Acute Phase Response
Cancer
Cardiovascular Disease
Cytokines, Chemokines, Growth Factors
Diabetes
Toxicology
Genotyping
Immunoglobulin Isotyping
Signal Transduction

Bio-Plex Pro™ Human Chemokine Panel

MAGNETIC SEPARATION ENABLED

6Ckine / CCL21, BCA-1 / CXCL13, CTACK / CCL27, ENA-78 / CXCL5, Eotaxin / CCL11, Eotaxin-2 / CCL24, Eotaxin-3 / CCL26, Fractalkine / CX3CL1, GCP-2 / CXCL6, GM-CSF, Gro-α / CXCL1, Gro-β / CXCL2, I-309 / CCL1, IFN-g, IL-1β, IL-2, IL-4, IL-6, IL-8 / CXCL8, IL-10, IL-16, IP-10 / CXCL10, I-TAC / CXCL11, MCP-1 / CCL2, MCP-2 / CCL8, MCP-3 / CCL7, MCP-4 / CCL13, MDC / CCL22, MIF, MIG / CXCL9, MIP-1α / CCL3, MIP-1δ / CCL15, MIP-3α / CCL20, MIP-3β / CCL19, MPIF-1 / CCL23, SCYB16 / CXCL16, SDF-1α+β / CXCL12, TARC / CCL17, TECK / CCL25, TNF-α

- All-in-one 40-plex kit
- Custom configurations
- Single level quality control
- Magnetic workflow

High-Performance Multiplex Immunoassays for Research

The Bio-Plex Pro Human Chemokine Panel features 40 magnetic bead–based immunoassays to measure chemokines and chemotaxis-relevant analytes. The assays have undergone rigorous evaluation to provide reliable performance for your research needs and are available in flexible, customized formats. Chemokines are typically associated with the following areas of research:

- Cancer/angiogenesis
- Cardiovascular disease
- Autoimmune disorders
- Allergy/asthma
- Diabetes, type 2
- Atherosclerosis
- COPD (chronic obstructive pulmonary disease)
- Dermatitis/psoriasis
- Alzheimer's disease

Assay Features

- Magnetic beads for simplified plate processing
- Single level quality control with kit lot–specific ranges
- Assay quick guide to get you started right away
- Compatible with Bio-Plex® 200, Bio-Plex 3D, and Bio-Plex® MAGPIX™ Systems

Rigorous Assay Validation

All Bio-Plex Pro Assays undergo rigorous evaluation that includes the following parameters:

- Specificity (cross-reactivity)
- Accuracy (recovery) in key sample matrices
- Inter- and intra-assay precision
- Sensitivity (limit of detection, LOD)
- Assay working range (LLOQ/ULOQ)
- Linearity of dilution
- Parallelism and matrix effect
- Performance characteristics in real samples

Assay Performance Definitions

The following parameters are indicative of assay performance, as shown in Table 1.

- **Assay working range** — the range of concentrations within which the assay is precise and accurate. Boundaries of the assay working range are defined by the lower limit of quantification (LLOQ) and the upper limit of quantification (ULOQ)
- **Precision** — the coefficient of variation (%CV) at concentrations within the assay working range
- **Accuracy (recovery)** — percentage of the observed concentration relative to the expected concentration of a known amount of analyte within the assay working range
- **Sensitivity (limit of detection, LOD)** — the concentration of analyte for which the fluorescence intensity signal is 2 standard deviations above the background signal

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Table 1. Representative performance characteristics.

	Assay Working Ranges, pg/ml		Assay Sensitivity	Assay Precision		Calibration to WHO/NIBSC	
Analyte	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 / CXCL1	3.1	7,024	4.2	2	4	–	–
Gro-β / CXCL2	4.6	13,257	2.7	3	8	–	–
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-1β	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	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-1α / CCL3	0.4	1,543	0.3	4	6	1.9	92/518
MIP-1δ / CCL15	1.7	9,100	0.2	3	5	–	–
MIP-3α / CCL20	0.3	4,675	0.1	2	3	–	–
MIP-3β / 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-1α+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

NIBSC, National Institute for Biological Standards and Control; WHO, World Health Organization.

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are mean data determined from three independent multiplex assays in a serum-based matrix. Intra-assay %CV is derived from one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points in which the performance specifications of individual standard points were met for a 10% intra-assay CV and recovery range of 70–130%. Data were generated using the magnetic workflow with the Bio-Plex Pro Wash Station.

