



MESO SCALE DISCOVERY®

www.mesoscale.com/Assays

High Performance Biomarker Assays and Services Singleplex and Multiplex Assay List 2017 Issue 2

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R-PLEX™

NEW Matched Antibody Sets
for Singleplex and Multiplex
Assays with the
Performance Benefits of
MSD MULTI-ARRAY® Technology

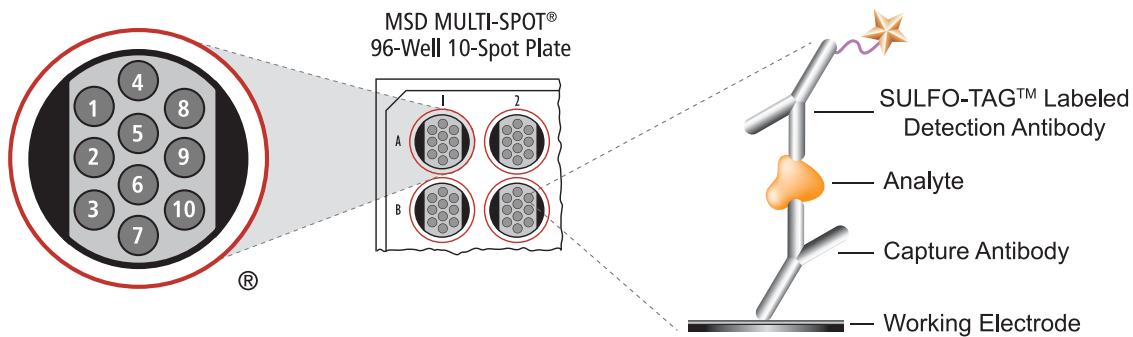
The MSD Advantage

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

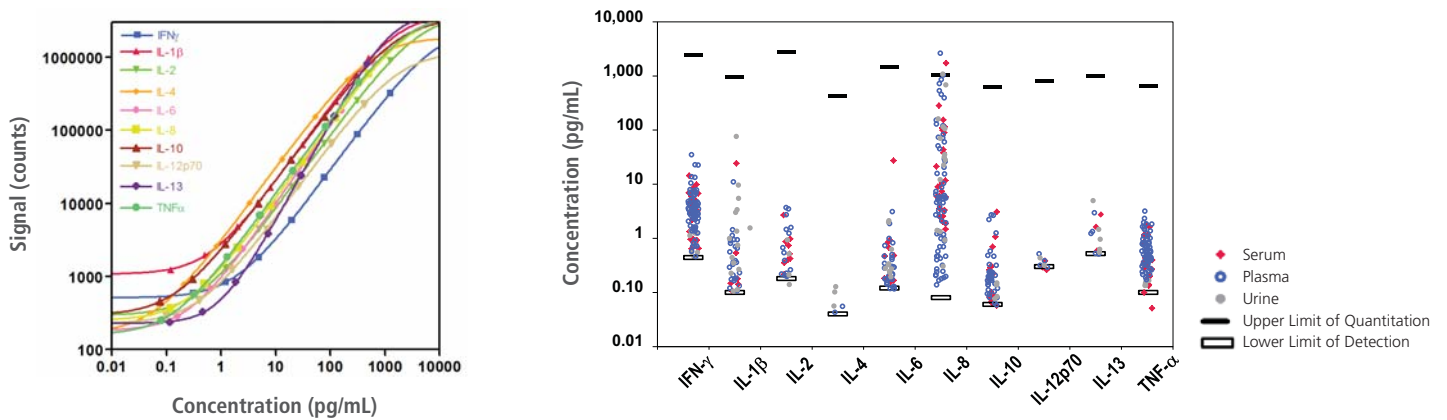
MULTI-ARRAY Technology

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.



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 is illustrated above, which enables the measurement of both normal and elevated analyte levels at a single dilution point. Quantification of multiple sample types is also shown, highlighting the assay's sensitivity, versatility, and matrix tolerance.

Discover the Right Immunoassay for You

Meso Scale Discovery biomarker assays provide a rapid and convenient method for measuring the levels of single or multiple targets within a single, small-volume sample. From easy-to-build personalized multiplex assays to high performance, validated assays, MSD has the right immunoassay product to meet all your immunoassay needs.

	 R-PLEX	 U-PLEX®	STANDARD	 V-PLEX®	 S-PLEX™
Description	Matched antibody sets for building your own single or multiplex assay	Flexible, customized multiplex assays	Ready-to-use single and multiplex assay kits	Validated single and multiplex assay kits	Validated ultrasensitive singleplex assay services
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 analytical performance	Provides confidence and reliability. Analytically validated with guaranteed performance specifications	Measures proteins that are otherwise unmeasurable. Built-in selectivity for rigorous results
Analyte menu	•••••	•••••	•••••	•••	••
Format	Antibody set and calibrator	Component-based assays	Kits	Lot-matched kits	Available as sample-testing service
Multiplex	General recommendations	Optimized groups	Compatible panels	Fixed validated panels	Singleplex assays
Sample compatibility	Tested with serum and plasma	Serum, EDTA plasma, cell culture supernatants	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, plasma, cell culture supernatants, urine; CSF for neurobiology products
Pre-coated plate			•	•	NA
Validation		Components		Complete kit	NA
Component level QC	•	•		•	NA
Final kit QC			•	•	NA
COA available		• (for components)		• (for components and kits)	NA

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 GOLD plates and custom services, MSD has the right assay development product to meet all your assay development needs.

	MSD GOLD Plates and Reagents	U-PLEX Assay Development	Assay Development Services
	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. Analytically validated with guaranteed specifications.	Easily creates custom multiplex panels. Use MSD reagents or bring your own.	Provides MSD products for your specific application that are otherwise unavailable.

R-PLEX

NEW 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.

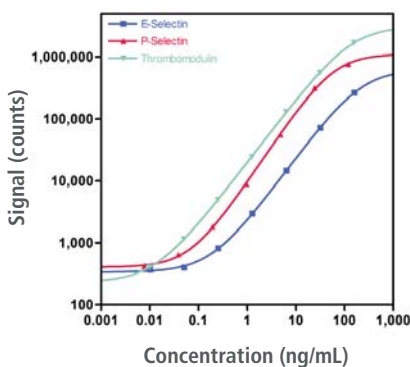
R-PLEX Antibody Set Components

- Biotinylated Capture Antibody
- SULFO-TAG labeled Detection Antibody
- Calibrator

Versatile

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 assays 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 are screened with relevant sample types including serum and plasma.

Human

Analyte	UniProt ID	Common Applications
A2M	P01023	inflammation
Adiponectin	Q15848	metabolism/obesity
AGP	P02763	aging, inflammation, metabolism
Ang-1	Q15389	angiogenesis, cardiovascular, cancer
Annexin A1	P04083	inflammation
ApoA1	P02647	atherosclerosis, metabolism/obesity
ApoC3	P02656	atherosclerosis, metabolism/obesity
BAFF-R	Q96RJ3	immunology, inflammation
BCMA	Q02223	immunology
BDNF	P23560	learning, memory
CA1	P00915	hypoxia, metabolism
CA125	Q8WXI7	cancer
CA15-3	P15941	cancer

Human

Analyte	UniProt ID	Common Applications
CA50	N/A	cancer
Calbindin	P05937	metabolism, neurobiology
Calprotectin	P05109	immunity, inflammation
Cathepsin D	P07339	cancer, neurobiology
CD31/PECAM-1	P16284	angiogenesis, cell adhesion
CEA	P06731	cancer
Clusterin	P10909	apoptosis, cell signaling, toxicology
Complement C3	P01024	cardiovascular, immunity, inflammation
Complement C9	P02748	cardiovascular, immunity, inflammation
Corin/ATC2	Q9Y5Q5	cardiovascular
Cystatin C	P01034	atherosclerosis, neurobiology, neurodegeneration, toxicology
Cytokeratin-8	P05787	cancer, cell signaling

