MSD®

MESO SCALE DISCOVERY®
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High Performance Biomarker Assays and Services
Singleplex and Multiplex Assay List
2024, Issue No. 1

Featured Product

S-PLEX®

NEW Ultrasensitive Tau (pT217) Assay

Spot the Difference®

MSD®

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The MSD Advantage

MSD® biomarker assays provide a rapid and convenient method for measuring the levels of individual or multiple targets within a single, small-volume sample. With a diverse menu of assay types well-suited to a broad range of applications, these highly-sensitive, easy-to-use assays enable researchers to:

- Measure multiple targets in a single sample,
- Measure high- and low-abundance targets in the same sample with no extra dilutions necessary, and
- Read plates quickly, in as little as 90 seconds.

MULTI-ARRAY® Technology

MSD's products are based on MULTI-ARRAY technology, a unique combination of electrochemiluminescence (ECL) detection and patterned arrays. MSD MULTI-ARRAY technology offers exceptional sensitivity, dynamic range, and convenience. Background signals are minimal because the stimulation mechanism (electricity) is decoupled from the signal (light). Arrays bring speed and high information density to discovery through miniaturization, organization, and parallel processing of biological assays. In combination with MULTI-SPOT® plates, this technology enables precise measurement of multiple analytes in a single sample requiring less time and effort than other assay platforms.
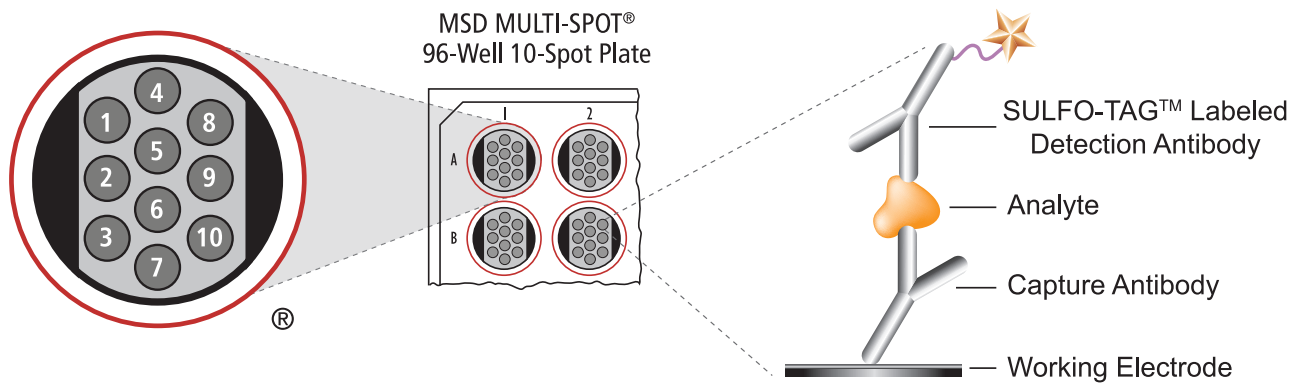
MULTI-SPOT technology enables multiplexing up to ten analytes per well and supports different assay formats including sandwich immunoassays.

MSD Assays Offer a Broad Linear Range and High Degree of Matrix Tolerance
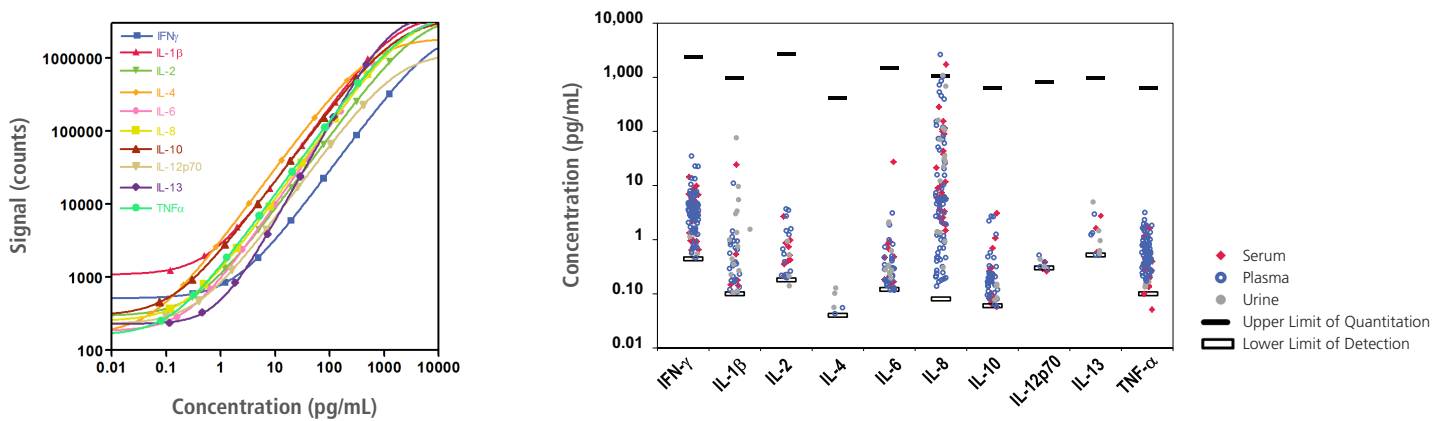
The wide linear dynamic range offered by MSD MULTI-ARRAY technology, illustrated above, enables the measurement of both normal and elevated analyte levels at a single dilution point. Measurement of multiple sample types is also shown, highlighting the assay's sensitivity, versatility, and matrix tolerance.

Discover the Right Immunoassay for You

From easy-to-build, personalized multiplex assays to high-performance, validated assays, MSD has the right immunoassay product or service to meet all your immunoassay needs.

	R-PLEX®	U-PLEX®	T-PLEX®	V-PLEX®	S-PLEX®
Description	Available as singleplex assays or matched antibody sets for building your own single or multiplex assay	Available as singleplex assays or flexible, customized multiplex assays	Ready-to-use single and multiplex assay kits that replace traditional methods like ELISA	Analytically validated single and multiplex assay kits	Ultrasensitive singleplex and multiplex assay kits
Benefits	Provides an expanding menu of emerging biomarkers with MSD MULTI-ARRAY performance	Easily creates customized multiplex panels. Use MSD reagents or bring your own	Analyzes protein levels from many sample types with a single assay. Improved performance	Provides confidence and reliability. Analytically validated with guaranteed performance specifications	Measures proteins that are otherwise unmeasurable.
Analyte Menu	• • • • •	• • • •	• •	• • •	• •
Format	Components	Component-based assays	Kits	Lot-matched kits	Lot-matched kits
Multiplex	General recommendations	Optimized groups	Compatible panels	Fixed validated panels	Fixed panels
Sample Compatibility	Tested with serum and plasma	Serum, EDTA plasma, cell culture supernatants, tissue and tumor lysates	Secreted biomarker assays tested with serum, plasma, and cell culture supernatants, intracellular assays tested with cell lysates	Serum, plasma, cell culture supernatants, urine, CSF for neurobiology products	Serum, EDTA Plasma, citrate plasma, heparin plasma, cell culture supernatants
Pre-coated Plate			•	•	
Validation		Components		Complete kit	Components
Component Level QC	•	•	•	•	•
Final Kit QC			•	•	•
COA Available		• (for components)		• (for components and kits)	• (for kits)

Discover the Right Assay Development Solution for You

MSD provides a suite of assay development tools to rapidly generate an assay to measure the levels of single or multiple targets within a single, small-volume sample. From easy-to-build U-PLEX multiplex assay development to high-performance MSD GOLD plates and custom services, MSD has the right assay development product or service to meet all your assay development needs.

	MSD GOLD Plates and Reagents	U-PLEX Assay Development	Assay Development Services
Description	Most validated	Most flexible	Personalized development and support
Recommended Applications	When lot-to-lot reproducibility and consistency of results are critical	When flexibility and variety in multiplex matters	Assays manufactured to specific requirements
Advantages	Provides confidence and reliability, made under stringent quality control procedures with guaranteed specifications	Easily create custom multiplex panels, use MSD reagents or bring your own	Provides MSD products that are otherwise unavailable for your specific application

S-PLEX

TrueSensitivity®, Simple Execution

S-PLEX is MSD's ultrasensitive assay platform. It can dramatically improve the sensitivity of immunoassays, reducing the lower limit of detection (LLOD) by 10- to 1000-fold over other assay methods. Detection limits in the low femtogram/mL range are common. These low detection limits enable the measurement of analytes at lower concentrations, reduce sample volume required, and reduce the amounts of critical reagents used. Now you can detect and measure very low abundance proteins in samples with the confidence that you are specifically identifying the target of interest.

The S-PLEX procedure is similar to other MSD assay methods. It is comprised of three simple steps. The first step of an S-PLEX assay — ASSEMBLE — is to build the immunoassay in an MSD plate. The second step — ENHANCE — involves adding S-PLEX reagents that aid in the generation of signal. The third step — READ — is simply the addition of MSD GOLD Read Buffer and measurement of the assay signals on an MSD instrument:

1. ASSEMBLE
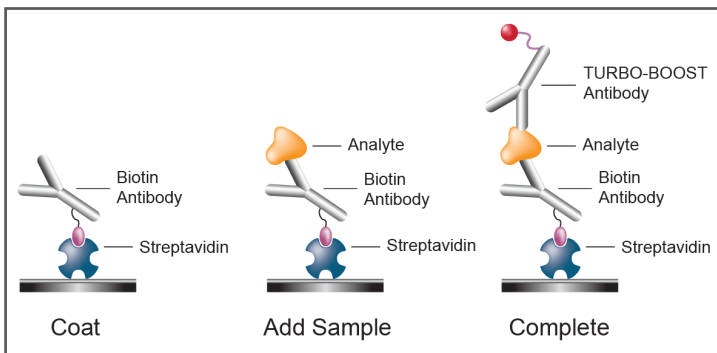
2. ENHANCE
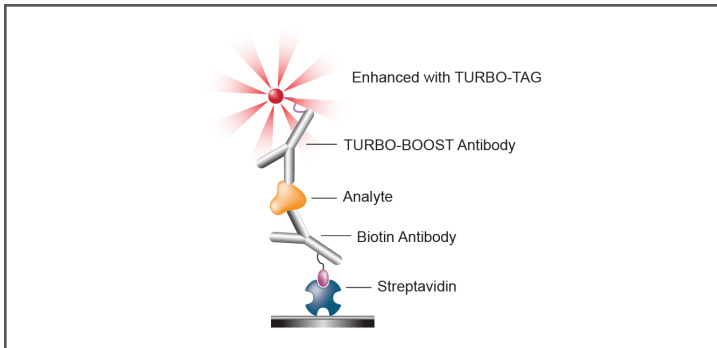
3. READ
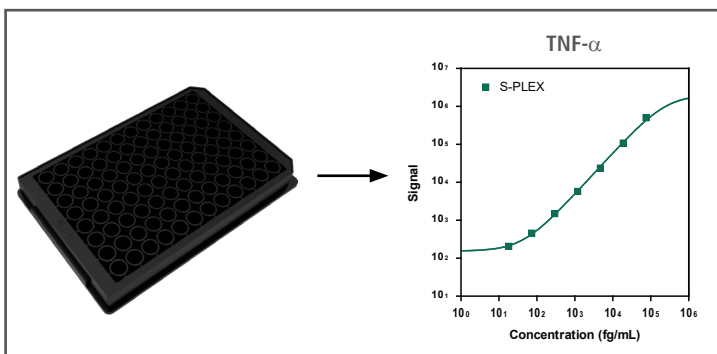
Sensitivity You Can Trust

The increased sensitivity of S-PLEX assays has important implications. S-PLEX shifts the dynamic range of assays, resulting in low detection limits. S-PLEX assays can measure new analytes that were previously below the detectable range of traditional assays, enabling the discovery and use of new biomarkers. S-PLEX assays have been tested with serum, plasma, and cell culture supernatants. For more information about exact sample types tested for each assay, consult the product insert or visit our website.
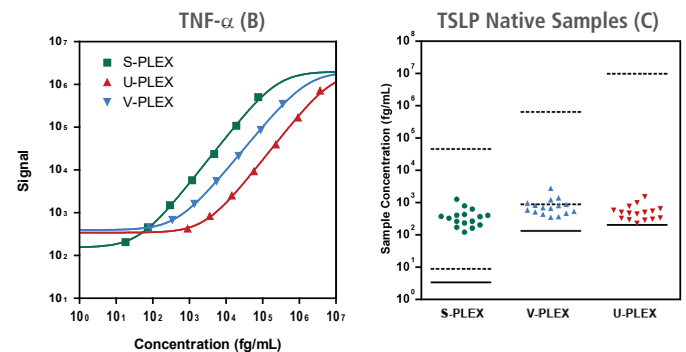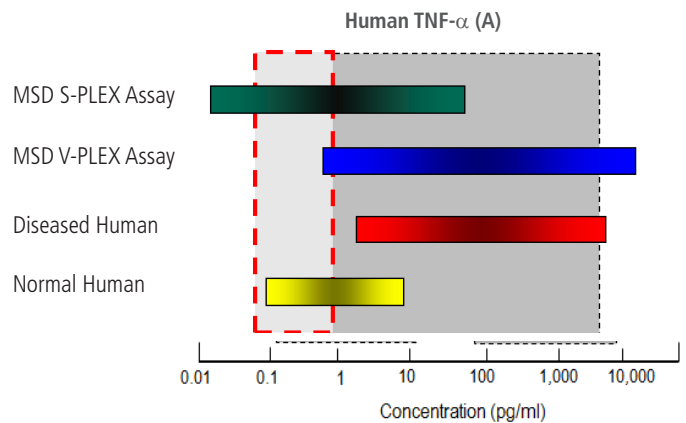
Representative data are presented above. (A) Comparison of sensitivity ranges for different human TNF-α assay types show the unique sensitivity of the S-PLEX assay format. Increasingly, studies have shown that many biomarker levels are actually lower than previously thought (red dotted box). (B) Calibration curves for multiple TNF-α assay formats compare sensitivity. (C) Data from TSLP measured in native samples using three assay platforms reveal how samples on the S-PLEX format fall easily within detection limits. Each sample tested is represented by a closed circle, upward triangle, or downward triangle. The solid line indicates the LLOD. Dashed lines indicate the estimated lower limit of quantitation (LLOQ) and upper limit of quantitation (ULOQ) for each assay format.

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S-PLEX Biomarker Assays

S-PLEX biomarker assays represent popular analytes, including cytokines, chemokines, and immunoregulatory proteins, that are present at low levels in native samples.

Human Analytes

Analyte	LLOD (fg/mL)	LLOQ - ULOQ (fg/mL)
CTLA-4	32	120 – 410,000
Eotaxin-3	59	141 – 266,000
G-CSF	44	460 – 990,000
IL-1β	19	98 – 70,000
IL-2	7.3	21 – 30,000
IL-3	4.6	21 – 17,000
IL-4	0.54	4.9 – 3,300
IL-5	2.02	5.9 – 19,000
IL-6	1.1	1.3 – 4,400
IL-9	8.6	39 – 68,000
IL-10	1.4	9.8 – 12,000
IL-12p70	2.3	6.2 – 18,000
IL-13	9.1	24 – 53,000

Human Analytes

Analyte	LLOD (fg/mL)	LLOQ - ULOQ (fg/mL)
IL-17A	13	120 – 140,000
IL-21 **NEW**	8.2	37 – 54,000
IL-22	2.2	7.6 – 24,000
IFN-α2a	4.9	29 – 52,000
IFN-β	17	64 – 81,000
IFN-γ	5.3	16 – 15,000
GM-CSF	1.9	4.4 – 21,000
TNF-α	6.8	12 – 42,000
TNF-β	3.3	11 – 16,000
TSLP	9.1	34 – 49,000
SARS-CoV-2 N	62	172 – 650,000
SARS-CoV-2 Spike	95	350 – 260,000

NHP Analytes

Analyte	LLOD (fg/mL)	LLOQ - ULOQ (fg/mL)
CTLA-4	32	130 – 170,000
G-CSF	44	120 – 410,000
IL-1β	19	98 – 70,000
IL-2	7.3	21 – 30,000
IL-5	2.02	5.9 – 19,000
IL-6	1.1	1.3 – 4,400
TNF-β	3.3	11 – 16,000

S-PLEX Biomarker Human Multiplex Panel

Name (Cat. No.)	Analyte
Proinflammatory Panel 1 (K15396S)	IFN-γ, IL-1β, IL-2, IL-4, IL-6, IL-10, IL-12p70, IL-17A, TNF-α

NEW S-PLEX Neurology Assays

Assays for human and NHP neurological analytes are available individually or in multiplex kits.

Human and NHP Analytes

Analyte	LLOD (fg/mL)	LLOQ - ULOQ (fg/mL)
GFAP	150	320 – 850,000
Tau (pT181)	77	130 – 170,000
Tau (pT217) **NEW**	880	5,900 - 2,400,000
Tau (pT231)	3,100	15,000 – 15,000,000
Tau (total)	37	120 – 160,000
Neurofilament L	1,700	8,480 – 1,400,000

S-PLEX Neurology Multiplex Panels

| Name (Cat. No.)	Analyte
Neurology Panel 1 Human Kit (K15639S)	GFAP, Neurofilament L, Tau (total)
Neurology Panel 1 NHP Kit (K15640S)	GFAP, Neurofilament L, Tau (total)

V-PLEX Validated Immunoassays for Unsurpassed Performance and Quality

V-PLEX assays are designed to maximize consistency in results and confidence in data. Developed under design control and according to fit-for-purpose principles, the final product represents the highest quality assay available from MSD. Comprehensive testing of all raw materials and kit components combined with rigorous manufacturing and QC specifications ensure reproducible results time after time.

Offering exceptional dynamic range, high sensitivity, accurate results, and lot-to-lot consistency, V-PLEX kits are available as individual analyte kits, preconfigured multiplex panels, and custom multiplex panels.

All cytokine V-PLEX assays have been validated with serum, plasma, urine, and cell culture supernatant samples. Neuroinflammation and neurodegeneration assays have also been validated with CSF. Metabolic assays have been validated with serum, plasma, and cell culture supernatant samples. For supplementary sample type information, including additional validated sample types, consult the product insert or visit our website.