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

Accuracy of Bio-Plex Pro Human Chemokine Panel

Linearity of dilution displays the ability of an assay to generate measured values from complex samples by comparing the accuracy over a range of sample dilutions. Bio-Plex Pro Assays are designed and validated with high linearity to return accurate results from complex matrices (Figure 1).

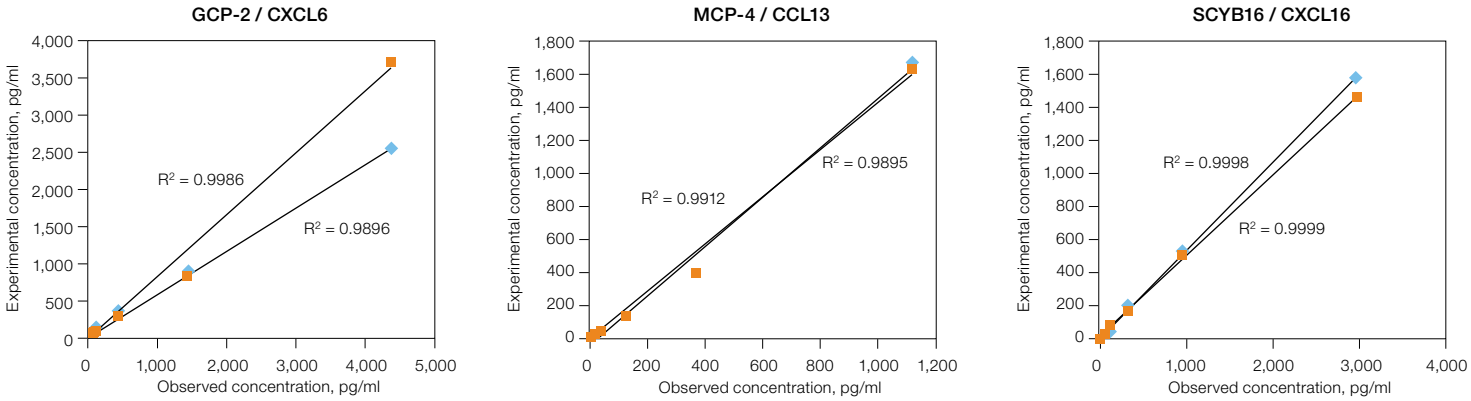

Fig. 1. Linearity of dilution determines the suitability of a standard curve for reflecting relative quantities of an analyte in a complex matrix. Linearity of dilution was assessed by spiking a known quantity of recombinant antigen into human serum and plasma matrices. Observed and expected analyte concentrations were plotted and the correlation coefficient (R^2) values reflect linearity in signal response. Plasma (◆); serum (■).

Bio-Plex Pro Assay Working Range

The assay working range should encompass the biological range of expression in order to be useful in research. Bio-Plex Pro Assays are developed and optimized to ensure real sample data fall within the quantifiable regions of the assay as demonstrated by comparing the standard curves of assay controls to biological samples (Figure 2).