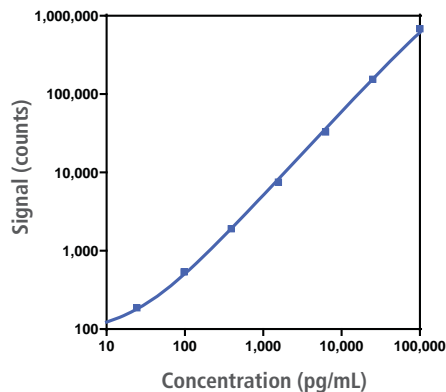
Human		
Analyte	UniProt ID	Common Applications
DPPIV	P27487	metabolism
E-Cadherin	P12830	cancer
Endoglin	P17813	angiogenesis, cancer, cardiovascular
Enolase 2	P09104	neurobiology
E-Selectin	P16581	cell adhesion, cell signaling
FAP- α /SEPR	Q12884	angiogenesis, apoptosis, cell adhesion
FasL	P48023	apoptosis, immunology
Fas (soluble)	P25445	apoptosis
FGF (basic)	P09038	angiogenesis, cancer
GDF-15	Q99988	cell signaling
Gelsolin	P06396	cell signaling
GFAP	P14136	neurobiology
GLP-1 (total)	P01275	metabolism/obesity
GLP-1 (active)	P01275	metabolism/obesity
GLP-1 (inactive)	P01275	metabolism/obesity
gp130 (soluble)	P40189	cell signaling
Haptoglobin	P00738	cardiovascular, immunity
ICAM-3	P32942	adhesion, immunology
IL-6R	P08887	immunity, immunology
LRRK2	Q55007	neurobiology, neurodegeneration
LRRK2 (pS935)	Q55007	neurobiology, neurodegeneration
Mesothelin	Q13421	cancer
MET (soluble)	P08581	cancer, cell signaling
MIG	P49682	immunity, immunology
MIP-4	P55774	cell signaling, immunity, inflammation
MMP-1	P03956	cancer, inflammation
MMP-3	P08254	angiogenesis, cancer, cardiovascular
MMP-7	P09237	angiogenesis, cancer, cardiovascular
MMP-9	P14780	angiogenesis, cancer, cardiovascular
Nectin-4	Q96NY8	cancer, infectious disease
Osteoactivin	Q14956	bone disorders, cancer
Osteocalcin	P02818	bone disorders
Osteonectin	P09486	bone disorders
Osteopontin	P10451	bone disorders, cancer, inflammation
Osteoprotegerin	O00300	bone disorders
P-Cadherin	P22223	cell adhesion, cell signaling
Pentraxin 3	P26022	immunity, infection, inflammation
PIGF	P49763	angiogenesis, cancer
PRDX-1	Q06830	oxidative stress, redox homeostasis
PRDX6	P30041	oxidative stress, redox homeostasis
P-Selectin	P16109	cardiovascular, cell adhesion
PSGL-1	Q14242	cell adhesion

Human		
Analyte	UniProt ID	Common Applications
PYY (1-36)	P10082	metabolism/obesity
RANTES	P13501	immunology, inflammation
Resistin	Q9HD89	metabolism/obesity
S100A12	P80511	immunity, inflammation
S100A8/MRP8	P05109	immunity, inflammation
SCF	P21583	cell signaling, immunology
Serpin A1	P01009	cardiovascular, immunology
Serpin A12/Vaspin	Q8IW75	metabolism/obesity
Tenascin C	P24821	cancer, wound healing
TFF3	Q07654	inflammation, wound healing
TfR-1 (soluble)	P02786	iron uptake, metabolism
Thrombomodulin	P07204	cardiovascular, hemostasis
Tie-2	Q02763	angiogenesis, cell signaling
TIMP-1	P01033	angiogenesis, cancer, cardiovascular
TNF-RI	P19438	apoptosis, immunity, inflammation
TNF-RII	P20333	apoptosis, immunity, inflammation
TNFRSF10C	O14798	cancer, cell signaling
VEGF-D	O43915	angiogenesis, cancer, cell differentiation
VILIP-1	P62760	cell signaling
vWF	P04275	cardiovascular, coagulation

Rat analytes for immunological research

Analyte	UniProt ID	Analyte	UniProt ID
EPO	P29676	IL-13	P42203
GM-CSF	P48750	KC/GRO	P14095
IL-1 α	P16598	MCP-1	P14844
IL-1 β	Q63264	MIP-3 α	P97884
IL-2	P17108	TNF- α	P16599
IL-6	P20607	VEGF-A	P16612
IL-10	P29456		

Complement C9

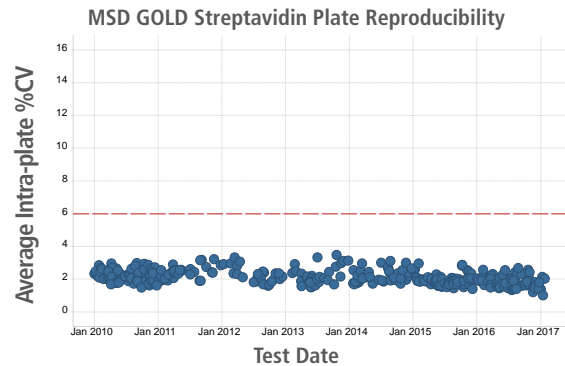


R-PLEX Complement C9 Antibody Set displays a sensitivity of 19 pg/mL and a dynamic range of 19 - 100,000 pg/mL.

MSD GOLD for Assay Development: Quality and Reliability

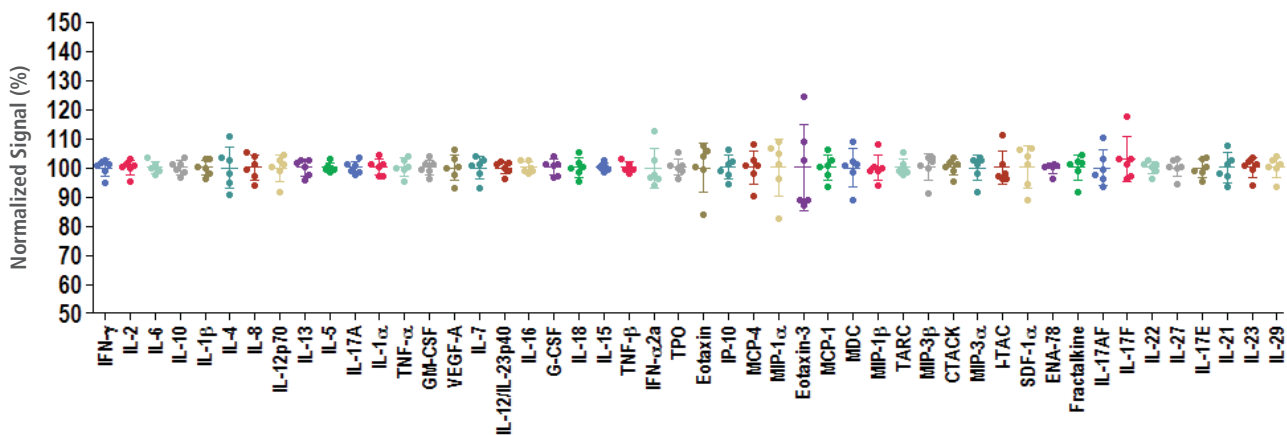
MSD GOLD products are a signature of our commitment to quality, consistency, and high performance in assay development. MSD GOLD plates and reagents are suitable for a wide range of research applications from biomarker discovery to personalized medicine.

