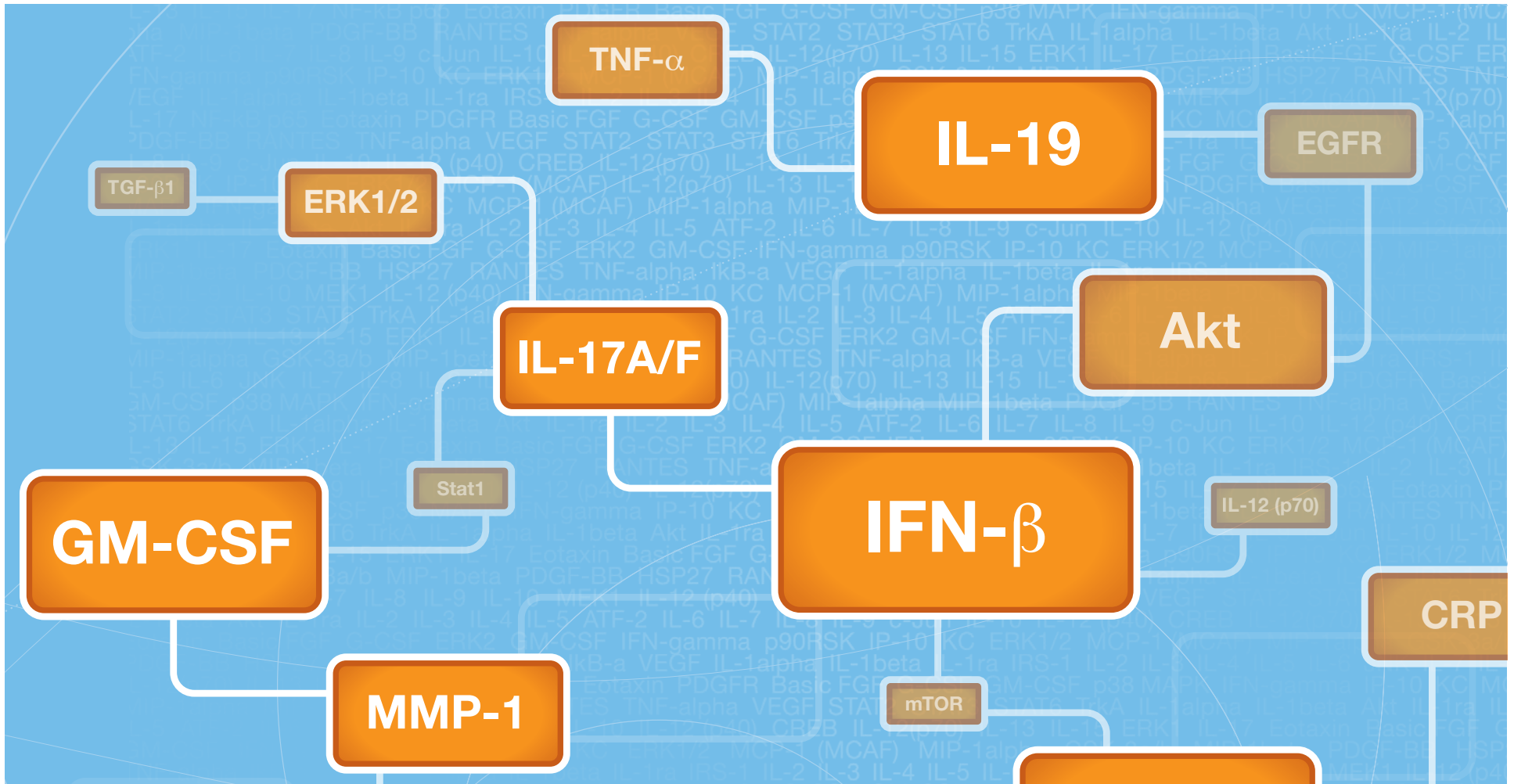


Bio-Plex™ Pro Multiplex Immunoassays

Analyte Guide 2023



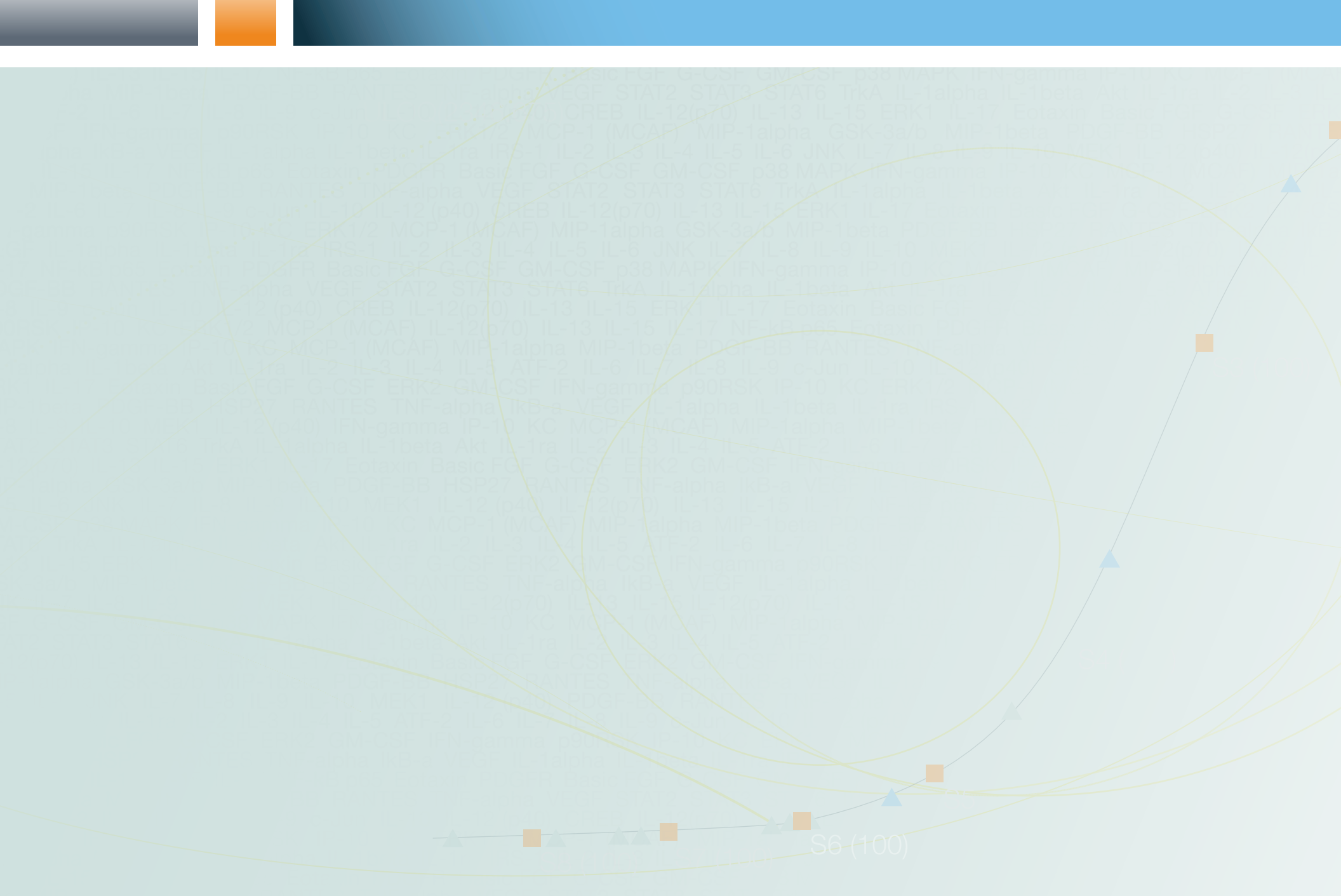


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LLOQ(0.195)

The Power of Bio-Plex Pro Assays

The Bio-Plex Multiplex Immunoassay System, powered by xMAP technology, enables you to generate thousands of usable data points per assay run, giving you the ultimate edge in sensitive, multianalyte detection.

- More answers
- More accuracy
- Less time
- Less sample

Proven Results

The Bio-Plex System is the most widely cited multiplex assay platform in life science research today. Application areas include inflammation, autoimmune diseases, asthma, diabetes/obesity, cancer, neurological disorders, cardiovascular disease, biomarker discovery, and drug and vaccine development.

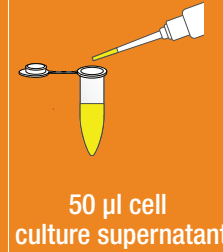
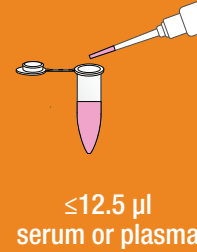
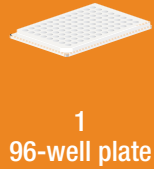
Open Platform

Bio-Plex Pro Magnetic Assays, configured on MagPlex Beads, are compatible with all xMAP life science instruments. Choose from a broad selection of preconfigured, optimized panels or custom options.

Bio-Plex Manager Software is compatible with all Luminex, Bio-Plex 200, and Bio-Plex 3D instruments and is capable of driving data acquisition and analysis of magnetic and nonmagnetic beads. The desktop version enables analysis from any xMAP platform. For more information, contact your local Bio-Rad sales representative.

The Power of Bio-Plex Pro Assays

Bio-Plex Multiplex System



What Would it Take to Measure:



x



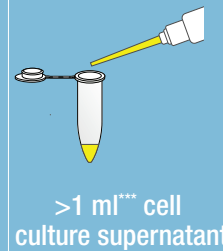
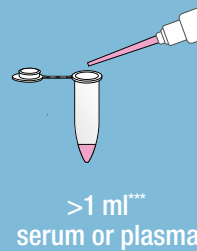
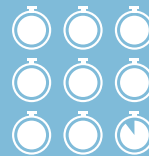
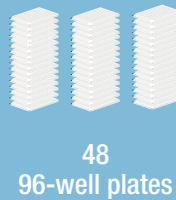
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38 samples*

1,824 data points

Enzyme-Linked Immunosorbent Assay (ELISA)



* Samples run in duplicate.

** Calculated as 2.2 hours required per plate.

*** Assumes 50 μl of sample used per well.

Bio-Plex Pro Assay Configurations – A Multitude of Choices

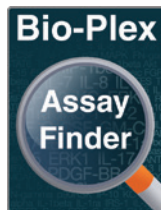
Bio-Rad offers a continually growing line of assays and associated products for extracellular and intracellular analysis. The assays are relevant to researchers studying everything from cancer to cardiovascular disease and available for use with multiple species and sample types. For the most up-to-date target information, go to [bio-rad.com/bio-plex](https://www.bio-rad.com/bio-plex).

Find Your Bio-Plex Assay

Use our web tool to quickly and easily locate currently available assays. Search by species, analyte name, or disease area.

- **Browse** the entire catalog of analytes alphabetically
- **Filter** by species and research area
- **Find** all relevant assays based on search criteria — results grouped for easier product selection

Go to [bio-rad.com/FindMyAssay](https://www.bio-rad.com/FindMyAssay)



Bio-Plex Assay Builder

Design your own custom assays from our selection of hundreds of analytes in four easy steps. With the Assay Builder you can:

- Get a price quote
- Place your order online
- Look up an existing assay by catalog number

Go to [bio-rad.com/AssayBuilder](https://www.bio-rad.com/AssayBuilder)

x-Plex Assay



We Mix

Express Assay



You Mix

More than 50% of multiplex assays worldwide are run using Bio-Plex Software.

Try Bio-Plex Manager and Bio-Plex Data Pro Software and find out why.

Human Assays

Bio-Plex Pro Human Cytokine Assays

Bio-Plex Pro Human Cytokine Assays are designed and optimized to detect a broad range of biologically relevant targets in both diseased and healthy control serum, plasma, and tissue culture supernatant samples. Cytokines are proteins that mediate a wide range of physiological responses, including immunity, inflammation, and hematopoiesis. Changes in analyte concentrations are associated with a spectrum of diseases including cancer, infections, and neurological disorders.

Bio-Plex Pro Human Cytokine Assays

Analyte	Singleplex	Bead Region	Bio-Plex Pro Human Cytokine Screening Panel, 48-Plex (12007283)	Bio-Plex Pro Human Cytokine Panel, 27-Plex (M500KCAF0Y)	Bio-Plex Pro Human Cytokine Panel, 17-Plex (M5000031YV)	Bio-Plex Pro Human Cytokine Panel, 8-Plex (M50000007A)	Bio-Plex Pro Human Cytokine Th1/Th2 Panel (M5000005L3)
Basic FGF	171B5016M	44	•	•			
CTACK / CCL27	171B6006M	72	•				
Eotaxin / CCL11	171B5015M	43	•	•			
G-CSF	171B5017M	57	•	•	•		
GM-CSF	171B5018M	34	•	•	•	•	•
GRO- α / KC / CXCL1	171B6007M	61	•				
HGF	171B6008M	62	•				
ICAM-1*	171B6009M	12					
IFN- α 2	171B6010M	20	•				
IFN- γ	171B5019M	21	•	•	•	•	•
IL-1 α	171B6001M	63	•				
IL-1 β	171B5001M	39	•	•	•		
IL-1ra	171B5002M	25	•	•			
IL-2	171B5003M	38	•	•	•	•	•
IL-2R α	171B6002M	13	•				
IL-3	171B6003M	64	•				
IL-4	171B5004M	52	•	•	•	•	•
IL-5	171B5005M	33	•	•	•		•
IL-6	171B5006M	19	•	•	•	•	
IL-7	171B5007M	74	•	•	•		
IL-8 / CXCL8	171B5008M	54	•	•	•	•	
IL-9	171B5009M	77	•	•			
IL-10	171B5010M	56	•	•	•	•	•
IL-12 (p40)	171B6004M	28	•				

continues

Bio-Plex Pro Human Cytokine Assays

Bio-Plex Pro Human Cytokine Assays

Analyte	Singleplex	Bead Region	Bio-Plex Pro Human Cytokine Screening Panel, 48-Plex (12007283)	Bio-Plex Pro Human Cytokine Panel, 27-Plex (M500KCAF0Y)	Bio-Plex Pro Human Cytokine Panel, 17-Plex (M5000031YV)	Bio-Plex Pro Human Cytokine Panel, 8-Plex (M50000007A)	Bio-Plex Pro Human Cytokine Th1/Th2 Panel (M5000005L3)
IL-12 (p70)	171B5011M	75	•	•	•		•
IL-13	171B5012M	51	•	•	•		•
IL-15	171B5013M	73	•	•			
IL-16	171B6005M	27	•				
IL-17A	171B5014M	76	•	•	•		
IL-18**	—	42	•				
IP-10 / CXCL10	171B5020M	48	•	•			
LIF	171B6011M	29	•				
MCP-1 / CCL2 / MCAF	171B5021M	53	•	•	•		
MCP-3 / CCL7	171B6012M	26	•				
M-CSF	171B6013M	67	•				
MIF	171B6014M	35	•				
MIG / CXCL9	171B6015M	14	•				
MIP-1 α / CCL3	171B5022M	55	•	•			
MIP-1 β / CCL4	171B5023M	18	•	•	•		
β -NGF	171B6016M	46	•				
PDGF-BB	171B5024M	47	•	•			
RANTES	171B5025M	37	•	•			
SCF	171B6017M	65	•				
SCGF- β	171B6018M	78	•				
SDF-1 α + β / CXCL12	171B6019M	22	•				
TNF- α	171B5026M	36	•	•	•	•	•
TNF- β	171B6020M	30	•				
TRAIL	171B6021M	66	•				
VCAM-1*	171B6022M	15					
VEGF	171B5027M	45	•	•			

* Due to differences in dilution factors, it is not possible to multiplex ICAM-1 or VCAM-1 with other assays.