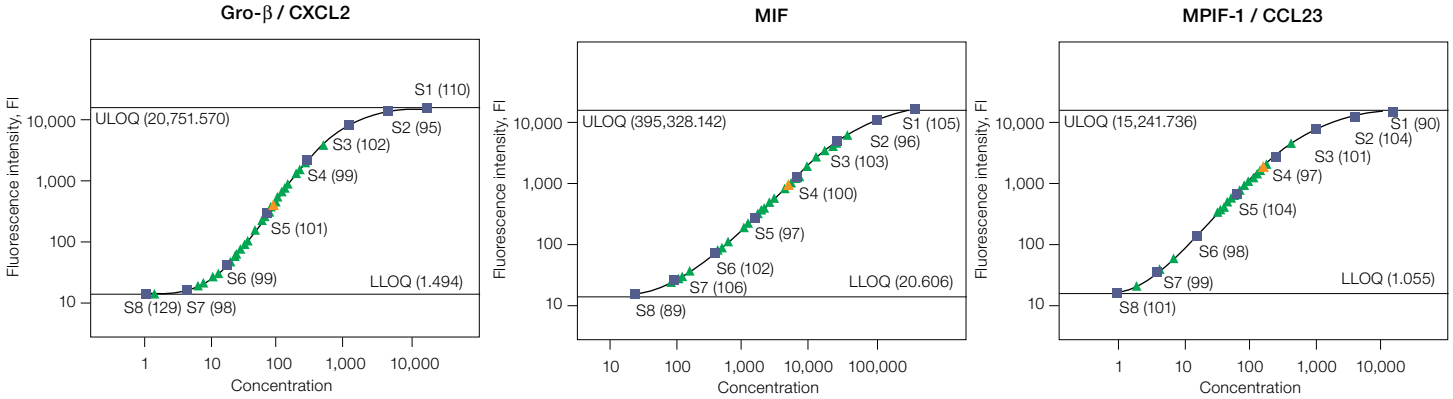

Fig. 2. Standard curves with assay controls and serum samples. Standard points were prepared by serially diluting a reconstituted standard fourfold to generate an eight-point standard curve. Standard points with percentage recovery (■); controls (▲); samples (▲). Data were generated in Bio-Plex Manager™ Software.

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 (Figure 3).