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



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 (available in 1, 5, 30, 120, and 510 plate pack sizes)	Cat. No.
96-well High Bind Avidin SECTOR Plates	L15AB
96-well High Bind Avidin QuickPlex Plates	L55AB
96-well Streptavidin SECTOR Plates	L15SA
96-well Streptavidin QuickPlex Plates	L55SA
96-well Small Spot Streptavidin SECTOR Plates	L45SA
Labeling Reagent (available in 150 nmol and 2 µmol sizes)	
SULFO-TAG™ NHS-Ester	R91A0
Conjugation Packs (available in ≤ 200 µg and ≤ 1 mg sizes)	
MSD GOLD SULFO-TAG Conjugation Pack (5 reactions)	R31AA
Read Buffer	
MSD GOLD Read Buffer NEW	R92TG

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





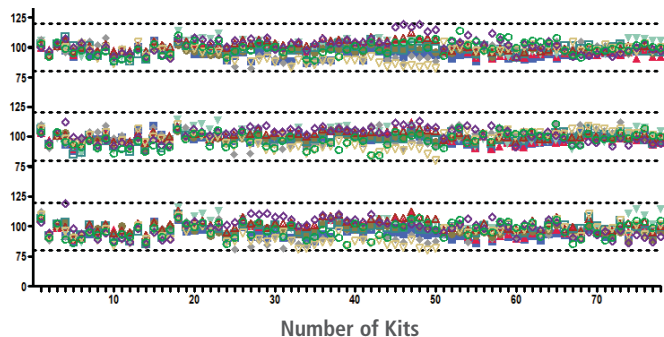
V-PLEX Validated Immunoassays for Unsurpassed Performance and Quality

V-PLEX assays are designed to maximize consistency in results and confidence in data. Developed under design control and according to the FDA's analytical validation guidelines, 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. 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 below illustrate their exceptional reproducibility, showing 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), 23 lots of V-PLEX Chemokine Panel 1 (human), and 25 lots of 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
hIFN- γ	94.9	97.9	93.9	3.1	2.1	2.1
hIL-1 β	99.4	99.8	98.6	3.2	2.5	3.1
hIL-2	100.3	100.1	99.6	3.0	2.6	3.0
hIL-4	97.6	100.2	94.4	3.3	3.2	3.2
hIL-6	97.6	98.7	96.9	2.5	2.4	2.4
hIL-8	98.7	98.2	97.9	2.4	2.4	2.5
hIL-10	101.8	101.0	101.3	1.9	1.7	2.3
hIL-12p70	94.8	97.2	92.9	4.7	4.5	5.0
hIL-13	102.2	101.4	99.3	2.2	2.3	2.4
hTNF- 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
hEotaxin	99.0	101.9	98.4	2.2	1.7	2.4
hMIP-1 β	97.1	96.1	93.0	2.6	2.1	2.3
hEotaxin-3	102.2	101.4	100.4	3.8	3.5	4.4
hTARC	93.4	97.6	92.6	3.8	3.0	3.4
hIP-10	93.3	93.3	91.9	5.2	3.8	3.7
hMIP-1 α	99.2	98.3	96.2	1.6	1.5	2.7
hIL-8	97.5	91.6	87.3	2.6	2.1	2.5
hMPC-1	96.0	96.6	92.3	4.7	4.3	5.0
hMDC	95.4	97.8	97.5	4.2	3.6	3.2
hMCP-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
hGM-CSF	97.8	99.7	93.9	3.8	2.7	3.1
hIL-1 α	100.1	99.7	97.1	4.8	4.1	5.1
hIL-5	100.8	101.4	99.1	3.3	3.1	3.3
hIL-7	96.7	98.5	95.4	3.3	2.8	3.2
hIL-12p40	96.2	97.8	93.3	2.7	2.5	2.8
hIL-15	95.4	97.3	96.7	3.6	2.7	3.1
hIL-16	93.6	94.4	95.0	3.3	3.1	3.6
hIL-17A	98.4	99.7	96.7	3.2	3.0	3.2
hTNF- β	98.4	97.7	94.7	2.4	2.5	2.7
hVEGF-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 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
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
FIt-1/VEGFR-1	0.90	10 – 6,410
GM-CSF	0.14	1.9 – 750
ICAM-1	1.03	6.40 – 32,700
IFN-γ	0.20	7.47 – 938
IL-1α	0.09	2.85 – 278
IL-1β	0.04	2.14 – 375
IL-2	0.09	0.89 – 938
IL-4	0.02	0.45 – 158
IL-5	0.22	6.28 – 562
IL-6	0.06	1.58 – 488
IL-7	0.16	1.37 – 563
IL-8	0.04	1.13 – 375
IL-8 (HA*)	95.6	713 – 43,400
IL-10	0.03	0.68 – 233
IL-12/IL-23p40	0.39	5.68 – 2,250
IL-12p70	0.11	1.22 – 315
IL-13	0.24	4.21 – 353
IL-15	0.17	1.4 – 525
IL-16	2.83	19.1 – 1,870
IL-17A	0.74	9.32 – 3,650
IL-17A (Gen. B)	0.413	5.86 – 1,950
IL-21	0.193	1.65 – 650
IL-22	0.270	2.78 – 325
IL-23	0.274	4.60 – 3,250
IL-27	4.20	38.7 – 13,000
IL-31	0.446	4.22 – 650
IP-10	0.37	1.37 – 500
MCP-1	0.090	1.09 – 375
MCP-4	1.69	5.13 – 469
MDC	1.22	88.3 – 7,500
MIP-1α	3.02	13.8 – 743
MIP-1β	0.37	2.27 – 750
MIP-3α	0.050	0.588 – 325
PIGF	0.21	1.5 – 800
SAA	10.9	54.0 – 138,000
TARC	0.22	3.32 – 1,120

Human		
Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
Tau	10.18	30 – 8000
Tie-2	31.3	396 – 63,400
TNF-α	0.04	0.69 – 248
TNF-β	0.05	1.15 – 458
VCAM-1	6.00	37.6 – 32,000
VEGF-A	1.12	7.7 – 784
VEGF-C	9.91	146 – 17,500
VEGF-D	4.36	67.1 – 18,800

Non-Human Primate (NHP)**		
Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
Eotaxin-3	1.77	10.2 – 3,750
GM-CSF	0.14	1.9 – 750
IFN-γ	0.20	7.47 – 938
IL-1β	0.04	2.14 – 375
IL-2	0.09	0.89 – 938
IL-5	0.22	6.28 – 562
IL-6	0.06	1.58 – 488
IL-7	0.16	1.37 – 563
IL-8	0.04	1.13 – 375
IL-8 (HA)	95.6	713 – 43,400
IL-10	0.03	0.68 – 233
IL-12/IL-23p40	0.39	5.68 – 2,250
IL-15	0.17	1.4 – 525
IL-16	2.83	19.1 – 1,870
IL-17A	0.74	9.32 – 3,650
IP-10	0.37	1.37 – 500
MCP-1	0.09	1.09 – 375
MCP-4	1.69	5.13 – 469
MDC	1.22	88.3 – 7,500
MIP-1α	3.02	13.8 – 743
MIP-1β	0.37	2.27 – 750
TARC	0.22	3.32 – 1,120
TNF-β	0.05	1.15 – 458
VEGF-A	1.12	7.7 – 784

Rat		
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	0.65	39.7 – 3,750
IL-1β	6.92	102 – 8,100
IL-4	0.69	8.0 – 723
IL-5	14.1	82 – 3,000

Rat		
Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
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	0.14	2.58 – 1,060
IL-5	0.07	1.6 – 590
IL-6	0.61	7.61 – 3,140
IL-10	0.95	19.8 – 2,030
IL-12p70	9.95	179 – 20,600
KC/GRO	0.24	3.29 – 1,230
TNF-α	0.13	0.97 – 403

NEW Cytokine Panel 2 (Human)		
Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
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-1RA	1.12	9.19 – 650
IL-3	2.37	12.6 – 1,950
IL-9	0.311	2.23 – 975
TSLP	0.063	0.460 – 325

NEW Cytokine Panel 1 (Mouse)		
Analyte	LLOD (pg/mL)	LLOQ - ULOQ (pg/mL)
IL-9	3.84	21.9 – 2,600
IL-15	16.0	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
MCP-1	0.672	4.42 – 325
MIP-1α	0.081	0.380 – 390
MIP-2	0.053	0.580 – 423

*High-abundance (This assay quantitates high levels of IL-8.)