V-PLEX Assays Demonstrate a High Degree of Lot-to-Lot Reproducibility
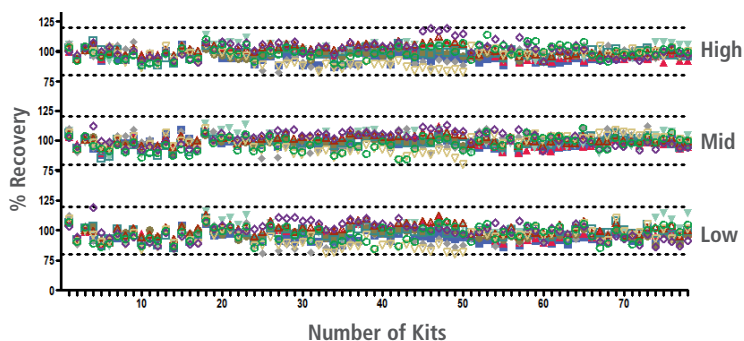
Control samples, spanning the quantifiable range of the assay, are used to confirm absolute quantification across runs and lots. Over 400 lots of V-PLEX kits have been manufactured by MSD. The data in the tables below illustrate their exceptional reproducibility. It shows the %recovery measurements for High, Mid, and Low control samples and average intra-plate concentration %CVs across 78 kit lots of the V-PLEX Proinflammatory Panel 1 (human), 323 lots of the V-PLEX Chemokine Panel 1 (human), and 25 lots of the V-PLEX Cytokine Panel 1 (human) manufactured over three years. The data for the V-PLEX Proinflammatory Panel 1 (human) for the High, Mid, and Low control samples are plotted to the left.

V-PLEX Proinflammatory Panel 1 (human)

	Average % Recovery			Average Intra-plate Conc. %CV		
	High	Mid	Low	High	Mid	Low
IFN-γ	94.9	97.9	93.9	3.1	2.1	2.1
IL-1β	99.4	99.8	98.6	3.2	2.5	3.1
IL-2	100.3	100.1	99.6	3.0	2.6	3.0
IL-4	97.6	100.2	94.4	3.3	3.2	3.2
IL-6	97.6	98.7	96.9	2.5	2.4	2.4
IL-8	98.7	98.2	97.9	2.4	2.4	2.5
IL-10	101.8	101.0	101.3	1.9	1.7	2.3
IL-12p70	94.8	97.2	92.9	4.7	4.5	5.0
IL-13	102.2	101.4	99.3	2.2	2.3	2.4
TNF-α	99.6	96.9	96.7	2.8	2.7	4.0

78 Lots

V-PLEX Chemokine Panel 1 (human)

	Average % Recovery			Average Intra-plate Conc. %CV		
	High	Mid	Low	High	Mid	Low
Eotaxin	99.0	101.9	98.4	2.2	1.7	2.4
MIP-1β	97.1	96.1	93.0	2.6	2.1	2.3
Eotaxin-3	102.2	101.4	100.4	3.8	3.5	4.4
TARC	93.4	97.6	92.6	3.8	3.0	3.4
IP-10	93.3	93.3	91.9	5.2	3.8	3.7
MIP-1α	99.2	98.3	96.2	1.6	1.5	2.7
IL-8	97.5	91.6	87.3	2.6	2.1	2.5
MPC-1	96.0	96.6	92.3	4.7	4.3	5.0
MDC	95.4	97.8	97.5	4.2	3.6	3.2
MCP-4	98.2	97.9	97.5	2.0	2.1	2.9

23 Lots

V-PLEX Cytokine Panel 1 (human)

	Average % Recovery			Average Intra-plate Conc. %CV		
	High	Mid	Low	High	Mid	Low
GM-CSF	97.8	99.7	93.9	3.8	2.7	3.1
IL-1α	100.1	99.7	97.1	4.8	4.1	5.1
IL-5	100.8	101.4	99.1	3.3	3.1	3.3
IL-7	96.7	98.5	95.4	3.3	2.8	3.2
IL-12p40	96.2	97.8	93.3	2.7	2.5	2.8
IL-15	95.4	97.3	96.7	3.6	2.7	3.1
IL-16	93.6	94.4	95.0	3.3	3.1	3.6
IL-17A	98.4	99.7	96.7	3.2	3.0	3.2
TNF-β	98.4	97.7	94.7	2.4	2.5	2.7
VEGF-A	95.4	94.7	95.9	2.0	2.1	2.4

25 Lots

Build Your Assay with the V-PLEX Assay Designer

The V-PLEX product line provides validated assays in customizable formats. Configure a V-PLEX assay that meets your exact research needs. Explore your options at **www.mesoscale.com/V-PLEX**.

V-PLEX Serology Panels for COVID-19, Mpox, and Respiratory Viral Disease Research

V-PLEX Serology panels detect antibodies to antigens from SARS-CoV-2, SARS-CoV-2 variants, SARS-1, MERS, circulating Coronaviruses, mpox, vaccinia, and other respiratory pathogens. They are built from a large library of antigens organized into panels. The menu includes the V-PLEX SARS-CoV-2 Panel 2, which was chosen by Operation Warp Speed (OWS) as the basis of its standard binding assays for immunogenicity assessments in all funded Phase III clinical trials of vaccines. All human serology tests are provided as complete kits and include reference standards and controls. The menu also includes kits to measure antibodies that block binding of ACE2 to the Spike and RBD antigens of the SARS-CoV-2 virus (including variants), a high-throughput alternative to traditional neutralization assays.

Species	V-PLEX Serology (IgG, IgM, IgA) Neutralization (ACE2) Panels	Antigens
Human or Mouse	V-PLEX SARS-CoV-2 Panel 1 Kit	SARS-CoV-1 Spike, SARS-CoV-2 N, SARS-CoV-2 S1 NTD, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX SARS-CoV-2 Panel 2 Kit	SARS-CoV-2 N, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX SARS-CoV-2 Panel 22 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.1.1.529), SARS-CoV-2 S1 RBD (B.1.1.7), SARS-CoV-2 S1 RBD (B.1.351; B.1.351.1), SARS-CoV-2 S1 RBD (P.1), SARS-CoV-2 S1 RBD (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+Δ144), SARS-CoV-2 Spike (B.1.1.529; BA.1)
	V-PLEX SARS-CoV-2 Panel 23 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (AY.4.2), SARS-CoV-2 Spike (B.1.1.529), SARS-CoV-2 Spike (B.1.1.7), SARS-CoV-2 Spike (B.1.351), SARS-CoV-2 Spike (P.1), SARS-CoV-2 Spike (B.1.617.2; AY.3; AY.5; AY.6; AY.7; AY.14) Alt Seq 1, SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2 **Note:** Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #"
	V-PLEX SARS-CoV-2 Panel 25 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.1.7), SARS-CoV-2 Spike (B.1.1.529; BA.1), SARS-CoV-2 Spike (B.1.351), SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2, SARS-CoV-2 Spike (B.1.640.2), SARS-CoV-2 Spike (BA.1+L452R), SARS-CoV-2 Spike (BA.1+R346K), SARS-CoV-2 Spike (BA.2), and SARS-CoV-2 Spike (BA.3) **Note:** Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #"
	V-PLEX SARS-CoV-2 Panel 26 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.1.1.529; BA.1), SARS-CoV-2 S1 RBD (BA.1.1), SARS-CoV-2 S1 RBD (BA.2), SARS-CoV-2 S1 RBD (B.1.1.7), SARS-CoV-2 S1 RBD (B.1.351; B.1.351.1), SARS-CoV-2 S1 RBD (P.1), SARS-CoV-2 S1 RBD (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+Δ144)
	V-PLEX SARS-CoV-2 Panel 27 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (BA.2), SARS-CoV-2 Spike (BA.2+L452M), SARS-CoV-2 Spike (BA.2+L452R). SARS-CoV-2 Spike (BA.2.12.1), SARS-CoV-2 Spike (BA.3), SARS-CoV-2 Spike (BA.4), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (B.1.351), SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2 **Note:** Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #"
	V-PLEX SARS-CoV-2 Panel 28 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (BA.2), SARS-CoV-2 S1 RBD (BA.2+L452M), SARS-CoV-2 S1 RBD (BA.2+L452R), SARS-CoV-2 S1 RBD (BA.2.12.1), SARS-CoV-2 S1 RBD (BA.3), SARS-CoV-2 S1 RBD (BA.4; BA.5), SARS-CoV-2 S1 RBD (B.1.1.7), SARS-CoV-2 S1 RBD (B.1.351; B.1.351.1), SARS-CoV-2 S1 RBD (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+Δ144)
	V-PLEX SARS-CoV-2 Panel 29 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.351), SARS-CoV-2 Spike (BA.2), SARS-CoV-2 Spike (BA.2.12.1), SARS-CoV-2 Spike (BA.2.75), SARS-CoV-2 Spike (BA.4), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2 **Note:** Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #"
	V-PLEX SARS-CoV-2 Panel 30 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.1.1.7), SARS-CoV-2 S1 RBD (B.1.351; B.1.351), SARS-CoV-2 S1 RBD (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+ΔY144), SARS-CoV-2 S1 RBD (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.10.1; BA.2.12), SARS-CoV-2 S1 RBD (BA.2.12.1), SARS-CoV-2 S1 RBD (BA.2.75), SARS-CoV-2 S1 RBD (BA.4; BA.5)
	V-PLEX SARS-CoV-2 Panel 31 Kit **(Omicron Panel)**	SARS-CoV-2 N, SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.4; BA.5), SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.5)
	V-PLEX SARS-CoV-2 Panel 32 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15), SARS-CoV-2 Spike (BA.2.75), SARS-CoV-2 Spike (BA.2.75.2), SARS-CoV-2 Spike (BA.4.6), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (BF.7), SARS-CoV-2 Spike (BQ.1), SARS-CoV-2 Spike (BQ.1.1), SARS-CoV-2 Spike (XBB.1)
	V-PLEX SARS-CoV-2 Panel 33 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.1.1.529; BA.1; BA.1.15), SARS-CoV-2 S1 RBD (BA.2.75), SARS-CoV-2 S1 RBD (BA.2.75.2), SARS-CoV-2 S1 RBD (BA.4; BA.5), SARS-CoV-2 S1 RBD (BA.4.6; BF.7), SARS-CoV-2 S1 RBD (BQ.1), SARS-CoV-2 S1 RBD (BQ.1.1), SARS-CoV-2 S1 RBD (XBB.1)
	V-PLEX SARS-CoV-2 Panel 34 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.1.529; BA.1), SARS-CoV-2 Spike (BA.2.75), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (BF.7), SARS-CoV-2 Spike (BN.1), SARS-CoV-2 Spike (BQ.1), SARS-CoV-2 Spike (BQ.1.1), SARS-CoV-2 Spike (XBB.1), SARS-CoV-2 Spike (XBB.1.5)

For Research Use Only. Not for use in diagnostic procedures.

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Species	V-PLEX Serology (IgG, IgM, IgA) Neutralization (ACE2) Panels	Antigens
Human or Mouse	V-PLEX SARS-CoV-2 Panel 36 Kit **(Omicron Panel) NEW**	SARS-CoV-2 N, SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.1.529; BA.1), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (BQ.1.1), SARS-CoV-2 Spike (XBB.1), SARS-CoV-2 Spike (XBB.1.5), SARS-CoV-2 Spike (XBB.1.16), SARS-CoV-2 Spike (XBB.1.16.1), SARS-CoV-2 Spike (XBB.2.3)
	V-PLEX SARS-CoV-2 Panel 37 Kit **(Omicron Panel) NEW**	SARS-CoV-2 N, SARS-CoV-2 Spike, SARS-CoV-2 Spike (BA.2.86), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (EG.5.1), SARS-CoV-2 Spike (FL.1.5.1), SARS-CoV-2 Spike (XBB.1.5), SARS-CoV-2 Spike (XBB.1.16), SARS-CoV-2 Spike (XBB.1.16.6), SARS-CoV-2 Spike (XBB.2.3)
	V-PLEX SARS-CoV-2 Key Variant Spike Panel 1 Kit **(Omicron Panel)**	SARS-CoV-2 Spike, SARS-CoV-2 Spike (B.1.1.7), SARS-CoV-2 Spike (B.1.1.529; BA.1; BA.1.15), SARS-CoV-2 Spike (B.1.351), SARS-CoV-2 Spike (BA.2), SARS-CoV-2 Spike (BA.2.12.1), SARS-CoV-2 Spike (BA.2.75), SARS-CoV-2 Spike (BA.5), SARS-CoV-2 Spike (B.1.617.2; AY.4) Alt Seq 2 **Note:** Alternative S-GENE mutations for Spike of B.1.617.2 are listed as "Alt Seq #"
	V-PLEX SARS-CoV-2 Key Variant RBD Panel 1 Kit **(Omicron Panel)**	SARS-CoV-2 S1 RBD, SARS-CoV-2 S1 RBD (B.1.1.7), SARS-CoV-2 S1 RBD (B.1.1.529; BA.1; BA.1.15), SARS-CoV-2 S1 RBD (B.1.351; B.1.351.1), SARS-CoV-2 S1 RBD (AY.3; AY.4; AY.4.2; AY.5; AY.6; AY.7; AY.12; AY.14; B.1.617.2; B.1.617.2+Δ144), SARS-CoV-2 S1 RBD (BA.2; BA.2.1; BA.2.2; BA.2.3; BA.2.5; BA.2.6; BA.2.7; BA.2.8; BA.2.10; BA.2.12), SARS-CoV-2 S1 RBD (BA.2.12.1), SARS-CoV-2 S1 RBD (BA.2.75), SARS-CoV-2 S1 RBD (BA.4; BA.5)
	V-PLEX COVID-19 Coronavirus Panel 2 Kit	HCoV-229E Spike, HCoV-HKU1 Spike, HCoV-OC43 Spike, HCoV-NL63 Spike, SARS-CoV-1 Spike, SARS-CoV-2 N, SARS-CoV-2 S1 NTD, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX COVID-19 Coronavirus Panel 3 Kit	HCoV-229E Spike, HCoV-HKU1 Spike, HCoV-OC43 Spike, HCoV-NL63 Spike, SARS-CoV-1 Spike, SARS-CoV-2 N, MERS-CoV Spike, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX Respiratory Panel 1 Kit	Flu A/Hong Kong H3, Flu A/Michigan H1, Flu A/Shanghai H7, Flu B/Brisbane HA, Flu B/Phuket HA, RSV Pre-Fusion F
	V-PLEX Respiratory Panel 4 **NEW**	Flu A/Darwin/2021 H3, Flu A/Shanghai/2013 H7, Flu A/Wisconsin/2019 H1, Flu B/Austria/2021 HA, Flu B/Phuket/2013 HA, RSV Pre-Fusion F, SARS-CoV-2 N, SARS-CoV-2 Spike, SARS-CoV-2 Spike (XBB.1.5)
	V-PLEX COVID19 Respiratory Panel 2 Kit	HCoV-229E Spike, Flu A/Hong Kong H3, Flu A/Michigan H1, Flu A/Shanghai H7, Flu B/Brisbane HA, Flu B/Phuket HA, HCoV-HKU1 Spike, HCoV-OC43 Spike, HCoV-NL63 Spike, RSV Pre-Fusion F, SARS-CoV-1 Spike, SARS-CoV-2 N, SARS-CoV-2 S1 NTD, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX COVID19 Respiratory Panel 3 Kit	HCoV-229E Spike, Flu A/Hong Kong H3, Flu A/Michigan H1, Flu A/Shanghai H7, Flu B/Brisbane HA, Flu B/Phuket HA, HCoV-HKU1 Spike, HCoV-OC43 Spike, HCoV-NL63 Spike, RSV Pre-Fusion F, SARS-CoV-1 Spike, SARS-CoV-2 N, MERS-CoV Spike, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX SARS-CoV-2 384 Panel 1 Kit	SARS-CoV-2 N, SARS-CoV-2 S1 RBD, SARS-CoV-2 Spike
	V-PLEX Orthopoxvirus Panel 1 Kit **NEW**	MPXV A29L, MPXV A35R, MPXV B6R, MPXV E8L, MPXV M1R, VACV A27L, VACV A33R, VACV B5R, VACV D8L, VACV L1R **Note:** MPXV = mpox virus and VACV = vaccinia virus

COVID-19 Proficiency Samples

MSD offers COVID-19 Proficiency Samples intended for use as test samples in V-PLEX COVID-19 Serology Kits. MSD provides assigned values for the concentration of antibodies to antigens in each sample enabling users to assess their laboratory performance for testing, training, concordance studies, validations, and troubleshooting. COVID-19 Proficiency samples are available in panels or as individual samples.

COVID-19 Proficiency Samples	Catalog No.
COVID-19 Proficiency Sample Panel 1 (18 samples)	C4417
COVID-19 Proficiency Sample Panel 2 (36 samples)	C4418
COVID-19 Proficiency Sample Panel 3 (42 samples)	C4419
Individual COVID-19 Proficiency Samples (42 samples)	C50AED; C50AEE; C50AEF; C50AEG; C50AEH; C50AEJ; C50AEK; C50AEL; C50AEM; C50AEN; C50AEP; C50AEQ; C50AER; C50AES; C50AET; C50AEU; C50AEV; C50AEW; C50AEX; C50AEY; C50AEZ; C50AFA; C50AFB; C50AFC; C50AFD; C50AFE; C50AFF; C50AFG; C50AFH; C50AFJ; C50AFK; C50AFL; C50AFM; C50AFN; C50AFP; C50AFQ; C50AFR; C50AFS; C50AFT; C50AFU; C50AFV; C50AFW

Preconfigured V-PLEX Kits

Subsets of analytes, which meet the same specifications for quality and performance, can be ordered from a preconfigured panel. All panels are available in 1, 5, and 25-plate packs. Panels that contain more than ten analytes will be fulfilled on multiple plates, with a maximum of ten analytes per plate. Some plates may contain fewer than ten analytes.

