response, and NK cells kept cytotoxic proteins at baseline while ramping up select cytokines like GM-CSF and IL-2. Head-to-head, the R&D Systems Luminex Assay delivered a meaningfully wider validated dynamic range for Granzyme A and B, sharper sensitivity for IFN-γ, and dramatically better dilutional linearity—a 70-fold linear range for Granzyme A versus the comparator's 3-fold. It's also the only multiplex panel available that measures granulysin alongside this full set of cytotoxic and inflammatory markers.

Download the full application note to see the complete comparative data and workflow.

Continue Reading



Assays in Action

Quantifying the Unseen

Tackling Low-Abundance Biomarkers with the Ella System

Drug developers depend on accurate biomarker data at every stage, from early discovery through late-stage trials—and for CROs, delivering that data with speed and regulatory rigor is the job. At Immunologix Laboratories, a GLP/GCP-compliant CRO supporting biologics, gene therapies, and nucleic acid-based treatments, one recurring obstacle was low-abundance biomarkers sitting below the sensitivity ceiling of traditional plate-based ELISAs.

Dr. Canfield's biomarker team turned to the Ella System and Simple Plex Assays to close that gap and saw two immediate shifts. Throughput more than doubled, from 90–120 samples per scientist per day on traditional ELISA to over 200 with Ella's automated workflow. And assay precision improved enough to noticeably reduce run-to-run variability—a difference Dr. Canfield says has strengthened the reliability of every client deliverable since.

As Ella's multiplexing capabilities continue to expand, Dr. Canfield expects its role at Immunologix to grow right along with it. "Our work supports life-saving therapeutics," he says. "By helping our clients generate better data faster, Ella contributes to something bigger—improving lives around the world."



> The Ella system is a valuable tool for supporting our clients' clinical programs. It's robust, reliable, and helps us deliver high-quality results faster and with greater confidence.

— Dr. John Canfield
Associate Director of Lab Sciences, Immunologix Laboratories



Read the Full Case Study

Featured Resource

Built for Reliability, Driven by Quality

How Quantikine ELISA Kits and Luminex Assays Are Developed

An assay is only as good as the process behind it. A new white paper pulls back the curtain on how R&D Systems develops and validates every Quantikine ELISA and Luminex High Performance Assay—from antibody screening through final calibration—and why that process matters for the data you generate.

Built on the Antibody Pair

Every assay starts with screening monoclonal and polyclonal antibodies to find the best-performing capture/detection pair, then carefully titering each for optimal signal-to-noise. Because R&D Systems Quantikine and Luminex Assays are manufacturing using R&D Systems antibodies and proteins manufactured in house, that optimization happens with full control over every component—not just whatever's available off the shelf.

Specificity and Recovery, Stress-Tested

Antibody pairs are exhaustively tested against structurally related molecules to rule out cross-reactivity, and recovery experiments spike known concentrations into real sample matrices—serum, plasma, saliva, urine—to confirm nothing in the matrix is throwing off the result. In head-to-head recovery and linearity-of-dilution testing, R&D Systems assays held steady where another suppliers kits didn't: IL-2 recovery stayed within 90–103% across serial dilutions on the Luminex High Performance platform, versus 133–155% for a kit from an other supplier measured on the same samples.

Precision You Can Build On

Intra- and inter-assay CVs stayed in the single digits to low teens across the analytes tested, and every kit lot is calibrated against a master standard so results generated today still line up with results from a year ago. That consistency holds across both platforms—whichever one fits your workflow, you're working from the same foundation of rigor.

Explore the Full White Paper



A Closer Look

Understanding early cancer development:

The case for multiplex immunoassays

Nearly 30% of bladder cancer patients aren't diagnosed until stage 2 or later, when five-year survival drops to around 50%—a gap that reflects a deeper problem: cancer progression rarely hinges on a single biomarker. A new technical note lays out how multiplex immunoassays are being used to understand the gap, and how R&D Systems Luminex Assays are built to meet the sensitivity and reproducibility the task demands.

Because tumor biology plays out across interacting cytokines, growth factors, and signaling networks, single-analyte assays miss the interplay—a rise in one marker offset by another simply isn't visible in isolation. Multiplexing captures that fuller picture from a single small-volume sample, with modern Luminex xMAP® platforms reaching detection limits as low as 0.06 pg/mL. In one lung cancer study, measuring VEGF and PD-L1 together on a single panel surfaced prognostic signatures neither marker revealed alone.

The note also points to Oncuria®, a bladder cancer urine test built on R&D Systems assays, as proof this translates beyond research use—validated in over 4,300 patients at 93% sensitivity and 95% specificity. It closes with the practical model behind that kind of translation: Discovery Panels (400+ analytes) for broad exploratory screening, then High Performance Panels for the validation rigor clinical-grade work requires—including the newly introduced 28-plex Human Tumor Biomarker Performance Panel spanning six cancer types.