** Not available as a singleplex; must order as a minimum 2-plex in Assay Builder or as part of a panel.

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Intra-Assay %CV	Inter-Assay %CV	Singleplex Bead Region
	LLOQ	ULOQ	LOD			
Basic FGF	3.26	3,341	2.54	3.1	2.4	44
CTACK / CCL27	2.10	15,656	0.82	2.7	5.2	72
Eotaxin / CCL11	0.14	2,281	0.05	4.4	1.2	43
G-CSF	6.35	104,106	3.63	3.1	4.0	57
GM-CSF	0.48	7,846	0.19	4.3	2.2	34
GRO- α / KC / CXCL1	21.05	31,255	13.45	2.6	7.9	61
HGF	8.76	143,513	7.09	2.6	2.9	62
ICAM-1	3.84	62,935	1.51	4.4	2.3	12
IFN- α 2	0.95	15,569	0.46	3.3	4.4	20
IFN- γ	1.57	25,665	1.05	3.1	3.6	21
IL-1 α	3.73	61,154	6.65	3.5	4.9	63
IL-1 β	0.29	4,672	0.24	3.6	3.2	39
IL-1ra	6.21	34,949	3.16	4.7	5.1	25
IL-2	1.29	21,178	0.75	1.7	2.5	38
IL-2R α	1.48	24,270	1.65	3.4	4.8	13
IL-3	0.13	2,139	0.13	5.0	3.9	64
IL-4	0.19	3,064	0.09	3.2	1.9	52
IL-5	3.63	59,499	0.86	2.3	2.3	33
IL-6	0.38	6,244	0.34	2.2	3.0	19
IL-7	1.92	31,475	1.22	2.7	3.9	74
IL-8 / CXCL8	0.85	13,992	0.36	3.2	2.8	54
IL-9	3.62	31,527	1.08	2.6	7.1	77
IL-10	1.06	17,427	0.69	2.3	3.4	56
IL-12 (p40)	14.68	240,582	6.39	4.5	2.4	28
IL-12 (p70)	1.43	23,425	0.78	3.3	2.9	75

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Intra-Assay %CV	Inter-Assay %CV	Singleplex Bead Region
	LLOQ	ULOQ	LOD			
IL-13	0.31	5,157	0.22	3.1	2.7	51
IL-15	12.42	203,426	12.82	2.8	4.1	73
IL-16	1.20	19,639	0.25	2.5	3.0	27
IL-17A	2.44	39,972	1.16	2.4	1.4	76
IL-18	0.66	10,892	0.31	2.9	2.2	42
IP-10 / CXCL10	3.41	34,953	1.43	2.8	6.0	48
LIF	3.86	53,806	2.05	2.5	4.7	29
MCP-1 / CCL2 / MCAF	0.53	8,755	0.44	3.2	3.4	53
MCP-3 / CCL7	0.48	4,899	0.24	4.4	4.2	26
M-CSF	0.75	12,290	0.27	2.4	3.6	67
MIF	2.70	44,168	2.45	3.4	4.7	35
MIG / CXCL9	3.16	32,365	1.39	4.4	4.2	14
MIP-1 α / CCL3	0.12	1,218	0.06	4.5	4.2	55
MIP-1 β / CCL4	1.41	1,439	1.41	3.4	2.5	18
β -NGF	0.47	7,655	0.23	2.9	3.9	46
PDGF-BB	7.12	37,133	2.96	3.3	9.7	47
RANTES	16.72	26,467	3.98	3.0	6.7	37
SCF	1.82	29,899	0.99	4.1	2.6	65
SCGF- β	82.11	1,345,200	141.77	2.3	3.8	78
SDF-1 α + β / CXCL12	7.54	9,381	2.44	2.2	5.4	22
TNF- α	3.33	54,566	1.13	3.5	3.0	36
TNF- β	0.80	13,186	0.38	3.0	4.7	30
TRAIL	1.78	29,188	0.89	3.2	4.5	66
VCAM-1	2.91	47,652	2.05	4.1	3.1	15
VEGF	18.01	149,830	10.16	2.8	8.5	45

Increase Usable Data Points with High Performing Assays

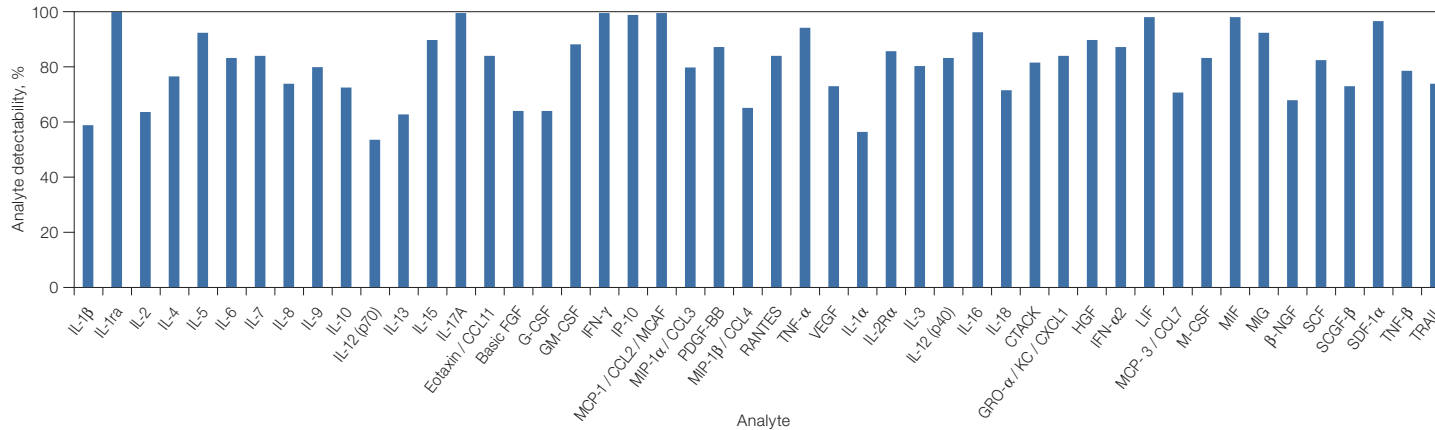
The ability of an assay to detect analytes across a broad range of concentrations is critical. Out-of-range results often mean gaps in data, difficulties in statistical analysis, and repeat experiments.

Bio-Plex Pro Assays are designed to deliver a high level of analyte detectability. Analyte detectability is defined as the percentage of analytes detected within the working assay range for all samples in a study.

For example, in an experiment using the new Bio-Plex Pro Human Cytokine Screening Panel, 48-Plex, the total number of data points that could be generated for the plate is 4,608 (48 analytes per well, 96 wells).

There are many factors that can impact how well analytes are detected within an assay. High-performance assays such as Bio-Plex Pro Panels use optimized reagent chemistry, superior antibodies, and rigorous development and testing methods using real human samples in order to maximize dynamic range and assay sensitivity. This results in fewer out-of-range results and more usable data points for your experiments.

Bio-Plex Pro Human Cytokine Screening Panel Analyte Detectability



Culture media, cancer serum, stimulated peripheral blood mononuclear cells, whole blood, and human immunodeficiency virus (HIV) plasma samples from six different laboratories were run on the Bio-Plex Pro Human Cytokine Screening Panel, 48-Plex. In these 420 test samples, the average analyte detectability was >80%, meaning less than 20% of data points were outside the working assay range.

Bio-Plex Pro Human Immunotherapy Assays

Bio-Plex Pro Human Immunotherapy 20-Plex Panel (12007975)

Analyte	Singleplex	20-Plex Panel (12007975)	Bead Region
GM-CSF	171B5018M	•	34
IFN- γ	171B5019M	•	21
IL-2	171B5003M	•	38
IL-4	171B5004M	•	52
IL-5	171B5005M	•	33
IL-6	171B5006M	•	19
IL-7	171B5007M	•	74
IL-8 / CXCL8	171B5008M	•	54
IL-10	171B5010M	•	56
IL-13	171B5012M	•	51
IL-15	171B5013M	•	73
IL-17A	171B5014M	•	76
IL-18*	—	•	42
IP-10 / CXCL10	171B5020M	•	48
MCP-1 / CCL2 / MCAF	171B5021M	•	53
MIG / CXCL9	171B6015M	•	14
MIP-1 α / CCL3	171B5022M	•	55
MIP-1 β / CCL4	171B5023M	•	18
RANTES	171B5025M	•	37
TNF- α	171B5026M	•	36

* Not available as a singleplex; must order as a minimum 2-plex in Assay Builder or as part of a panel.

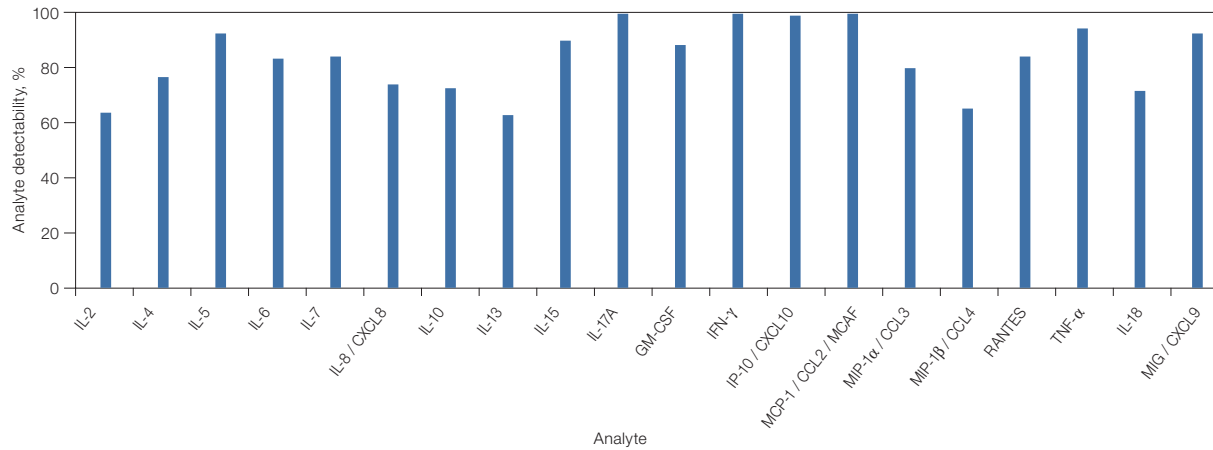
Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Mean Intra-Assay %CV	Mean Inter-Assay %CV	Singleplex Bead Region
	LLOQ	ULOQ	LOD			
GM-CSF	0.48	7,846	0.19	4.3	2.2	34
IFN- γ	1.57	25,665	1.05	3.1	3.6	21
IL-2	1.29	21,178	0.75	1.7	2.5	38
IL-4	0.19	3,064	0.09	3.2	1.9	52
IL-5	3.63	59,499	0.86	2.3	2.3	33
IL-6	0.38	6,244	0.34	2.2	3.0	19
IL-7	1.92	31,475	1.22	2.7	3.9	74
IL-8 / CXCL8	0.85	13,992	0.36	3.2	2.8	54
IL-10	1.06	17,427	0.69	2.3	3.4	56
IL-13	0.31	5,157	0.22	3.1	2.7	51
IL-15	12.42	203,426	12.82	2.8	4.1	73
IL-17A	2.44	39,972	1.16	2.4	1.4	76
IL-18	0.66	10,892	0.31	2.9	2.2	42
IP-10 / CXCL10	3.41	34,953	1.43	2.8	6.0	48
MCP-1 / CCL2 / MCAF	0.53	8,755	0.44	3.2	3.4	53
MIG / CXCL9	3.16	32,365	1.39	4.4	4.2	14
MIP-1 α / CCL3	0.12	1,218	0.06	4.5	4.2	55
MIP-1 β / CCL4	1.41	1,439	1.41	3.4	2.5	18
RANTES	16.72	26,467	3.98	3.0	6.7	37
TNF- α	3.33	54,566	1.13	3.5	3.0	36

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Human Immunotherapy Assays

Bio-Plex Pro Human Immunotherapy Panel Analyte Detectability



Culture media, cancer serum, stimulated peripheral blood mononuclear cells, whole blood, and HIV plasma samples from six different laboratories were run on the assay. In these 420 test samples, the average analyte detectability was >80%. Analyte detectability is defined as the percentage of analytes detected within the working assay range for all samples in the study.

Bio-Plex Pro Human Inflammation Assays

Analyze key human inflammation markers using a comprehensive, high-performance assay. Study TNF superfamily proteins, IFN family proteins, Treg cytokines, and MMPs in a single-well assay, or choose from a selection of subpanels to meet your needs. Custom configurations are also available.

Bio-Plex Pro Human Inflammation Assays

Analyte	Singleplex	Bead Region	Bio-Plex Pro Human Inflammation Panel, 37-Plex (171AL001M)	Bio-Plex Pro Human Treg Cytokine Panel, 12-Plex (171AL003M)
APRIL / TNFSF13	171BL001M	42	•	
BAFF / TNFSF13B	171BL002M	37	•	
sCD30 / TNFRSF8	171BL003M	53	•	
sCD163	171BL004M	46	•	
Chitinase-3-like 1	171BL005M	72	•	
gp130 / sIL-6Rβ	171BL006M	14	•	
IFN-α2	171BL007M	20	•	
IFN-β	171BL008M	44	•	
IFN-γ	171BL009M	21	•	
IL-2	171BL010M	38	•	•
sIL-6Rα	171BL011M	19	•	
IL-8 / CXCL8	171BL012M	54	•	
IL-10	171BL013M	56	•	•
IL-11	171BL014M	39	•	
IL-12 (p40)	171BL015M	28	•	•
IL-12 (p70)	171BL016M	75	•	•
IL-19	171BL017M	29	•	•
IL-20	171BL018M	30	•	•
IL-22	171BL019M	18	•	•
IL-26	171BL020M	22	•	•
IL-27 (p28)	171BL021M	13	•	•
IL-28A / IFN-λ2	171BL022M	66	•	•
IL-29 / IFN-λ1	171BL023M	33	•	•
IL-32	171BL024M	35	•	
IL-34	171BL025M	15	•	
IL-35	171BL026M	34	•	•
LIGHT / TNFSF14	171BL027M	51	•	
MMP-1	171BL028M	43	•	
MMP-2	171BL029M	26	•	
MMP-3	171BL030M	45	•	
Osteocalcin	171BL031M	65	•	
Osteopontin	171BL032M	77	•	
Pentraxin-3	171BL033M	48	•	
sTNF-R1	171BL034M	73	•	
sTNF-R2	171BL035M	67	•	
TSLP	171BL036M	52	•	
TWEAK / TNFSF12	171BL037M	62	•	

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ		Intra-Assay %CV	Inter-Assay %CV
APRIL / TNFSF13	455	995,390	83.65	9.01	9.23
BAFF / TNFSF13B	159	347,678	126.67	2.56	11.09
sCD30 / TNFRSF8	8	18,377	1.23	2.49	7.83
sCD163	282	617,571	64.21	2.29	11.08
Chitinase-3-like 1	49	71,493	10.9	4.47	13.09
gp130 / sIL-6R β	72	156,594	2.94	2.41	10.58
IFN- α 2	6	12,219	0.9	2.53	12.34
IFN- β	1	3,069	0.42	2.95	20.78
IFN- γ	7	15,079	0.66	4.37	12.7
IL-2	5	10,223	0.39	3.06	10.92
sIL-6R α	17	36,429	1.8	2.02	10.51
IL-8 / CXCL8	4	9,100	2.97	3.84	9.93
IL-10	3	6,147	1.2	2.53	17.25
IL-11	1	1,262	0.17	2.67	26.84
IL-12 (p40)	8	18,546	0.94	2.49	10.1
IL-12 (p70)	1	3,139	0.28	2.71	9.81
IL-19	14	20,144	11.25	3.4	11.15
IL-20	4	9,819	0.62	3.27	17.94
IL-22	12	26,618	2.95	2.64	17.51
IL-26*	118	103,216	47.4	4.29	26.7
IL-27 (p28)	9	19,964	6.38	2.72	16.55
IL-28A / IFN- λ 2	9	19,087	0.55	3.02	17.23
IL-29 / IFN- λ 1	10	21,154	2.62	3.45	12.98
IL-32	8	12,104	3.36	3.35	17.75
IL-34	47	102,537	25.04	2.98	14.06
IL-35	23	49,763	2.84	2.72	16.55

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

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* Unique target.