Species	Name (Cat. No.)	Analytes
Human	Biomarker 54-Plex Kit (K15248G)	CRP, Eotaxin, Eotaxin-3, FGF (basic), Flt-1, GM-CSF, ICAM-1, IFN-γ, IL-1α, IL-1β, IL-1RA, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-8 (high abundance), IL-9, IL-10, IL-12p70, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, MIP-3α, PlGF, SAA, TARC, Tie-2, TNF-α, TNF-β, TSLP, VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Biomarker 46-Plex Kit (K15088G)	CRP, Eotaxin, Eotaxin-3, FGF (basic), Flt-1, GM-CSF, ICAM-1, IFN-γ, IL-1α, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-8 (HA*), IL-10, IL-12p70, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, MIP-3α, PlGF, SAA, TARC, Tie-2, TNF-α, TNF-β, VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Biomarker 40-Plex Kit (K15209G)	CRP, Eotaxin, Eotaxin-3, FGF (basic), Flt-1, GM-CSF, ICAM-1, IFN-γ, IL-1α, IL1β, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-8 (HA*), IL-10, IL-12p70, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, PlGF, SAA, TARC, Tie-2, TNF-α, TNF-β, VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Cytokine 44-Plex Kit (K15249G)	Eotaxin, Eotaxin-3, GM-CSF, IFN-γ, IL-1α, IL-1β, IL-1RA, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-8 (high abundance), IL-9, IL-10, IL-12p70, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, MIP-3α, TARC, TNF-α, TNF-β, TSLP, VEGF-A
	Cytokine 35-Plex Kit (K15089G)	Eotaxin, Eotaxin-3, GM-CSF, IFN-γ, IL-1α, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, MIP-3α, TARC, TNF-α, TNF-β, VEGF-A
	Cytokine 30-Plex Kit (K15054G)	Eotaxin, Eotaxin-3, GM-CSF, IFN-γ, IL-1α, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-8 (HA*), IL-10, IL-12p70, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, TARC, TNF-α, TNF-β, VEGF-A
	Proinflammatory Panel 1 (K15049G)	IFN-γ, IL-1β, IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, IL-13, TNF-α
	TH17 Panel 1 (K15085G)	IL-17A (Version B), IL-21, IL-22, IL-23, IL-27, IL-31, MIP-3α
	Cytokine Panel 1 (K15050G)	GM-CSF, IL-1α, IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF-β, VEGF-A
	Cytokine Panel 2 (K15084G)	IL-17A/F, IL-17B, IL-17C, IL-17D, IL-1RA, IL-3, IL-9, TSLP
	Chemokine Panel 1 (K15047G)	Eotaxin, Eotaxin-3, IL-8 (HA*), IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, TARC
	Angiogenesis Panel 1 (K15190G)	FGF (basic), Flt-1, PlGF, Tie-2, VEGF-A**, VEGF-C, VEGF-D
	Vascular Injury Panel 2 (K15198G)	CRP, ICAM-1, SAA, VCAM-1
	Neuroinflammation Panel 1 (K15210G)	CRP, Eotaxin, Eotaxin-3, Flt-1/VEGFR-1, ICAM-1, IFN-γ, IL-1α, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-7, IL-8, IL-10, IL-12/IL-23p40, IL-13, IL-15, IL-16, IL-17A, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, PlGF, SAA, TARC, Tie-2, TNF-α, TNF-β, VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Aβ Peptide Panel 1 (6E10) (K15200G)	Aβ38 (6E10), Aβ40 (6E10), Aβ42 (6E10)
	Aβ Peptide Panel 1 (4G8) (K15199G)	Aβ38 (4G8), Aβ40 (4G8), Aβ42 (4G8) This product is suitable for human, mouse, and rat samples.
	Metabolic Panel 1 (K15325DG)	C-Peptide, GIP (active), GLP-1 (active), Glucagon, Insulin, Leptin, and PP
	Viral Panel 1 Kit (K15345D)	IL-1β, IL-6, IL-8, TNF-α
	Viral Panel 2 Kit (K15346D)	IFN-γ, IL-1β, IL-4, IL-6, IL-8, IL-10, TNF-α
	Viral Panel 3 Kit (K15347D)	IFN-γ, IL-1β, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12p70, TNF-α
NHP***	Cytokine 24-Plex Kit (K15058G)	Eotaxin-3, GM-CSF, IFN-γ, IL-1β, IL-2, IL-5, IL-6, IL-7, IL-8, IL-8 (HA*), IL-10, IL-12/IL-23p40, IL-15, IL-16, IL-17A, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, TARC, TNF-β, VEGF-A
	Cytokine Panel 1 (K15057G)	GM-CSF, IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF-β, VEGF-A
	Proinflammatory Panel 1 (K15056G)	IFN-γ, IL-1β, IL-2, IL-6, IL-8, IL-10
	Chemokine Panel 1 (K15055G)	Eotaxin-3, IL-8 (HA*), IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, TARC
	Metabolic Panel 1 (K15332G)	C-Peptide, GIP (active), GLP-1 (active), Glucagon, Insulin, and PP
	Viral Panel 1 Kit (K15348D)	IL-1β, IL-6, IL-8
	Viral Panel 2 Kit (K15349D)	IFN-γ, IL-1β, IL-6, IL-8, IL-10
	Viral Panel 3 Kit (K15350D)	IFN-γ, IL-1β, IL-5, IL-6, IL-8, IL-10
Mouse	Proinflammatory Panel 1 (K15048G)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-10, IL-12p70, KC/GRO, TNF-α
	Cytokine Panel 1 (K15245G)	IL-9, IL-15, IL-17A/F, IL-27p28/IL-30, IL-33, IP-10, MIP-1α, MIP-2, MCP-1
	Cytokine 19-Plex Kit (K15255G)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p70, IL-15, IL-17 A/F, IL-27p28/IL-30, IL-33, IP-10, KC/GRO, MCP-1, MIP-1α, MIP-2, TNF-α
	Metabolic Panel 1 (K15333G)	GLP-1 (active) and Glucagon
Rat	Metabolic Panel 1 (K15334G)	GIP (active), GLP-1 (active), and Glucagon
	Proinflammatory Panel 2 (K15059G)	IFN-γ, IL-1β, IL-4, IL-5, IL-6, IL-10, IL-13, KC/GRO, TNF-α
Canine	Metabolic Panel 1 (K15335G)	GIP (active), GLP-1 (active), Glucagon, and Insulin

*High-abundance (This assay quantitates high levels of IL-8.)
**This version of VEGF-A is unique to the Angiogenesis Panel; LLOQ = 5.00 pg/mL and ULOQ = 1,510 pg/mL.
***NHP assays recognize analytes from Cynomolgus and Rhesus monkeys.

V-PLEX Analytes

V-PLEX analytes are available as validated individual assays or as part of a validated multiplex panel.

Human

Analyte	LLOD (pg/mL)	LLOQ-ULOQ (pg/mL)
Aβ38 (6E10)	16.7	60 – 8,480
Aβ40 (6E10)	9.97	50 – 7,000
Aβ42 (6E10)	0.368	3.13 – 1,270
Aβ38 (4G8)	22.2	60 – 7,500
Aβ40 (4G8)	5.41	20 – 6,000
Aβ42 (4G8)	0.516	2.5 – 1,270
Aβ42	0.33	3.0 – 8,000
C-Peptide	4.72	19 – 3,150
CRP	1.33	27.6 – 49,600
Eotaxin	3.26	12.3 – 1,120
Eotaxin-3	1.77	10.2 – 3,750
FGF (basic)	0.09	2.6 – 1,780
Flt-1/VEGFR-1	0.90	10 – 6,410
GIP (active)	0.233	3.18 – 390
GM-CSF	0.16	0.842 – 750
ICAM-1	1.94	15.0 – 32,700
IFN-γ	0.37	1.76 – 938
IL-1α	0.09	2.85 – 278
IL-1β	0.05	0.646 – 375
IL-1RA	1.12	9.19 – 650
IL-2	0.09	0.890 – 938
IL-3	2.37	12.6 – 1,950
IL-4	0.02	0.218 – 158
IL-5	0.14	4.41 – 562
IL-6	0.06	0.633 – 488
IL-7	0.12	0.851 – 563
IL-8	0.07	0.591 – 375
IL-8 (HA*)	95.6	713 – 43,400
IL-9	0.311	2.23 – 975
IL-10	0.04	0.298 – 233
IL-12/IL-23p40	0.33	1.32 – 2,250
IL-12p70	0.11	1.22 – 315
IL-13	0.24	4.21 – 353
IL-15	0.15	0.774 – 525
IL-16	2.83	19.1 – 1,870
IL-17A	0.31	3.19 – 3,650
IL-17A (Gen. B)	0.413	5.86 – 1,950
IL-17A/F	0.930	7.57 – 3,900
IL-17B	0.185	1.12 – 1,040
IL-17C	0.682	3.84 – 1,620
IL-17D	3.87	11.2 – 5,200
IL-21	0.193	6.12 – 650
IL-22	0.27	2.78 – 325
IL-23	0.274	4.60 – 3,250
IL-27	4.2	38.7 – 13,000
IL-31	0.446	4.22 – 650
Insulin	0.006	0.07 – 19.5 (μIU/ml)
IP-10	0.37	1.37 – 500
Leptin	5.78	37.7 – 7,150
MCP-1	0.090	1.09 – 375
MCP-4	0.18	1.49 – 472
MDC	1.22	88.3 – 7,500
MIP-1α	3.02	13.8 – 743
MIP-1β	0.17	1.88 – 750

Human

Analyte	LLOD (pg/mL)	LLOQ-ULOQ (pg/mL)
MIP-3α	0.05	0.75 – 325
PlGF	0.21	1.5 – 800
PP	0.043	0.41 – 325
SAA	10.9	54.1 – 138,000
TARC	0.22	3.32 – 1,120
Tie-2	31.3	396 – 63,400
TNF-α	0.04	0.690 – 248
TNF-β	0.08	0.465 – 458
TSLP	0.063	0.460 – 325
VCAM-1	6.00	37.6 – 32,000
VEGF-A	0.40	5.0 – 1,510
VEGF-C	10.5	146 – 17,500
VEGF-D	4.36	67.1 – 18,800

*High-abundance (This assay quantitates high levels of IL-8.)
The LLOQ and ULOQ represent the lower and upper limits of quantitation of the assay.
The LLOD represents the lower limit of detection of the assay.

Non-Human Primate (NHP)**

Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
C-Peptide	4.72	19 – 3,150
Eotaxin-3	1.77	10.2 – 3,750
GIP (active)	0.233	3.18 – 390
GM-CSF	0.16	0.842 – 750
IFN-γ	0.37	1.76 – 938
IL-1β	0.05	0.646 – 375
IL-2	0.09	0.890 – 938
IL-5	0.14	4.41 – 562
IL-6	0.06	0.633 – 488
IL-7	0.12	0.546 – 563
IL-8	0.07	0.591 – 375
IL-8 (HA)	95.6	713 – 43,400
IL-10	0.04	0.298 – 233
IL-12/IL-23p40	0.33	1.32 – 2,250
IL-15	0.15	0.774 – 525
IL-16	2.83	19.1 – 1,870
IL-17A	0.31	3.19 – 3,650
Insulin	0.006	0.07 – 19.5 (μIU/ml)
IP-10	0.37	1.37 – 500
MCP-1	0.09	1.09 – 375
MCP-4	0.17	1.49 – 472
MDC	1.22	88.3 – 7,500
MIP-1α	3.02	13.8 – 743
MIP-1β	0.17	1.02 – 750
PP	0.043	0.41 – 325
TARC	0.22	3.32 – 1,120
TNF-β	0.08	0.465 – 458
VEGF-A	0.40	5.0 – 1,510

*High-abundance (This assay quantitates high levels of IL-8.)
**NHP assays recognize analytes from Cynomolgus and Rhesus monkeys
The LLOQ and ULOQ represent the lower and upper limits of quantitation of the assay.
The LLOD represents the lower limit of detection of the assay.

Canine

Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
Insulin	0.006	0.07 – 19.5 (μIU/ml)
GIP (active)	0.233	3.18 – 390

Rat

Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
Aβ38 (4G8)	22.2	3.18 – 390
Aβ40 (4G8)	5.41	20 – 6,000
Aβ42 (4G8)	0.516	2.5 – 1,270
IFN-γ	0.65	39.7 – 3,750
GIP (active)	0.233	3.18 – 390
IL-1β	6.92	102 – 8,100
IL-4	0.69	8.0 – 723
IL-5	14.1	82 – 3,000
IL-6	13.8	96.9 – 8,550
IL-10	16.4	163 – 15,670
IL-13	1.97	12.5 – 1,080
KC/GRO	1.04	21.7 – 728
TNF-α	0.72	9.1 – 793

Mouse

Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
Aβ38 (4G8)	22.2	60 – 7,500
Aβ40 (4G8)	5.41	20 – 6,000
Aβ42 (4G8)	0.516	2.5 – 1,270
IFN-γ	0.04	0.39 – 570
IL-1β	0.11	0.72 – 1,030
IL-2	0.22	1.03 – 1,570
IL-4	0.11	0.818 – 1,060
IL-5	0.06	0.302 – 590
IL-6	0.61	7.61 – 3,140
IL-9	3.84	21.9 – 2,600
IL-10	0.94	7.26 – 2,030
IL-12p70	9.95	179 – 20,600
IL-15	16	43.2 – 26,000
IL-17A/F	0.23	1.39 – 1,620
IL-27p28/IL-30	1.39	5.91 – 6,500
IL-33	0.36	1.85 – 1,950
IP-10	0.32	2.15 – 650
KC/GRO	0.24	3.29 – 1,230
MCP-1	0.672	4.42 – 325
MIP-1α	0.081	0.380 – 390
MIP-2	0.053	0.580 – 423
TNF-α	0.13	0.97 – 403

Human/NHP/Mouse/Rat/Canine

Analyte	LLOD (pM)	LLOQ - ULOQ (pM)
Glucagon	0.015	0.33 – 52
GLP-1 Active***	0.02	0.30 – 120
GLP-1 Total***	0.017	0.18 – 120

***These assays are provided in singleplex format.

U-PLEX Assays and Assay Development Tools Deliver Maximum Flexibility

NEW Recent Expansion of Immuno-Oncology Group 1

The flexibility of the U-PLEX platform empowers you to make personalized multiplex assay combinations quickly and easily. Select singleplex, preconfigured or custom multiplex assays, or use your own reagents to make multiplex assays with U-PLEX Development Packs. Choose 96- or 384-well formats to meet your throughput needs. All U-PLEX assays are tested with serum, plasma, and cell culture samples.

U-PLEX 96-Well
10-Assay Plate
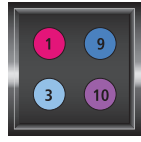
U-PLEX 384-Well
4-Assay Plate

1. COUPLE

Biotinylated Antibody

U-PLEX
Coupled
Antibody

U-PLEX
Linker

2. COAT

3. COMPLETE

Run personalized combinations of assays

The U-PLEX assay development workflow is a simple three-step process.
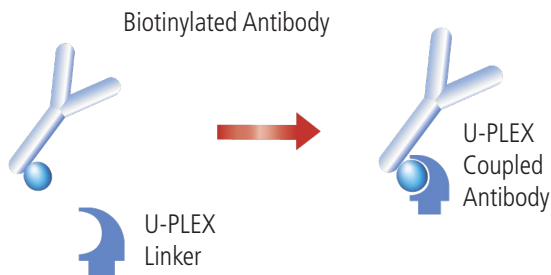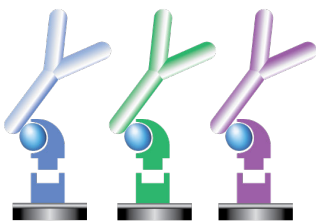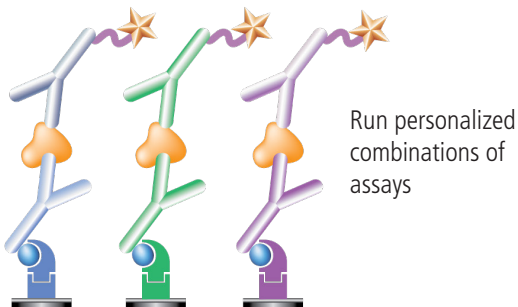
U-PLEX Assays

U-PLEX Assays are organized into Groups, which are organized by species, abundance in matrices tested, analytical compatibility, and expected use. Select any number of assays from within a Group to create a custom multiplexed assay. Non-U-PLEX assays can also be incorporated in a custom U-PLEX multiplex assay by selecting the appropriate number of Open Spots. Up to 10 assays may be multiplexed on each plate for simultaneous measurement.

U-PLEX Custom Assays

Species	Name	Cat. No.	
		96-well	384-well
Human	Biomarker Group 1	K15067M	K25067M
Human	Biomarker Group 2	K151ADM	K251ADM
Human	Biomarker Group 3	K151AGM	K251AGM
Human	Immuno-Oncology Group 1	K151AEM	K251AEM
Human	Metabolic Group 1	K151ACM	K251ACM
Mouse	Biomarker Group 1	K15069M	K25069M
Mouse	Biomarker Group 2	K152ADM	K252ADM
Mouse	Metabolic Group 1	K152ACM	K252ACM
NHP	Biomarker Group 1	K15068M	K25068M
NHP	Biomarker Group 2	K156ADM	K256ADM
Rat	Metabolic Group 1	K153ACM	K253ACM

U-PLEX Development Packs

Perform custom multiplexing with your own analytes, with 2 to 10 activated spots per well.

Name	Cat. No. (96-well format)	Cat. No. (384-well format)
Development Pack, 2-Assay	K15227N	K25227N
Development Pack, 3-Assay	K15228N	K25228N
Development Pack, 4-Assay	K15229N	K25229N
Development Pack, 5-Assay	K15230N	-
Development Pack, 6-Assay	K15231N	-
Development Pack, 7-Assay	K15232N	-
Development Pack, 8-Assay	K15233N	-
Development Pack, 9-Assay	K15234N	-
Development Pack, 10-Assay	K15235N	-

U-PLEX Assays: Built on Quality Components

The U-PLEX technology is an open and highly flexible platform that delivers the quality for which MSD is known. Every order is filled with proven, high-quality components that have been thoroughly characterized. U-PLEX assays are designed, developed, and manufactured under MSD's Quality Management System.

Rigorous quality standards are applied, and a wide range of performance measurements are taken during the development of every U-PLEX assay. Representative data for three performance measurements are presented below. In addition, precision, spike recovery, cross-reactivity, and dilution linearity are also characterized.

Biomarker Titration

Standard curves and LLODs are generated from at least three experimental runs. U-PLEX curves typically show a 3-4 log dynamic range, allowing measurement in both normal and diseased/stimulated samples with minimal sample dilution.
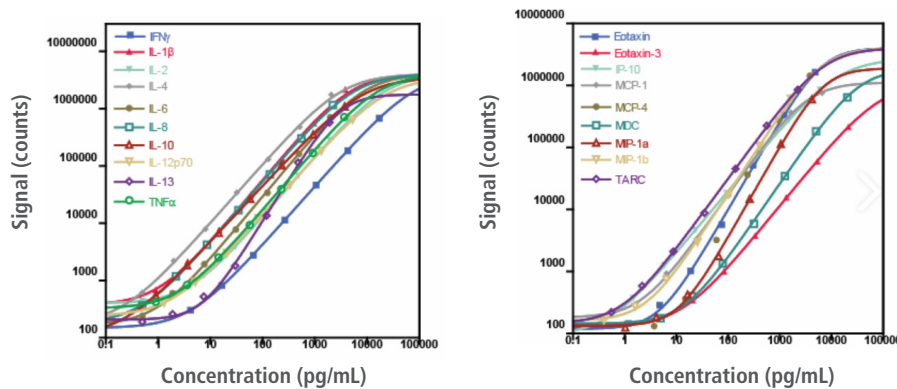
Typical calibration curves for U-PLEX biomarkers are shown at left.