Read the Full Technical Paper

Latest Assays

ELISA Kits

New QuicKit™ ELISAs

Albumin	QK1455
CD25/IL-2 R alpha	QK0223
CD40 Ligand/TNFSF5	QK1012
Granulysin	QK3138
IL-10	QK1064
PD-L1/B7-H1	QK1146
SP-D	QK1920

All QuicKit ELISAs

New Assay Kits

Endotoxin Gel-Clot Assay Kits	GCT003
Endotoxin End-Point Quantitation Kit	ECT032
Endotoxin Kinetic Quantitation Kit	EKC032
Endotoxin rFC Quantitation Kit	EFC005

All Endotoxin Assays and Components

Matched Pair antibodies provide a reliable starting point for immunoassay development, helping streamline assay design and optimization. → Learn more about Matched Pairs

Luminex Panels

Human Luminex Discovery Assays — LXSAHM

NEW Analytes

Amphiregulin	FGF-21	Intelectin-1	TIMP-3
CD21	Granulysin	Nectin-2	TIMP-4
Clusterin	IL-9	PD-L2	
COMP	IL-20	Perforin	
CRHBP	IL-22	TIMP-2	

Simple Plex Assays

Human Dopa Decarboxylase/DDC	SPCKB-PS-015351
Non-Human Primate Neurogranin Cartridge	SPCKB-NP-015849
Non-Human Primate Chitinase 3-like 1 Cartridge	SPCKB-NP-016629
Human Chitinase 3-like 1/YKL-40 Cartridge	SPCKB-PS-000255
Non-Human Primate TREM2 Cartridge	SPCKB-NP-016628
Human Enolase 2 Cartridge	SPCKC-PS-015516
Non-Human Primate GFAP 2nd Gen Cartridge	SPCKB-NP-016651
Non-Human Primate GDF-8/Myostatin Cartridge	SPCKB-NP-016707
Discovery Human FCRL5/FcRH5 Cartridge	SPCKB-PS-016663
Discovery Human IL-15R alpha	SPCKB-PS-016662
Human Progranulin/PGRN Cartridge	SPCKB-PS-016248
Human PLA2G7 Discovery Assay	SPCKB-PS-016136
Human vWF-A2 Discovery Assay	SPCKB-PS-016135
Human Serpin B2/PAI-2 Discovery Assay	SPCKB-PS-016665
Human SPARC Discovery Assay	SPCKB-PS-016134
Human Peptide YY Discovery Assay	SPCKB-PS-016664

Upcoming Events

Society for Neuroscience

Nov. 14-18
Washington, DC
sfn.org/meetings

Clinical Trials on Alzheimer's Disease conference (CTAD)

Nov. 16-19
Boston, MA
ctad-alzheimer.com

Advanced Therapies Week (ATW 2027)

Jan. 18-21
San Diego, CA
phacilitate.com/advanced-therapies-week

AACR Annual Meeting 2027

April 2-7
Orlando, FL
aacr.org/meeting/aacr-annual-meeting-2027

Annual Meeting of the American Association of Immunologists (Immunology 2027)

April 20 - May 4
Los Angeles, CA
immunology2027.aai.org

Annual Meeting of the American Society of Gene and Cell Therapy (ASGCT 2027)

May 3-7
Philadelphia, PA
annualmeeting.asgct.org

We Want to Hear Your Story!

We’re looking for inspiring stories to feature in our upcoming newsletter. Whether it’s a breakthrough moment, a creative application, or a standout achievement, your story could be the one to motivate and inform others in our community.

Submit Your Story Today

Scan the QR code or visit
https://forms.office.com/r/1MXsKgA8qN



Analyte Menu

Check out our comprehensive selection of immunoassays optimized for accurate biomarker quantification.

Full Simple Plex Menu / **rndsystems.com/simpleplexmenu**

Full ELISA Menu / **rndsystems.com/elisa**

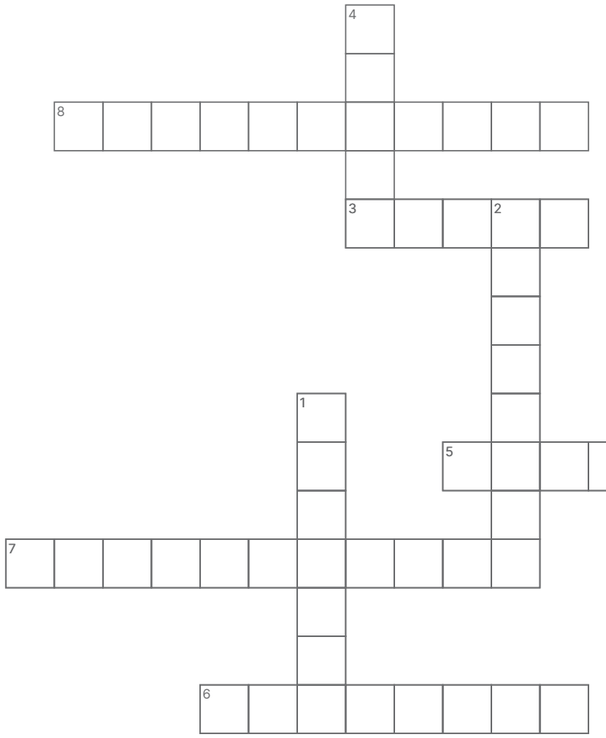
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Contact an Immunoassay Specialist / **rndsystems.com/contactus**

Crossword Solutions **Across:** 8. specificity 3. assay 5. monoclonal 7. sensitivity 6. sandwich **Down:** 4. elisa 2. antibody 1. antigen

Crossword

Lab Break: Test Your Immunoassay Fundamentals



Across

8. Ability to distinguish the target from similar substances
3. Test to detect of quantify a molecule
5. Originating from a single immune cell clone
7. Ability to detect very small amounts of analyte
6. Immunoassay format where analyte is captured by two antibodies

Down

4. Plate-based test using antibodies to detect a target
2. Protein produced by immune cells that binds a target
1. Substance that triggers an immune response

Solutions on previous page

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