**NHP assays recognize analytes from Cynomolgus and Rhesus monkeys. The LLOQ and the ULOQ represent the limits of quantitation of the assay. The LLOD represents the lower limit of detection of the assay.

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 pack sizes.

Species	Name (Cat. No.)	Analytes
Human	Biomarker 54-Plex Kit (K15248G) NEW	CRP, Eotaxin, Eotaxin-3, FGF (basic), Flt-1, GM-CSF, ICAM-1, IFN- γ , IL-1 α , IL-1 β , 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-1 α , MIP-1 β , MIP-3 α , PIGF, SAA, TARC, Tie-2, TNF- α , TNF- β , TSLP, VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Biomarker 47-Plex Kit (K15300G)	CRP, Eotaxin, Eotaxin-3, FGF (basic), Flt-1, GM-CSF, ICAM-1, IFN- γ , IL-1 α , IL-1 β , 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 (Version A), IL-17A (Version B), IL-21, IL-22, IL-23, IL-27, IL-31, IP-10, MCP-1, MCP-4, MDC, MIP-1 α , MIP-1 β , MIP-3 α , PIGF, 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-1 α , IL-1 β , 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-1 α , MIP-1 β , PIGF, SAA, TARC, Tie-2, TNF- α , TNF- β , VCAM-1, VEGF-A, VEGF-C, VEGF-D
	Cytokine 44-Plex Kit (K15249G) NEW	Eotaxin, Eotaxin-3, GM-CSF, IFN- γ , IL-1 α , IL-1 β , 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-1 α , MIP-1 β , MIP-3 α , TARC, TNF- α , TNF- β , TSLP, VEGF-A
	Cytokine 30-Plex Kit (K15054G)	Eotaxin, Eotaxin-3, GM-CSF, IFN- γ , IL-1 α , IL-1 β , 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-1 α , MIP-1 β , TARC, TNF- α , TNF- β , VEGF-A
	Proinflammatory Panel 1 (K15049G)	IFN- γ , IL-1 β , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70, IL-13, TNF- α
	TH17 Panel 1 (K15301G)	IL-17A (Version B), IL-21, IL-22, IL-23, IL-27, IL-31, MIP-3 α
	Cytokine Panel 1 (K15050G)	GM-CSF, IL-1 α , IL-5, IL-7, IL-12/IL-23p40, IL-15, IL-16, IL-17A, TNF- β , VEGF-A
	Cytokine Panel 2 (K15084G) NEW	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-1 α , MIP-1 β , TARC
	Angiogenesis Panel 1 (K15190G)	FGF (basic), Flt-1, PIGF, 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-1 α , IL-1 β , 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-1 α , MIP-1 β , PIGF, SAA, TARC, Tie-2, TNF- α , TNF- β , VCAM-1, VEGF-A, VEGF-C, VEGF-D
A β Peptide Panel 1 (6E10) (K15200G)	A β 38 (6E10), A β 40 (6E10), A β 42 (6E10)	
A β Peptide Panel 1 (4G8) (K15199G)	A β 38 (4G8), A β 40 (4G8), A β 42 (4G8) This product is suitable for human, mouse, and rat samples.	
NHP	Cytokine 24-Plex Kit (K15058G)	Eotaxin-3, GM-CSF, IFN- γ , IL-1 β , 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-1 α , MIP-1 β , 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-1 β , 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-1 α , MIP-1 β , TARC
Mouse	Proinflammatory Panel 1 (K15048G)	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-10, IL-12p70, KC/GRO, TNF- α
	Cytokine Panel 1 (K15245G) NEW	IL-9, IL-15, IL-17A/F, IL-27p28/IL-30, IL-33, IP-10, MIP-1 α , MIP-2, MCP-1
	Cytokine 19-Plex Kit (K15255G) NEW	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12p70, IL-15, IL-17A/F, IL-27p28/IL-30, IL-33, IP-10, KC/GRO, MCP-1, MIP-1 α , MIP-2, TNF- α
Rat	Proinflammatory Panel 2 (K15059G)	IFN- γ , IL-1 β , IL-4, IL-5, IL-6, IL-10, IL-13, KC/GRO, TNF- α

* 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.

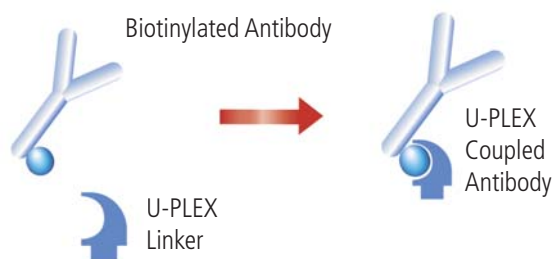
***NHP assays recognize analytes from Cynomolgus and Rhesus monkeys.



U-PLEX Assays and Assay Development Tools Deliver Maximum Flexibility

Design and run a personalized multiplex in your own lab without any additional equipment or time-consuming assay development. The flexibility of the U-PLEX platform empowers you to make personalized multiplex assay combinations quickly and easily. Select your U-PLEX assays from Groups, Custom Assays, Development Packs, or individual assays.

1. COUPLE

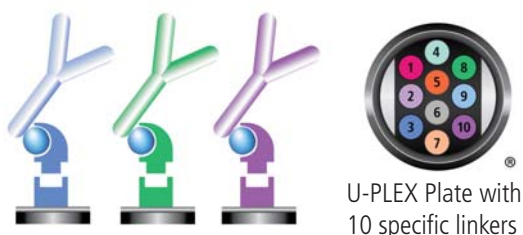


U-PLEX Groups

U-PLEX groups represent a comprehensive menu of analytes assembled by species, abundance in matrices tested, analytical compatibility, clinical range, and expected use. Any number of assays may be selected from within a group to create personalized multiplex combinations. Up to 10 U-PLEX assays may be multiplexed on each plate for simultaneous quantitation.

Species	Name	Cat. No.
Human	Biomarker Group 1 Assays	K15067L
NHP	Biomarker Group 1 Assays	K15068L
Mouse	Biomarker Group 1 Assays	K15069L

2. COAT

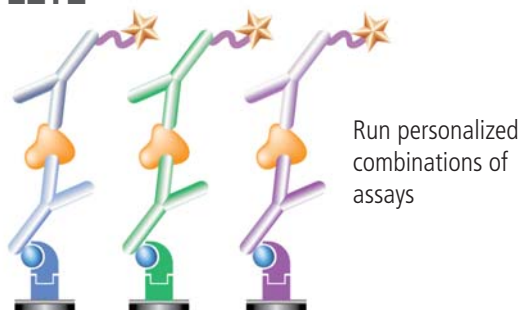


U-PLEX Custom Assays

U-PLEX custom assays enable creation of custom multiplexes with a combination of MSD U-PLEX assays and your own analytes, using activated spots.

Species	Name	Cat. No.
Human	Custom Biomarker Assays	K15067M
NHP	Custom Biomarker Assays	K15068M
Mouse	Custom Biomarker Assays	K15069M

3. COMPLETE



U-PLEX Development Packs

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

Name	Cat. No.
Development Pack, 2-Assay SECTOR Plate	K15227N
Development Pack, 3-Assay SECTOR Plate	K15228N
Development Pack, 4-Assay SECTOR Plate	K15229N
Development Pack, 5-Assay SECTOR Plate	K15230N
Development Pack, 6-Assay SECTOR Plate	K15231N
Development Pack, 7-Assay SECTOR Plate	K15232N
Development Pack, 8-Assay SECTOR Plate	K15233N
Development Pack, 9-Assay SECTOR Plate	K15234N
Development Pack, 10-Assay SECTOR Plate	K15235N

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

Customize Your Assay with the U-PLEX Assay Designer

The U-PLEX platform allows you to create custom multiplex assays from a selection of MSD assays, your own analytes, or a combination of both. Explore your options at www.mesoscale.com/U-PLEX.