Lower Limit of Detection

LLODs for U-PLEX assays range from pg/mL to sub-pg/mL levels.

Assays	LLOD (pg/mL)									
	IFN-γ	IL-1β	IL-2	IL-4	IL-6	IL-8	IL-10	IL-12p70	IL-13	TNF-α
U-PLEX	1.7	0.15	0.7	0.08	0.33	0.150	0.14	0.69	3.1	0.51

Assays	LLOD (pg/mL)							
	Eotaxin	IP-10	MCP-1	MCP-4	MDC	MIP-1α	MIP-1β	TARC
U-PLEX	3.2	0.49	0.74	7.5	8.4	7.7	1.5	0.51

Native Sample Testing

Testing of normal and diseased serum and plasma samples (n>3 of each) is part of every assay development. If an analyte is not detected, then samples are spiked with supernatants from cultured PBMCs that have been stimulated to secrete a wide array of biomarkers. Analyte concentrations from each sample are determined and plotted along with the LLOD for each standard.
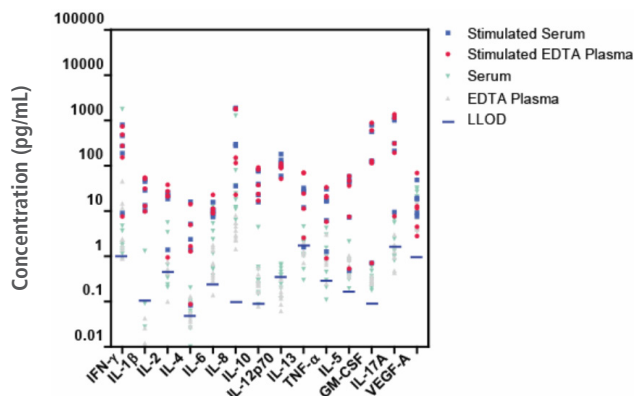
Native analytes are detectable in normal serum and EDTA plasma, as well as in serum and EDTA plasma that are spiked with culture supernatants obtained from stimulated PBMCs.

U-PLEX Biomarker Groups 1, 2, and 3 Assays

U-PLEX Biomarker Groups encompass assays for popular analytes including cytokines, chemokines, and growth factors.

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
A2M	13.2 – 32,000
Adiponectin	1.46 – 5,000
ApoA1	4.93 – 25,000
ApoC3	1.06 – 10,000
CA1	1.01 – 6,000
Clusterin	57.7 – 500,000
Complement C9	10.3 – 70,000
Complement factor D	0.31 – 3,000
CRP	0.92 – 2,170
CTACK	1.8 – 4,200
Cystatin C	23.9 – 20,000
DPPIV	0.85 – 7,000
ENA-78	0.53 – 3,900
Eotaxin	3.2 – 4,800
Eotaxin-2	3.1 – 6,000
Eotaxin-3	7.3 – 21,400
EPO	1.8 – 20,000
Factor VII	0.60 – 6,000
FLT3L	0.49 – 6,000
Fractalkine	100 – 181,000
G-CSF	1.6 – 20,400
GM-CSF	0.12 – 9,400
GRO-α	0.25 – 2,500
I-309	6.8 – 3,000
ICAM-1	0.11 – 1,930
IFN-α2a	4.0 – 42,400
IFN-β	3.1 – 100,000
IFN-γ	1.7 – 17,000
IL-1α	0.98 – 5,100
IL-1β	0.15 – 3,800
IL-1RA	1.7 – 5,000
IL-2	0.70 – 1,900

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
IL-2Rα	10 – 55,000
IL-3	11 – 16,000
IL-4	0.08 – 2,100
IL-5	0.24 – 4,000
IL-6	0.33 – 2,000
IL-7	1.5 – 7,000
IL-8	0.15 – 2,200
IL-9	0.14 – 1,500
IL-10	0.14 – 3,700
IL-12/IL-23p40	2.8 – 21,000
IL-12p70	0.69 – 5,300
IL-13	3.1 – 1,900
IL-15	0.82 – 3,000
IL-16	6.6 – 21,500
IL-17A	2.6 – 23,400
IL-17A/F	1.8 – 18,400
IL-17B	0.79 – 4,000
IL-17C	2.2 – 20,000
IL-17D	4.8 – 40,000
IL-17E/IL-25	0.58 – 9,200
IL-17F	160 – 112,000
IL-18	2.5 – 42,000
IL-21	1.2 – 12,600
IL-22	0.13 – 3,400
IL-23	1.4 – 21,600
IL-27	9.6 – 50,600
IL-29/IFN-λ1	1.2 – 11,800
IL-31	7.3 – 11,100
IL-33	0.59 – 10,300
IP-10	0.49 – 6,000
I-TAC	1.5 – 5,100
MCP-1	0.74 – 6,600

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
MCP-2	0.11 – 2,000
MCP-3	0.79 – 5,000
MCP-4	7.5 – 3,800
M-CSF	0.29 – 2,000
MDC	8.4 – 20,100
MIF	4.3 – 27,000
MIP-1α	7.7 – 4,200
MIP-1β	1.5 – 1,600
MIP-3α	1.8 – 20,800
MIP-3β	0.67 – 2,000
MIP-5	0.34 – 30,000
NGAL/LCN2	0.78 – 4,000
RBP4	3.78 – 4,000
SAA	1.60 – 16,200
SDF-1α	280 – 103,000
Serpin A1	5.52 – 22,000
SHBG	3.52 – 25,000
sTfR-1	0.29 – 3,000
TARC	0.51 – 2,200
TGF-β1	9.1 – 37,000
TGF-β2	2.5 – 38,900
TGF-β3	1.4 – 38,600
TNF-α	0.54 – 3,700
TNF-β	0.47 – 4,300
TPO	19 – 40,400
TRAIL	0.66 – 10,000
TSLP	0.20 – 10,100
VCAM-1	7.78 – 20,500
VEGF-A	2.0 – 4,900
vWF	67.4 – 1,000,000
YKL-40	0.39 – 5,000

For Research Use Only. Not for use in diagnostic procedures.

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U-PLEX NHP and Mouse Biomarker Groups 1 and 2 Assays

NHP Biomarkers

Analyte	LLOD - ULOD pg/mL
CTACK	1.8 – 4,200
ENA-78	0.36 – 3,900
Eotaxin	0.30 – 4,800
Eotaxin-2	3.1 – 6,000
Eotaxin-3	7.3 – 21,400
FLT3L	0.49 – 6,000
Fractalkine	100 – 181,000
G-CSF	1.5 – 20,400
GM-CSF	0.12 – 9,400
GRO-α	0.25 – 2,500
I-309	6.8 – 3,000
IFN-α2a	1.7 – 40,800
IFN-γ	1.7 – 17,000
IL-1α	0.60 – 5,100
IL-1β	0.15 – 3,800
IL-1RA	1.7 – 5,000
IL-2	0.70 – 1,900
IL-4	0.06 – 2,100
IL-5	0.24 – 4,000
IL-6	0.33 – 2,000
IL-7	1.5 – 7,000
IL-8	0.15 – 2,200
IL-9	0.14 – 1,500
IL-10	0.14 – 3,700
IL-12/IL-23p40	2.8 – 21,000
IL-12p70	0.54 – 5,300
IL-13	1.2 – 1,900
IL-15	0.82 – 3,000
IL-16	6.6 – 21,500
IL-17A	2.3 – 23,400
IL-17A/F	1.8 – 18,400

NHP Biomarkers

Analyte	LLOD - ULOD pg/mL
IL-17B	0.79 – 4,000
IL-17C	2.2 – 20,000
IL-17D	4.8 – 40,000
IL-17F	160 – 112,000
IL-18	2.5 – 42,000
IL-22	0.13 – 3,400
IL-23	1.4 – 21,600
IP-10	0.49 – 6,000
I-TAC	1.5 – 2,000
MCP-1	0.74 – 6,600
MCP-2	0.11 – 2,000
MCP-4	7.5 – 3,800
M-CSF	0.29 – 2,000
MDC	8.4 – 20,100
MIF	4.3 – 27,000
MIP-1α	7.7 – 4,200
MIP-1β	1.5 – 1,600
MIP-3α	0.27 – 20,800
MIP-3β	0.67 – 2,000
MIP-5	0.34 – 30,000
SDF-1α	18 – 103,000
TARC	0.51 – 2,200
TGF-β1	9.1 – 37,000
TGF-β2	2.5 – 38,900
TGF-β3	1.4 – 38,600
TNF-α	0.54 – 3,700
TNF-β	0.47 – 4,300
TPO	19 – 40,400
TRAIL	0.66 – 10,000
VEGF-A	2.0 – 4,900
YKL-40	0.39 – 5,000

Mouse Biomarkers

Analyte	LLOD - ULOD pg/mL
6CKine/CCL21	1.5 – 4,000
BAFF	0.51 – 4,000
BCA-1/BLC	21 – 32,000
CD40	2.6 – 8,000
Eotaxin	4.6 – 15,000
EPO	4.5 – 12,500
GM-CSF	0.16 – 1,000
IFN-α	140 – 100,000
IFN-β	5.2 – 6,000
IFN-γ	0.16 – 2,900
IL-1β	3.1 – 13,000
IL-2	1.1 – 10,900
IL-4	0.56 – 10,000
IL-5	0.63 – 2,800
IL-6	4.8 – 16,000
IL-9	1.4 – 8,900
IL-10	3.8 – 22,800
IL-12/IL-23p40	1.4 – 20,400
IL-12p70	48 – 89,000
IL-13	2.7 – 22,800
IL-15	24 – 131,000
IL-16	3.6 – 6,300
IL-17A	0.30 – 2,100
IL-17A/F	0.61 – 10,600
IL-17C	2.3 – 45,600
IL-17E/IL-25	1.6 –18,900
IL-17F	24 – 52,600

Mouse Biomarkers

Analyte	LLOD - ULOD pg/mL
IL-21	6.5 – 40,600
IL-22	1.2 – 1,800
IL-23	4.9 – 20,400
IL-27p28/IL-30	8.7 – 73,300
IL-31	45 – 66,300
IL-33	2.2 – 36,000
IP-10	0.51 – 4,900
KC/GRO	4.8 – 16,000
MCP-1	1.4 – 1,400
MCP-5/CCL12	0.14 – 1,500
MDC	13 – 10,000
MIP-1α	0.21 – 2,100
MIP-1β	13 – 30,800
MIP-2	0.30 – 2,000
MIP-3α	0.10 – 2,500
MMP-9 (total)	49 – 80,000
NGAL/LCN2	24 – 50,000
RANTES	0.72 – 2,000
SDF-1α	8.1 – 50,000
TARC	0.32 – 1,200
TGF-β1	37 – 37,000
TGF-β2	2.5 – 38,900
TGF-β3	2.5 – 38,600
TNF-α	1.3 – 6,200
TNF-RI	0.46 – 2,000
VEGF-A	0.77 – 12,100

U-PLEX Biomarker Human Combinations

Name (Cat. No.)	Analytes
Biomarker Group 3 21-PLEX (K15391K)	A2M, Adiponectin, ApoA1, ApoC3, CA1, Clusterin, Complement C9, Complement factor D, CRP, Cystatin C, DPPIV, Factor VII, ICAM-1, NGAL/LCN2, RBP4, SAA, Serpin A1, SHBG, sTfR-1, VCAM-1, vWF
CAR-T Cell Safety Combo 1 (K15711K) **NEW**	GM-CSF, IFN-γ, IL-1β, IL-6, IL-10, MCP-1, TNF-α
Chemokine Combo 1 (K15047K)	Eotaxin, Eotaxin-2, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-2, MCP-3, MCP-4, MDC, MIP-1α, MIP-1β, TARC
Chemokine Combo 2 (K15046K)	CTACK, ENA-78, Fractalkine, GRO-α, I-309, I-TAC, MIF, MIP-3α, MIP-3β, MIP-5, SDF-1α
Cytokine Combo 1 (K15045K)	GM-CSF, IL-1α, IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF-β, VEGF-A
Inflammation Combo 1 (K15387K)	Complement C9, Complement factor D, CRP, ICAM 1, NGAL/LCN2, SAA, VCAM-1
Interferon Combo (K15094K)	IFN-α, IFN-β, IFN-γ, IL-29/IFN-λ1
Kidney Injury Combo 1 (K15389K)	A2M, Clusterin, Cystatin C, NGAL/LCN2, RBP4, Serpin A1
Macrophage M1 Combo 1 (K15336K)	IL-1β, IL-6, IL-12p70, IL-18, IL-23, IP-10, MCP-1, MIP-1α, TNF-α
Macrophage M2 Combo 1 (K15337K)	Eotaxin-2, IL-4, IL-10, IL-13, M-CSF, MDC, TARC
Proinflammatory Combo 1 (K15049K)	IFN-γ, IL-1β, IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, IL-13, TNF-α
Proinflammatory Combo 2 (K15066K)	GM-CSF, IFN-γ, IL-1β, IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70
Proinflammatory Combo 3 (K15052K)	IFN-γ, IL-1β, IL-6, TNF-α
Proinflammatory Combo 4 (K15053K)	IL-1β, IL-6, IL-8, TNF-α
T-Cell Combo (K15093K)	GM-CSF, IFN-γ, IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, MIP-3α, TNF-α
TGF-β Combo (K15241K)	TGF-β1, TGF-β2, TGF-β3
TH1/TH2 Combo 1 (K15010K)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, IL-13, TNF-α
TH17 Combo 1 (K15075K)	IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-27, IL-31, IL-33
TH17 Combo 2 (K15076K)	IFN-γ, IL-1β, IL-6, IL-10, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF-α
Vascular Injury Combo 1 (K15390K)	CRP, Factor VII, ICAM-1, SAA, VCAM-1
Viral Combo 1 (K15343K)	G-CSF, GM-CSF, IFN-α2a, IFN-β, IFN-γ, IL-1β, IL-1RA, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12p70, IP-10, MCP-1, MIP-1α, TNF-α, VEGF-A

U-PLEX Biomarker NHP Combinations

Name (Cat. No.)	Analytes
Chemokine Combo 1 (K15055K)	Eotaxin, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-4, MDC, MIP-1α, MIP-1β, TARC
Cytokine Combo 1 (K15057K)	GM-CSF, IL-1α, IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF-β, VEGF-A
Proinflammatory Combo 1 (K15070K)	IFN-γ, IL-1β, IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, TNF-α
T-Cell Combo (K15095K)	GM-CSF, IFN-γ, IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17F, IL-22, MIP-3α, TNF-α
TGF-β Combo (K15243K)	TGF-β1, TGF-β2, TGF-β3
TH1/TH2 Combo (K15080K)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, TNF-α
TH17 Combo 1 (K15079K)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-10, IL-17A, TNF-α
Viral Combo 1 (K15344K)	G-CSF, GM-CSF, IFN-α2a, IFN-γ, IL-1RA, IL-1β, IL-4, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12p70, IP-10, MCP-1, MIP-1α, TNF-α, VEGF-A

U-PLEX Biomarker Mouse Combinations

Name (Cat. No.)	Analytes
Chemokine Combo 1 (K15321K)	IP-10, KC/GRO, MCP-1, MIP-1α, MIP-1β, MIP-2, MIP-3α, MDC
Chemokine Combo 2 (K15319K)	6CKine/CCL21, BCA-1/BLC, MCP-5/CCL12, RANTES, SDF-1α, TARC
Interferon Combo (K15320K)	IFN-α, IFN-β, IFN-γ
Macrophage M1 Combo 1 (K15408K)	IL-1β, IL-6, IL-12p70, IL-15, IL-23, IP-10, MCP-1, MIP-1α, TNF-α
Macrophage M2 Combo 1 (K15409K)	IL-4, IL-10, IL-13, MDC, TARC
T-Cell Combo (K15098K)	GM-CSF, IFN-γ, IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, MIP-3α, TNF-α
TGF-β Combo (K15242K)	TGF-β1, TGF-β2, TGF-β3
TH1/TH2 Combo 1 (K15072K)	IFN-γ, IL-1β, IL-2, IL-4, IL-5, IL-10, IL-12p70, IL-13, KC/GRO, TNF-α
TH17 Combo 1 (K15077K)	IL-17A, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-31, IL-33
TH17 Combo 2 (K15078K)	IFN-γ, IL-1β, IL-6, IL-17A, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF-α

U-PLEX Immuno-Oncology Group 1 Assays

Great strides have been made in the field of cancer research as a result of harnessing native and modified cells of the immune system. Therapies using genetically modified T-cells have proven to be effective against certain hematologic malignancies. Antibodies that bind to checkpoint ligands and receptors have immensely increased the effectiveness of drug treatments and cell therapies against many types of cancers.

MSD provides solutions that address your Immuno-Oncology research needs. The U-PLEX platform offers a wide range of singleplex and multiplex assays in preconfigured or customizable options including an extensive menu of effector- and target-cell checkpoint proteins.

