

Acute Phase Response
Cancer
Cardiovascular Disease
Diabetes
Cytokines, Chemokines,
and Growth Factors
Immunology/Inflammation
Immunoglobulin Isotyping
Cell Signaling
Toxicology

Bio-Plex Pro Human Th17 Cytokine Assays

MAGNETIC SEPARATION ENABLED

IL-1 β , IL-4, IL-6, IL-10, IL-17A, IL-17F, IL-21, IL-22, IL-23, IL-25, IL-31, IL-33, IFN- γ , sCD40L, TNF- α , IL-17A/F

- Validated on human plasma, serum, and cell culture samples
- Magnetic or vacuum assay separation
- All-in-one kit format
- Flexible ordering options



High-Performance Multiplex Assays for Immunology Research

The Bio-Plex Pro Human Th17 Cytokine Panel is a unique blend of magnetic bead-based immunoassays designed to meet the needs of the most discerning preclinical and clinical researchers. The multiplex format enables robust and reproducible measurement of 15+1 soluble proteins involved in the T-helper cell type 17 immune response pathway, which is thought to play a key role in inflammatory conditions such as:

- Rheumatoid arthritis, lupus, psoriasis, multiple sclerosis, and other autoimmune diseases
- Antimicrobial immunity
- Transplant rejection
- Cancer

These assays incorporate several features to enhance both quality and ease of use:

- Reagent Kit II with diluents optimized for serum and plasma samples
- Assay quick guide to get you started right away
- Assay protocol optimized for high-precision and broad-assay working ranges
- 2-level quality controls included with premixed kits

Benefits of Magnetic Bead-Based Assays

Magnetic bead-based assays enable automation of wash steps with a Bio-Plex Pro series or similar wash station. This innovation simplifies assay processing and eliminates the need for a vacuum manifold. After adopting the magnetic assay workflow, many users experience improved assay precision, in particular with viscous samples.

Rigorous Assay Validation

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

- Specificity and cross-reactivity
- Accuracy (recovery) in key sample matrices
- Inter- and intra-assay precision
- Sensitivity (limit of detection [LOD])
- Assay working range (lower and upper limits of quantification [LLOQ/ULOQ])
- Linearity of dilution
- Parallelism and matrix effect
- Performance characteristics in real samples (Figures 1–3)

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 LLOQ and ULOQ
- Precision** — the percentage 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 (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 assay performance.

Target	Assay Working Range, pg/ml		Assay Sensitivity, pg/ml	Assay Precision		Calibration to WHO/NIBSC		
	Alternate Names	LLOQ	ULOQ	LOD	Intra-Assay %CV	Inter-Assay %CV	Factor**	NIBSC Catalog #
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-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	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	–	–
IFN- γ	–	0.7	11,377	0.3	3.4	2.1	1.7	87/586
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
IL-17A/F*	–	1.62	6,631	1.28	4.3	5.8	–	–

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 the mean of eight standard points run in triplicate within one representative assay. LLOQ and ULOQ are defined as the boundary standard curve points that meet precision and accuracy specifications of 10% intra-assay CV and 80–120% recovery. Data were generated using the magnetic workflow with the Bio-Plex Pro II Wash Station.