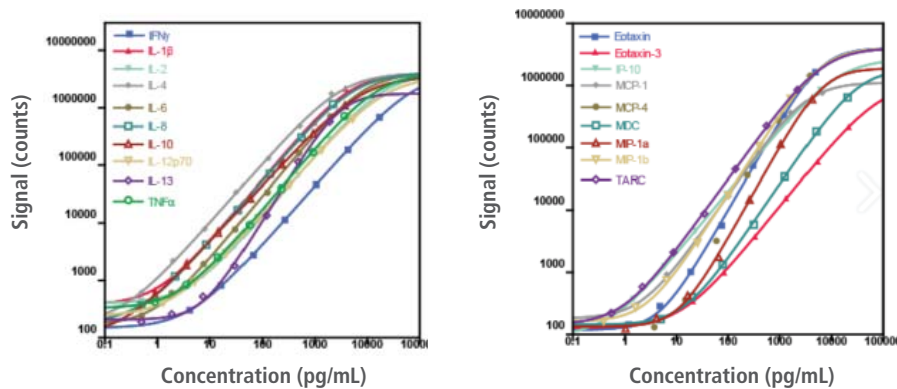
U-PLEX Assays: Built on Quality Components

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 quantification 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

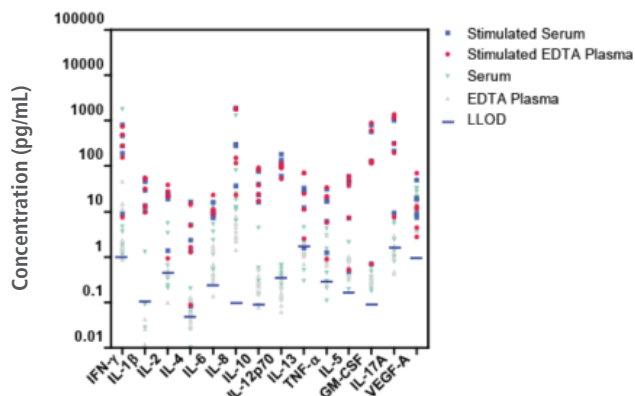
LLODs for U-PLEX assays range from pg/mL to sub pg/mL levels.

		LLOD (pg/mL)									
Assays	IFN- γ	IL-1 β	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	

		LLOD (pg/mL)							
Assays	Eotaxin	IP-10	MCP-1	MCP-4	MDC	MIP-1 α	MIP-1 β	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 Combinations

U-PLEX Combinations represent popular combinations of analytes, grouped into separate catalog numbers for ordering convenience. All Combinations are available in 1, 5, and 25-plate pack sizes.

Species	Name (Cat. No.)	Analytes
Human	Biomarker Group 1 71-Plex (K15081K)	CTACK, ENA-78, Eotaxin, Eotaxin-2, Eotaxin-3, EPO, FLT3L, Fractalkine, G-CSF, GM-CSF, GRO- α , I-309, IFN- α 2a, IFN- β , IFN- γ , IL-1 α , IL-1 β , IL-1RA, IL-2, IL-2R α , IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-17E/IL-25, IL-17F, IL-18, IL-21, IL-22, IL-23, IL-27, IL-29/IFN- λ 1, IL-31, IL-33, IP-10, I-TAC, MCP-1, MCP-2, MCP-3, MCP-4, M-CSF, MDC, MIF, MIP-1 α , MIP-1 β , MIP-3 α , MIP-3 β , MIP-5, SDF-1 α , TARC, TNF- α , TNF- β , TPO, TRAIL, TSLP, VEGF-A, YKL-40
	Chemokine Combo 1 (K15047K)	Eotaxin, Eotaxin-2, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-2, MCP-3, MCP-4, MDC, MIP-1 α , MIP-1 β , TARC
	Chemokine Combo 2 (K15046K)	CTACK, ENA-78, Fractalkine, GRO- α , I-309, I-TAC, MIF, MIP-3 α , MIP-3 β , MIP-5, SDF-1 α
	Cytokine Combo 1 (K15045K)	GM-CSF, IL-1 α , IL-5, IL-7, IL-12/p40, IL-15, IL-16, IL-17A, TNF- β , VEGF-A
	Interferon Combo (K15094K)	IFN- α 2a, IFN- β , IFN- γ , IL-29/IFN- λ 1
	Proinflammatory Combo 1 (K15049K)	IFN- γ , IL-1 β , 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-1 β , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12p70
	Proinflammatory Combo 3 (K15052K)	IFN- γ , IL-1 β , IL-6, TNF- α
	Proinflammatory Combo 4 (K15053K)	IL-1 β , 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-3 α , TNF- α
	TGF- β Combo (K15241K)	TGF- β 1, TGF- β 2, TGF- β 3
	TH1/TH2 Combo (K15010K)	IFN- γ , IL-1 β , 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-1 β , IL-6, IL-10, IL-17A, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF- α
NHP*	Biomarker Group 1 61-Plex (K15082K)	CTACK, Eotaxin, Eotaxin-2, Eotaxin-3, ENA-78, FLT3L, Fractalkine, G-CSF, GM-CSF, GRO- α , I-309, IFN- α 2a, IFN- γ , IL-1 α , IL-1 β , IL-1RA, IL-2, IL-2R α , IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17B, IL-17C, IL-17D, IL-17E, IL-18, IL-22, IL-23, IP-10, I-TAC, MCP-1, MCP-2, MCP-3, MCP-4, M-CSF, MDC, MIF, MIP-1 α , MIP-1 β , MIP-3 α , MIP-3 β , MIP-5, SDF-1 α , TARC, TNF- α , TNF- β , TPO, TRAIL, VEGF-A, YKL-40
	Chemokine Combo 1 (K15055K)	Eotaxin, Eotaxin-3, IL-8, IP-10, MCP-1, MCP-4, MDC, MIP-1 α , MIP-1 β , TARC
	Cytokine Combo 1 (K15057K)	GM-CSF, IL-1 α , 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-1 β , IL-2, IL-4, IL-6, IL-8, IL-10, IL-12/IL-23p40, TNF- α
	T-Cell Combo (K15095K)	GM-CSF, IFN- γ , IL-2, IL-4, IL-9, IL-10, IL-13, IL-17A, IL-17E, IL-22, MIP-3 α , TNF- α
	TGF- β Combo (K15243K)	TGF- β 1, TGF- β 2, TGF- β 3
	TH1/TH2 Combo (K15080K)	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, TNF- α
TH17 Combo 1 (K15079K)	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-10, IL-17A, TNF- α	
Mouse	Biomarker Group 1 35-Plex (K15083K)	EPO, GM-CSF, IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-6, IL-9, IL-10, IL-12/IL-23p40, IL-12p70, IL-13, IL-15, IL-16, IL-17A, IL-17A/F, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, IL-23, IL-27p28/IL-30, IL-31, IL-33, IP-10, KC/GRO, MCP-1, MIP-1 α , MIP-1 β , MIP-2, MIP-3 α , TNF- α , VEGF-A
	Chemokine Combo (K15099K)	KC/GRO, IP-10, MCP-1, MIP-1 α , MIP-1 β , MIP-2, MIP-3 α
	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-3 α , TNF- α
	TGF- β Combo (K15242K)	TGF- β 1, TGF- β 2, TGF- β 3
	TH1/TH2 Combo (K15071K)	IFN- γ , IL-1 β , 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-17F, IL-21, IL-22, IL-23, IL-31, IL-33
	TH17 Combo 2 (K15078K)	IFN- γ , IL-1 β , IL-6, IL-17A, IL-17C, IL-17E/IL-25, IL-17F, IL-21, IL-22, TNF- α

* NHP assays recognize analytes from *Cynomolgus* and *Rhesus* monkeys.