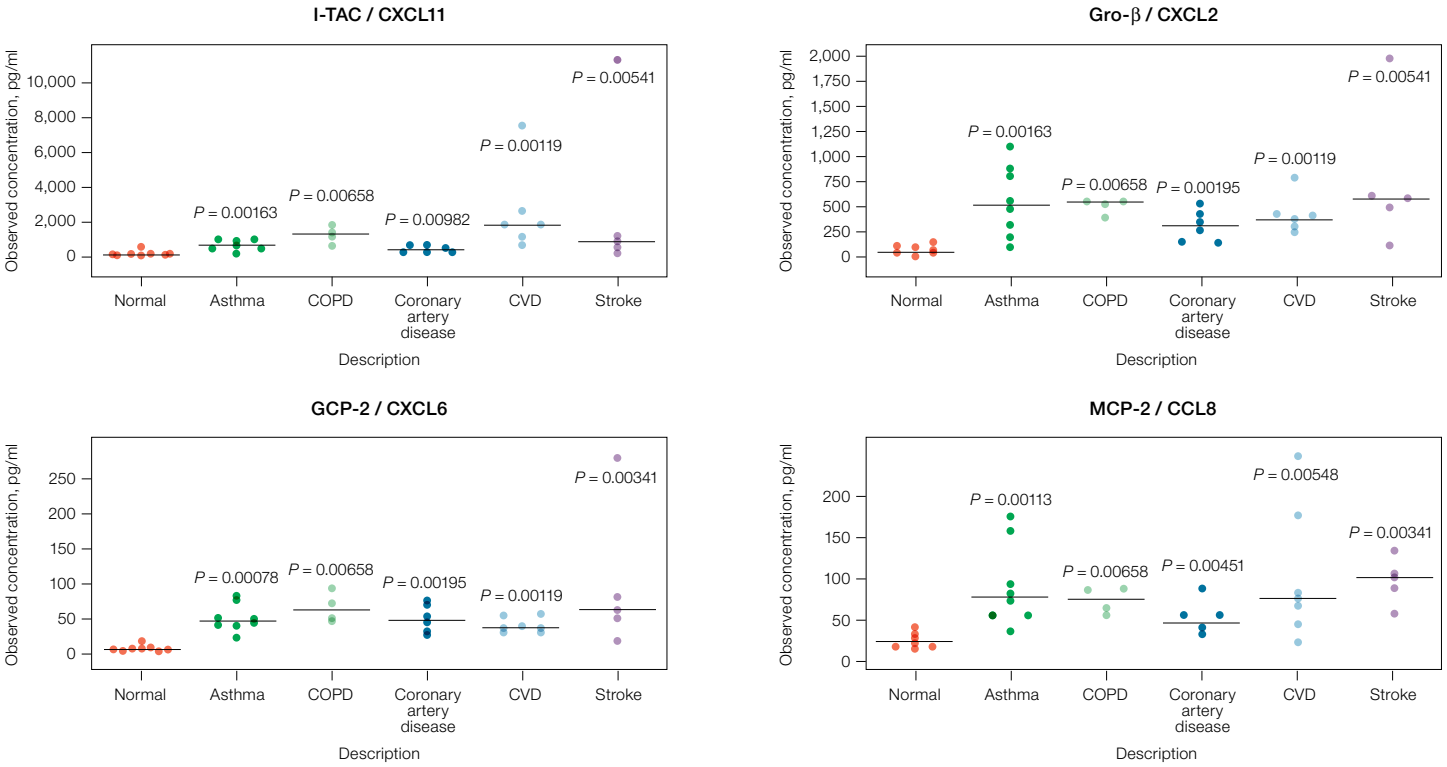

Fig. 3. Levels of biomarkers in sera of normal and various disease groups (asthma, COPD [chronic obstructive pulmonary disease], coronary artery disease, CVD [cardiovascular disease], and stroke). A Student *t* test was used to determine statistical significance between groups. Black lines denote mean values; *P* values are indicated above each population. Data analysis, graphing, and statistics were performed with Bio-Plex Data Pro™ Software.

Consistent Results across Different Multiplex Readers

Reliability of detection of analytes using Bio-Plex Pro Assays can be seen using a variety of Bio-Plex (or Luminex) platforms (Figure 4).

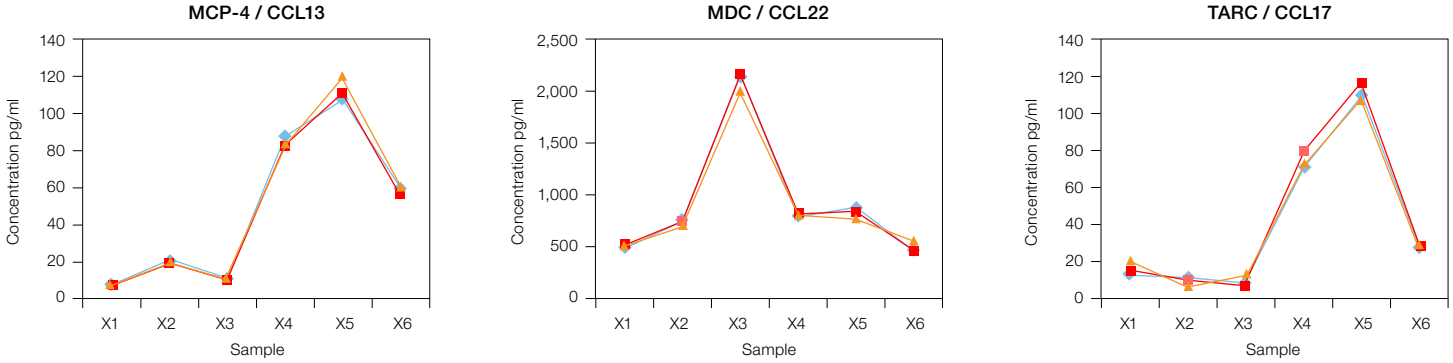

Fig. 4. Alignment of values from human serum samples across all Bio-Plex Readers. Bio-Plex MAGPIX (—▲—); Bio-Plex 200 (—■—); Bio-Plex 3D (—◆—). Data were generated in Bio-Plex Manager Software.

Flexible Ordering Options

Feature	Premixed Panel 40-Plex Panel	x-Plex™ Custom Assay (we mix)	Express Custom Assay (you mix)	Singleplex/Individual Components
All-in-one kit	•	•	•	
Single level quality controls	•			
Filter plate or flat bottom plate*	Flat bottom plate only	Filter or flat bottom plate	Filter or flat bottom plate	Filter or flat bottom plate
Choice of analytes		•	•	•
Number of analytes	40	11-plex or higher	10-plex or lower	Varies, 1–40
Detailed product data sheet	•	•	•	•
Assay quick guide**	•	•	•	•
Faster delivery	•		•	•
Premium performance	•	•		

* Filter plates are used for vaccum separation, flat bottom plates for magnetic separation.
** Go to **bio-rad.com/web/Bio-PlexPanels** for assay quick guides and manuals.