Performance Characteristics

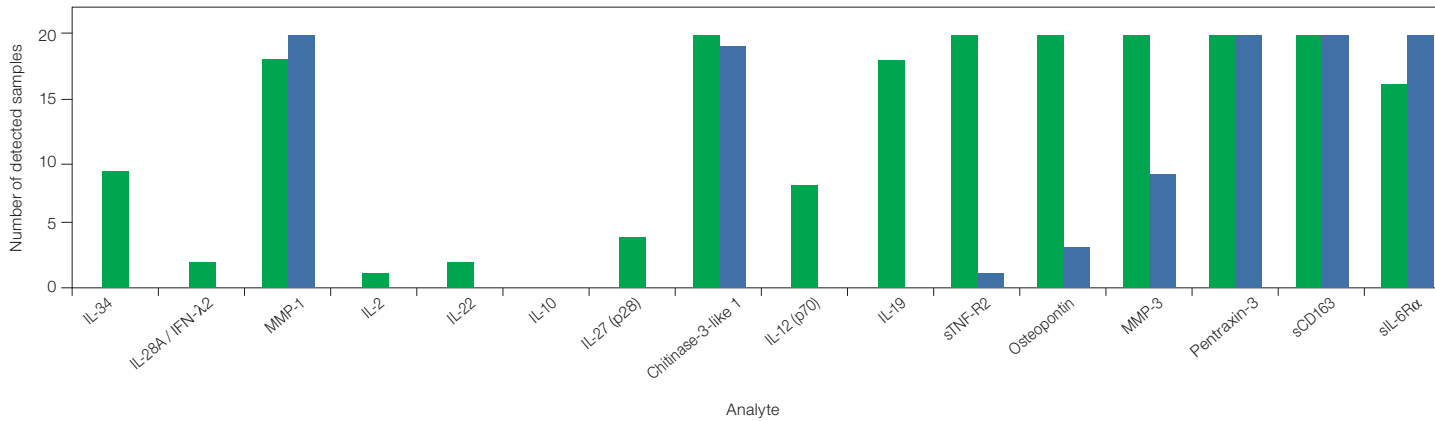
Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
LIGHT / TNFSF14	4	8,293	0.68	2.35	12.18
MMP-1	103	226,295	5.26	2.42	12.82
MMP-2	201	439,914	75.91	3.62	22.02
MMP-3	189	344,257	31.3	3.21	26.45
Osteocalcin	69	149,899	19.23	3.42	16.44
Osteopontin	138	301,476	96.88	2.38	9.93
Pentraxin-3	33	72,713	8.29	4.12	14.23
sTNF-R1	22	16,385	4.51	2.26	11.14
sTNF-R2	9	19,939	10.42	3.88	9.36
TSLP	1	2,085	0.22	3.96	19.5
TWEAK / TNFSF12	6	12,292	0.31	2.19	14.64

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Assays Provide More Reliable Sample Detection

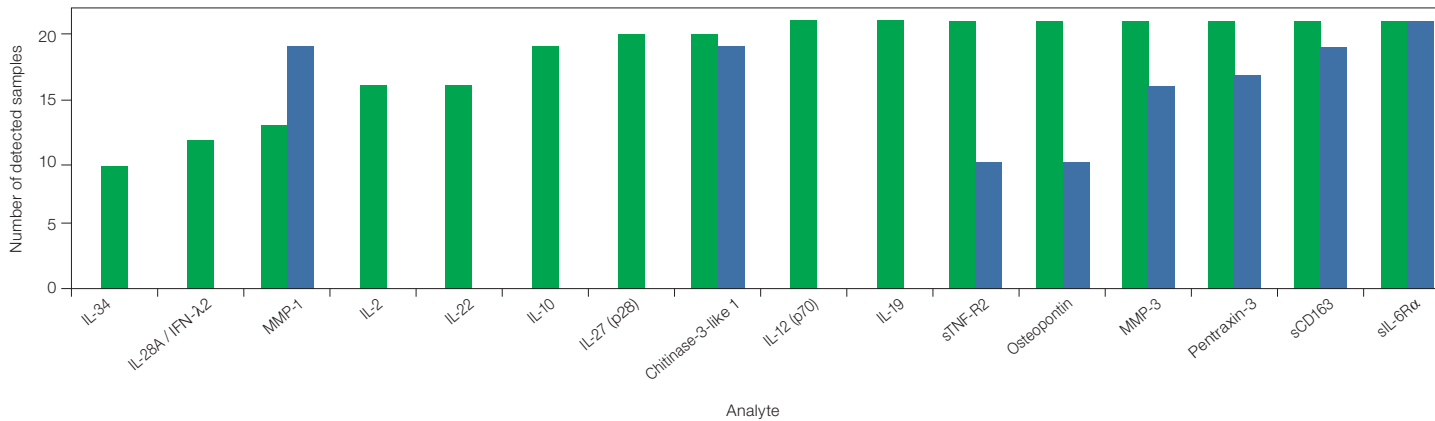
The Bio-Plex Pro Human Inflammation Assays were compared to overlapping assays from vendor R to highlight more reliable sample detection in serum.

Normal samples



Comparison of the Bio-Plex Pro Human Inflammation Assays to an equivalent multiplex assay from vendor R. Serum samples from 20 normal donors (top panel) and 21 donors with severe rheumatoid arthritis (bottom panel) were collected and evaluated for the presence of various analytes. The number of samples in which the analytes were detected is shown. The Bio-Plex Pro Human Inflammation Assays detected target proteins in 67% more samples than assays from vendor R. Vendor R's 21-plex assay required two base kits and separate runs to accommodate the different sample dilution requirements for certain analytes, while the Bio-Plex Pro 37-Plex Assay required only a single run and single dilution. Bio-Plex Pro Assays (■); vendor R assays (■).

RA samples



Bio-Plex Pro Human Th17 Cytokine Assays

The Bio-Plex Pro Human Th17 Cytokine Assays are a unique blend of immunoassays designed for performance across many different disease and treatment states, particularly autoimmune diseases. This robust panel enables reproducible measurement of 15 biologically relevant targets, making it an ideal assay for a wide range of preclinical and clinical studies. These analytes are involved in the T-helper cell type 17 immune response pathway that plays a key role in many inflammatory conditions.

Bio-Plex Pro Human Th17 Assays (171AA001M)

Analyte	Singleplex	Bead Region	Bio-Plex Pro Human Th17 Cytokine Panel, 15-Plex (171AA001M)
IFN- γ	171BA013M	21	•
IL-1 β	171BA001M	39	•
IL-4	171BA002M	52	•
IL-6	171BA003M	19	•
IL-10	171BA004M1	56	•
IL-17A	171BA005M	76	•
IL-17A/F	171BA016M	66	
IL-17F*	171BA006M	44	•
IL-21	171BA007M	47	•
IL-22	171BA008M	18	•
IL-23 (p19)	171BA009M	43	•
IL-25 / IL-17E	171BA010M	55	•
IL-31	171BA011M	62	•
IL-33	171BA012M	46	•
sCD40L	171BA014M	29	•
TNF- α	171BA015M	36	•

* Only available as a singleplex and in Express assay format.

Bio-Plex Pro Human Th17 Cytokine Assays

bio-rad.com/HumanTh17
Bio-Rad bulletin 6249

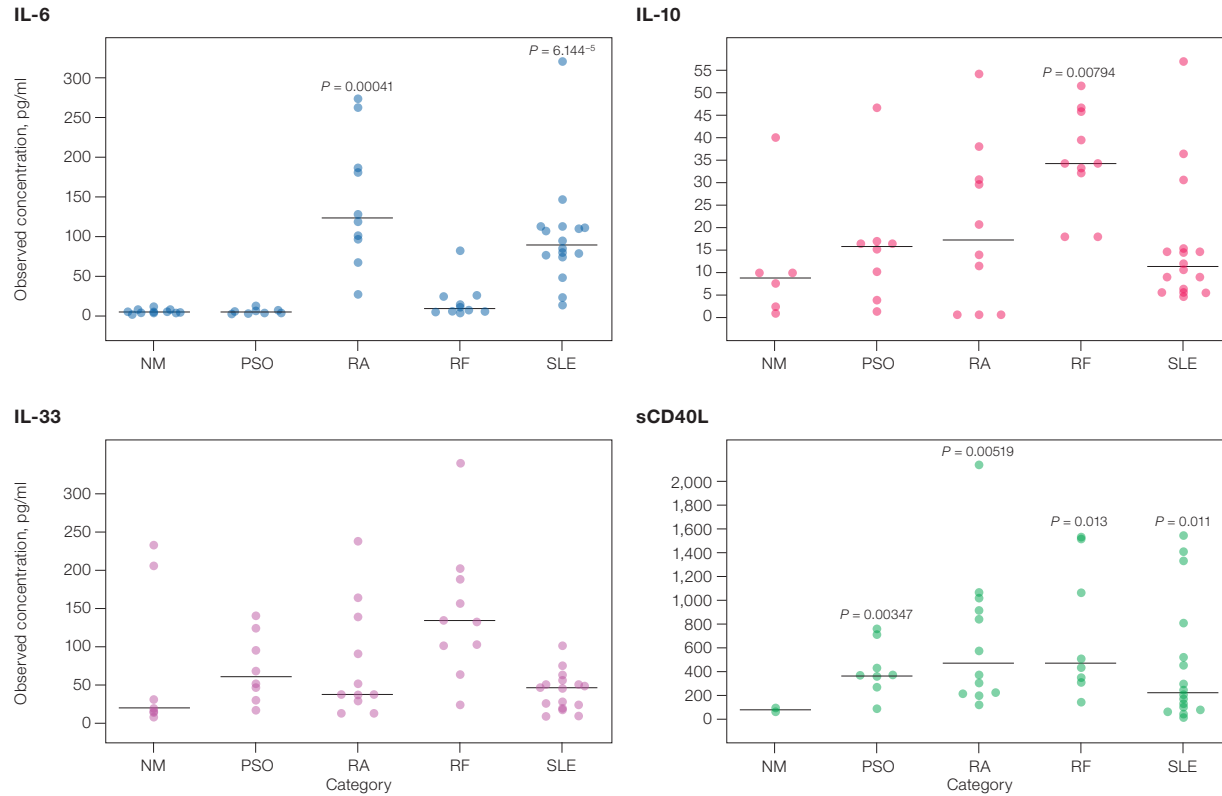
Performance Characteristics

Analyte	Alternate Names	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision		Calibration to WHO/NIBSC	
		LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV	Factor**	NIBSC Catalog #
IFN- γ	—	0.7	11,377	0.3	3.4	2.1	1.7	87/586
IL-1 β	—	0.4	2,877	0.1	1.6	5.4	1.0	86/680
IL-4	—	1.9	7,861	1.9	3.7	10.4	0.7	88/656
IL-6	—	3.1	25,399	2.0	3.1	4.3	1.6	89/548
IL-10	—	3.2	12,923	1.4	3.2	6.0	1.3	93/722
IL-17A	IL-17, CTLA8	1.6	25,915	0.8	3.5	5.1	0.4	01/420
IL-17A/F*	—	1.62	6,631	1.28	4.3	5.8	—	—
IL-17F	—	7.5	30,743	3.1	3.9	9.8	—	—
IL-21	Za11	15.3	250,446	2.5	3.3	10.3	—	—
IL-22	—	2.5	41,572	0.9	3.3	4.3	—	—
IL-23 (p19)	IL-23A, SGRF	10.7	132,017	5.2	3.9	6.0	—	—
IL-25	IL-17E	1.3	21,804	0.8	2.6	4.4	—	—
IL-31	—	3.6	58,723	2.1	5.9	10.4	—	—
IL-33	—	6.8	55,852	1.6	2.6	6.1	—	—
sCD40L	CD154	7.7	126,350	4.4	2.9	3.9	—	—
TNF- α	—	0.3	4,678	0.04	3.2	6.5	0.4	88/786

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; NIBSC, National Institute for Biological Standards and Control; ULOQ, upper limit of quantitation; WHO, World Health Organization.

* IL-17A/F values are derived from the singleplex assay format.

** Factor \times NIBSC value (pg/ml) = Bio-Plex value (pg/ml). Factors are based on average percentage recovery of Bio-Plex Standards (in the linear range) relative to NIBSC standards run on the same assay plate.



Serum cytokine levels from individuals with psoriasis (PSO, n = 8), rheumatoid arthritis (RA, n = 14), rheumatoid factors (RF, n = 10), and systemic lupus erythematosus (SLE, n = 18). Nonmatching normal (NM, n = 11) serum samples were used as the baseline reference. The t-test function in Bio-Plex Data Pro Software was used to calculate statistical differences. Only P values with statistical significance are shown.

Selected Bio-Plex Pro Human Th17 Cytokine Panel Citations

Debnath M et al. (2018). Comprehensive cytokine profiling provides evidence for a multi-lineage Th responses in Guillain Barré Syndrome. *Cytokine* 110, 58–62.

Lereclus E et al. (2017). A possible association of baseline serum IL-17A concentrations with progression-free survival of metastatic colorectal cancer patients treated with a bevacizumab-based regimen. *BMC Cancer* 17, 220.

Rosine N et al. (2018). Increase in IL-31 serum levels is associated with reduced structural damage in early axial spondyloarthritis. *Sci Rep* 8, 7,731.

Sharp SP et al. (2017). Local and systemic Th17 immune response associated with advanced stage colon cancer. *J Surg Res* 208, 180–186.

Bio-Plex Pro Human Chemokine Assays

The Human Chemokine Panel consists of 40 assays that measure analytes relevant to many disease states, including cancer, infection, vascular disease, and autoimmune disease. These 40 assays can be used to discover underlying causes of diseases based on impairment of chemokine systems and for the development of therapeutics against specific chemokine receptor antagonists.

Bio-Plex Pro Human Chemokine Panel, 40-Plex (171AK99MR2)

Analyte	Singleplex	Bead Region	Analyte	Singleplex	Bead Region
6Ckine / CCL21	171BK11MR2	12	IL-16	171BK33MR2	27
BCA-1 / CXCL13	171BK12MR2	74	IP-10 / CXCL10	171BK34MR2	48
CTACK / CCL27	171BK13MR2	72	I-TAC / CXCL11	171BK35MR2	25
ENA-78 / CXCL5	171BK14MR2	73	MCP-1 / CCL2 / MCAF	171BK36MR2	53
Eotaxin / CCL11	171BK15MR2	43	MCP-2 / CCL8	171BK37MR2	57
Eotaxin-2 / CCL24	171BK16MR2	30	MCP-3 / CCL7	171BK38MR2	26
Eotaxin-3 / CCL26	171BK17MR2	65	MCP-4 / CCL13	171BK39MR2	28
Fractalkine / CX3CL1	171BK18MR2	77	MDC / CCL22	171BK41MR2	29
GCP-2 / CXCL6	171BK19MR2	15	MIF	171BK42MR2	35
GM-CSF	171BK21MR2	34	MIG / CXCL9	171BK43MR2	14
GRO- α / KC / CXCL1	171BK22MR2	61	MIP-1 α / CCL3	171BK44MR2	55
GRO- β / CXCL2	171BK23MR2	78	MIP-1 δ / CCL15	171BK46MR2	66
I-309 / CCL1	171BK24MR2	20	MIP-3 α / CCL20	171BK47MR2	62
IFN- γ	171BK25MR2	21	MIP-3 β / CCL19	171BK48MR2	76
IL-1 β	171BK26MR2	39	MPIF-1 / CCL23	171BK49MR2	37
IL-2	171BK27MR2	38	SCYB16 / CXCL16	171BK51MR2	64
IL-4	171BK28MR2	52	SDF-1 α + β / CXCL12	171BK52MR2	22
IL-6	171BK29MR2	19	TARC / CCL17	171BK53MR2	67
IL-8 / CXCL8	171BK31MR2	54	TECK / CCL25	171BK54MR2	46
IL-10	171BK32MR2	56	TNF- α	171BK55MR2	36

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity	Assay Precision		Calibration to WHO/NIBSC	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV	Factor*	Catalog #
6Ckine / CCL21	21.9	3,923	12.0	4	6	—	—
BCA-1 / CXCL13	0.7	1,200	0.1	2	2	—	—
CTACK / CCL27	1.2	5,000	0.3	3	5	—	—
ENA-78 / CXCL5	7.3	120,000	5.7	3	6	—	—
Eotaxin / CCL11	1.5	3,859	0.7	3	4	—	—
Eotaxin-2 / CCL24	6.2	4,073	3.2	3	4	—	—
Eotaxin-3 / CCL26	0.9	12,109	0.5	3	4	—	—
Fractalkine / CX3CL1	4.0	11,463	0.9	3	4	—	—
GCP-2 / CXCL6	0.8	11,135	0.6	3	7	—	—
GM-CSF	5.3	35,000	1.0	4	3	—	—
GRO- α / KC / CXCL1	3.1	7,024	4.2	2	4	—	—
GRO- β / CXCL2	4.6	13,257	2.7	3	8	—	—