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
APRIL/TNFSF13	7.47 – 45,000
BAFF-R/TNFRSF13C	1.4 – 14,000
BCMA/TNFRSF17	0.13 – 600
CD20	5.7 – 80,000
CD27	0.41 – 3,400
CD276/B7-H3	4.0 – 40,000
CD28	14 – 144,000
CD40L (soluble)	0.23 – 1,800
CTLA-4	0.12 – 1,500
E-Selectin	45 – 200,000
FGF (basic)	2.1 – 1,200
Galectin-9	0.41 – 5,500
GITR/TNFRSF18	0.18 – 1,300
GITRL/TNFSF18	0.09 – 1,000
gp130 (soluble)	5.8 – 188,000
Granzyme A	0.49 – 3,700
Granzyme B	0.10 – 750

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
HAVCR2/TIM-3	2.1 – 9,500
HVEM/TNFRSF14	0.53 – 5,000
ICOS	1.78 – 9,000
ICOS-L/B7-H2	0.98 – 12,000
LAG3	6.8 – 36,000
LIGHT/TNFSF14	0.58 – 5,000
MIG	0.73 – 4,000
MMP-1	1.35 – 15,000
MMP-2	10.4 – 25,000
MMP-7	1.83 – 9,000
MMP-9 (total)	0.88 – 15,000
Nectin-4	1.61 – 10,000
OX40/TNFRSF4	0.26 – 1,800
P-Selectin	10.5 – 40,000
PD1 (epitope 1)	0.25 – 2,500
PD1 (epitope 2)	0.11 – 2,200
PD-L1 (epitope 1)	0.09 – 1,100

Human Biomarkers

Analyte	LLOD - ULOD pg/mL
PD-L1 (epitope 2)	0.55 – 1,500
PD-L2	3.9 – 41,000
Pentraxin 3	11.7 – 40,000
Perforin	1.92 – 20,000
PlGF	0.19 – 1,200
proMMP-9	1.42 – 15,000
RAGE (soluble)	0.26 – 2,000
RANKL/TNFSF11	1.8 – 4,000
RANTES	0.41 – 1,500
S100A12	0.1 – 750
Tie-2	2.9 – 29,000
TIGIT	0.36 – 3,500
TLR1	4.4 – 37,000
TNF-RI	0.15 – 1,000
TNF-RII	1.6 – 7,000
VEGF-D	0.30 – 1,500
VEGFR-1/Flt-1	2.69 – 15,000

U-PLEX Immuno-Oncology Combination

Name (Cat. No.)	Analytes
Angiogenesis Combo 1 (K15339K)	FGF (basic), PlGF, Tie-2, VEGF-A, VEGF-D
CAR-T Cell Combo 1 (K15338K)	GM-CSF, Granzyme A, Granzyme B, IFN-γ, IL-2, TNF-α
CAR-T Cell Combo 2 (K15600K)	GM-CSF, Granzyme A, Granzyme B, IFN-γ, IL-2, Perforin, TNF-α
CAR-T Cell Efficacy Combo 1 (K15709K) **NEW**	Granzyme B, IFN-γ IL-2, IL-6, IL-12p70, IP-10, Perforin, TNF-α
CAR-T Cell Exhaustion Combo 1 (K15710K) **NEW**	CD28, CTLA-4, IFN-γ LAG3, PD-L1 (epitope 1), TIGIT, TNF-α
CAR-T Cell Persistence Combo 1 (K15708K) **NEW**	CD40L (soluble), Granzyme B, IFN-γ, IL-7, IL-15, IL-18, LAG3, PD-L1 (epitope 1), TNF-α
Effector Cell Checkpoint Combo 1 (K15341K)	CD27, CD28, CD40L (soluble), CTLA-4, GITR/TNFRSF18, HAVCR2/TIM-3, LAG3, OX40/TNFRSF4, PD1 (epitope 1), TIGIT
Long COVID Combo 1 (K15622K)	IFN-β, IFN-γ, IL-6, Pentraxin 3
Metastasis Combo 1 (K15602K)	E-Selectin, MMP-1, MMP-2, MMP-7, MMP-9 (total), P-Selectin, VEGFR-1/Flt-1
Oncolysis Combo 1 (K15603K)	CTLA-4, IFN-α2a, IFN-β, IL-1β, IL-2Rα, IL-6, IL-8, IP-10, LAG3, MIP-1α, PD1 (epitope 1), TIGIT
Target Cell Checkpoint Combo 1 (K15340K)	CD276/B7-H3, GITRL/TNFSF18, PD-L1 (epitope 1), PD-L2

U-PLEX Metabolic Group 1 Assays

The complex pathologies of diabetes, cardiovascular disease, and metabolic syndrome have driven an increased demand for quantitative measurement of biomarkers associated with these disease states. Obesity is directly related to increased risk for diabetes, hypertension, atherosclerosis, and metabolic syndrome. Novel proteomic technologies have helped define key serum biomarkers produced in the gut and adipose tissue and altered in abundance in disease states.

MSD provides solutions to support and simplify your metabolic research needs. Assays for Metabolic Human, Mouse, and Rat analytes are available individually or in multiplexes.

Assays that are anchored to NIBSC/WHO International Standards are indicated in the tables below. Additional information on the NIBSC/WHO International Standards is provided in the U-PLEX metabolic product inserts available on the website.

U-PLEX Metabolic Group I Human Analytes

Analyte	LLOD - ULOD	Units
BAFF	0.05 – 500	pg/mL
BDNF*	0.72 – 2,000	pg/mL
β-NGF*	0.05 – 498	pg/mL
C-Peptide*	14 – 7,610	pg/mL
FGF-21	2.8 – 8,230	pg/mL
FGF-23	0.75 – 3,000	pg/mL
FSH	9.0 – 75,000	μIU/mL
Ghrelin (active)	13 – 7,160	pg/mL
Ghrelin (total)	1.7 – 2,710	pg/mL
GIP (active)	1.3 – 1,920	pg/mL
GIP (inactive)	27 – 12,500	pg/mL

Assays are anchored to NIBSC/WHO International Standards.

U-PLEX Metabolic Group I Human Analytes

Analyte	LLOD - ULOD	Units
GIP (total)	3.7 – 12,500	pg/mL
GLP-1 (active)	0.01 – 57	pM
GLP-1 (inactive)	1.5 – 576	pM
GLP-1 (total)	0.59 – 576	pM
Glucagon*	0.13 – 156	pM
Insulin*	0.32 – 736	μIU/mL
Leptin*	14 – 47,500	pg/mL
LH*	1.6 – 27,700	μIU/mL
PP	0.19 – 1,830	pg/mL
Proinsulin*	0.05 – 130	pM
PYY (total)	2.7 – 2,260	pg/mL

Assays are anchored to NIBSC/WHO International Standards.

U-PLEX Metabolic Group I Mouse Analytes

Analyte	LLOD - ULOD	Units
BDNF*	0.72 – 2,000	pg/mL
C-Peptide	220 – 125,000	pg/mL
FGF-21	2.8 – 8,230	pg/mL
Ghrelin (active)	13 – 7,160	pg/mL
Ghrelin (total)	1.7 – 2,710	pg/mL
GLP-1 (active)	0.14 – 57.0	pM
GLP-1 (inactive)	1.5 – 576	pM
GLP-1 (total)	0.59 – 576	pM
Glucagon*	0.13 – 156	pM
Insulin	3.0 – 5,500	μIU/mL
Leptin	11 – 50,000	pg/mL
PYY (total)	1.1 – 4,000	pg/mL

Assays are anchored to NIBSC/WHO International Standards.

U-PLEX Metabolic Group I Rat Analytes

Analyte	LLOD - ULOD	Units
BDNF*	0.72 – 2,000	pg/mL
C-Peptide	220 – 125,000	pg/mL
FGF-21	2.8 – 8,230	pg/mL
Ghrelin (active)	13 – 7,160	pg/mL
Ghrelin (total)	1.7 – 2,710	pg/mL
GLP-1 (active)	0.14 – 57.0	pM
GLP-1 (inactive)	1.5 – 576	pM
GLP-1 (total)	0.59 – 576	pM
Glucagon*	0.13 – 156	pM
Insulin	3.0 – 5,500	μIU/mL
Leptin	11 – 50,000	pg/mL
PYY (total)	1.1 – 4,000	pg/mL

Assays are anchored to NIBSC/WHO International Standards.

Individual assays can be configured into customized multiplex combinations of your choice.

Additional assays that are compatible with the above assays are available on the U-PLEX platform. View our complete portfolio, and customize your U-PLEX Assay with the Assay Designer at www.mesoscale.com/U-PLEX.

For Research Use Only. Not for use in diagnostic procedures.

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U-PLEX Metabolic Human Combinations

Name (Cat. No.)	Analytes
Adipokine Combo 1 (K15276K)	BDNF, β-NGF, IL-1β, IL-6, IL-8, IL-10, Insulin, Leptin, MCP-1, TNF-α
Diabetes Combo 1 (K15274K)	C-Peptide, GIP (total), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Diabetes Combo 2 (K15275K)	C-Peptide, GIP (total), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Metabolic Combo 1 (K15281K)	BAFF, BDNF, β-NGF, C-Peptide, FGF-21, FGF-23, FSH, Ghrelin (active), Ghrelin (total), GIP (active), GIP (inactive), GIP (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, LH, PP, Proinsulin, PYY (total)
Metabolic Combo 2 (K15388K)	Adiponectin, ApoA1, ApoC3, Clusterin, CRP, DPPIV, NGAL/LCN2, RBP4, SHBG, sTfR-1
Metabolic 2-Plex Combo 1 (K15282K)	Insulin, Leptin
Metabolic 3-Plex Combo 1 (K15283K)	GLP-1 (active), Glucagon, Insulin
Metabolic 4-Plex Combo 1 (K15284K)	GLP-1 (active), Glucagon, Insulin, Leptin
Microbiome Combo 1 (K15441K)	Ghrelin (total), GLP-1 (total), Glucagon, Insulin, Leptin, PP, PYY (total)
Obesity Combo 1 (K15277K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15278K)	C-Peptide, FGF-23, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

U-PLEX Metabolic Mouse Combinations

Name (Cat. No.)	Analytes
Adipokine Combo 1 (K15299K)	BDNF, IL-1β, IL-6, IL-10, Insulin, Leptin, MCP-1, TNF-α
Diabetes Combo 1 (K15298K)	C-Peptide, GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Gut Hormone Combo 1 (K15307K)	Ghrelin (active), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Metabolic Combo 1 (K15297K)	BAFF, BDNF, C-Peptide, FGF-21, Ghrelin (active), Ghrelin (total), GLP-1 (active), GLP-1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Metabolic 2-Plex Combo 1 (K15302K)	Insulin, Leptin
Metabolic 2-Plex Combo 2 (K15303K)	Glucagon, Insulin
Metabolic 3-Plex Combo 1 (K15304K)	GLP-1 (total), Glucagon, Insulin
Metabolic 3-Plex Combo 2 (K15305K)	GLP-1 (active), Glucagon, Insulin
Metabolic Hormones Combo 1 (K15306K)	C-Peptide, Ghrelin (active), GLP-1 (active), Glucagon, IL-6, Insulin, Leptin, MCP-1, PYY (total), TNF-α
Obesity Combo 1 (K15300K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15301K)	C-Peptide, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

U-PLEX Metabolic Rat Combinations

Name (Cat. No.)	Analytes
Metabolic Combo 1 (K15308K)	BDNF, C-Peptide, FGF-21, Ghrelin (active), Ghrelin (total), GLP-1 (active), GLP1 (inactive), GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Diabetes Combo 1 (K15309K)	C-Peptide, GLP-1 (total), Glucagon, Insulin, Leptin, PYY (total)
Metabolic 2-Plex Combo 1 (K15312K)	Insulin, Leptin
Metabolic 2-Plex Combo 2 (K15313K)	Glucagon, Insulin
Metabolic 3-Plex Combo 1 (K15314K)	GLP-1 (total), Glucagon, Insulin
Metabolic 3-Plex Combo 2 (K15315K)	GLP-1 (active), Glucagon, Insulin
Metabolic Hormones Combo 1 (K15316K)	C-Peptide, Ghrelin (active), GLP-1 (active), Glucagon, Insulin, Leptin, PYY (total)
Obesity Combo 1 (K15310K)	BDNF, FGF-21, Ghrelin (total), Glucagon, Leptin
Obesity Combo 2 (K15311K)	C-Peptide, Ghrelin (total), GLP-1 (total), Insulin, Leptin, PYY (total)

R-PLEX

Matched Antibody Sets and Assays for a Wide Menu of Biomarkers

R-PLEX Antibody Sets are available as singleplex R-PLEX Assays

R-PLEX Assays come with all the components required to develop and run a singleplex assay:

- Matched Antibody Pair
- Calibrator
- Plates
- Recommended Diluents
- Read Buffer

R-PLEX Antibody Sets are a fast, easy way to design a high-performance singleplex or multiplex immunoassay that delivers all of the advantages of MSD MULTI-ARRAY technology. Choose the plate type depending on the specific application; singleplex assays are created on MSD GOLD Small Spot Streptavidin plates, while multiplex assays are designed by combining R-PLEX Antibody Sets on U-PLEX plates.

Need more assay options? R-PLEX Antibody Sets can be multiplexed with our extensive selection of U-PLEX Antibody Sets.

Representative Calibration Curves and Sensitivity
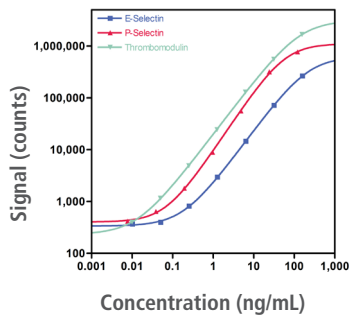
Representative data from three R-PLEX Antibody Sets multiplexed on U-PLEX plates. The data represent the superior performance of MSD's MULTI-ARRAY technology with high sensitivity and large dynamic range.

The R-PLEX portfolio is well suited to measure biomarkers in a wide range of research areas including cancer, inflammation, immunology, metabolism, obesity, cell signaling, and neurodegeneration. R-PLEX Antibody Sets and Assays are screened with relevant sample types including serum and plasma.

Human

Analyte	UniProt ID	Common Applications
α-GST	multiple	kidney injury
4-1BB/TNFRSF9	Q07011	immunology, immuno-oncology
4-1BBL/TNFSF9	P41273	immunology/inflammation
5'-Nucleotidase	P21589	liver injury
6CKine/CCL21	O00585	cytokines & chemokines
Aβ (total)	P05067	neurodegeneration
Aβ38 (4G8)	P05067	neurodegeneration
Aβ38 (6E10)	P05067	neurodegeneration
Aβ40 (4G8)	P05067	neurodegeneration
Aβ40 (6E10)	P05067	neurodegeneration
Aβ42 (4G8)	P05067	neurodegeneration
Aβ42 (6E10)	P05067	neurodegeneration
ACE	P12821	cardiac biomarkers
ACE2	59272	cardiovascular disorders
AChE	P22303	neurobiology, neurodegeneration
ADAM9	Q13443	oncology & cancer
ADAM17	P78536	oncology & cancer, immunology/inflammation
ADAM-TS4	O75173	bone disorders

Human

Analyte	UniProt ID	Common Applications
ADAM-TS 13	Q76LX8	reproductive biology
ADP-ribosyl cyclase	P28907	oncology & cancer
AFP	P02771	reproductive biology
AGP	P02763	aging, inflammation, metabolism
Aiolos	Q9UKT9	intracellular signaling, cardiac biomarkers
Albumin	P02768	infectious disease, toxicology
Alpha-amylase 1	P04745	metabolism
Alpha Defensin 1	P59665	immunology/inflammation
AMICA1	Q86YT9	immunology/inflammation
Amphiregulin	P15514	cytokines & chemokines
Ang-1	Q15389	angiogenesis, cancer, cardiovascular disorders
Ang-2	O15123	cardiovascular disorders
Ang-4	Q9Y264	angiogenesis and vascular, cardiac biomarkers
Ang-like 3	Q9Y5C1	angiogenesis and vascular, cardiac biomarkers
Ang-like 4	Q9BY76	angiogenesis and vascular, cardiac biomarkers
Ang-like 6	Q8NI99	angiogenesis and vascular, cardiac biomarkers

Human

Analyte	UniProt ID	Common Applications
Angiogenin	P03950	angiogenesis and vascular, cardiac biomarkers
Annexin A1	P04083	inflammation
Annexin A5	P08758	immunology/inflammation
Antileukopro-teinase	P03973	immunology/inflammation
ALCAM/CD166	Q13740	oncology & cancer
ALK	Q9UM73	oncology & cancer
ApoA1	P02647	artherosclerosis, metabolism/obesity
ApoC3	P02656	artherosclerosis, metabolism/obesity
ApoE	P02649	metabolism
APP (total)	P05067	Alzheimer's disease, neurobiology, neurodegeneration
APRIL/TNFSF13	O75888	immuno-oncology, immunology/inflammation
Arginase-1	P05089	liver injury
Autotaxin	Q13822	oncology & cancer, cardiac injury, toxicology
AXL/UFO	P30530	oncology & cancer
B2M	P61769	immunology
B7-H2/ICOS-L	O75144	immunology, immuno-oncology

Human

Analyte	UniProt ID	Common Applications
Basigin	P35613	oncology & cancer
BCA-1/BLC	O43927	immuno-oncology, inflammation
Bcl-2	P10415	intracellular signaling
Bcl-X/Bcl2-L-1	Q07817	intracellular signaling
Betacellulin	P35070	oncology & cancer
Bikunin	P02760	oncology & cancer
BIM/Bcl2-L-11	O43521	intracellular signaling
BMP-2	P12643	bone disorders
BMP-4	P12644	bone disorders
BMP-5	P22003	bone disorders
BMP-6	P22004	bone disorders
BMP-7	P18075	bone disorders
BMP-9/GDF-2	Q9UK05	bone disorders
BMP-10	O95393	vascular, growth factors
BMP-11/GDF-11	O95390	cardiac injury, toxicology
BTLA	Q7Z6A9	immunology/inflammation, immuno-oncology
C1q receptor	Q9NPY3	intracellular signaling
CA1	P00915	hypoxia, metabolism
CA9	Q16790	kidney injury, oncology & cancer
CA15-3	P15941	cancer
CA125	Q8WXI7	cancer
Calbindin	P05937	metabolism, neurobiology
Calprotectin	P05109	immunity, inflammation
Caspase-1	P29466	cytokines & chemokines, immunology/inflammation
Cathepsin B (total)	P07858	immuno-oncology
Cathepsin D	P07339	oncology & cancer
Cathepsin L2	O60911	oncology & cancer
Cathepsin S (total)	P25774	Immunology/inflammation, oncology & cancer, immunogenciity
CCN1	O00622	oncology & cancer
CD5	P06127	immunology, oncology
CD5L	O43866	cytokines & chemokines
CD8α	P01732	Immunology/inflammation
CD9 (EV)	P21926	cancer, immunology
CD14	P08571	immunogenicity
CD21/CR2	P20023	oncology & cancer
CD22	P20273	immunology/inflammation, immuno-oncology
CD30/TNFRSF8	P28908	oncology & cancer
CD31/PECAM-1	P16284	angiogenesis, cell adhesion
CD40/TNFRSF5	P25942	immuno-oncology
CD44	P16070	oncology & cancer
CD47	Q08722	immunology/inflammation, oncology & cancer, cardiac injury, toxicology
CD63 (EV)	P08962	cancer, immunology
CD80/B7-1	P33681	immuno-oncology, inflammation
CD81 (EV)	P60033	cancer, immunology