Standard Assays: MSD's Broadest Menu

Standard assays offer a broad menu and provide greater consistency, sensitivity, and dynamic range than western blots and traditional ELISAs. Standard singleplex and multiplex assays are compatible with a wide range of sample matrices providing the ability to analyze protein levels from multiple sample types with a single assay.

For many analytes, we offer multiple assay formats, compatible with a wide variety of sample types and with varying levels of sensitivity, to fit diverse research needs. To facilitate targeted disease research, we have assembled a variety of disease-specific panels that include the most widely-studied analytes. Explore our website to find the right assays for you.

	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, Cerebral Spinal Fluid
Sample volume required*	As little as 25 μ L per well	As little as 0.25 μ g 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	Standard assay workflow is approximately 3 hours. Plate read time is 90 seconds per plate.	

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

Standard Multiplex Panels

Cytokine/Inflammation Panels

Species	Name	Analytes
Human	TH1-TH2 10-Plex	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, IL-8, IL-10, IL-12p70, IL-13, TNF- α
Human	TH1-TH2 7-Plex	IFN- γ , IL-2, IL-4, IL-5, IL-10, IL-12p70, IL-13
Mouse	TH1-TH2 9-Plex	IFN- γ , IL-1 β , IL-2, IL-4, IL-5, KC/GRO, IL-10, IL12 total, TNF- α
Human	ProInflammatory 9-Plex	GM-CSF, IFN- γ , IL-1 β , IL-2, IL-6, IL-8, IL-10, IL-12p70, TNF- α
Human	ProInflammatory 7-Plex	IFN- γ , IL-1 β , IL-6, IL-8, IL-10, IL-12p70, TNF- α
Human	ProInflammatory I 4-Plex	IFN- γ , IL-1 β , IL-6, TNF- α
Human	ProInflammatory II 4-Plex	IL-1 β , IL-6, IL-8, TNF- α
Mouse	Proinflammatory 7-Plex	IFN- γ , IL-1 β , IL-6, IL-10, IL-12p70, KC/GRO, TNF- α
Canine	Proinflammatory Panel 3	IL-2, IL-6, IL-8, TNF- α
Rat	Inflammation Panel 1	NGAL, TSP-1, TIMP-1, MCP-1
Cyno	Inflammation Panel 3	MCP-1, NGAL, TIMP-1
Human	MMP 2-Plex Ultra-Sensitive Kit	MMP-2, MMP-10
Human	MMP 3-Plex Ultra-Sensitive Kit	MMP-1, MMP-3, MMP-9

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
Human, Rat	Leptin, Insulin
Mouse, Rat	Glucagon, Insulin
Mouse, Rat	Active GLP-1 (7-36) amide, Insulin, Glucagon
Mouse, Rat	Active GLP-1, Insulin, Glucagon
Human, Mouse, Rat	GLP-1 (7-36) amide, Insulin, Glucagon
Human	Active GLP-1, Insulin, Glucagon, Leptin
Human	Active GLP-1 (7-36) amide, Insulin, Glucagon, Leptin

Neurodegeneration Panels

Species	Analytes
Human	sAPP α sAPP α , sAPP β
Human, Mouse	Tau (pT231)/Total Tau

Toxicology/Injury Panels

Species	Name	Analytes
Rat	Acute Phase Protein Panel 1	A2M, AGP
Rat	Inflammation Panel 1	NGAL, TSP-1, TIMP-1, MCP-1
Cyno	Inflammation Panel 3	MCP-1, NGAL, TIMP-1
Rat	Argutus AKI Test™	αGST, GSTYb1, RPA-1
Rat	Cardiac Injury Panel 2	cTnI, cTnT, FABP3
Rat	Cardiac Injury Panel 3	cTnI, cTnT, FABP3, Myl3
Rat	Muscle Injury Panel 1	cTnI, cTnT, sTnI, FABP3, Myl3
Rat	Muscle Injury Panel 2	TIMP-1, CK
Mouse	Muscle Injury Panel 3	cTnI, FABP3, Myl3, sTnI
Rat	Liver Injury Panel 1	Arginase-1, αGST
Rat	Kidney Injury Panel 1	Albumin, TIM-1, N-GAL, Osteopontin
Human	Kidney Injury Panel 3	αGST, Calbindin, Clusterin, KIM-1, Osteoactivin, TFF3, VEGF-A
Human	Kidney Injury Panel 5	Albumin, B2M, Cystatin C, EGF, NGAL, Osteopontin, Uromodulin
Human	Vascular Injury Panel I	sICAM-3, E-Selectin, P-Selectin, Thrombomodulin
Human	Hypoxia Panel	EPO, VEGF-A
Mouse, Rat	Hypoxia Panel	EPO, VEGF-A
Human	Growth Factor Panel I	bFGF, VEGF-A, sFlt-1, PlGF
Human	Growth Factor Panel II	c-Kit, KDR
Human	Bone Panel I	ALP, Sclerostin, Osteoprotegrin
Human	Bone Panel II	Osteocalcin, Osteonectin, Osteopontin

Intracellular Signaling Panels

Species	Name	Analytes
Human, Mouse, Rat	Akt Signaling Panel (Phosphoprotein)	pAkt, p70S6K, pGSK-3β
Human, Mouse, Rat	Akt Signaling Panel (Total Protein)	Akt, p70S6K, GSK-3β
Human, Mouse, Rat	Akt Signaling Panel II (Phosphoprotein)	pAkt, p70S6K, pGSK-3β, pS6RP
Human	Apoptosis Panel	pp53, p53, Cl. Caspase-3, Cl. PARP
Human	EGFR Family	pEGFR, pErbB2, pIGF-1R
Human, Mouse, Rat	ERK-STAT3 Cascade Panel	pERK1/2, pMEK1/2, pSTAT3
Human	Insulin Signaling Panel (Phosphoprotein)	pIR, pIGF-1R, pIRS-1
Human	Insulin Signaling Panel (Total Protein)	IR, IGF-1R, IRS-1
Human, Mouse, Rat	MAP Kinase Panel (Phosphoprotein)	pERK1/2, pJNK, p38
Human	MAP Kinase Panel (Total Protein)	ERK1/2, JNK, p38
Human, Mouse, Rat	Phospho-STAT Panel	pSTAT3, pSTAT4, pSTAT5a,b

Activated/Total Panels

Species	Analytes
Human, Mouse, Rat	Akt pS473/Total
Human, NHP	BAD pS112/Total
Human	Caspase-3 (Cl. p20/p17)/Total
Human	c-Kit pY721/Total
Human	EGFR pY1173/Total
Human	ErbB2 pY1248/Total
Human, Mouse, Rat	ERK1/2 (pT202/pY204)/(pT185/pY187)/Total
Human, Mouse, Rat	GSK-3β pS9/Total
Human	HSP27 pS78/Total
Human	HSP27 pS82/Total
Human	JNK (pT183/pY185)/Total
Human, Mouse, Rat	MEK1/2 (pS217/221)/Total
Human	Met pY1349/Total
Human	MDM2 Ub/Total
Human, Mouse, Rat	mTOR pS2448/Total
Human, Mouse, Rat	p38 (pT180/pY182)/Total
Human	p53 pS15/Total
Human, Mouse, Rat	p53 Ub/Total
Human, Mouse, Rat	p70S6K (pT421/pS424)/Total
Human	Rb pS608/Total
Human	Rb pS780/Total
Human, Mouse, Rat	S6RP (pS240/244)/Total
Human, Mouse, Rat	STAT5a,b pY694/Total