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

continues

Bulletin 6335

Performance Characteristics

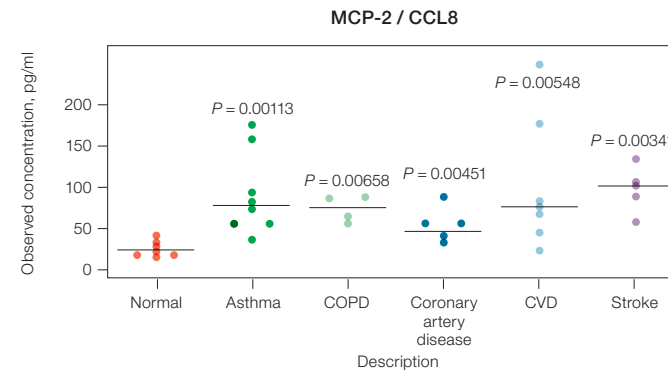
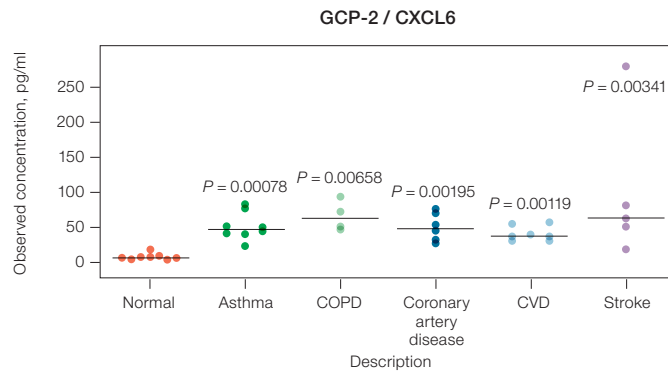
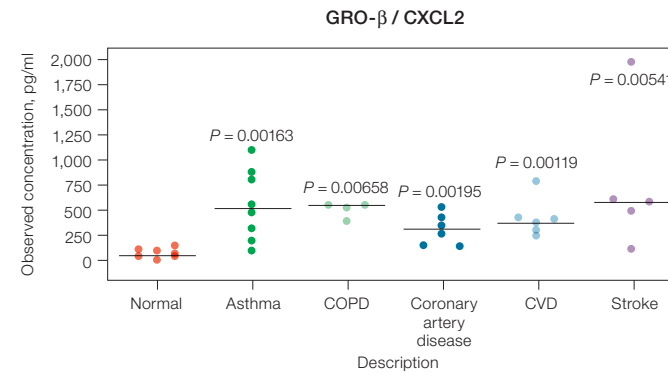
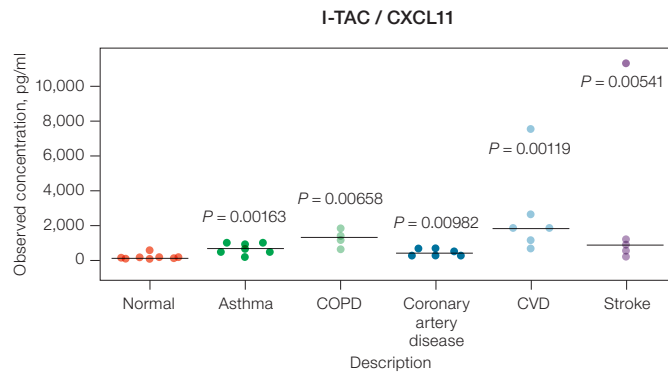
Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity	Assay Precision		Calibration to WHO/NIBSC	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV	Factor*	Catalog #
I-309 / CCL1	1.8	1,015	1.6	3	6	—	—
IFN- γ	2.3	20,236	0.4	3	5	0.7	87/586
IL-1 β	0.4	7,000	0.1	2	4	1.1	86/680
IL-2	0.8	13,000	0.1	3	6	—	—
IL-4	1.2	4,804	1.0	2	4	1.2	88/656
IL-6	0.7	12,000	0.1	2	5	1.0	89/548
IL-8 / CXCL8	0.5	7,640	0.04	3	4	1.7	89/520
IL-10	1.3	18,708	0.9	3	3	1.8	93/722
IL-16	2.1	34,000	0.8	3	4	—	—
IP-10 / CXCL10	1.6	7,714	1.1	2	7	—	—
I-TAC / CXCL11	0.1	2,298	0.05	3	8	—	—
MCP-1 / CCL2 / MCAF	0.3	4,812	0.1	3	3	2.5	92/794
MCP-2 / CCL8	0.3	4,056	0.04	3	5	—	—
MCP-3 / CCL7	1.9	20,133	1.3	6	6	—	—
MCP-4 / CCL13	0.2	3,368	0.1	3	4	—	—
MDC / CCL22	0.9	14,649	0.5	3	3	—	—
MIF	23.1	377,724	15.4	2	7	—	—
MIG / CXCL9	1.8	19,600	1.1	3	7	—	—
MIP-1 α / CCL3	0.4	1,543	0.3	4	6	1.9	92/518
MIP-1 δ / CCL15	1.7	9,100	0.2	3	5	—	—
MIP-3 α / CCL20	0.3	4,675	0.1	2	3	—	—
MIP-3 β / CCL19	3.0	48,494	1.1	2	4	—	—
MPIF-1 / CCL23	1.0	14,450	0.5	3	3	—	—
SCYB16 / CXCL16	0.5	2,867	0.1	3	4	—	—
SDF-1 α + β / CXCL12	8.3	115,730	10.3	4	8	—	—
TARC / CCL17	1.7	430	1.1	4	5	—	—
TECK / CCL25	20.6	114,493	4.9	4	5	—	—
TNF- α	0.9	13,879	0.2	3	8	1.8	88/786

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; NIBSC, National Institute for Biological Standards and Control; ULOQ, upper limit of quantitation; WHO, World Health Organization.

* Factor x NIBSC value (pg/ml) = Bio-Plex value (pg/ml). Factors are based on average percentage recovery of Bio-Plex Standards (in the linear range) relative to NIBSC standards run on the same assay plate.

Detection of Analytes

Bio-Plex Pro Assays are tested with samples from multiple sources to ensure target analytes are detected within normal biological expression levels and levels associated with disease.



Levels of biomarkers in sera of normal and various disease groups (asthma, chronic obstructive pulmonary disease [COPD], coronary artery disease [CAD], cardiovascular disease [CVD], and stroke). A Student *t*-test was used to determine statistical significance between groups. Black lines denote mean values; *P* values are indicated above each population. Data analysis, graphing, and statistics were performed with Bio-Plex Data Pro Software.

Bio-Plex Pro Multispecies TGF- β Assays

Bio-Plex Pro TGF- β Assays are magnetic bead-based multiplex assays designed to measure levels of TGF- β 1, TGF- β 2, and TGF- β 3 in human, mouse, and rat models in diverse matrices like serum, plasma, urine, and human milk.

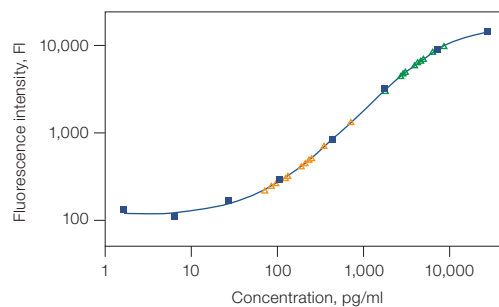
Bio-Plex Pro TGF- β 3-Plex Panel (171W4001M)

Analyte	Singleplex	Bead Region
TGF- β 1	171V4001M	13
TGF- β 2	171V4002M	72
TGF- β 3	171V4003M	66

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Premixed 3-Plex Assay					
TGF- β 1	1.69	27,616	3.9	4.5	4.9
TGF- β 2	14.7	30,080	1.9	6.3	9.1
TGF- β 3	2.8	15,031	0.5	6.9	8.2 CV, coefficient

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.



TGF- β 1 standard curves with human serum samples.

Data were analyzed using Bio-Plex Manager Software version 6.0 using the standard curve optimization function. Recovery range specification was set to 80–120%. Δ , normal serum; \blacktriangle , serum from patients with breast or colon cancer.

Bio-Plex Pro Human SARS-CoV-2 Serology IgG Assay

Bio-Plex Pro Human IgG SARS-CoV-2, 4-Plex (12014634)

Analyte	Bead Region
Nucleocapsid (N)	20
Receptor binding domain (RBD)	36
Spike 1 (S1)	28
Spike 2 (S2)	42

Performance Characteristics

Viral Antigen	Clinical Specificity, %*	Clinical Sensitivity, %**
	IgG n = 282	IgG n = 65
Nucleocapsid	99	100
RBD	96	100
S1	99	98
S2	95	100

n, number of samples run; RBD, receptor binding domain; S1, spike 1; S2, spike 2.

* Clinical specificity was determined by testing 282 severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)-negative samples that were collected earlier than December 2015.

** Clinical sensitivity was determined by samples from patients who previously had a SARS-CoV-2-positive PCR result.

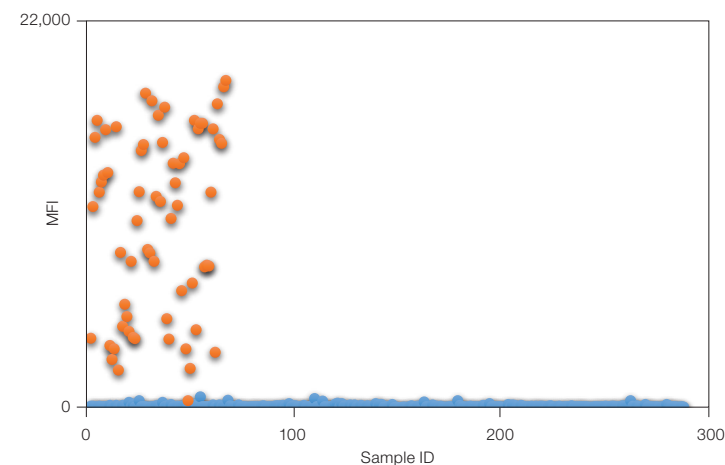
Performance and Assay Characteristics

Parameter/Assay Characteristics	IgG
Reactive species	Human
Compatible sample matrices	Serum, plasma
Analytical specificity, % analyte cross-reactivity	<5
Intra-assay precision, %CV	<10
Inter-assay precision, %CV	<15

CV, coefficient of variation.

Healthy and Diseased Sample Data for Anti-RBD IgG Assay

Anti-RBD IgG



Antibody profile of healthy and diseased samples in coronavirus disease 2019 (COVID-19) infection. The diseased samples for IgG (n = 65) were obtained from donors who were SARS-CoV-2 positive (confirmed by PCR testing). The healthy samples (n = 282) were collected from healthy donors prior to December 2015. Both serum and plasma samples were included in the study. Data for the other targets for the IgG isotype can be referenced in bulletin 7430. Healthy (●); diseased (●). MFI, median fluorescence intensity.

Bio-Plex Pro Human SARS-CoV-2 Neutralization Antibody Assays

Bio-Plex Pro Human SARS-CoV-2 Neutralization Antibody Assays

Analyte	Bead Region	Bio-Plex Pro Human SARS-CoV-2 Variant Neutralization Antibody Panel, 11-Plex (12016897)	Bio-Plex Pro Human SARS-CoV-2 Neutralization Antibody Panel, 2-Plex (12016848)	Component	Catalog #
RBD wild type	36	•	•	Bio-Plex Pro Human SARS-CoV-2 Neutralization Antibody Custom Assay Developer Kit	17007632
S1 wild type	28	•	•		
Alpha S1	43	•			
Beta S1	47	•			
Epsilon RBD	26	•			
Gamma RBD	37	•			
Kappa RBD	56	•			
D614G S1	25	•			
E484K RBD	45	•			
K417N RBD	15	•			
N501Y RBD	30	•			

RBD, receptor binding domain; S1, spike 1.

Performance Characteristics

SARS-CoV-2 Wild-Type and Variant Antigens	Clinical Specificity, %* n = 118	Clinical Sensitivity, %** n = 84
RBD	100	98
S1	99	98
Alpha S1	100	99
Beta S1	100	90
Epsilon RBD	100	95
Gamma RBD	97	90
Kappa RBD	99	93
D614G S1	100	99
E484K RBD	99	89
K417N RBD	96	99
N501Y RBD	99	99

n, number of samples run; RBD, receptor binding domain; S1, spike 1.

* Clinical specificity was determined by testing 118 SARS-CoV-2–negative samples that were collected earlier than December 2019.

** Clinical sensitivity was determined by running 84 SARS-CoV-2–positive serum and plasma samples that were confirmed to be human IgG anti–SARS-CoV-2 positive.

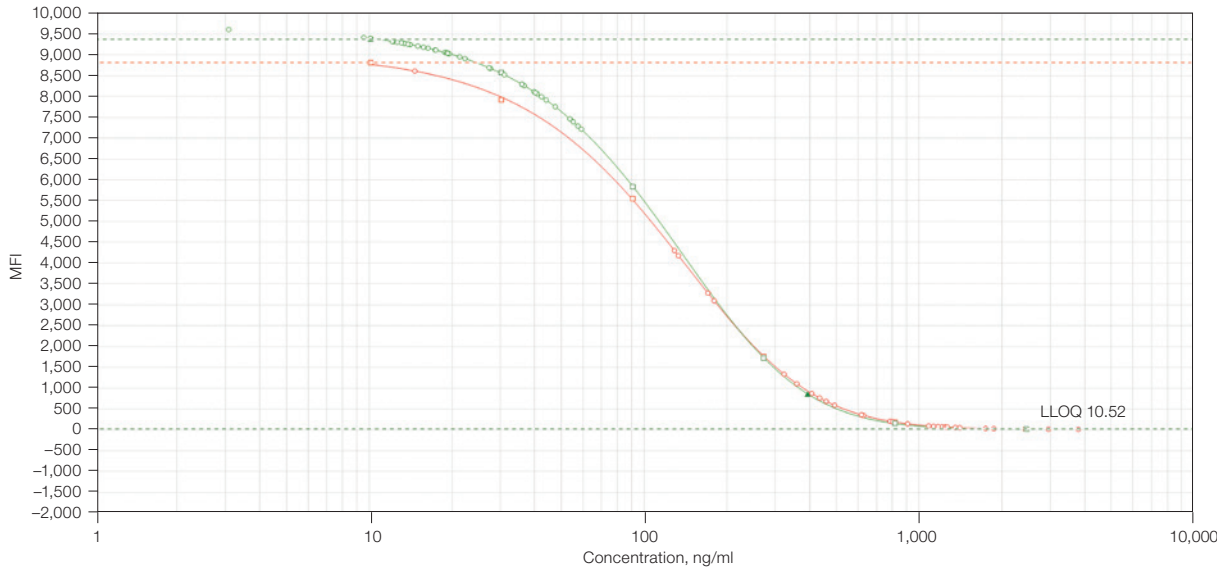
Performance and Assay Characteristics

Parameter	Characteristic
Reactive species	Human
Analytical specificity, % analyte cross-reactivity*	<5
Intra-assay precision, %CV	<10
Inter-assay precision, %CV	<20
Compatible sample matrices	Serum, plasma

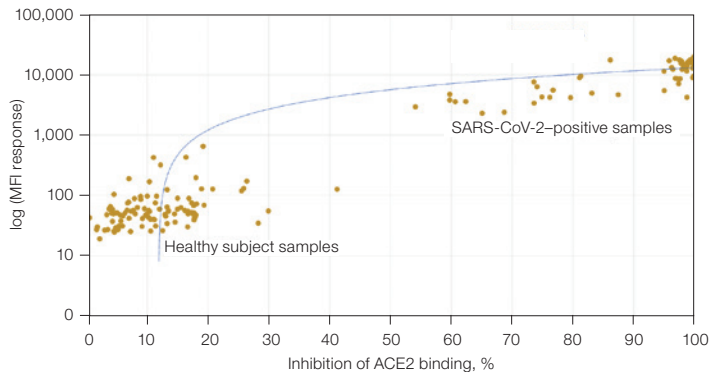
CV, coefficient of variation.

* Cross-reactivity to samples that are positive for non–SARS-CoV-2 pathogens.