Human

Analyte	UniProt ID	Common Applications
CD163	Q86VB7	liver injury, oncology & cancer
CD276/B7-H3	Q5ZPR3	inflammation, immuno-oncology
CD177	Q8N6Q3	immunology/inflammation
CD200	P41217	immunology/inflammation, oncology & cancer
CEACAM-1	P13688	immuno-oncology
CEACAM-5	P06731	cancer
CEACAM-7/CGM2	Q14002	immuno-oncology
Chemerin	Q99969	cytokines & chemokines
Cholecystokinin	P06307	Metabolic
Cholinesterase	P06276	neurobiology, neurodegeneration
Chromogranin-A	P10645	metabolic
cIAP1	Q13490	cancer, cardiovascular disorders, oncology
cIAP2	Q13489	cancer, cardiovascular disorders, oncology
CK Beta 8-1/CCL23	P55773	cytokines & chemokines
CKBB	P12277	immunology, neurodegeneration
Clusterin	P10909	apoptosis, cell signaling, toxicology
CNTF	P26441	neurobiology, neurodegeneration
COMP/TSP-5	P49747	bone disorders
Complement C3	P01024	immunology/inflammation
Complement C3a	P01024	immunology/inflammation
Complement C5a	P01031	cardiac biomarkers, immunology/inflammation
Complement C9	P02748	immunology/inflammation
Complement factor D	P00746	metabolism
Contactin-2/TAG-1	Q02246	Alzheimer's disease
Corin/ATC	Q9Y5Q5	cardiovascular disorders
COX-2/PTGS2	P35354	immunology/inflammation
CRP	P02741	autoimmune disorders, inflammation
Cystatin B	P04080	intracellular signaling
Cystatin C	P01034	toxicology
Cytokeratin-8	P05787	cancer, cell signaling
Cytokeratin-19	P08727	biomarker immunoassays
Decorin	P07585	oncology & cancer, bone disorders, neurobiology, neurodegeneration
Delta-like 1	O00548	intracellular signaling
DKK-1	O94907	bone disorders, immunology/inflammation
DKK-3	Q9UBP4	oncology & cancer
DKK-4	Q9UBT3	reproductive biology
DPPIV	P27487	metabolism
E-Cadherin	P12830	cancer
EGF	P01133	cardiovascular disorders, toxicology
EGFR	P00533	immunology/inflammation, oncology & cancer
Elastase-2	P08246	immunology/inflammation
Endoglin	P17813	angiogenesis, cancer, cardiovascular disorders

Human

Analyte	UniProt ID	Common Applications
Endostatin	P39060	angiogenesis and vascular
Endothelin-1	P05305	cardiac biomarkers, vascular immunoassays
Enolase 2	P09104	neurobiology
eNOS	P29474	cardiac biomarkers
Ep-CAM	P16422	immuno-oncology
ER-α	P03372	phosphoproteins, intercellular signaling
ErbB2	P04626	immuno-oncology
ErbB3/HER3	P21860	oncology & cancer
ERK1/2 (total)	P27361	phosphoproteins, intercellular signaling
E-Selectin	P16581	cell adhesion, cell signaling
FABP2/I-FABP	P12104	metabolic
FABP3/H-FABP	P05413	cardiovascular disorders, toxicology
FABP4/A-FABP	P15090	metabolic
Factor VII	P08709	vascular immunoassays, cardiac biomarkers
FAP-α/SEPR	Q12884	angoigenesis, apoptosis, cell adhesion
Fas (soluble)	P25445	apoptosis
FasL	P48023	apoptosis, immunology
Fc-epsilon RII	P06734	intracellular signaling
Ferritin	P02794, P02792	immunology/inflammation, metabolic
FGF (acidic)	P05230	angiogenesis and vascular, oncology & cancer
FGF-7	P21781	oncology & cancer
FGF-19	O95750	metabolic
FGF-BP1	Q14512	immunology/inflammation
Fibronectin	Q9Y2H6	bone disorders
Folate R alpha	P15328	immuno-oncology
Follistatin	P19883	immunology/inflammation, muscle injury
Furin	P09958	oncology & cancer
GAD2/GAD-65	Q05329	metabolic, immunology/inflammation
Galectin-1	P09382	biomarker immunoassays
Galectin-3	P17931	cardiovascular disorders, oncology
GAS-6/AXL-L	Q14393	oncology & cancer
GCPII/PSMA	Q04609	oncology & cancer
GDF-8	O14793	growth factors
GDF-15	Q99988	cell signaling
Gelsolin	P06396	cell signaling
GFAP	P14136	neurobiology
Glicentin	P01275	metabolism
Granulysin	P22749	immunology/inflammation
GRP	P07492	oncology & cancer
GRO-β/CXCL2	P19875	cytokines & chemokines
Growth Hormone	P01241	metabolic
Haptoglobin	P00738	cardiovascular disorders, immunity
HAVCR1/KIM-1	Q96D42	infectious disease, toxicology
HB-EGF	Q99075	oncology & cancer

Human

Analyte	UniProt ID	Common Applications
HCC-4/CCL16	O15467	cytokines & chemokines
hCG alpha	P01215	reproductive biology
HE4/WFDC2	Q14508	immuno-oncology
Heme Oxygenase 1	P09601	vascular immunoassays
Hemoglobin alpha	P69905	angiogenesis, cardiovascular disorders
Hemojuvelin	Q6ZVN8	metabolism
Hemopexin	P02790	angiogenesis, cardiovascular disorders
Hepcidin	P81172	growth factors
HGF	P14210	cardiovascular disorders, oncology
HSP27/HspB1	P04792	muscle injury, toxicology
HSP70	P0DMV8	cell signaling
HVEM/TNFRSF14	Q92956	oncology & cancer
Hyaluronidase-1	Q12794	oncology & cancer, immunology/inflammation
IA-2/R-PTP-N	Q16849	phosphoproteins, intercellular signaling, oncology & cancer
ICAM-1	P05362	immunology
ICAM-3	P32942	adhesion, immunology
ICOS	Q9Y6W8	immunology, immuno-oncology
ICOS-L/B7-H2	Q68D85	cytokines & chemokines, oncology & cancer
IgE	NA	immunology/inflammation
IGF-1	P05019	metabolism
IGF-1R	P08069	oncology & cancer, metabolic
IGF-2R/CI-M6P-R	P11717	oncology & cancer, metabolic
IGFBP-1	P08833	metabolic
IGFBP-2	P18065	metabolic
IGFBP-3	P17936	metabolic
IGFBP-4	P22692	metabolism, growth factors
IGFBP-8	P29279	angiogenesis and vascular
Ikaros	Q13422	intracellular signaling
IL1RL1/ST2	Q01638	cardiovascular disorders
IL-1R2	P27930	toxicology
IL-6R	P08887	immunity, immunology
IL-11	P20809	cytokines
IL-17RB	Q9NRM6	cytokines & chemokines
IL-18BP	O95998	cytokines, immunology/inflammation
IL-19	Q9UHD0	cytokines, oncology & cancer
IL-22Rα2	Q969J5	cytokines & chemokines
IL-23R	Q13007	immuno-oncology, immunology/inflammation
IL-24	Q13007	immuno-oncology, immunology/inflammation
IL-28A/IFN-λ2	Q8IZI0	immunology/inflammation
IL-28B/IFN-λ3	Q8IZI9	liver injury, oncology & cancer
IL-32	P24001	cytokines & chemokines
IL-34	Q6ZMJ4	immunology/inflammation, metabolic
IL-36γ	Q9NZH8	cytokines & chemokines
IL-36RA	Q9UBH0	immunology/inflammation

Human

Analyte	UniProt ID	Common Applications
IL-37	Q9NZH6	cytokines & chemokines
Influenza A NP	B6A6U5	virology
Influenza B NP	Q596H1	virology
IR (soluble)	P06213	metabolism
IRS-1	P35568	metabolism
Jagged-1	P78504	oncology & cancer, intracellular signaling
Kallikrein 3/PSA	P07288	reproductive biology
Ki-67	P46013	neurobiology, neurodegeneration
Klotho	Q9UEF7	kidney injury
Lactotransferrin	P02788	immunology
LBP	P18428	immunogenicity
LDL Receptor	P01130	cardiac biomarkers
Legumain	Q99538	neurobiology, neurodegeneration
LIF	P15018	cytokines & chemokines
LIGHT/TNFSF14	O43557	immunology/inflammation
LOX-1/OLR1	P78380	cardiac injury, toxicology
LRRK2	Q5S007	neurobiology, neurodegeneration
LRRK2 (pS935)	Q5S007	neurobiology, neurodegeneration
Lymphotactin	P47992	cytokines & chemokines
LYVE-1	Q9Y5Y7	oncology & cancer
MAdCAM-1	Q13477	cytokines & chemokines
MCAM/CD146	P43121	immuno-oncology
Mcl-1/BAK Complex	Q07820/ Q16611	intracellular signaling
Mcl-1/Bcl2-L-3	Q07820	intracellular signaling
Mcl-1/BIM Complex	Q07820/ Q43521	intracellular signaling
MerTK	Q12866	oncology & cancer, immunogenicity
Mesothelin	Q13421	cancer
Met (soluble)	P08581	cancer, cell signaling
MIC-A	Q29983	immunology/inflammation, metabolic
MIC-B	Q29980	oncology & cancer, immunology/inflammation
Midkine	P21741	oncology & cancer
MIG	P49682	immunity, immunology
MIP-4	P55774	cell signaling, immunity, inflammation
MMP-1	P03956	cancer, inflammation
MMP-2	P08253	immunology/inflammation
MMP-3 (total)	P08254	angiogenesis, cancer, cardiovascular disorders
MMP-7	P09237	angiogenesis, cancer, cardiovascular disorders
MMP-8	P22894	immunology/inflammation
MMP-9 (active)	P14780	angiogenesis, cancer, cardiovascular disorders
MMP-9 (total)	P14780	cancer, inflammation
MMP-10 (total)	P09238	oncology & cancer, cardiac injury, toxicology
MMP-12	P39900	oncology & cancer
MMP-13	P45452	oncology & cancer
MMP-14	P50281	oncology & cancer

Human

Analyte	UniProt ID	Common Applications
MPIF-1/CCL23	P55773	cytokines & chemokines
MPO	P05164	cardiovascular disorders, inflammation
MSP	P26927	oncology & cancer
MyD88	Q99836	oncology & cancer
Myoglobin	P02144	kidney injury
Myosin BP (cardiac)	Q14896	cardiac biomarkers
NAP-2/CXCL7	P02775	cytokines & chemokines
N-Cadherin	P19022	cardiac biomarkers
NCAM-1	P13591	neurobiology, neurodegeneration
Nectin-4	Q96NY8	cancer, infectious disease
Nephrin	O60500	kidney injury
Neprilysin	P08473	Alzheimer's disease
Nesfatin-1	P80303	metabolic
Neurofilament H	P12036	neurobiology, neurodegeneration
Neurofilament L	P07196	neurobiology, neurodegeneration
Neuropilin-1	O14786	neurobiology, neurodegeneration
Neurotrophin-3	P20783	neurobiology, neurodegeneration
Neurotrophin-4	P34130	immunology/inflammation, neurobiology, neurodegeneration
Neuronal pentraxin-1	Q15818	Alzheimer's disease
NGAL/LCN2	P80188	immunology/inflammation, toxicology
NT-ProBNP	P16860	cardiovascular disorders, toxicology
NPY	P49146	neurobiology, neurodegeneration
Oncostatin-M	P13725	oncology & cancer
Osteoactivin	Q14956	bone disorders, cancer
Osteocalcin	P02818	bone disorders
Osteonectin	P09486	bone disorders
Osteopontin	P10451	bone disorders, cancer, inflammation
Osteoprotegerin	O00300	bone disorders
OX40L	P23510	immunology/inflammation, immunogenicity
OXM/Glicentin	P01275	metabolic
p38 (pT180/ pY182)	Q15759	phosphoproteins, intercellular signaling
p38 (total)	Q15759	phosphoproteins, intercellular signaling
PAF-AH	Q13093	cardiac biomarkers
P-Cadherin	P22223	cell adhesion, cell signaling
PC9/PCSK9	Q8NBP7	cardiac biomarkers
PDGF-A	P04085	growth factors
PDGF-B	P01127	growth factors
PDGF-A/B	P04085 P01127	cardiac biomarkers
PDGF-C	Q9NRA1	cardiac biomarkers
PDGFR-β (total)	P09619	cardiovascular, neurobiology, neurodegeneration
PR/PGR	P06401	reproductive biology
Pentraxin 3	P26022	immunity, infection, inflammation

Human

Analyte	UniProt ID	Common Applications
Perforin	P14222	immuno-oncology
Periostin/OSF-2	Q15063	inflammation, oncology
PF-4/CXCL4	P02776	cytokines & chemokines
PRAS40 (total)	Q96B36	phosphoproteins, intercellular signaling
PRDX-1	Q06830	oxidative stress, redox homeostatsis
PRDX6	P30041	oxidative stress, redox homeostatsis
Presenilin-1 NTF	P49768	neurobiology, neurodegeneration
Procalcitonin	P01258	immunology/inflammation
proCollagen alpha-1	P02452	bone disorders
proCollagen II	P02458	bone disorders
Progranulin	P28799	oncology & cancer
Prolactin	P01236	fertility
proMMP-9	P14780	cardiovascular disorders, immuno-oncology
proMMP-10	P09238	Oncology & cancer, cardiac injury, toxicology
proMMP-13	P45452	immuno-oncology
Protein C Receptor	Q9UNN8	cardiac biomarkers, cardiovascular
P-Selectin	P16109	cardiovascular disorders, cell adhesion
PSGL-1	Q14242	cell adhesion
PSP-D	P35247	neurobiology, neurodegeneration
PTEN (total)	P60484	phosphoproteins, intercellular signaling
PYY (active)	P10082	metabolism
RAGE (soluble)	Q15109	immunology/inflammation
RANTES	P13501	immunology/inflammation
RBP4	P04916	cardiovascular disorders, metabolism
Reg-3-alpha	Q06141	metabolic
Relaxin-2	P04090	reproductive biology
Renin	P00797	cardiac biomarkers
Resistin	Q9HD89	metabolism/obesity
S100A8/MRP8	P05109	immunity, inflammation
S100A12	P80511	immunity, inflammation
S100B	P04271	neurobiology, neurodegeneration
SAA	P0DJ18	inflammation, cardiovascular
SARS-CoV-2 N	P0DTC9	immunology/inflammation
SARS-CoV-2 Spike	P0DTC2	immunology/inflammation
SCF	P21583	cell signaling, immunology
SCFR/Kit	P10721	cardiovascular disorders, oncology
Sclerostin	Q9BQB4	bone disorders, kidney injury
SerpinA4	P29622	other markers
Serpin A12/ Vaspin	Q8IW75	metabolism/obesity
Serpin E1 (active)	P05121	cardiovascular disorders
Serpin E1 (inactive)	P05121	cardiovascular disorders
Serpin E1 (total)	P05121	cardiovascular disorders
Serpin F1/PEDF	P36955	angiogenesis and vascular, bone disorders
Serpin F2	P08697	angiogenesis, cardiovascular disorders

Human

Analyte	UniProt ID	Common Applications
SHBG	P04278	reproductive biology
SOD2	P04179	phosphoproteins, intercellular signaling
SPINK-1	P00995	metabolic, oncology & cancer
Spk1	Q9NYA1	vascular immunoassays
SR-PSOX/CXCL16	Q9H2A7	immunology/inflammation, oncology & cancer
Survivin/BIRC5	O15392	oncology & cancer
Syndecan-1	P18827	metabolic, oncology & cancer
Syndecan-4	P31431	cardiac injury, oncology & cancer, toxicology
TACI/TNFRSF13	O14836	immuno-oncology
Tau (total)	P10636	neurobiology, neurodegeneration
TDP-43	Q13148	neurobiology, neurodegeneration
TECH/CCL25	O15444	cytokines & chemokines
Tenascin C	P24821	cancer, wound healing
TFF2	Q03403	metabolic
TFF3	Q07654	inflammation, wound healing
TFPI	P10646	oncology & cancer, toxicology
TGF-α	P01135	immuno-oncology
TGF-β RII	P37173	immuno-oncology
TGM-2	P21980	metabolic, immunology/ inflammation
Thrombomodulin	P07204	cardiovascular disorders, hemostasis
Thyroglobulin	P01266	oncology & cancer
TIMP-1	P01033	angiogenesis, cancer, cardiovascular disorders
TIMP-3	P25625	oncology & cancer
TIMP-4	Q99727	oncology & cancer, cardiac injury, toxicology
TLR2	O60603	oncology & cancer
TNFAIP6/TSG-6	P98066	inflammation
TNF-RI	P19438	apoptosis, immunity, inflammation
TNF-RII	P20333	apoptosis, immunity, inflammation
TNFRSF10C	O14798	cancer, cell signaling
tPA	P00750	angiogenesis and vascular
Trk-A (total)	P04629	oncology & cancer
Troponin I (cardiac)	P19429	cardiovascular disorders, toxicology
Troponin T (cardiac)	P45379	cardiovascular disorders, toxicology
TSP-1	P07996	inflammatory, oncology & cancer
TSP-2	P35442	cardiac injury, toxicology
TWEAK/TNFSF12	O43508	cytokines, immuno-oncology
TYRO-3	Q06418	oncology & cancer, neurobiology, neurodegeneration
ULBP-2	Q9BZM5	immunology/inflammation
U-PAR	Q03405	cancer, oncology
Uromodulin	P07911	inflammation, toxicology
VCAM-1	P19320	angiogenesis
VE-Cadherin	P33151	cardiovascular

Human

Analyte	UniProt ID	Common Applications
VEGFR-2/KDR	P35968	angiogenesis
VEGFR-3/Flt-4	P35916	angiogenesis
VILIP-1	P62760	cell signaling
Visfatin	P43490	immunology/inflammation, metabolic
VISTA/B7-H5	Q9H7M9	oncology & cancer
Vit D Binding Protein	P02774	metabolism
VTCN1/B7-H4	Q7Z7D3	immuno-oncology, immunology/inflammation
vWF	P04275	cardiovascular disorders, coagulation
ZnT8	Q8IWU4	metabolic, immunology/ inflammation