Ordering Information

Catalog #	Description
Bio-Plex Pro Human Chemokines Panel All-in-One Kit	
171AK99MR2	**Bio-Plex Pro Human Chemokine Panel**, 1 x 96-well, includes coupled magnetic capture beads, premixed detection antibodies, standards, quality controls, detection antibody diluent HB, standard diluent HB, sample diluent HB, assay buffer, wash buffer, streptavidin-PE, 96-well flat bottom plate, sealing tape, and instructions for the detection of 40 biomarkers noted below
Bio-Plex Pro Human Chemokines Panel Singleplex Sets*	
171BK11MR2	6Ckine / CCL21
171BK12MR2	BCA-1 / CXCL13
171BK13MR2	CTACK / CCL27
171BK14MR2	ENA-78 / CXCL5
171BK15MR2	Eotaxin / CCL11
171BK16MR2	Eotaxin-2 / CCL24
171BK17MR2	Eotaxin-3 / CCL26
171BK18MR2	Fractalkine / CX3CL1
171BK19MR2	GCP-2 / CXCL6
171BK21MR2	GM-CSF
171BK22MR2	Gro-α / CXCL1
171BK23MR2	Gro-β / CXCL2
171BK24MR2	I-309 / CCL1
171BK25MR2	IFN-γ
171BK26MR2	IL-1β
171BK27MR2	IL-2
171BK28MR2	IL-4
171BK29MR2	IL-6
171BK31MR2	IL-8 / CXCL8
171BK32MR2	IL-10
171BK33MR2	IL-16
171BK34MR2	IP-10 / CXCL10
171BK35MR2	I-TAC / CXCL11
171BK36MR2	MCP-1 / CCL2
171BK37MR2	MCP-2 / CCL8
171BK38MR2	MCP-3 / CCL7
171BK39MR2	MCP-4 / CCL13
171BK41MR2	MDC / CCL22
171BK42MR2	MIF
171BK43MR2	MIG / CXCL9
171BK44MR2	MIP-1α / CCL3
171BK46MR2	MIP-1δ / CCL15
171BK47MR2	MIP-3α / CCL20
171BK48MR2	MIP-3β / CCL19
171BK49MR2	MPIF-1 / CCL23
171BK51MR2	SCYB16 / CXCL16
171BK52MR2	SDF-1α+β / CXCL12
171BK53MR2	TARC / CCL17
171BK54MR2	TECK / CCL25
171BK55MR2	TNF-α

* Singleplex sets should not be mixed with others from different panels or groups.

Catalog #	Description
Reagent Kits	
171304090	**Bio-Plex Pro Reagent Kit III with Filter Plate**, 1 x 96-well, includes detection antibody diluent HB, standard diluent HB, sample diluent HB, assay buffer, wash buffer, streptavidin-PE, filter plate, and sealing tape for vacuum separation methods
171304090M	**Bio-Plex Pro Reagent Kit III with Flat Bottom Plate**, 1 x 96-well, includes detection antibody diluent HB, standard diluent HB, sample diluent HB, assay buffer, wash buffer, streptavidin-PE, flat bottom plate, and sealing tape for magnetic separation methods
Standards	
171DK0001	**Bio-Plex Pro Human Chemokine Standard**, pkg of 1 vial, lyophilized mixture of 40 standard analytes
171DK0050	**Bio-Plex Pro Human Chemokine Standard**, pkg of 50 lot-matched vials, lyophilized mixture of 40 standard analytes
Wash Stations and Accessories	
30034376	**Bio-Plex Pro Wash Station**, microplate wash station for magnetic bead–based assays, includes magnetic plate carrier, waste bottle, 2 liquid bottles
171020100	**Bio-Plex Handheld Magnetic Washer**, includes magnetic washer and adjustment hex tools for use in manual wash steps for all Bio-Plex Magnetic Assays
171025001	**Bio-Plex Pro Flat Bottom Plates**, pkg of 40, 96-well plates, for use with Bio-Plex Pro Wash Stations when using magnetic bead–based assays
Software	
171001510	**Bio-Plex Data Pro Software with Bio-Plex Manager Software**, Bio-Plex Data Pro Software (5 seats), for multi-experiment analysis and advanced data visualization, and Bio-Plex Manager Software (5 seats), for instrument data evaluation and optimization. CDs and security HASP key included
171001513	**Bio-Plex Data Pro Software**, (5 seats), for multi-experiment analysis and advanced data visualization
171STND01	**Bio-Plex Manager Software**, includes 1 user desktop license, for analysis of Bio-Plex data and generation of protocols, does not operate the instrument with Bio-Plex Pro Wash Stations when using magnetic bead–based assays

Visit **bio-rad.com/web/Bio-PlexPanels** for more information.

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