Secreted Analytes

Analyte	Species
A2M*	H, R
Aβ (Total)**	H
Adiponectin	H, M, R
Angiopoietin 1	H
Angiopoietin 2	H
sAPPα	H
sAPPβ (wild type)	H, M
sAPPβ (Swedish variant)*	H
B2M*	H, R
BDNF**	H
BNP	R
cAMP	H, M, R
Cancer Antigen 125	H
CHO (HCP)	H
Clusterin	H, R
c-Peptide	H, M, R
DJ-1/PARK7	H
E-Cadherin	H
Eotaxin-3 (CCL26)*	H
EPO*	H, M, R
E-Selectin	H
FABP3	H, M, R
Factor VII	H
Fas	H
FasL	H
Flt-1/VEGFR1	H
FSH	H
G-CSF*	H
Ghrelin (active)**	H
GIP	H
GLP-1 (Active)	C, H, M, P, R
GLP-1 (Total)	C, H, M, P, R
GLP-1 (x-36) amide	H, M, R
Glucagon	H, M, R
GM-CSF	H, M, R
HGF	H
I-309 (CCL1)	H
IFN-α2a	H
IFN-β	H
IFN-γ	H, M, R
IgA	H, P
IgG	H, P
IgM	H, P
IL-1β	H, M, R
IL-2	H, M
IL-4	H, M, R
IL-5	H, M, R
IL-6	H, M, R
IL-6R	H
IL-8 (CXCL8)	H

Analyte	Species
IL-10	H, M
IL-12	H, M
IL-12/IL-23p40	H, M
IL-12p70	H, M
IL-17A	H, M
IL-17B	H
IL-17D	H
IL-18	H
Insulin	H, M, R
IP-10 (CXCL10)	H
I-TAC	H
KC/GRO (CXCL1)	M, R
KIM-1/TIM-1/HAVCR	H, R
LBP	H
Leptin	H, M, R
MCP-1 (CCL2)	H, M, R
MCP-2 (CCL8)	H
M-CSF	H
MDC (CCL22)	H
MIF	H
MIG**	H
MIP-1β (CCL4)	H
MIP-3α (CCL20)	H, M, R
MIP-3β (CCL19)	H
MIP-4 (CCL18)	H
MIP-5 (CCL15)	H
MMP-1	H
MMP-2	H
MMP-3	H
MMP-9	H
MMP-10	H
Myeloperoxidase (MPO)	H
NT-proANP	R
NT-proBNP	H, R
Osteocalcin	H, R
Osteonectin	H
Osteopontin	H, M
Osteoprotegerin	H, M
P-Cadherin	H
Prolactin	H
Protein A	H
E-Selectin	H
P-Selectin	H
PYY	H, M, R
RANTES (CCL5)	H, M
RBP4	H
Resistin	H, M, R
Tau	B, H, M
Tau (pT181)**	H, M
Tau (pT231)	H, M

Analyte	Species
Tenascin C	H
TGF-β1	H
Thrombomodulin	H
TIMP-1	H
TNF-α	H, M
TNF-RI	H
TNF-RII	H
sTroponin I (sTnI)	R
Troponin I (TNNI1)	R
Troponin ITC Complex	R
VEGF-R2	H
YKL-40	H

* available in both singleplex and multiplex

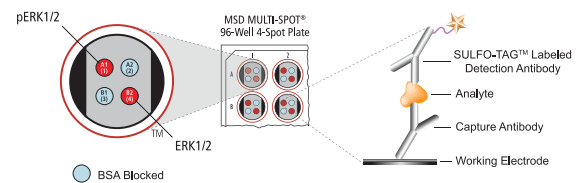
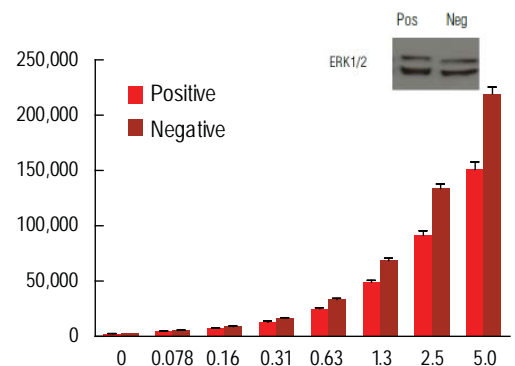
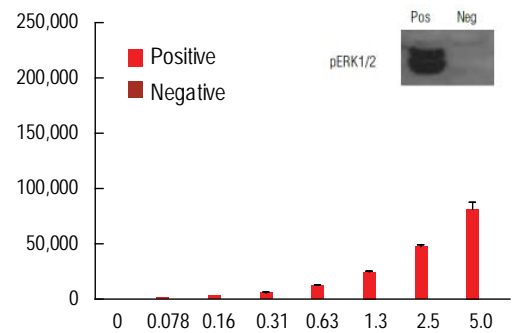
**available in multiplex only

Intracellular Analytes

Analyte	Species
4E-BP1	H, M
4E-BP1 (pT37/46)	H, M
Akt*	H, M, P, R
Akt (pS473)*	H, M, P, R
Akt (pT308)*	H, M
Aurora A	H
Aurora A (pT288)	H
BAD*	H, P
BAD (pS112)*	H, P
Caspase-3*	H
Caspase-3 (p20/p17) (cleaved)	H
CHO (HCP)	H
CHOP	H, M, R
c-Jun	H, M, R
c-Kit	H
EGFR*	H
EGFR (pY1173)	H
eIF4E	H
eIF4E (pS209)	H
ErbB2*	H
ErbB2 (pY1248)*	H
ERK-1/2	H, M, R
ERK-1/2(pT202/pY204) (pT185/pY187)	H, M, R
FOXO3a	H, M
FOXO3a (pT32)	H, M, R
FRS2 (pY196)	H, M
FRS2 (pY436)	H, M
GAPDH	H, P
GSK-3 α (pS21)	H
GSK-3 β *	H, M, R
GSK-3 β (pS9)*	H, M, R
HIF-1 α	H, M, R
Histone H3 (pS10)	H, M, R
HSP27*	H
HSP27 (pS78)*	H
HSP27 (pS82)*	H
HSP70	H
IGF-1R (pY)**	H
IRE-1 α (CXCL11)	H, M, R
IRS-1 (S312)	H
JNK*	
P-JNK*	H
MDM2*	H
MDM2 (ubiquitinated)*	H, M, R
MDM2 - p53 complex	H

Analyte	Species
MEK 1/2	H, M, R
MEK 1/2 (pS217/pS221)	H, M, R
MEK2	H, M, R
Met*	H
Met (pY1349)*	H
mTOR (pS2488)	
mTOR	H, M, R
NF κ B (pS468)	H, M, R
NF κ B (pS536)	H, M, R
p38*	H, M, P, R
p38 (pT180/pY182)*	H, M, R
p53*	H, M, R
p53 (pS15)*	H, M, R
p53 (ubiquitinated)*	H, M, R
p62 (SQSTM1)	H, M, R
p70S6K	H, M, R
p70S6K (pT389)	H, M, R
p70S6K (pT421/pS424)	H, M, R
PARP	H
pDGFR- β (pY751)	H, M
PERK	H, M, R
PERK (p980)	
Pleckstrin (pS)	H, M, R
PRAS40	H
PRAS40 (pT246)	H, M, R
PSD-95	H, M, R
Rb	H
Rb (pS608)	H
Rb (pS780)	H
S6RP	H, M, P, R
S6RP (pS235/236)	H, M, P, R
S6RP (pS240/244)	H, M, R
Sclerostin	H
Smad1 (pS463/465)	H, M
SRC3	H
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
VASP	H
VASP (pS157)	H
VEGFR2/KDR	H
Wnt3a	H, M, R
XBP-1	H, M, R

* available in both singleplex and multiplex
**available in multiplex only



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.