Mouse

Analyte	UniProt ID	Common Applications
Aβ38 (4G8)	P05067	neurodegeneration
Aβ40 (4G8)	P05067	neurodegeneration
Aβ42 (4G8)	P05067	neurodegeneration
Adiponectin	Q60994	metabolism
Amphiregulin	P31955	oncology & cancer, immunology/inflammation
AXL/UFO	Q00993	oncology & cancer
C1q receptor	O89103	cytokines & chemokines
CCL6	P27784	oncology & cancer, toxicology
CCL28	Q9JIL2	cytokines & chemokines, immunology/inflammation
CCN3	Q64299	oncology & cancer
CD14	P10810	cytokines & chemokines
CD163	Q2VLH6	toxicology
Clusterin	Q06890	apoptosis, cell signalling, toxicology
Complement C5a	P06684	oncology & cancer, immunology/inflammation
CRP	P14847	immunology/inflammation, immunogenicity
CTLA-4	P09793	immuno-oncology
CXCL15	Q9WVL7	chemokines
Cystatin C	P21460	toxicology
Decorin	P28654	oncology & cancer, bone disorders
DPPIV	P28843	oncology & cancer, immunology/inflammation
EGF	P01132	oncology & cancer
Elastase-2	Q3UP87	immunology/inflammation
Endoglin	Q63961	vascular, cardiovascular, immuno-oncology
Eotaxin-2	Q9JKC0	immunology/inflammation
Epiregulin	Q61521	oncology & cancer
E-selectin	Q00690	immunology/inflammation, oncology & cancer
FasL	P48023	immunology/inflammation, oncology & cancer
Fractalkine	O35188	cytokines & chemokines
FLT3L	P49772	growth factors, immunology/inflammation, cardiovascular
Galectin-1	P16045	oncology & cancer
Galectin-3	P16110	cardiac injury, oncology & cancer, toxicology
GAS-6/AXL-L	Q61592	oncology & cancer, immunology/inflammation
G-CSF	P09920	cytokines & chemokines, immunology/inflammation
GDF-15	Q9Z0J7	oncology & cancer
Granzyme B	Q3TZH4	immuno-oncology
HAVCR1/KIM-1	Q5QNS5	oncology & cancer
HGF	Q08048	oncology & cancer
ICAM-1	P13597	immunology/inflammation
IGF-1	P05017	growth factors, cardiovascular
IGFBP-5	Q07079	metabolic
IL-1RA	P25085	cytokines & chemokines, immunology/inflammation
IL-1α	P01582	cytokines & chemokines, immunology/inflammation

Mouse

Analyte	UniProt ID	Common Applications
IL-2Rα	P01590	cytokines & chemokines, immunology/inflammation
IL-6Rα	P22272	immunology/inflammation, oncology & cancer
IL-7	P10168	cytokines & chemokines, immunology/inflammation
IL-11	P47873	cytokines & chemokines, oncology & cancer
IL-15Rα	Q60819	cytokines & chemokines, immunology/inflammation
IL-18	P70380	immunology/inflammation, oncology & cancer
IL-20	Q9JKV9	cytokines & chemokines, immunology/inflammation
IL-24	Q925S4	immuno-oncology, immunology/inflammation
IL-34	Q8R1R4	metabolic, immunology/inflammation, cytokines
I-TAC	Q9JHH5	immunology/inflammation
LIX/CXCL5	Q6P56	immunology/inflammation, oncology & cancer
Lymphotactin	P47993	cytokines & chemokines
M-CSF	P07141	cytokines & chemokines, immunology/inflammation
Meteorin-like	Q8VE43	cytokines & chemokines, immunology/inflammation
MIF	P34884	immunology/inflammation
MIG	P18340	cytokines & chemokines
MIP-1γ/CCL9	P51670	immunology/inflammation
MMP-3 (total)	P28862	angiogenesis & vascular, oncology & cancer
Oncostatin-M	P53347	immunology/inflammation, oncology & cancer
Osteoprotegerin	O08712	bone disorders
PD1	Q02242	immuno-oncology
PDGF-B	P31240	intracellular signaling
PD-L1	Q9EP73	immuno-oncology
Pentraxin 3	P48759	immunology/Inflammation
Periostin/OSF-2	Q62009	oncology & cancer
PF-4/Cxcl4	Q9Z126	cytokines & chemokines
Prolactin	P06879	immunology/inflammation
PSP-D	P50404	oncology & cancer
RAGE (soluble)	Q62151	immunology/inflammation, neurobiology, neurodegeneration, oncology & cancer
RANKL/TNFSF11	O35235	cytokines & chemokines, oncology & cancer
RBP4	Q00724	cardiovascular disorders, metabolism
Resistin	Q99P87	inflammation, metabolism
S100A8/MRP8	P27005	immunology/inflammation, oncology & cancer
SAA	multiple	inflammation, cardiovascular
SR-PSOX/CXCL16	Q8BSU2	immunology/inflammation, oncology & cancer
Tau (total)	P10637	neurodegeneration
TIMP-1	P12032	angiogenesis, cancer, cardiovascular
TNF-RII	P25119	apoptosis, immunity, inflammation
TRAIL	P50592	oncology & cancer
TREM-1	Q9JKE2	cytokines & chemokines

Mouse

Analyte	UniProt ID	Common Applications
TSLP	Q9JIE6	immunology/inflammation
VCAM-1	P29533	immunology/inflammation
VEGF-D	P97946	vascular, oncology & cancer
VEGFR-1/Flt-1	P35969	angiogenesis
YM1	O35744	immunology/inflammation

Rat

Analyte	UniProt ID	Common Applications
A2M	P06238	cardiovascular disorders, toxicology
Aβ38 (4G8)	P05067	neurodegeneration
Aβ40 (4G8)	P05067	neurodegeneration
Aβ42 (4G8)	P05067	neurodegeneration
Adiponectin	Q8K3R4	inflammation, metabolism/obesity
AGP	P02764	immunology, inflammation
Albumin	P02770	kidney injury
Cystatin C	P14841	toxicology
β-NGF	P25427	neurobiology, neurodegeneration
EPO	P29676	autoimmune disorders, toxicology
Fractalkine	O55145	neurobiology, neurodegeneration, immunology/inflammation
GM-CSF	P48750	immunity, inflammation, oncology
GRO-β/CXCL2		immunology/inflammation, oncology & cancer
HAVCR1/KIM-1	O54947	infectious disease, toxicology
IFN-γ	P01581	inflammation, neurodegeneration, toxicology
IL-1α	P16598	inflammation, neurodegeneration
IL-1β	Q63264	inflammation, neurodegeneration
IL-2	P17108	infectious disease, inflammation
IL-4	P20096	immunology, inflammation
IL-5	Q08125	immunology, inflammation
IL-6	P20607	cardiovascular disorders, inflammation
IL-10	P29456	infectious disease, inflammation
IL-13	P42203	infectious disease, inflammation
IL-17A	Q61453	immunology/inflammation
IL-18	P97636	immunology/inflammation
KC/GRO	P14095	cardiovascular disorders, inflammation
MCP-1	P14844	cardiovascular disorders, neurodegeneration
MIP-3α	P97884	immunology, inflammation
NGAL/LCN2	P30152	oncology, toxicology
Osteopontin	P08721	bone disorders, cancer, inflammation
Resistin	Q99P87	metabolic
TIMP-1	P30120	oncology
TNF-α	P16599	inflammation
TNF-RII	P16599	immunology, inflammation
TREM-1	D4ABU7	cytokines & chemokines
VEGF-A	P16612	cardiovascular disorders

NHP

Analyte	UniProt ID	Common Applications
Alpha-amylase 2A	P04746	metabolism
CD177	A0A1D-5QCX9	immunology/inflammation

Design Your Assay Using R-PLEX Antibody Sets

Visit **www.mesoscale.com/r-plex** to view the following resources, which will assist in building an assay using R-PLEX Antibody Sets:

- R-PLEX Product Inserts
- R-PLEX Datasheets
- R-PLEX Assay/Antibody Diluent Combinations
- R-PLEX Assay Diluent Volume Calculation

MSD GOLD for Assay Development: Quality and Reliability

MSD GOLD products are a signature of our commitment to quality, consistency, and high performance in assay development. MSD GOLD plates and reagents are suitable for a wide range of research applications from biomarker discovery to personalized medicine.

- Best suited for long-term studies
- Long shelf life
- Detailed certificate of analysis
- Exceptional lot-to-lot reproducibility
- High precision
- Stringent quality control procedures

MSD GOLD Streptavidin Plate Reproducibility
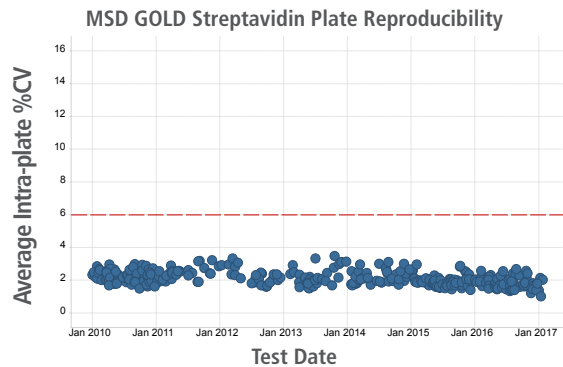
To date, over 300 lots of MSD GOLD Streptavidin plates have been analyzed, showing an average intra-plate %CV of less than 4%. QC specification is 6%, depicted by the red dashed line.

Inter-Lot Assay Reproducibility of MSD GOLD Streptavidin Plates
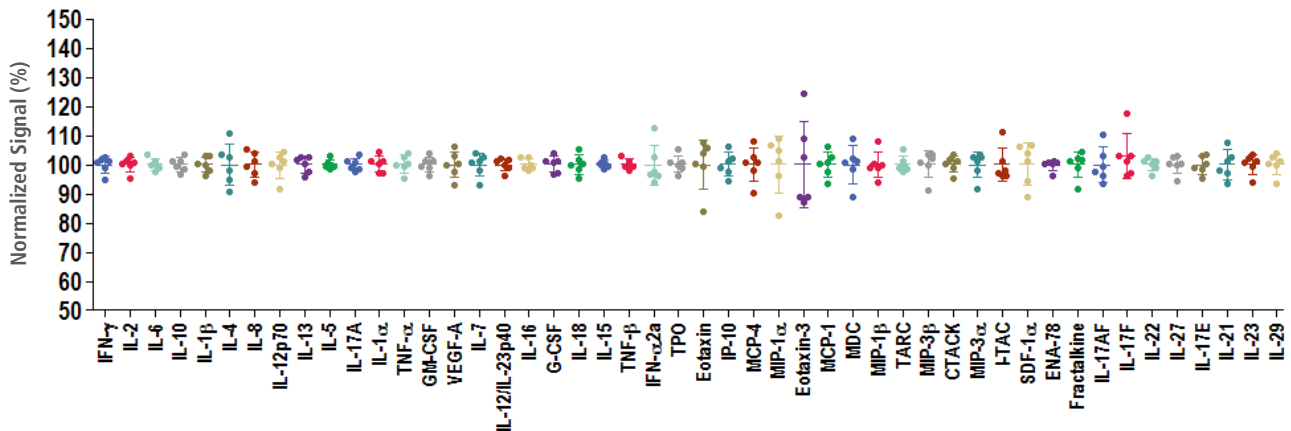
A total of 48 individual biomarker assays were developed on MSD GOLD Streptavidin plates. Calibrator signals (ranging from 200 to 22,000 ECL counts across all assays) were normalized to the average signal measured across six plate lots for each assay, and the normalized signal from each plate lot is shown above. Each data point represents the average of three replicates on a plate, with the error bars representing the inter-lot %CVs. All assays tested produced inter-lot %CVs of less than 10.0% with the exception of Eotaxin-3 (14.8%).

MSD GOLD Plates and Accessories

Plates	Cat. No.
MSD GOLD 96-well Streptavidin SECTOR Plates	L15SA
MSD GOLD 96-well Small Spot Streptavidin SECTOR Plates	L45SA
Labeling Reagent (available in 150 nmol and 2 µmol sizes)	**Cat. No.**
SULFO-TAG NHS-Ester	R91AO
Conjugation Packs (available in ≤200 µg and ≤1 mg sizes)	**Cat. No.**
MSD GOLD SULFO-TAG Conjugation Pack (5 reactions)	R31AA
Read Buffers	**Cat. No.**
MSD GOLD Read Buffer A	R92TG
MSD GOLD Read Buffer B	R60AM

Additional MSD GOLD products can be found at www.mesoscale.com.

Ready-to-use MSD GOLD Read Buffer B: multi-lot reproducibility data demonstrate that this new read buffer reduces variability and ensures reproducibility of ECL signals across experiments.

For Research Use Only. Not for use in diagnostic procedures.

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MSD Assay Services and Bioanalytical Laboratory

In pre-clinical and clinical research, there is an ever-increasing need for high-quality tests to guide decision making. MSD's Assay Services and Bioanalytical Laboratory offer a seamless process from assay development to sample testing for your application. We have successfully collaborated with top biotech and pharmaceutical clients to develop assays ranging from immunoassays for secreted proteins and phosphoproteins to assays that measure protein-protein interactions, serology, and immunogenicity. Depending on your need, assays may be developed for basic research purposes or designed to include additional qualification and validation.

Assay Services

- Employ structured processes to develop high-quality assays
- Provide unique early access to new MSD technologies where needed
- Choose assay development services depending on your specific needs

Bioanalytical Laboratory (BAL)

- Seamless and efficient transfer from MSD's Assay Service
- Sample testing for exploratory endpoints through GLP/GCLP testing
- Access to newly developed MSD assays for testing before commercial release

Method Development	Method Qualification and Validation	Sample Testing
▪ Select platform	▪ Fit-for-purpose based on study needs	▪ Clinical study sample testing
▪ Coat or conjugate antibodies/proteins	▪ Build kit lot reagents	▪ Data transfer
▪ Screen and select antibodies/proteins	▪ Perform accuracy and precision	▪ Bioanalytical testing report
▪ Optimize reagents, protocol, and sample dilution	▪ Evaluate matrix selectivity, specificity, and stability	
▪ Evaluate matrix tolerance, assay sensitivity, and reproducibility	▪ Generate validation report	

Assay Services Highlights

Assay Development Services

Let MSD's experienced scientists develop high-quality multiplex assays for your application.

U-PLEX
S-PLEX
R-PLEX
V-PLEX
N-PLEX®
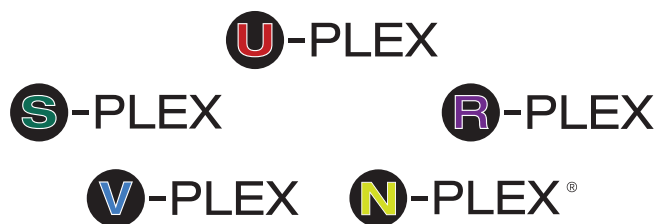
Bioanalytical Laboratory Highlights

Quality
Established QMS that complies with the applicable principles of GLP and GCLP

Speed
Projects can be initiated very quickly due to our large internal scientific team

Customized
Assays developed in standard (e.g., V-PLEX, S-PLEX) and novel (e.g., N-PLEX®) formats that are not readily available via CROs

Expertise
Experienced in custom assay development for Biomarker/Anti-drug Antibody/Pharmacokinetic (BM/ADA/PK) and Serology assays that can seamlessly transfer into the BAL for sample testing

T-PLEX

T-PLEX assays offer a diverse menu and provide greater consistency, sensitivity, and dynamic range than western blots or ELISAs. To facilitate targeted disease research, we have assembled a variety of disease-specific panels that include popular analytes.

	Secreted Biomarker Assays	Intracellular Biomarker Assays
Description and Common Usage	Inflammation, Cytokine Research, Immunology	Cell Signaling Research, Phosphorylation States, Neurobiological Applications
Sample Types*	Serum, Plasma, Urine, Cell Culture Supernatant	Cell Lysates, Cell Culture Supernatant, Cerebrospinal Fluid
Sample Volume Required*	As little as 25 µL per well	As little as 0.25 µg cell lysate per well
Calibrator Included	Yes	No
Format	Available in both singleplex and multiplex 96-well formats; 384-well custom formats available.	
Typical Assay Run Time	T-PLEX assay workflow is approximately 3 hours. Plate read time is 90 seconds.	

*Please consult the product insert for specific information about each analyte of interest.

Cytokine/Inflammation Panels

Species	Name	Analytes
Canine	Proinflammatory Panel 3	IL-2, IL-6, IL-8, TNF-α
Rat	Inflammation Panel 1	NGAL, TSP-1, TIMP-1, MCP-1
Human	MMP 3-Plex Kit	MMP-1, MMP-3, MMP-9

Toxicology/Injury Panels

Species	Name	Analytes
Rat	Inflammation Panel 1	NGAL, TSP-1, TIMP-1, MCP-1
Rat	Muscle Injury Panel 2	TIMP-1, CK
Mouse	Muscle Injury Panel 3	cTnI, FABP3, Myl3, sTnI
Rat	Kidney Injury Panel 1	Albumin, TIM-1, N-GAL, Osteopontin
Human	Kidney Injury Panel 3	Calbindin, Clusterin, KIM-1, Osteoactivin, TFF3, VEGF-A

Isotyping Panels

Species	Name	Analytes
Human, NHP	Isotyping Panel 1	IgA, IgG, IgM
Mouse	Isotyping Panel 1	IgA, IgG1, IgG2a, IgG2b, IgG3, IgM

Metabolic Panels

Species	Analytes
Mouse	Leptin, Insulin

Neurodegeneration Panels

Species	Analytes
Human	sAPPα, sAPPβ
Human, Mouse	Tau (pT231)/Total Tau

Intracellular Signaling Panels

Species	Name	Analytes
Human	Insulin Signaling Panel (Phosphoprotein)	pIR, pIGF-1R, pIRS-1
Human, Mouse, Rat	Phospho-STAT Panel	pSTAT3, pSTAT4, pSTAT5a,b

Activated/Total Panels

Species	Analytes
Human, Mouse, Rat	Akt pS473/Total
Human	Caspase-3 (Cl. p20/p17)/Total
Human, Mouse, Rat	ERK1/2 (pT202/pY204)/(pT185/pY187)/Total
Human, Mouse, Rat	p38 (pT180/pY182)/Total
Human, Mouse, Rat	STAT5a,b pY694/Total

Secreted Analytes

Analyte	Species
sAPPα	H
sAPPβ	H
B2M	R
BNP	R
cAMP	H, M, R
Clusterin	R
GM-CSF	H, M, R
IFN-β	H
IgA	H, N
IgG	H, N
IgM	H, N
IL-1β	M
IL-2	C
IL-6	C
IL-8	C
Insulin	R
KIM-1/TIM-1/HAVCR	R
MCP-1 (CCL2)	R
MMP-1	H
MMP-3	H
MMP-9	H
Myeloperoxidase (MPO)	H
NT-proANP	R
NT-proBNP	R
Osteopontin	R
Tau	H, M
Tau (pT231)	H, M
TIMP-1	H
TNF-α	C
sTroponin I (sTnI)	R
Troponin ITC Complex	R

C=Canine, H=Human, M=Mouse, N=NHP, R=Rat

Intracellular Analytes

Analyte	Species
4E-BP1 (pT37/46)	H, M
Akt (pT308)	H, M
Caspase-3	H
CHOP	H, M, R
EGFR	H
ERK-1/2	H, M, R
ERK-1/2(pT202/pY204)(pT185/pY187)	H, M, R
FRS2 (pY196)	H, M
FRS2 (pY436)	H, M
GAPDH	H, N
HIF-1α	H, M, R
Histone H3 (pS10)	H, M, R
IRS-1 (S312)	H
p38 (pT180/pY182)	H, M, R
PRAS40 (pT246)	H, M, R
PSD-95	H, M, R
S6RP	H, M, N, R
STAT3	H, M, R
STAT3 (pY705)	H, M, R
STAT4	H, M, R
STAT4 (pY693)	H, M, R
STAT5a/b	H, M, R
STAT5a/b (pY694)	H, M, R
Wnt3a	H, M, R

H=Human, M=Mouse, N=NHP, R=Rat

Phospho-ERK1/2
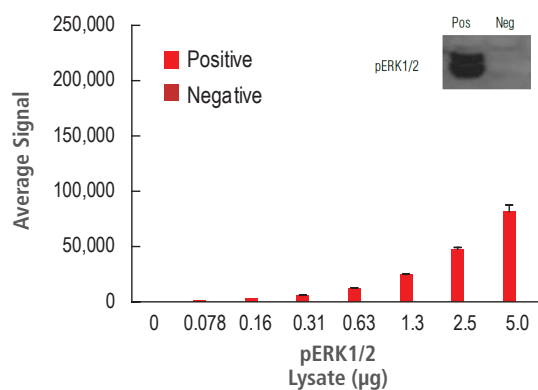
Total ERK1/2
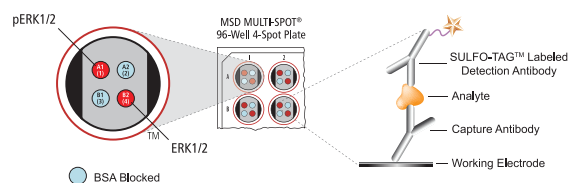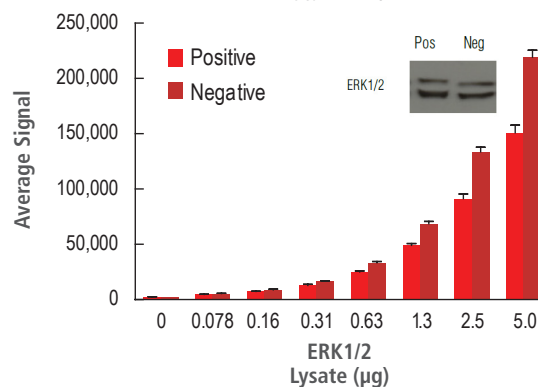
Sample data generated with MULTI-SPOT Phospho (Thr202/Tyr204; Thr185/Tyr187)/Total ERK1/2 Assay. Increased signal for phosphorylated ERK1/2 was observed with only pERK1/2-positive cell lysate. Total ERK1/2 signal increased throughout the titration of both pERK1/2 positive and negative cell lysates. Results correlate with Western blots (inset). The spot map for the assay is shown below the graphs.