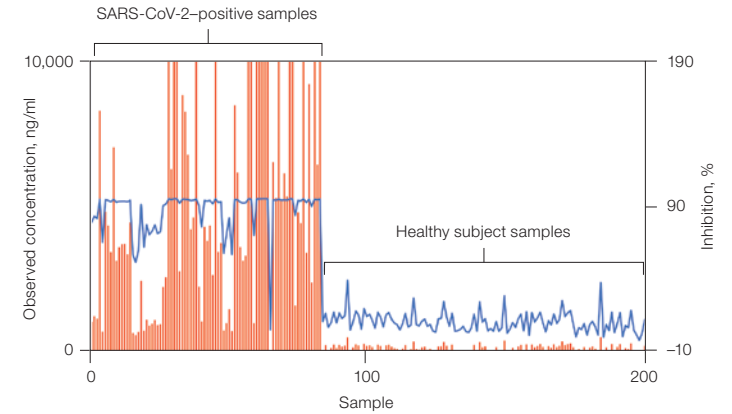
Neutralizing Antibody and Serology Assay Results



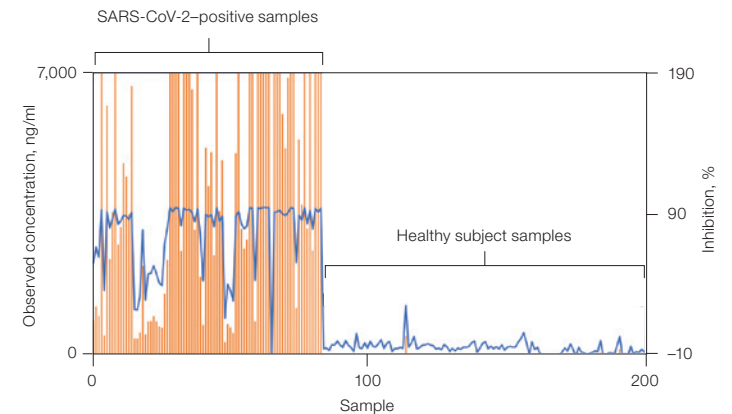
Standard curves for SARS-CoV-2 K417N RBD with SARS-CoV-2-positive samples (n = 29) in red, healthy subject samples (n = 39) in green, and the assay positive control. The MFI signal is inversely proportional to the concentration of neutralizing antibodies in this competitive assay format. The standard calibration curve was plotted with standard points (□, □); control (▲); samples (○, ○); upper limit of quantitation (—); and lower limit of quantitation (---). Standard curves shown are for two different experiments (SARS-CoV-2-positive samples and healthy subject samples) presented in standard curve overlay view from Bio-Plex Data Pro Software. MFI, median fluorescence intensity.



A plot that correlates the level of anti-RBD neutralizing antibody assayed using the Bio-Plex Pro Human IgG SARS-CoV-2 N/RBD/S1/S2 4-Plex Panel with the degree of neutralization (percentage inhibition) in samples. Left, control samples from healthy subjects; right, samples positive for SARS-CoV-2 (confirmed by PCR testing). MFI, median fluorescence intensity.



A plot comparing the degree of RBD antibody neutralization (percentage inhibition) and observed concentration in samples. Left, samples positive (n = 84) for SARS-CoV-2 (confirmed by PCR testing); right, control samples from healthy subjects (n = 118). Observed concentration (—); percentage inhibition (—).



A plot comparing the degree of S1 antibody neutralization (percentage inhibition) and observed concentration in samples. Left, samples positive (n = 84) for SARS-CoV-2 (confirmed by PCR testing); right, control samples from healthy subjects (n = 118). Observed concentration (—); percentage inhibition (—).

Bio-Plex Pro Cell Signaling Phosphoprotein Assays

Phosphoprotein Assay	Lysate Control for Phosphoprotein Assay	Lysate Control Catalog #	Untreated HeLa Lysate Control for Total Protein Assay (171YZT002)	Bead Region	Compatible Species
Akt 8-Plex Panel (LQ00006JK0K0RR)					
Akt (Ser ⁴⁷³)	EGF-treated HEK-293	171YZ0001*	•	75	H, M, R
BAD (Ser ¹³⁶)	PDGF-treated NIH3T3	171YZ0007*		26	H, M, R
GSK-3α/β (Ser ²¹ /Ser ⁹)	EGF-treated HEK-293	171YZ0001*	•	18	H, M, R
IRS-1 (Ser ⁶³⁶ /Ser ⁶³⁹)	PDGF-treated NIH3T3	171YZ0007*		76	H, M, R
mTOR (Ser ²⁴⁴⁸)	PDGF-treated NIH3T3	171YZ0007*	•	46	H, M, R
p70 S6 kinase (Thr ³⁸⁹)	β-NGF-treated PC12	171YZ0006*	•	55	H, M, R
PTEN (Ser ³⁸⁰)	PDGF-treated NIH3T3	171YZ0007*	•	22	H, M, R
S6 ribosomal protein (Ser ²³⁵ /Ser ²³⁶)	EGF-treated SK-Br3	171YZ0003*		74	H, M, R
MAPK 9-Plex Panel (LQ00000S6KL81S)					
ATF-2 (Thr ⁷¹)	UV-treated HEK-293	171YZ0009**		20	H, M, R
ERK1/2 (Thr ²⁰² /Tyr ²⁰⁴ , Thr ¹⁸⁵ /Tyr ¹⁸⁷)	EGF-treated HEK-293	171YZ0001***	•	38	H, M
HSP27 (Ser ⁷⁸)	EGF-treated SK-Br3	171YZ0003**		51	H
JNK (Thr ¹⁸³ /Tyr ¹⁸⁵)	UV-treated HEK-293	171YZ0009**	•	34	H
MEK1 (Ser ²¹⁷ /Ser ²²¹)	EGF-treated HEK-293	171YZ0001***	•	27	H, M, R
p38 MAPK (Thr ¹⁸⁰ /Tyr ¹⁸²)	UV-treated HEK-293	171YZ0009**	•	36	H, M, R
p53 (Ser ¹⁵)	UV-treated HEK-293	171YZ0009**		53	H
p90 RSK (Ser ³⁸⁰)	EGF-treated SK-Br3	171YZ0003***		35	H, M, R
Stat3 (Ser ⁷²⁷)	IFN-α-treated HeLa	171YZ0004**		52	H, M, R

H, human; M, mouse; R, rat.

* Included in LQ00006JK0K0RR.

** Included in LQ00000S6KL81S.

*** Included in LQ00000S6KL81S and LQ00006JK0K0RR.

Bio-Plex Pro Housekeeping Proteins

Housekeeping Protein	Singleplex Catalog #	Lysate Control	Lysate Control Catalog #
Human GAPDH	171V60019M	Untreated HeLa	171YZT002
β-actin	171V60020M	Untreated HeLa	171YZT002
Negative control for all housekeeping protein assays	—	Detection antibody diluent	—

The capacity for multiplexed biomarker analysis makes the Bio-Plex platform ideal for signal transduction assays. Bio-Plex Pro Cell Signaling Assays can be used to determine intracellular levels of phosphorylated proteins in the investigation of diverse biological processes including apoptosis, translation control, gene expression, cell cycle regulation, cytoskeletal restructuring, and neurological function.

Performance Characteristics

Phosphoprotein Assay	P/B Ratio*	Intra-Assay %CV	Inter-Assay %CV	Sensitivity (LOD), µg/well
Akt (Ser ⁴⁷³)	65	2.9	4.5	0.15
ATF-2 (Thr ⁷¹)	68	4.0	6.3	0.15
BAD (Ser ¹³⁶)	12	9.7	9.4	0.15
ERK1/2 (Thr ²⁰² /Tyr ²⁰⁴ , Thr ¹⁸⁵ /Tyr ¹⁸⁷)	48	4.3	4.9	0.15
GSK-3α/β (Ser ²¹ /Ser ⁹)	19	2.9	5.4	0.15
HSP27 (Ser ⁷⁸)	58	2.7	4.4	0.15
IRS-1 (Ser ⁶³⁶ /Ser ⁶³⁹)	52	5.5	9.3	0.3
JNK (Thr ¹⁸³ /Tyr ¹⁸⁵)	73	4.7	4.1	0.15
MEK1 (Ser ²¹⁷ /Ser ²²¹)	44	1.9	5.5	0.15
mTOR (Ser ²⁴⁴⁸)	40	3.3	9.2	0.3
p38 MAPK (Thr ¹⁸⁰ /Tyr ¹⁸²)	62	3.1	6.4	0.15
p53 (Ser ¹⁵)	59	8.0	12.2	0.15
p70 S6 kinase (Thr ³⁸⁹)	196	8.4	10.3	0.15
p90 RSK (Ser ³⁸⁰)	80	1.7	4.2	0.15
PTEN (Ser ³⁸⁰)	39	9.0	6.3	0.3
S6 ribosomal protein (Ser ²³⁵ /Ser ²³⁶)	26	4.3	5.2	0.15
Stat3 (Ser ⁷²⁷)	89	7.0	10.1	0.15

CV, coefficient of variation; LOD, limit of detection.

* Signal ratio (positive/background) of the stimulated cell lysate divided by the negative control cell lysate.

Bio-Plex Pro Human Apolipoprotein Assay Panel, 10-Plex

Apolipoproteins are involved in normal cholesterol trafficking, but we now know that they can have much broader impacts on our health when misregulated. In studies ranging from cancer to cardiovascular disease and Alzheimer's disease, apolipoproteins can serve as powerful biomarkers. Discover more about these fascinating proteins and see how they may be connected to your research with the Bio-Plex Pro Apolipoprotein Panel.

Bio-Plex Pro Human Apolipoprotein Assay Panel, 10-Plex (12003081)

Analyte	Bead Region
Apo A1	22
Apo A2	26
Apo B	44
Apo C1	36
Apo C3	39
Apo D	12
Apo E	38
Apo H	75
Apo J / Clusterin	48
CRP	78

Performance Characteristics

Analyte	Bead Region	Assay Working Ranges, ng/ml		Assay Sensitivity, ng/ml	Assay Precision	
		LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Apo A1	22	0.059	70	0.045	4	7
Apo A2	26	0.032	36	0.016	6	15
Apo B	44	0.41	360	0.22	6	12
Apo C1	36	0.030	17	0.0082	3	5
Apo C3	39	0.023	28	0.013	3	10
Apo D	12	0.055	30	0.027	3	9
Apo E	38	0.021	12	0.012	4	6
Apo H	75	0.15	210	0.11	3	8
Apo J / Clusterin	48	0.12	170	0.078	2	8
CRP	78	0.019	11	0.0087	3	5

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Human RBM Apoptosis Assays

Use the Bio-Plex Pro RBM Apoptosis Multiplex Assays for the detection of a highly relevant set of intracellular proteins involved in the commitment, onset, and induction of apoptosis by the intrinsic pathway.

Bio-Plex Pro RBM Apoptosis Panel 1 (171WAR1CK)

Analyte	Bead Region
Bak	74
Bax	27
Lamin B, intact and 45 kD	14
Smac	19

Bio-Plex Pro RBM Apoptosis Panel 2 (171WAR2CK)

Analyte	Bead Region
Bad	73
Bax / Bcl-2 dimer	42
Bcl-xL	22
Bim	12
Mcl-1	18

Bio-Plex Pro RBM Apoptosis Panel 3 (171WAR3CK)

Analyte	Bead Region
Bcl-xL / Bak dimer	47
Caspase-3, active	57
Mcl-1 / Bak dimer	54
Survivin	20

Performance Characteristics

Analyte	Bead Region	Assay Working Ranges, ng/ml		Assay Sensitivity, ng/ml	Assay Precision	
		LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Panel 1						
Bak	74	0.43	630	0.18	6	14
Bax	27	0.25	255	0.26	10	19
Lamin B, intact and 45 kD	14	0.057	95	0.044	5	14
Smac	19	0.16	165	0.075	8	19
Panel 2						
Bad	73	0.27	200	0.18	5	9
Bax / Bcl-2 dimer	42	0.47	1020	0.47	7	9
Bcl-xL	22	0.070	30	0.046	4	7
Bim	12	0.014	16	0.015	4	8
Mcl-1	18	0.10	180	0.10	6	6
Panel 3						
Bcl-xL / Bak dimer	47	0.081	45	0.021	5	14
Caspase-3, active	57	0.039	50	0.023	6	8
Mcl-1 / Bak dimer	54	0.33	600	0.27	8	13
Survivin	20	0.056	50	0.023	6	8

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Human Diabetes Assays

The Bio-Plex Pro Human Diabetes Assays offer reliable performance and a convenient format for studying human diabetes and obesity markers. These assays are magnetic bead-based assays, available as either premixed panels or singleplex sets, that rapidly (<3 hr) detect multiple diabetes and obesity biomarkers in a single experiment, using as little as 12.5 µl of sample.

Bio-Plex Pro Human Diabetes 10-Plex Panel (171A7001M)

Analyte	Singleplex	Bead Region
C-peptide	171B7003M	72
Ghrelin	171B7004M	26
GIP	171B7005M	14
GLP-1	171B7006M	27
Glucagon	171B7007M	15
Insulin	171B7008M	12
Leptin	171B7009M	78
PAI-1	171B7010M	61
Resistin	171B7011M	65
Visfatin	171B7012M	22

Bio-Plex Pro Human Diabetes 2-Plex Panel (171A7002M)

Analyte	Singleplex	Bead Region
Adiponectin*	171A7003M	64
Adipsin*		35

* Adiponectin and adipsin can also be assayed and are available as a 2-plex. Adiponectin is also available as a singleplex ready-to-use kit. Due to different dilution schemes, these biomarkers should be assayed separately from the ten in the panel.

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ		Intra-Assay %CV	Inter-Assay %CV
2-Plex Assay*					
Adiponectin	56	918,749	31	3	2
Adipsin	4	60,653	6	4	6
10-Plex Panel					
C-peptide	9	31,805	4	3	5
Ghrelin	3	41,664	3	4	3
GIP	3	20,458	3	3	6
GLP-1	12	88,106	12	3	4
Glucagon	47	83,803	47	3	3
Insulin	1	13,620	1	3	5
Leptin	3	41,614	3	4	4
PAI-1	3	57,156	3	4	3
Resistin	2	37,222	1	3	3
Visfatin	19	157,030	8	3	3

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

* Due to a different dilution scheme, adiponectin and adipsin were assayed as a 2-plex assay.

Bio-Plex Pro Human Hormone Assays

The Bio-Plex Pro RBM Human Metabolic and Hormone Assays, developed in partnership with Myriad RBM, are composed of a highly relevant set of biomarkers involved in diabetes, obesity, metabolic syndrome, cardiovascular disease, and the hormonal control of metabolism and reproductive organs. The assays are built on magnetic beads to enable robust quantitation of multiple proteins in human serum, plasma, and cell culture media samples. The assays are offered as premixed all-in-one kits.

Bio-Plex Pro RBM Human Hormone Panel 1 (171AHR1CK)

Analyte	Bead Region
FSH	18
GH	38
LH	15
Prolactin	19
TSH	22

Bio-Plex Pro Human Kidney Toxicity Assays

bio-rad.com/bio-plexkidneytox
Bio-Rad bulletin 6347

The Bio-Plex Pro RBM Human Kidney Toxicity Assays, developed in partnership with Myriad RBM, are composed of a highly relevant set of biomarkers for early detection and characterization of kidney injury. Myriad RBM's close collaboration with the Predictive Safety Testing Consortium (PSTC), U.S. Food and Drug Administration (FDA), and European Medicines Evaluation Agency (EMA) was instrumental in the selection of the markers found in these panels. The assays are built on magnetic beads to enable robust quantitation of multiple proteins in human urine samples, providing valuable information throughout drug development — from lead optimization to preclinical and clinical protocol decision making. The assays are offered as premixed all-in-one kits.

Bio-Plex Pro RBM Human Kidney Toxicity Panel 1 (171ATR1CK)

Analyte	Bead Region
Calbindin	64
Clusterin	12
GST-π	25
IL-18	21
KIM-1	44
MCP-1 / CCL2 / MCAF	15

Bio-Plex Pro RBM Human Kidney Toxicity Panel 2 (171ATR2CK)

Analyte	Bead Region
Albumin	30
B2M	22
Cystatin C	51
NGAL	46
Osteopontin	20
TFF3	61

Performance Characteristics

Analyte	Alternate Name	Assay Working Ranges, ng/ml		Assay Sensitivity, ng/ml	Assay Precision	
		LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Human Kidney Toxicity Panel 1						
Calbindin		4.4	1,750	0.97	4	5
Clusterin	Apo J	1.3	1,250	0.57	3	10
GST-π		0.5	230	0.23	5	8
IL-18		0.019	15	0.048	5	7
KIM-1	TIM-1	0.021	21	0.01	4	5
MCP-1	CCL2 / MCAF	0.011	3.8	0.0017	3	8
Human Kidney Toxicity Panel 2						
Albumin		2.8	640	1.2	2	8
B2M		0.043	22	0.022	3	9
Cystatin C		0.16	40	0.077	3	20
NGAL	Lipocalin-2	0.062	34	0.052	3	8
Osteopontin	OPN	3.8	2,100	1.7	6	12
TFF3		0.075	98	0.036	2	6

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Human Isotyping Assays

The Bio-Plex Pro Human Isotyping Assays are available in a multiplex format and offer robust and reproducible measurement of eight different immunoglobulin subclasses or isotypes associated with allergic responses, immunodeficiency disorders, autoimmune diseases, cancer, infectious diseases, and drug and vaccine development.