MSD Services and Custom Assay Capabilities: Personalized Development and Support

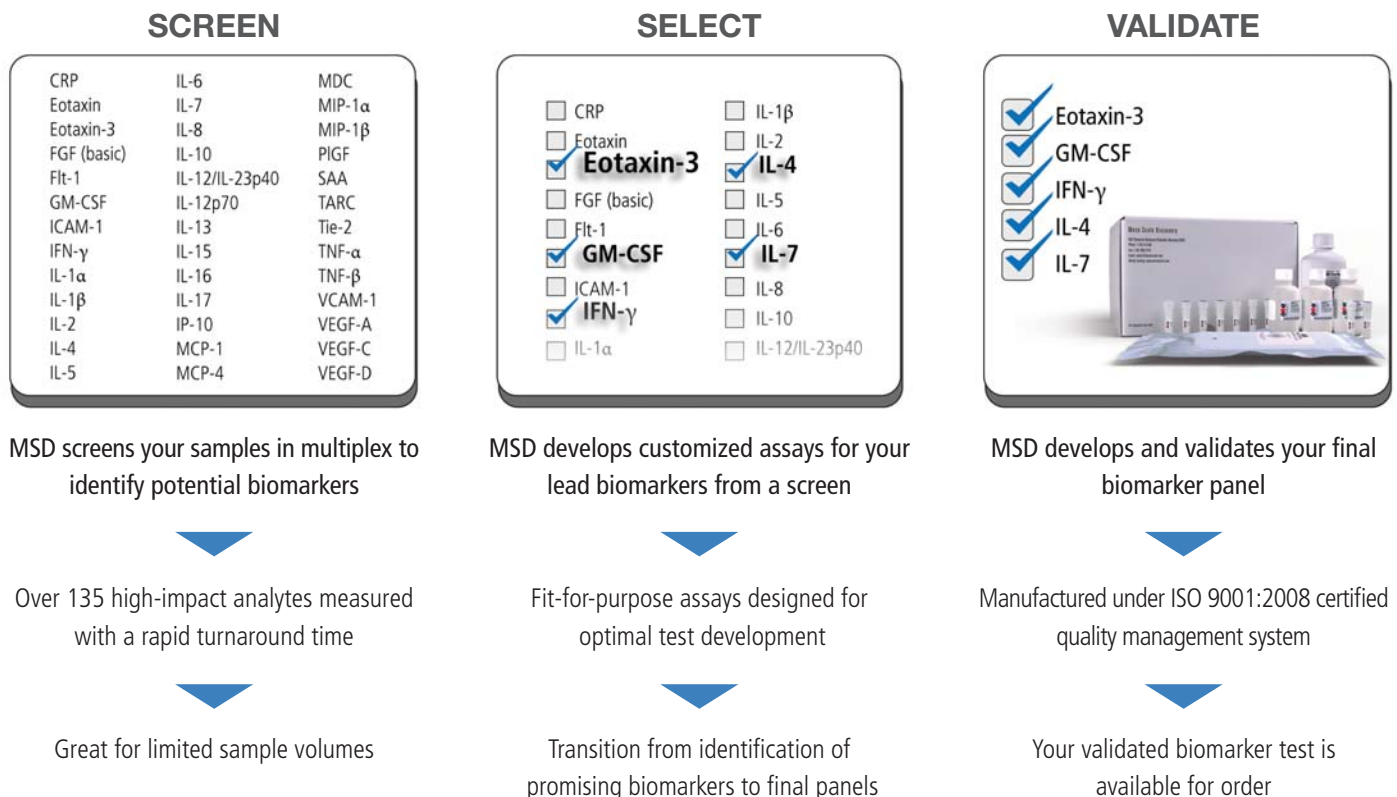
With over 20 years of experience in developing immunoassays of unsurpassed quality and performance, MSD's personalized services provide you with the tools to precisely measure biomarkers and meet the requirements of each unique project.

MSD specialists will work with you to provide customized solutions in the following areas:

- Biomarker screens with your samples from a selection of over 135 assays
- Development and validation of singleplex and multiplex assays
- Creation of custom configurations of MSD multiplexes
- Conjugation of antibodies, proteins, peptides, and oligonucleotides with biotin or SULFO-TAG
- Custom printing of MSD single-spot and multi-spot plates with your biomarkers of choice

Biomarker Screening and Assay Development

Whether you require a biomarker screen or the development of a validated kit for lead biomarkers, MSD will tailor a custom service package for you. With our knowledge in developing and multiplexing high-quality commercial immunoassays, MSD can accelerate your biomarker program from early stage discovery to the production of fully validated kits or components.



For more information, contact us at assayservices@mesoscale.com.

S-PLEX Sample-Testing Services: MSD's Most Sensitive Assay Platform



S-PLEX assays achieve femtogram/mL sensitivity with the precision and reliability you have come to expect from MSD. We offer S-PLEX sample-testing services with even higher sensitivity than currently available from MSD. Now you can detect and quantitate very low abundance proteins in your samples with the confidence that you are specifically measuring your protein of interest. Our experts will work with you to understand your sample-testing needs and develop a plan that is right for you.

S-PLEX Assays Available for Sample-Testing Services

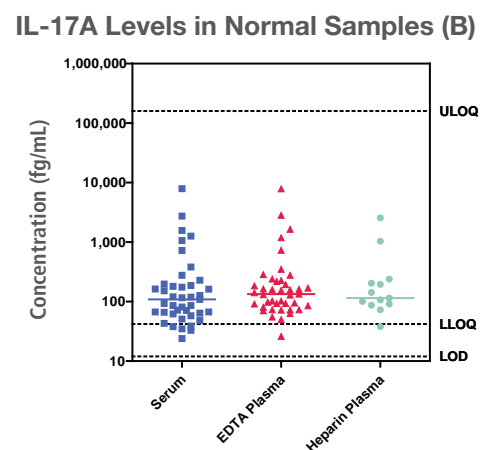
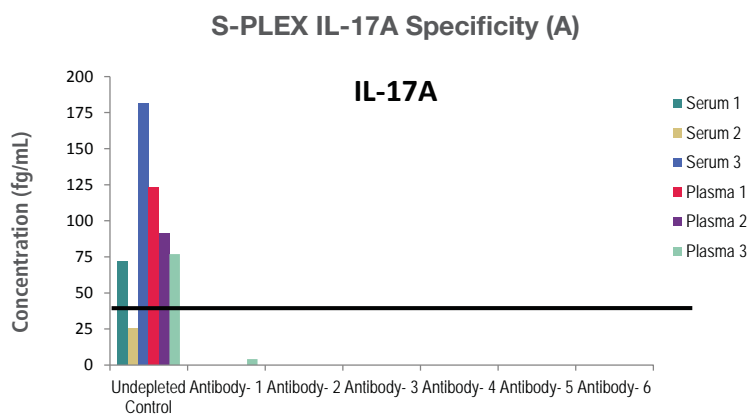
Target Analyte (hu)	Limit of Detection (LOD) (fg/mL)	Lower Limit of Quantitation (LLOQ) (fg/mL)	Upper Limit of Quantitation (ULOQ) (fg/mL)
Cardiac Troponin I	25	125	480,000
IFN- γ	2.5	14	56,000
IL-2	0.8	1.9	22,000
IL-4	0.7	3.6	10,000
IL-6	0.7	3.1	12,000
IL-10	0.7	2.3	25,000
IL-17A	12	42	160,000
PSA (free)	141	480	240,000
Tau	6.2	21	160,000
TNF- α	6.7	18	120,000
TSLP	1.5	6.0	20,000

S-PLEX assays currently in development for sample-testing services:

- GFAP
- HIVp24
- IL-1 β
- IL-5
- IL-13
- IL-21
- IL-25
- Phospho-Tau

Sensitivity You Can Trust

S-PLEX technology utilizes a novel process to generate sensitivity that is up to 1000 times greater than ELISAs. The assays detect a few hundred molecules per sample with extremely high specificity. Target depletion studies were used to validate the specificity of each S-PLEX assay. Data for IL-17A are shown below.



(A) Six unique IL-17A specific antibodies were selected to deplete IL-17A from six normal samples (three serum and three plasma samples). Data are presented relative to the undepleted control samples. IL-17A depletion was 95% or greater in the six samples tested. (B) IL-17A levels were measured in 42 serum, 42 EDTA plasma, and 12 heparin plasma samples from normal individuals.

Customer Support

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Hours of Operation: 5:00 AM to 8:00 PM, Monday – Friday, U.S. Eastern Time

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