	V	S	U	R	T
V: V-PLEX					
S: S-PLEX					
U: U-PLEX					
R: R-PLEX					
T: T-PLEX					

Analytes	V	S	U	R	T
α-GST				•	
α-Synuclein			•		
β-NGF			•	•	
4-1BB/TNFRSF9				•	
4-1BBL/TNFSF9				•	
4E-BP1 (pT37/46)					•
6CKine/CCL21			•	•	
A2M			•	•	•
Aβ (total)				•	
Aβ38 (4G8)	•		•		
Aβ38 (6E10)	•		•		
Aβ40 (4G8)	•		•		
Aβ40 (6E10)	•		•		
Aβ42 (4G8)	•		•		
Aβ42 (6E10)	•				
ACE			•		
ADAM17			•		
ADAM9			•		
ADAM-TS 4			•		
ADAM-TS 13			•		
Adiponectin		•			
ADP-ribosyl cyclase			•		
AFP			•		
AGP			•	•	
Aiolos			•		
Akt (pT308)					•
Akt (total)					•
Albumin			•	•	
Alpha Defensin 1			•		
Alpha-amylase 1			•		
Alpha-amylase 2A			•		
AMICA1			•		
Amphiregulin			•		
Ang-1			•		
Ang-2			•		
Ang-4			•		
Angiogenin			•		
Ang-like 3			•		
Ang-like 4			•		
Ang-like 6			•		
Annexin A1			•		
Antileukoproteinase			•		
ApoA1			•	•	
ApoC3			•	•	
ApoE			•		
APP (total)			•		
APRIL/TNFSF13			•		
Arginase-1			•		
Autotaxin			•		
AXL/UFO			•		
B2M			•	•	•
B7-H2/ICOS-L			•		
BAFF		•			
BAFF-R/TNFRSF13C		•			
Basigin			•		
BCA-1/BLC			•	•	
Bcl-2			•		
Bcl-X/Bcl2-L-1			•		
BCMA/TNFRSF17		•			
BDNF		•			
Betacellulin			•		
Bikunin			•		
BIM/Bcl2-L-11			•		
BMP-10			•		
BMP-11/GDF-11			•		
BMP-2			•		
BMP-4			•		
BMP-5			•		
BMP-6			•		
BMP-7			•		
BMP-9/GDF-2			•		
BNP				•	•
BTLA			•		

Analytes	V	S	U	R	T
C1q receptor				•	
CA1			•	•	
CA125				•	
CA15-3				•	
CA50				•	
CA9				•	
Calbindin				•	•
Calprotectin				•	
cAMP					•
Caspase-1			•	•	
Caspase-3					•
Cathepsin B (total)				•	
Cathepsin S (total)				•	
Cathepsin-D				•	
CCL23				•	
CCN1				•	
CD14				•	
CD163				•	
CD177				•	
CD20			•		
CD200				•	
CD21/CR2				•	
CD22				•	
CD27			•		
CD276/B7-H3			•	•	
CD28			•		
CD30/TNFRSF8				•	
CD31/PECAM-1				•	
CD40			•	•	
CD40/TNFRSF5				•	
CD40L (soluble)			•		
CD47				•	
CD5				•	
CD5L				•	
CD63 (EV)				•	
CD80/B7-1				•	
CD81 (EV)				•	
CD8α				•	
CD9 (EV)				•	
CEACAM-1				•	
CEACAM-5				•	
CEACAM-7/CGM2				•	
Chemerin				•	
Cholecystokinin				•	
CHOP					•
Chromogranin-A				•	
cIAP1				•	
cIAP2				•	
CK					•
CK Beta 8-1/CCL23				•	
CKBB				•	
Clusterin			•	•	•
CNTF				•	
COMP/TSP-5				•	
Complement C3				•	
Complement C3a				•	
Complement C5a				•	
Complement C9			•	•	
Complement factor D			•	•	
Contactin-2/TAG-1				•	
Corin/ATC				•	
C-Peptide	•		•		
CRP	•		•	•	
CTACK			•		
CTLA-4		•	•	•	
CXCL15				•	
Cystatin B				•	
Cystatin C			•	•	
Cytokeratin-19				•	
Cytokeratin-8				•	
Decorin				•	
Delta-like 1				•	
DKK-1				•	

Analytes	V	S	U	R	T
DKK-3				•	
DKK-4				•	
DPPIV			•	•	
E-Cadherin				•	
EGF				•	
EGFR				•	•
Elastas				•	
Elastase-2				•	
ENA-78		•			
Endoglin				•	
Endogline-2				•	
Endostatin				•	
Endothelin-1				•	
Enolase 2				•	
eNOS				•	
Eotaxin	•		•		
Eotaxin-2			•	•	
Eotaxin-3	•	•	•		
Ep-CAM				•	
Epiregulin				•	
EPO			•	•	
ER-α				•	
ErbB2				•	
ERK-1/2 (total)				•	•
ERK-1/2 (pT202/pY204) (pT185/pY187)					•
E-Selectin				•	
FABP2/I-FABP				•	
FABP3/H-FABP				•	
FABP4/A-FABP				•	
Factor VII			•	•	
FAP-α/SEPR				•	
Fas (soluble)				•	
FasL				•	
Fc-epsilon RII				•	
Ferritin				•	
FGF (acidic)				•	
FGF (basic)	•		•		•
FGF-19				•	
FGF-21		•			
FGF-23		•			
FGF-7				•	
FGF-BP1				•	
Fibronectin				•	
Flt-1/VEGFR-1	•				•
FLT3L			•	•	
Folate R alpha				•	
Follistatin				•	
Fractalkine			•	•	
FRS2 (pY196)					•
FRS2 (pY436)					•
FSH		•			
Galectin-1				•	
Galectin-3				•	
GAD2/GAD-65				•	
GAPDH					•
GAS-6/AXL-L				•	
GCPII/PSMA				•	
G-CSF		•	•		
GDF-15				•	
GDF-8				•	
Gelsolin				•	
GFAP				•	
Ghrelin (active)			•		
Ghrelin (total)			•		
GIP (active)	•		•		
GIP (inactive)			•		
GIP (total)				•	
GITR/TNFRSF18				•	
GITRL/TNFSF18				•	
Glicentin			•		
GLP-1 (active)	•		•		

Analytes	V	S	U	R	T
GLP-1 (inactive)			•	•	
GLP-1 (total)	•		•	•	
Glucagon	•		•	•	
GM-CSF	•	•	•	•	•
gp130 (soluble)				•	
Granulysin				•	
Granzyme A			•	•	
Granzyme B			•	•	•
GRO-α				•	
GRO-β/CXCL2				•	
Growth Hormone				•	
GRP				•	
Haptoglobin				•	
HAVCR1/KIM-1				•	•
HAVCR2/TIM-3				•	
HB-EGF				•	
HCC-4/CCL16				•	
HE4/WFDC2				•	
Heme Oxygenase 1				•	
Hemoglobin alpha				•	
Hemopexin				•	
Hepcidin				•	
HGF				•	
HIF-1α					•
Histone H3 (pS10)					•
HSP27/HspB1				•	
HSP70				•	
HVEM/TNFRSF14				•	
Hyaluronidase-1				•	
I-309			•		
IA-2/R-PTP-N				•	
ICAM-1	•		•	•	•
ICAM-3				•	•
ICOS				•	
ICOS-L/B7-H2				•	
IFN-α			•		
IFN-α2a		•	•		
IFN-β		•	•		•
IFN-γ	•	•	•	•	•
IgA					•
IgE				•	
IGF-1				•	
IGF-1R				•	
IGF-2R/CI-M6P-R				•	
IGFBP-1				•	
IGFBP-2				•	
IGFBP-3				•	
IGFBP-4				•	
IGFBP-5				•	
IGFBP-6				•	
IGFBP-8				•	
IgG					•
IgM					•
Ikaros				•	
IL-1α	•		•		
IL-1β	•	•	•	•	•
IL-2	•	•	•	•	•
IL-2Rα				•	
IL-3	•	•	•		
IL-4	•	•	•	•	•
IL-5	•	•	•	•	•
IL-6	•	•	•	•	•
IL-6R				•	
IL-6Rα				•	
IL-7	•		•		
IL-8	•		•	•	
IL-9	•	•	•		
IL-10	•	•	•	•	•
IL-11				•	
IL-12/IL-23p40	•		•		
IL-12p70	•	•	•		
IL-13	•	•	•	•	•
IL-15	•		•	•	

Analytes	V	S	U	R	T
IL-15Rα				•	
IL-16	•		•		
IL-17A	•	•	•	•	
IL-17A/F	•		•		
IL-17B	•		•		
IL-17C	•		•		
IL-17D	•		•		
IL-17E/IL-25			•		
IL-17F			•		
IL-17RB				•	
IL-18			•	•	
IL-18BP			•		
IL-19			•		
IL-20			•		
IL-1R2			•		
IL-1RA	•		•		
IL1RL1/ST2				•	
IL-21	•		•		
IL-22	•	•	•		
IL-22Rα2				•	
IL-23	•		•		
IL-23R			•		
IL-24			•		
IL-27	•		•		
IL-27p28/IL-30	•		•		
IL-28A/IFN-λ2				•	
IL-28B/IFN-l3				•	
IL-29/IFN-l1			•		
IL-31	•		•		
IL-33	•		•		
IL-34			•		
IL-36γ			•		
IL-36RA			•		
Influenza A NP			•		
Influenza B NP			•		
Insulin	•		•		•
IP-10	•		•		
IR (soluble)			•		
IRS-1			•		
IRS-1 (S312)					•
I-TAC		•	•		
Jagged-1			•		
Kallikrein 3/PSA			•		
KC/GRO	•		•		
Ki-67			•		
Klotho			•		
Lactotransferrin			•		
LAG3		•			
LBP			•		
LDL Receptor			•		
Legumain			•		
Leptin	•		•		•
LH			•		
LIGHT/TNFSF14			•		
LIX/CXCL5			•		
LOX-1/OLR1			•		
LRRK2			•		
LRRK2 (pS935)			•		
Lymphotactin			•		
LYVE-1			•		
MAdCAM-1			•		
MCAM/CD146			•		
Mcl-1/BAK Complex			•		
Mcl-1/Bcl2-L-3			•		
Mcl-1/BIM Complex			•		
MCP-1	•		•	•	•
MCP-2			•		
MCP-3			•		
MCP-4	•		•		
MCP-5/CCL12			•		
M-CSF			•		
MDC	•		•		
MerTK				•	

Analytes	V	S	U	R	T
Mesothelin				•	
Met (soluble)				•	
Meteorin-like				•	
MIC-A				•	
MIC-B				•	
MIF			•	•	
MIG				•	
MIP-1α	•		•		
MIP-1β	•		•		
MIP-1γ/CCL9				•	
MIP-2	•		•		
MIP-3α	•		•	•	
MIP-3β	•		•		
MIP-4				•	
MIP-5			•		
MMP-1				•	•
MMP-2				•	
MMP-3				•	•
MMP-3 (total)			•		
MMP-7				•	
MMP-8				•	
MMP-9					•
MMP-9 (active)				•	
MMP-9 (total)			•	•	
MMP-10 (total)			•		
MMP-14				•	
MPIF-1/CCL23			•		
MPO				•	•
MSP				•	
MyD88			•		
Myl3					•
Myoglobin				•	
Myosin BP (cardiac)				•	
NAP-2/CXCL7				•	
N-Cadherin				•	
NCAM-1				•	
Nectin-4				•	
Nephrin				•	
Neprilysin				•	
Nesfatin-1				•	
Neurofilament H				•	
Neurofilament L		•			
Neuronal pentraxin-1				•	
Neuropilin-1				•	
Neurotrophin-3				•	
Neurotrophin-4				•	
NGAL/LCN2			•	•	•
NPY				•	
NT-proANP					•
NT-ProBNP				•	•
Oncostatin-M				•	
Osteoactivin				•	•
Osteocalcin				•	
Osteonectin				•	
Osteopontin				•	•
Osteoprotegerin				•	
OX40/TNFRSF4			•		
OX40L				•	
OXM/Glicentin				•	
p38 (pT180/pY182)				•	•
PAF-AH				•	
PC9/PCSK9				•	
P-Cadherin				•	
PD1				•	
PD1 (epitope 1)			•		
PD1 (epitope 2)			•		
PDGF-A				•	
PDGF-A/B				•	
PDGF-B				•	
PDGF-C				•	
PD-L1				•	
PD-L1 (epitope 1)			•		
PD-L2			•		

Analytes	V	S	U	R	T
Pentraxin 3				•	
Perforin				•	
Periostin/OSF-2				•	
PF-4/CXCL4				•	
PIGF	•		•		
PP	•		•		
PRAS40 (total)				•	•
PRAS40 (pT246)					•
PRDX-1				•	
PRDX6				•	
Presenilin-1 NTF				•	
proCollagen alpha-1				•	
proCollagen II				•	
Progranulin				•	
Proinsulin		•			
Prolactin				•	
proMMP-10				•	
proMMP-13				•	
proMMP-9				•	
Protein C Receptor				•	
PSD-95					•
PTEN (total)				•	
P-Selectin				•	
PSGL-1				•	
PSP-D				•	
PYY (active)				•	
PYY (total)		•			
RAGE (soluble)				•	
RANKL/TNFSF11			•	•	
RANTES			•	•	
RBP4			•	•	
Reg-3-alpha				•	
Relaxin-2				•	
Renin				•	
Resistin				•	
S100A12				•	
S100A8/MRP8				•	
S100B				•	
S6RP					•
SAA	•		•	•	
sAPPα					•
sAPPb					•
SARS-CoV-2 N		•		•	
SARS-CoV-2 Spike		•		•	
SCF				•	
SCFR/Kit				•	
Sclerostin				•	
SDF-1α		•			
Serpin A1			•	•	
Serpin A12/ Vaspin				•	
Serpin E1 (active)				•	
Serpin E1 (inactive)				•	
Serpin E1 (total)				•	
Serpin F1/PEDF				•	
Serpin F2				•	
SerpinA4				•	
SHBG		•		•	
SOD2				•	
SPINK-1				•	
Spk1				•	
SR-PSOX/CXCL16				•	
STAT3					•
STAT3 (pY705)					•
STAT4					•
STAT4 (pY693)					•
STAT5a/b					•
STAT5a/b (pY694)					•
sTfR-1		•			
sTroponin I (sTnI)					
Syndecan-1				•	
Syndecan-4				•	
TACI/TNFRSF13				•	
TARC	•		•		

Analytes	V	S	U	R	T
Tau	•				
Tau (pT181)		•			
Tau (pT231)		•			
Tau (pT217)		•			
Tau (total)		•		•	•
TDP-43				•	
TECH/CCL25				•	
Tenascin C				•	
TFF2				•	
TFF3				•	•
TFPI				•	
TfR-1 (soluble)			•		
TGF-α				•	
TGF-b RII				•	
TGF-b1			•		
TGF-b2			•		
TGF-b3			•		
TGM-2				•	
Thrombomodulin				•	
Tie-2	•		•		
TIGIT			•		
TIMP-1				•	•
TIMP-3				•	
TLR1			•		
TNF-α	•	•	•	•	•
TNFAIP6/TSG-6				•	
TNF-β	•	•	•		
TNF-RI				•	•
TNF-RII				•	
TNFRSF10C				•	
tPA				•	
TPO			•		
TRAIL				•	•
TREM-1				•	
Trk-A (total)				•	
Troponin I (cardiac)				•	•
Troponin ITC Complex					•
Troponin T (cardiac)				•	•
TSLP	•	•	•	•	
TSP-1				•	•
TSP-2				•	
TWEAK/TNFSF12				•	
TYRO-3				•	
UCH-L1				•	
ULBP-2				•	
U-PAR				•	
Uromodulin				•	
VCAM-1	•		•	•	
VEGF-A	•		•	•	
VEGF-C	•				
VEGF-D	•		•	•	
VEGFR-2/KDR				•	
VEGFR-3/Flt-4				•	
VILIP-1				•	
Visfatin				•	
VISTA/B7-H5				•	
Vit D Binding Protein				•	
VTCN1/B7-H4				•	
vWF			•	•	
Wnt3α					•
YKL-40			•		
YM1				•	
ZnT8				•	

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