Bio-Plex Pro Human Isotyping Panel (171A3100M)

Analyte	6-Plex	Singleplex	Bead Region
IgA	•	171A3101M	12
IgM	•	171A3104M	56
IgE*	—	171A3102M	38
IgG total*	—	171A3103M	66
IgG1	•	—	54
IgG2	•	—	21
IgG3	•	—	36
IgG4	•	—	72

* IgE and IgG total are not part of the 6-plex.

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, ng/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
6-Plex Assay					
IgA	0.56	4,568	0.33	3	10
IgM	0.44	7,129	0.09	3	9
IgG1	0.44	3,639	0.21	4	11
IgG2	0.62	1,689	0.13	3	10
IgG3	0.08	1,247	0.03	2	8
IgG4	0.02	324	0.01	4	7
Singleplex Assay					
IgE	0.04	451	0.03	5	6
IgG total	0.52	8,588	0.25	4	3

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Human Acute Phase Assays

Disease research involving the study of inflammation, sepsis, cardiovascular disease, and diabetes often requires the measurement of multiple acute phase biomarkers. Bio-Plex Pro Human Acute Phase Assays deliver accurate and reproducible measurements of the most commonly measured biomarkers.

Bio-Plex Pro Human Acute Phase 4-Plex Panel (171A4C09M)

Analyte	Bead Region
CRP	81
Haptoglobin	79
α -2-macroglobin	92
Serum amyloid P (SAP)	98

Performance Characteristics

Analyte	Assay Working Ranges, ng/ml		Assay Sensitivity, ng/ml	Dynamic Ranges, ng/ml*	WHO/NIBSC	1 IU = x ng
	LLOQ	ULOQQ	LOD			
CRP	0.01	50	0.004	0.01–125	85/506	3.0 x 10 ⁶
Haptoglobin	0.1	500	0.07	0.03–500	—	—
α -2-macroglobulin	0.5	1,875	0.25	0.5–7,500	—	—
SAP	0.1	250	0.063	0.02–250	—	—

CV, coefficient of variation; IU, international units; LLOQ, lower limit of quantitation; LOD, limit of detection; NIBSC, National Institute for Biological Standards and Control; ULOQ, upper limit of quantitation; WHO, World Health Organization.

* Standard curve ranges.

Mouse Assays

Bio-Plex Pro Mouse Cytokine Assays

bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 5827

Bio-Plex Pro Mouse Cytokine, Chemokine, and Growth Factor Magnetic Bead-Based Assays detect and measure levels of 46 analytes in diverse matrices such as serum, plasma, and tissue culture supernatants. Cytokines, chemokines, and growth factors are cell-signaling proteins that mediate a wide range of physiological responses, including immunity, inflammation, and hematopoiesis. They are associated with a spectrum of diseases including tumor growth, infections, and Parkinson's disease.

Bio-Plex Pro Mouse Cytokine Assays

Analyte	Singleplex	23-Plex Panel (M60009RDPD)	8-Plex Panel (M60000007A)	Th1/Th2 Panel (M6000003J7)	Th1 Panel (L6000004C6)	Th2 Panel (L60000UKVT)	Th17 6-Plex Panel (M6000007NY)	Bead Region
Eotaxin / CCL11	171G5014M	•						74
G-CSF	171G5015M	•						54
GM-CSF	171G5016M	•	•	•				73
IFN- γ	171G5017M	•	•	•	•		•	34
IL-1 α	171G5001M	•						53
IL-1 β	171G5002M	•	•		•		•	19
IL-2	171G5003M	•	•	•	•	•		36
IL-3	171G5004M	•						18
IL-4	171G5005M	•	•	•		•		39
IL-5	171G5006M	•	•	•		•		52
IL-6	171G5007M	•			•	•	•	38
IL-9	171G5008M	•				•		33
IL-10	171G5009M	•	•	•	•	•	•	56
IL-12 (p40)	171G5010M	•						76
IL-12 (p70)	171G5011M	•		•	•			78
IL-13	171G5012M	•				•		37
IL-17A	171G5013M	•					•	72
KC / Gro- α / CXCL1	171G5018M	•						57
MCP-1 / CCL2 / MCAF	171G5019M	•						51
MIP-1 α / CCL3	171G5020M	•						77
MIP-1 β / CCL4	171G5021M	•						75
RANTES	171G5022M	•						55
TNF- α	171G5023M	•	•	•	•		•	21

Bio-Plex Pro Mouse Cytokine Assays

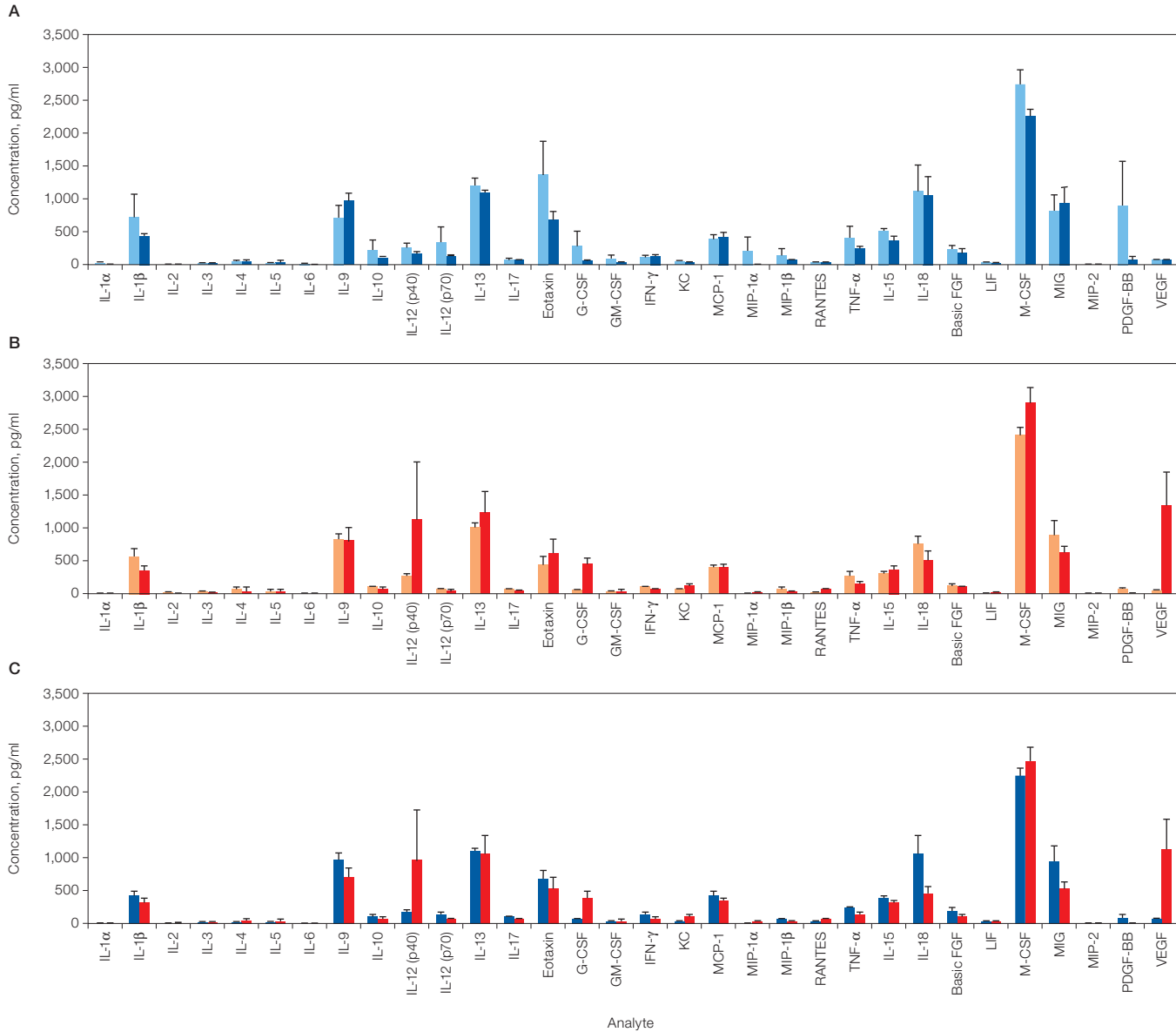
bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 5827

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ		LOD	Intra-Assay %CV
Eotaxin / CCL11	257.9	4,636	147.4	4	5
G-CSF	5.1	84,244	0.6	3	12
GM-CSF	21.2	3,401	5.6	3	24
IFN- γ	1.84	30,164	1.2	4	6
IL-1 α	1.84	21,093	0.2	3	29
IL-1 β	10.36	60,631	9.4	4	7
IL-2	3.72	51,857	0.6	3	19
IL-3	1.55	21,632	0.2	2	15
IL-4	6.98	9,372	2.1	3	20
IL-5	3.57	13,315	0.3	4	14
IL-6	0.74	12,053	0.2	3	16
IL-9	6.89	28,208	12.5	4	9
IL-10	2.95	12,066	1.0	4	5
IL-12 (p40)	1.53	25,024	0.4	2	7
IL-12 (p70)	1.62	26,507	2.3	3	7
IL-13	47.2	57,011	38.7	4	5
IL-17A	2.65	43,337	0.8	3	10
KC / Gro- α / CXCL1	3.2	18,202	0.3	3	30
MCP-1 / CCL2 / MCAF	22.4	41,873	3.7	5	7
MIP-1 α / CCL3	256.2	15,565	36.3	3	11
MIP-1 β / CCL4	3.33	24,798	0.8	3	8
RANTES	2.78	8,759	0.6	4	4
TNF- α	5.8	59,626	1.4	3	6

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Mouse Cytokine Assays



Comparison of plasma cytokine levels in FVB/N (control) and C3TAG (transgenic) mice. A, 1.5 month old FVB/N (light blue) vs. C3TAG mice (dark blue); **B,** 6.0 month old FVB/N (orange) vs. tumor-bearing C3TAG mice (red); **C,** 1.5 month old (dark blue) vs. 6.0 month old (red) C3TAG mice.

Bio-Plex Pro Mouse Cytokine and TGF- β Assays

bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 5827

Bio-Plex Pro Mouse Cytokine 9-Plex Panel (MD000000EL)

Analyte	Singleplex	Bead Region
Basic FGF	171G6002M	25
IL-15	171G6001M	42
IL-18*		20
LIF	171G6003M	45
M-CSF	171G6004M	26
MIG / CXCL9	171G6005M	44
MIP-2 / CXCL2	171G6006M	27
PDGF-BB	171G6007M	35
VEGF	171G6008M	47

* Not available as a singleplex.

Bio-Plex Pro TGF- β 3-Plex Panel (171W4001M)

Analyte	Singleplex	Bead Region
TGF- β 1	171V4001M	13
TGF- β 2	171V4002M	72
TGF- β 3	171V4003M	66

Bio-Plex Pro Mouse Th17 Cytokine 10-Plex Panel (12010828)

Analyte	Singleplex	10-Plex Panel (12010828)	Bead Region
CD40L	171GA001M	•	30
ICAM-1*	171GA010M		22
IL-17F	171GA002M	•	28
IL-21	171GA003M	•	14
IL-22	171GA004M	•	15
IL-23 (p19)	171GA005M	•	61
IL-25 / IL-17E	171GA006M	•	67
IL-27 (p28)	171GA007M	•	43
IL-31	171GA008M	•	29
IL-33	171GA009M	•	13
MIP-3 α / CCL20	171GA011M	•	12

* Due to differences in dilution factors, it is not possible to multiplex ICAM-1 with other assays.

Performance Characteristics

Mouse Cytokine 9-Plex Panel

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ		Intra-Assay %CV	Inter-Assay %CV
Basic FGF	4.8	35,500	2.2	8	8
IL-15	5.7	37,501	6.6	6	3
IL-18	81.4	29,761	31.8	8	18
LIF	3.5	57,366	0.6	4	12
M-CSF	1.5	24,221	0.4	4	14
MIG / CXCL9	183	46,393	3.4	5	21
MIP-2 / CXCL2	32	8,574.2	0.4	5	13
PDGF-BB	10.4	36,939	4.3	5	10
VEGF	27.2	32,771	1.6	4	15

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Mouse Cytokine and TGF- β Assays

bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 5827

Performance Characteristics

Mouse Th17 Assay

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
10-Plex					
CD40L	8	136,300	4.4	2.8	1.9
ICAM-1*	81	90,319	14	3.0	5.0
IL-17F	25	86,159	8.3	5.9	1.7
IL-21	30	31,793	7.1	4.4	3.2
IL-22	1	21,071	0.5	4.7	1.4
IL-23 (p19)	80	273,553	31.8	4.5	1.7
IL-25/IL-17E	5	71,463	2.8	2.8	1.4
IL-27	4	60,530	0.9	2.7	0.4
IL-31	86	1,452,700	36.1	3.0	2.0
IL-33	43	170,779	22.4	3.9	2.7
MIP-3 α	1	5,499	0.7	2.7	2.9
6-Plex					
IFN- γ	1.84	30,164	1.2	1	6
IL-1 β	10.36	60,631	9.4	4	7
IL-6	0.74	12,053	0.2	3	16
IL-10	2.95	12,066	1.0	4	5
IL-17A	2.65	43,337	0.8	3	10
TNF- α	5.8	59,626	1.4	3	6
TGF-β 3-Plex					
TGF- β 1	1.69	27,616	3.9	4.5	4.9
TGF- β 2	14.7	30,080	1.9	6.3	9.1
TGF- β 3	2.8	15,031	0.5	6.9	8.2

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

* ICAM-1 was measured as a singleplex assay.

Bio-Plex Pro Mouse Chemokine Assays

bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 7050

The Bio-Plex Pro Mouse Chemokine Panel enables you to detect and quantify chemokines from mouse biological samples, requiring only 10 µl of precious sample. Whether you are studying oncology, immunology, autoimmunity, neurology, infectious diseases, or discovering biomarkers, the Bio-Plex Pro Mouse Chemokine Panel will provide a robust, efficient tool to screen even low-level analytes in a high-throughput, multiplex assay.

Bio-Plex Pro Mouse Chemokine 31-Plex Panel (12009159)

Analyte	Singleplex	31-Plex Panel (12009159)	Bead Region
BCA-1 / CXCL13	12002232	•	28
CTACK / CCL27	12002233	•	62
ENA-78 / CXCL5	12002234	•	20
Eotaxin / CCL11	12002235	•	74
Eotaxin-2 / CCL24	12002236	•	73
Fractalkine / CX3CL1	12002237	•	25
GM-CSF	12002238	•	22
I-309 / CCL1	12002239	•	26
IFN-γ	12002438	•	34
IL-1β	12002240	•	19
IL-2	12002439	•	36
IL-4	12002440	•	39
IL-6	12002241	•	38
IL-10	12002242	•	56
IL-16	12002243	•	29
IP-10 / CXCL10	12002244	•	35
I-TAC / CXCL11	12002245	•	37
KC / Gro-α / CXCL1	12002246	•	57
MCP-1 / CCL2 / MCAF	12002441	•	51
MCP-2 / CCL8*	12002247		42
MCP-3 / CCL7	12002248	•	46
MCP-5 / CCL12	12002249	•	48
MDC / CCL22	12002250	•	52
MIP-1α / CCL3	12002252	•	77
MIP-1β / CCL4	12002253	•	75
MIP-2 / CXCL2**	12002254		27
MIP-3α / CCL20	12002443	•	12
MIP-3β / CCL19	12002255	•	64
RANTES / CCL5	12002256	•	55
SCYB16 / CXCL16	12002257	•	65
SDF-1α / CXCL12	12002258	•	67
TARC / CCL17	12002259	•	63
TECK / CCL25**	12002260		78
TNF-α	12002444	•	21

* Available as singleplex set only.

** Can be run as singleplex sets or multiplexed with each other as a 2-plex panel.

Bio-Plex Pro Mouse Chemokine Assays

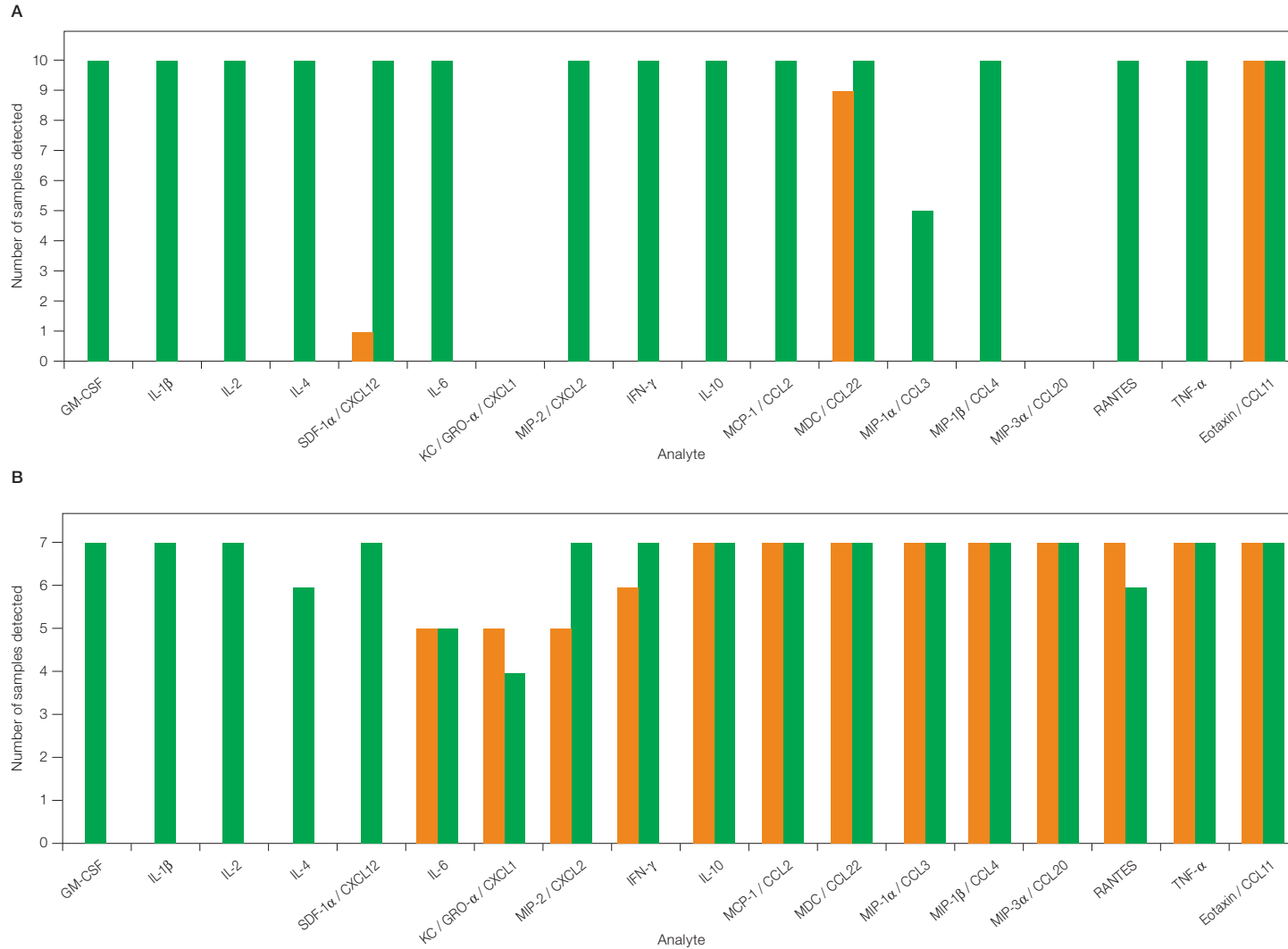
bio-rad.com/bio-plex_mousecytokines
Bio-Rad bulletin 7050

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Singleplex Bead Region
	LLOQ	ULOQ	LOD	
BCA-1 / CXCL13	7.22	5,175	≤3.7	28
CTACK / CCL27	30.94	289,593	≤7.6	62
ENA-78 / CXCL5	8.66	81,052	≤5.7	20
Eotaxin / CCL11	0.56	1,291	≤0.3	74
Eotaxin-2 / CCL24	3.58	23,453	≤3.6	73
Fractalkine / CX3CL1	10.02	50,504	≤3.6	25
GM-CSF	0.37	3,498	≤0.1	22
I-309 / CCL1	0.67	2,748	≤0.5	26
IFN-γ	2.18	20,382	≤0.4	34
IL-1β	13.91	70,131	≤6.9	19
IL-2	0.86	8,096	≤0.2	36
IL-4	3.75	6,135	≤1.9	39
IL-6	1.10	10,240	≤0.8	38
IL-10	32.29	71,217	≤19	56
IL-16	22.33	52,270	≤11	29
IP-10 / CXCL10	171.30	100,233	≤89	35
I-TAC / CXCL11	25.91	6,633	≤28	37
KC / Gro-α / CXCL1	4.90	11,473	≤2.7	57
MCP-1 / CCL2 / MCAF	17.12	56,990	≤15	51
MCP-2 / CCL8	1.19	2,266	≤0.6	42
MCP-3 / CCL7	1.07	1,338	≤0.8	46
MCP-5 / CCL12	0.52	4,851	≤0.1	48
MDC / CCL22	0.32	3,025	≤0.1	52
MIP-1α / CCL3	0.33	3,071	≤0.2	77
MIP-1β / CCL4	5.49	41,738	≤2.1	75
MIP-2 / CXCL2	16.93	30,332	≤13.7	27
MIP-3α / CCL20	1.07	4,379	≤1.1	12
MIP-3β / CCL19	28.75	50,927	≤19	64
RANTES	0.72	6,745	≤0.1	55
SCYB16 / CXCL16	0.32	2,989	≤0.3	65
SDF-1α / CXCL12	9.56	48,205	≤6.4	67
TARC / CCL17	3.38	19,748	≤2.7	63
TECK / CCL25	4.82	79,042	≤2.4	78
TNF-α	2.66	24,906	≤0.3	21

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Mouse Chemokine Assays



Competitive comparison. Serum samples from ten normal mice (A) and seven lipopolysaccharide-challenged mice (B) were used in this study to compare analyte detectability between Bio-Plex Pro and another multiplex chemokine assay, Vendor A's 19-plex. The average analyte detectability of Vendor A's 19-plex assay (■) was 34% while that of the Bio-Plex Pro Mouse Chemokine Panel (■) was 90%, providing 56% more actionable data.

Bio-Plex Pro Mouse Diabetes Assays

bio-rad.com/bio-plexprodiabetes
Bio-Rad bulletin 6342

The Bio-Plex Pro Mouse Diabetes Assays offer reliable performance and a convenient format for studying mouse diabetes and obesity markers. These assays are magnetic bead-based assays, available as either premixed panels or singleplex sets, that rapidly (<3 hr) detect multiple diabetes and obesity biomarkers in a single experiment, using as little as 12.5 µl of sample.

Bio-Plex Pro Mouse Diabetes 8-Plex (171F7001M)

Analyte	Singleplex	Bead Region
Ghrelin	171G7002M	64
GIP	171G7003M	46
GLP-1	171G7004M	62
Glucagon	171G7005M	63
Insulin	171G7006M	66
Leptin	171G7007M	65
PAI-1	171G7008M	48
Resistin	171G7009M	30

Bio-Plex Pro Mouse Diabetes Assay Adiponectin All-in-One (171F7002M)

Analyte	Singleplex	Bead Region
Adiponectin	171F7002M	29

Performance Characteristics

Target	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Singleplex Assay					
Adiponectin*	38.0	62,043	8.4	4	3
8-Plex Assay					
Ghrelin	3.1	7,296	0.8	5	4
GIP	13.4	14,999	2.3	4	10
GLP-1	3.4	1,969	0.8	6	11
Glucagon	24.0	3,067	7.0	6	6
Insulin	93.4	47,815	22.0	6	4
Leptin	17.1	69,900	6.2	4	3
PAI-1	0.7	2,922	0.5	5	2
Resistin	125.9	257,870	32.0	4	4

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

* Due to the different dilution scheme, adiponectin was assayed as a single assay.

Rat Assays

Bio-Plex Pro Rat Cytokine and TGF-β Assays

bio-rad.com/ratcytokines
Bio-Rad bulletins 6100 and 6054

Bio-Plex Pro Rat Cytokine, Chemokine, and Growth Factor Magnetic Bead-Based Assays detect and measure levels of analytes in diverse matrices such as serum, plasma, and tissue culture supernatants. Cytokines, chemokines, and growth factors are cell signaling proteins that mediate a wide range of physiological responses, including immunity, inflammation, and hematopoiesis. They are associated with a spectrum of diseases ranging from tumor growth to infections to Parkinson's disease.

Bio-Plex Pro Rat Cytokine and TGF-β Assays

Analyte	Singleplex Set	23-Plex (12005641)	12-Plex Th1/Th2 Panel (171K1002M)	TGF-β 3-Plex (171W4001M)	Bead Region
G-CSF	171L1003M	•			54
GM-CSF	171L1004M	•	•		37
GRO-α / KC / CXCL1	171L1005M	•			57
IFN-γ	171L1006M	•	•		34
IL-1α	171L1007M	•	•		21
IL-1β	171L1008M	•	•		28
IL-2	171L1009M	•	•		22
IL-4	171L1010M	•	•		33
IL-5	171L1011M	•	•		52
IL-6	171L1012M	•	•		56
IL-7	171L1013M	•			38
IL-10	171L1014M	•	•		19
IL-12 (p40)*	171L1015M				76
IL-12 (p70)	171L1016M	•	•		78
IL-13	171L1017M	•	•		15
IL-17A	171L1018M	•			72
IL-18		•			20
M-CSF	171L1020M	•			26
MCP-1 / CCL2 / MCAF	171L1027M	•			51
MIP-1α / CCL3	171L1021M	•			77
MIP-2 / CXCL2**	171L1022M				27
MIP-3α / CCL20	171L1023M	•			36
RANTES	171L1024M	•			55
TGF-β1	171V4001M			•	13
TGF-β2	171V4002M			•	72
TGF-β3	171V4003M			•	66
TNF-α	171L1025M	•	•		43
VEGF	171L1026M	•			47

* IL-12 (p40) cannot be multiplexed with IL-12 (p70).

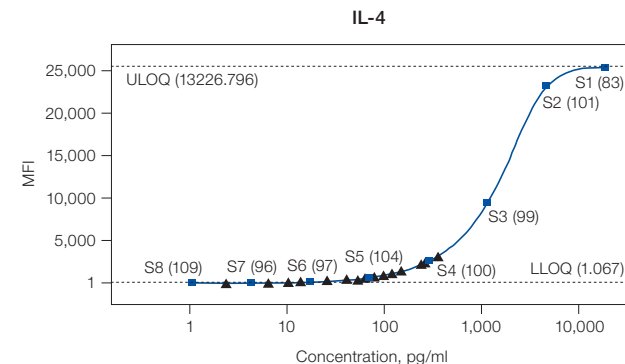
** MIP-2 cannot be multiplexed with GRO-α / KC / CXCL1.

Bio-Plex Pro Rat Cytokine and TGF- β Assays

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Singleplex Assay					
IL-12 (p40)	2	2,015	0.4	3	4
MIP-2 / CXCL2	0.3	1,085	0.2	4	5
23-Plex Assay					
G-CSF	1	2,911	0.2	2	1
GM-CSF	6	31,519	0.6	4	1
GRO- α / KC / CXCL1	2	1,521	0.6	4	2
IFN- γ	4	23,955	1	5	3
IL-1 α	2	24,649	1	3	3
IL-1 β	6	31,666	2	4	2
IL-2	8	7,981	3	4	3
IL-4	1	16,209	1	6	3
IL-5	6	2,007	6	4	0.4
IL-6	13	30,766	10	4	3
IL-7	2	32,472	0.4	4	3
IL-10	4	34,385	5	4	6
IL-12 (p70)	4	15,481	0.7	4	3
IL-13	2	15,751	0.9	4	2
IL-17	1	3,079	0.1	3	2
IL-18	4	31,652	4	4	5
M-CSF	2	23,264	0.4	2	3
MCP-1 / CCL2 / MCAF	12	48,000	4	4	4
MIP-1 α / CCL3	25	4,325	12	4	7
MIP-3 α / CCL20	1	3,032	0.7	4	2
TGF- β 1	1.69	27,616	3.9	4.5	4.9
TGF- β 2	14.7	30,080	1.9	6.3	9.1
TGF- β 3	2.8	15,031	0.5	6.9	8.2
RANTES	8	7,950	3	5	2
TNF- α	16	8,207	3	5	7
VEGF	0	3,963	0.3	3	5

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.



Normal and diabetic rat serum and plasma IL-4 levels fall within the broad dynamic range. LLOQ, lower limit of quantitation; MFI, median fluorescence intensity; S, sample; ULOQ, upper limit of quantitation.

Bio-Plex Pro Rat Diabetes Assays

Bio-Plex Pro Rat Diabetes Assays offer reliable performance and a convenient format for studying rat diabetes and obesity markers. These assays are magnetic bead-based assays, available as either premixed panels or singleplex sets, that rapidly (<3 hr) detect multiple diabetes and obesity biomarkers in a single experiment, using as little as 12.5 µl of sample.

Bio-Plex Pro Rat Diabetes Singleplex Sets

Analyte	Singleplex	Bead Region
Ghrelin	171L7001M	64
GLP-1	171L7003M	62
Glucagon	171L7004M	63
Leptin	171L7006M	65
PAI-1	171L7007M	61

Performance Characteristics

Analyte	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Ghrelin	1	16,152	0.3	4	4
GLP-1	4	6,062	3	8	6
Glucagon	6	4,443	6	3	4
Leptin	24	130,465	5	4	3
PAI-1	49	66,888	27	5	3

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Pro Rat Kidney Toxicity Assays

The Bio-Plex Pro RBM Rat Kidney Toxicity Assays, developed in partnership with Myriad RBM, are composed of a highly relevant set of biomarkers for early detection and characterization of kidney injury. Myriad RBM's close collaboration with the Predictive Safety Testing Consortium (PSTC), U.S. Food and Drug Administration (FDA), and European Medicines Evaluation Agency (EMA) was instrumental in the selection of the markers found in these panels. The assays are built on magnetic beads to enable robust quantitation of multiple proteins in rat urine samples, providing valuable information throughout drug development — from lead optimization to preclinical and clinical protocol decision making.

Bio-Plex Pro RBM Rat Kidney Toxicity Panel 1 (171KTR1CK)

Analyte	Bead Region
Clusterin	12
IL-18	21
KIM-1	20
MCP-1 / CCL2 / MCAF	15
Osteopontin	52

Bio-Plex Pro RBM Rat Kidney Toxicity Panel 2 (171KTR2CK)

Analyte	Bead Region
B2M	22
Calbindin	62
Cystatin C	44
NGAL	46

Bio-Plex Pro RBM Rat Kidney Toxicity Albumin Kit (171KTR3CK)

Analyte	Bead Region
Albumin	30

Performance Characteristics

Analyte	Alternate Name	Assay Working Ranges, ng/ml		Assay Sensitivity, ng/ml	Assay Precision	
		LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV
Rat Kidney Toxicity Panel 1						
Clusterin	Apo J	0.99	840	0.43	3	12
IL-18		0.36	35	0.17	4	5
KIM-1	TIM-1	0.042	50	0.023	4	7
MCP-1 / CCL2 / MCAF		0.15	35	0.045	2	6
Osteopontin	OPN	0.0039	3.2	0.0015	4	5
Rat Kidney Toxicity Panel 2						
B2M		8.3	2,760	4.1	10	18
Calbindin		0.7	535	0.61	9	14
Cystatin C		0.062	42	0.026	2	6
NGAL	Lipocalin-2	0.63	480	0.22	5	10
Rat Kidney Toxicity Albumin Kit						
Albumin		0.043	35	0.014	5	9

CV, coefficient of variation; LLOQ, lower limit of quantitation; LOD, limit of detection; ULOQ, upper limit of quantitation.

Bio-Plex Comprehensive Analyte Tables

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
6CKine / CCL21	Chemokine 40-plex (p 19)			
Adiponectin	Diabetes (p 30)	Diabetes (p 43)		
Adipsin	Diabetes 2-plex (p 30)			
Akt (Ser ⁴⁷³)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
Albumin	Kidney Toxicity 2 6-plex (p 32)		Kidney Toxicity (p 47)	
Alpha S1	SARS-CoV-2 Neutralization Antibody (p 24)			
Apo A1	Apolipoprotein 10-plex (p 28)			
Apo A2	Apolipoprotein 10-plex (p 28)			
Apo B	Apolipoprotein 10-plex (p 28)			
Apo C1	Apolipoprotein 10-plex (p 28)			
Apo C3	Apolipoprotein 10-plex (p 28)			
Apo D	Apolipoprotein 10-plex (p 28)			
Apo E	Apolipoprotein 10-plex (p 28)			
Apo H	Apolipoprotein 10-plex (p 28)			
Apo J / Clusterin	Apolipoprotein 10-plex (p 28) Kidney Toxicity 1 6-plex (p 32)			
APRIL / TNFSF13	Inflammation 37-plex (p 12)			
ATF-2 (Thr71)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
Bad	Apoptosis 2 (p 29)			
BAD (Ser ¹³⁶)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
BAFF / TNFSF13B	Inflammation 37-plex (p 12)			
Bak	Apoptosis 1 (p 29)			
Basic FGF	Cytokine 27-plex, 48-plex (p 6)	Cytokine 9-plex (p 38)		
Bax	Apoptosis 1 (p 29)			
Bax / Bcl-2 dimer	Apoptosis 2 (p 29)			
Beta S1	SARS-CoV-2 Neutralization Antibody (p 24)			
BCA-1 / CXCL13	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
Bcl-xL	Apoptosis 2 (p 29)			
Bcl-xL / Bak dimer	Apoptosis 3 (p 29)			
Bim	Apoptosis 2 (p 29)			
B2M	Kidney Toxicity 2 6-plex (p 32)		Kidney Toxicity 2 4-plex (p 47)	
Calbindin	Kidney Toxicity 1 6-plex (p 32)		Kidney Toxicity 2 4-plex (p 47)	
Caspase-3, active	Apoptosis 3 (p 29)			
sCD30 / TNFRSF8	Inflammation 37-plex (p 12)			
sCD163	Inflammation 37-plex (p 12)			
sCD40L	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
Chitinase-3-like 1	Inflammation 37-plex (p 12)			
Clusterin	Apolipoprotein 10-plex (p 28) Kidney Toxicity 1 6-plex (p 32)		Kidney Toxicity 1 5-plex (p 47)	

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
C-peptide	Diabetes 10-plex (p 30)			
CRP	Apolipoprotein 10-plex (p 28) Acute Phase 4-plex (p 34)			
CTACK / CCL27	Cytokine Screening Panel 48-plex (p 6) Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
Cystatin C	Kidney Toxicity 2 6-plex (p 32)		Kidney Toxicity 2 4-plex (p 47)	
D614G S1	SARS-CoV-2 Neutralization Antibody (p 24)			
E484K RBD	SARS-CoV-2 Neutralization Antibody (p 24)			
ENA-78 / CXCL5	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
Eotaxin / CCL11	Cytokine 27-plex, 48-plex (p 6) Chemokine 40-plex (p 19)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)		
Eotaxin-2 / CCL24	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
Eotaxin-3 / CCL26	Chemokine 40-plex (p 19)			
Epsilon RBD	SARS-CoV-2 Neutralization Antibody (p 24)			
ERK1/2 (Thr ²⁰² /Thr ²⁰⁴ , Thr ¹⁸⁵ /Thr ¹⁸⁷)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
Fractalkine / CX3CL1	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
FSH	Hormone Panel 1 (p 31)			
Gamma S1	SARS-CoV-2 Neutralization Antibody (p 24)			
GCP-2 / CXCL6	Chemokine 40-plex (p 19)			
G-CSF	Cytokine 17-plex, 27-plex, 48-plex (p 6)	Cytokine 23-plex (p 35)	Cytokine 23-plex (p 44)	
GH	Hormone Panel 1 (p 31)			
Ghrelin	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)	Diabetes (p 46)	
GIP	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)		
GLP-1	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)	Diabetes (p 46)	
Glucagon	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)	Diabetes (p 46)	
GM-CSF	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2 (p 6) Immunotherapy 20-plex (p 10) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1/Th2 (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
gp130 / sIL-6Rb	Inflammation 37-plex (p 12)			
GRO- α / KC / CXCL1	Cytokine 48-plex (p 6) Chemokine 40-plex (p 19)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44)	
GRO- β / CXCL2	Chemokine 40-plex (p 19)			
GSK-3 α / β (Ser ²¹ /Ser ⁹)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
GST- π	Kidney Toxicity 1 6-plex (p 32)			
Haptoglobin	Acute Phase 4-plex (p 34)			
HGF	Cytokine 48-plex (p 6)			
HSP27 (Ser ⁷⁸)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
I-309 / CCL1	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
ICAM-1	Cytokine singleplex (p 6)	Th17 Cytokine singleplex (p 38)		
IFN- α 2	Cytokine 48-plex (p 6) Inflammation 37-plex (p 12)			
IFN- β	Inflammation 37-plex (p 12)			
IFN- γ	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2 (p 6) Immunotherapy 20-plex (p 10) Inflammation 37-plex (p 12) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1, Th1/Th2, Th17 6-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
IgA	Isotyping 6-plex (p 33)			
IgE	Isotyping singleplex (p 33)			
IgG1	Isotyping 6-plex (p 33)			
IgG2	Isotyping 6-plex (p 33)			
IgG3	Isotyping 6-plex (p 33)			
IgG4	Isotyping 6-plex (p 33)			
IgG total	Isotyping singleplex (p 33)			
IgM	Isotyping 6-plex (p 33)			
IL-1 α	Cytokine 48-plex (p 6)	Cytokine 23-plex (p 35)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-1 β	Cytokine 17-plex, 27-plex, 48-plex (p 6) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1, Th17 6-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-1ra	Cytokine 27-plex, 48-plex (p 6)			
IL-2	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2, (p 6) Immunotherapy 20-plex (p 10) Inflammation 37-plex, Treg (p 12) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1, Th2, Th1/Th2 (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-2R α	Cytokine 48-plex (p 6)			
IL-3	Cytokine 48-plex (p 6)	Cytokine 23-plex (p 35)		
IL-4	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2 (p 6) Immunotherapy 20-plex (p 10) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th2, Th1/Th2 (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-5	Cytokine 17-plex, 27-plex, 48-plex, Th1/Th2 (p 6) Immunotherapy 20-plex (p 10)	Cytokine 8-plex, 23-plex, Th2, Th1/Th2 (p 35)	Cytokine 23-plex, Th1/Th2 (p 44)	

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
IL-6	Cytokine 8-plex, 17-plex, 27-plex, 48-plex (p 6) Immunotherapy 20-plex (p 10) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 23-plex, Th1, Th2, Th17 6-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
sIL-6R α	Inflammation 37-plex (p 12)			
IL-7	Cytokine 17-plex, 27-plex, 48-plex (p 6) Immunotherapy 20-plex (p 10)		Cytokine 23-plex (p 44)	
IL-8 / CXCL8	Cytokine 8-plex, 17-plex, 27-plex, 48-plex (p 6) Immunotherapy 20-plex (p 10) Inflammation 37-plex (p 12) Chemokine 40-plex (p 19)			
IL-9	Cytokine 27-plex, 48-plex (p 6)	Cytokine 23-plex, Th2 (p 35)		
IL-10	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2 (p 6) Immunotherapy 20-plex (p 10) Inflammation 37-plex, Treg (p 12) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1, Th2, Th1/Th2, Th17 6-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-11	Inflammation 37-plex (p 12)			
IL-12 (p40)	Cytokine 48-plex (p 6) Inflammation 37-plex, Treg (p 12)	Cytokine 23-plex (p 35)	Cytokine singleplex (p 44)	
IL-12 (p70)	Cytokine 17-plex, 27-plex, 48-plex, Th1/Th2 (p 7) Inflammation 37-plex, Treg (p 12)	Cytokine 23-plex, Th1, Th1/Th2 (p 35)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-13	Cytokine 17-plex, 27-plex, 48-plex, Th1/Th2 (p 7) Immunotherapy 20-plex (p 10)	Cytokine 48-plex, Th2 (p 35)	Cytokine 23-plex, Th1/Th2 (p 44)	
IL-15	Cytokine 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10)	Cytokine 9-plex (p 38)		
IL-16	Cytokine 48-plex (p 7) Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
IL-17A	Cytokine 17-plex, 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10) Th17 Cytokine 15-plex (p 16)	Cytokine 23-plex, Th17 6-plex (p 35)	Cytokine 23-plex (p 44)	
IL-17A/F	Th17 Cytokine singleplex (p 16)			
IL-17E / IL-25	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-17F	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-18	Cytokine 48-plex (p 7) Immunotherapy 20-plex (p 10) Kidney Toxicity 1 6-plex (p 32)	Cytokine 9-plex (p 38)	Cytokine 23-plex (p 44) Kidney Toxicity 1 5-plex (p 47)	
IL-19	Inflammation 37-plex, Treg (p 12)			
IL-20	Inflammation 37-plex, Treg (p 12)			

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
IL-21	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-22	Inflammation 37-plex, Treg (p 12) Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-23 (p19)	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-25 / IL-17E	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-26*	Inflammation 37-plex, Treg (p 12)			
IL-27 (p28)	Inflammation 37-plex, Treg (p 12)	Th17 Cytokine 10-plex (p 38)		
IL-28A / IFN- λ 2	Inflammation 37-plex, Treg (p 12)			
IL-29 / IFN- λ 1	Inflammation 37-plex, Treg (p 12)			
IL-31	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-32	Inflammation 37-plex (p 12)			
IL-33	Th17 Cytokine 15-plex (p 16)	Th17 Cytokine 10-plex (p 38)		
IL-34	Inflammation 37-plex (p 12)			
IL-35	Inflammation 37-plex, Treg (p 12)			
Insulin	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)		
IP-10 / CXCL10	Cytokine 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10) Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
IRS-1 (Ser ⁶³⁶ /Ser ⁶³⁹)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
I-TAC / CXCL11	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
JNK (Thr ¹⁸³ /Tyr ¹⁸⁵)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
Kappa RBD	SARS-CoV-2 Neutralization Antibody (p 24)			
K417N RBD	SARS-CoV-2 Neutralization Antibody (p 24)			
KC / GRO- α / CXCL1	Cytokine 48-plex (p 6) Chemokine 40-plex (p 19)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44)	
KIM-1	Kidney Toxicity 1 6-plex (p 32)		Kidney Toxicity 1 5-plex (p 47)	
Lamin B, intact and 45 kD	Apoptosis 1 (p 29)			
Leptin	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)	Diabetes (p 46)	
LH	Hormone Panel 1 (p 31)			
LIF	Cytokine 48-plex (p 7)	Cytokine 9-plex (p 38)		
LIGHT / TNFSF14	Inflammation 37-plex (p 12)			
α -2-macroglobin	Acute Phase 4-plex (p 34)			
Mcl-1	Apoptosis 2 (p 29)			
Mcl-1 / Bak dimer	Apoptosis 3 (p 29)			
MCP-1 / CCL2 / MCAF	Cytokine 17-plex, 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10) Chemokine 40-plex (p 19) Kidney Toxicity 1 6-plex (p 32)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44) Kidney Toxicity 1 5-plex (p 47)	
MCP-2 / CCL8	Chemokine 40-plex (p 19)	Chemokine singleplex (p 40)		

* Unique target.

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
MCP-3 / CCL7	Cytokine 48-plex (p 7) Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
MCP-4 / CCL13	Chemokine 40-plex (p 19)			
MCP-5 / CCK12		Chemokine 31-plex (p 40)		
M-CSF	Cytokine 48-plex (p 7)	Cytokine 9-plex (p 38)	Cytokine 23-plex (p 44)	
MDC / CCL22	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
MEK1 (Ser ²¹⁷ /Ser ²²¹)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
MIF	Cytokine 48-plex (p 7) Chemokine 40-plex (p 19)			
MIG / CXCL9	Cytokine 48-plex (p 7) Immunotherapy 20-plex (p 10) Chemokine 40-plex (p 19)	Cytokine 9-plex (p 38)		
MIP-1 α / CCL3	Cytokine 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10) Chemokine 40-plex (p 19)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44)	
MIP-1 β /CCL4	Cytokine 17-plex, 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)		
MIP-1 δ / CCL15	Chemokine 40-plex (p 19)			
MIP-2 / CXCL2		Cytokine 9-plex (p 38) Chemokine singleplex (p 40)	Cytokine singleplex (p 44)	
MIP-3 α / CCL20	Chemokine 40-plex (p 19)	Th17 Cytokine 10-plex (p 38) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44)	
MIP-3 β / CCL19	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
MMP-1	Inflammation 37-plex (p 12)			
MMP-2	Inflammation 37-plex (p 12)			
MMP-3	Inflammation 37-plex (p 12)			
MPIF-1 / CCL23	Chemokine 40-plex (p 19)			
mTOR (Ser ²⁴⁴⁶)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
N501Y RBD	SARS-CoV-2 Neutralization Antibody (p 24)			
NGAL	Kidney Toxicity 2 6-plex (p 32)		Kidney Toxicity 2 4-plex (p 47)	
β -NGF	Cytokine 48-plex (p 7)			
Nucleocapsid IgG	SARS-CoV-2 Serology (p 23)			
Osteocalcin	Inflammation 37-plex (p 12)			
Osteopontin	Inflammation 37-plex (p 12) Kidney Toxicity 2 6-plex (p 32)		Kidney Toxicity 1 5-plex (p 47)	
PAI-1	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)	Diabetes singleplex (p 46)	
PDGF-BB	Cytokine 27-plex, 48-plex (p 7)	Cytokine 9-plex (p 38)		
Pentraxin-3	Inflammation 37-plex (p 12)			
Prolactin	Hormone Panel 1 (p 31)			
p38 MAPK (Thr ¹⁸⁰ /Tyr ¹⁸²)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
p53 (Ser ¹⁵)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)

continues

Target	Human (pp 6–34)	Mouse (pp 35–43)	Rat (pp 44–47)	Multispecies (pp 22 and 26–27)
p70 S6 kinase (Thr ³⁸⁹)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
p90 RSK (Ser ¹⁵)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
PTEN (Ser ³⁸⁰)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
RANTES	Cytokine 27-plex, 48-plex (p 7) Immunotherapy 20-plex (p 10)	Cytokine 23-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex (p 44)	
RBD IgG	SARS-CoV-2 Serology (p 23)			
Resistin	Diabetes 10-plex (p 30)	Diabetes 8-plex (p 43)		
SAP	Acute Phase 4-plex (p 34)			
SCF	Cytokine 48-plex (p 7)			
SCGF-β	Cytokine 48-plex (p 7)			
SCYB16 / CXCL16	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
SDF-1α+β / CXCL12	Cytokine 48-plex (p 7) Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
Smac	Apoptosis 1 (p 29)			
Spike 1 IgG	SARS-CoV-2 Serology (p 23)			
Spike 2 IgG	SARS-CoV-2 Serology (p 23)			
Stat3 (Ser ⁷²⁷)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)	Cell Signaling 9-plex (p 26)
Survivin	Apoptosis 3 (p 29)			
S6 ribosomal protein (Ser ²³⁵ /Ser ²³⁶)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)	Cell Signaling 8-plex (p 26)
TARC / CCL17	Chemokine 40-plex (p 19)	Chemokine 31-plex (p 40)		
TECK / CCL25	Chemokine 40-plex (p 19)	Chemokine singleplex (p 40)		
TFF3	Kidney Toxicity 2 6-plex (p 32)			
TGF-β1	TGF-β (p 22)	TGF-β (p 38)	TGF-β (p 44)	TGF-β (p 22)
TGF-β2	TGF-β (p 22)	TGF-β (p 38)	TGF-β (p 44)	TGF-β (p 22)
TGF-β3	TGF-β (p 22)	TGF-β (p 38)	TGF-β (p 44)	TGF-β (p 22)
TNF-α	Cytokine 8-plex, 17-plex, 27-plex, 48-plex, Th1/Th2 (p 7) Immunotherapy 20-plex (p 10) Th17 Cytokine 15-plex (p 16) Chemokine 40-plex (p 19)	Cytokine 8-plex, 23-plex, Th1, Th1/Th2, Th17 6-plex (p 35) Chemokine 31-plex (p 40)	Cytokine 23-plex, Th1/Th2 (p 44)	
TNF-β	Cytokine 48-plex (p 7)			
sTNF-R1	Inflammation 37-plex (p 12)			
sTNF-R2	Inflammation 37-plex (p 12)			
TRAIL	Cytokine 48-plex (p 7)			
TSH	Hormone Panel 1 (p 31)			
TSLP	Inflammation 37-plex (p 12)			
TWEAK / TNFSF12	Inflammation 37-plex (p 12)			
VCAM-1	Cytokine singleplex (p 7)			
VEGF	Cytokine 27-plex, 48-plex (p 7)	Cytokine 9-plex (p 38)	Cytokine 23-plex (p 44)	
Visfatin	Diabetes 10-plex (p 30)			

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