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

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

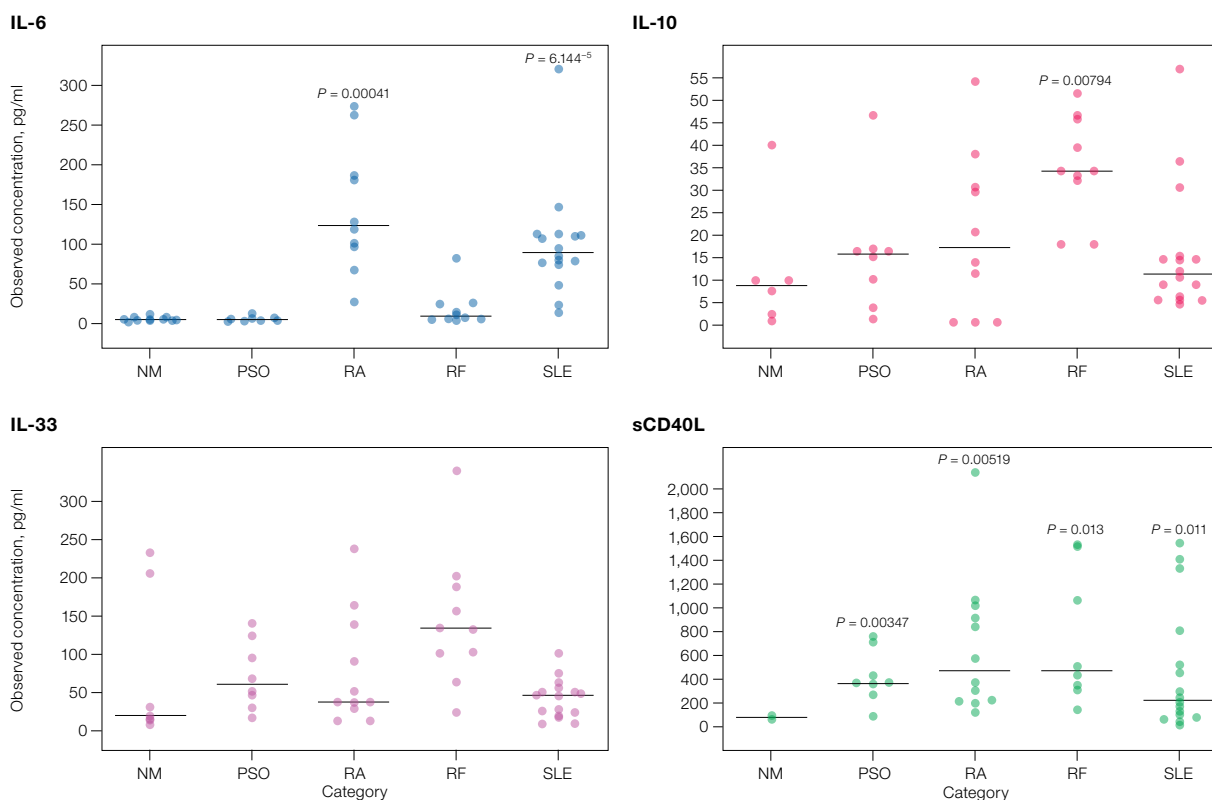


Fig. 1. Serum cytokine levels from individuals with psoriasis (PSO, N = 8), rheumatoid arthritis (RA, N = 14), rheumatoid factors (RF, N = 10), and systemic lupus erythematosus (SLE, N = 18). Nonmatching normal (NM, N = 11) serum samples were used as the baseline reference.

The *t*-test function in Bio-Plex Data Pro Software was used to calculate statistical differences. Only *P* values with statistical significance are shown.

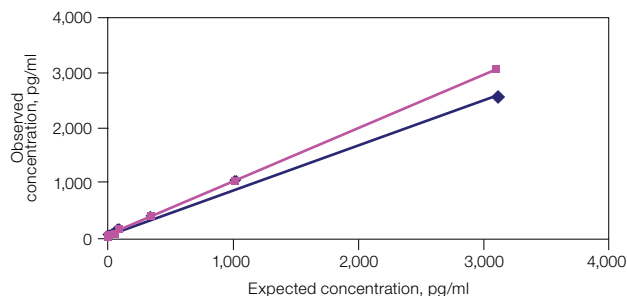


Fig. 2. Linearity of dilution determines the suitability of a standard curve for reflecting relative quantities of an analyte in a complex matrix. Linearity of dilution of IL-17F was assessed by spiking a known quantity of recombinant antigen into human serum and plasma matrices. The observed and expected concentrations within the assay working range were plotted. The correlation coefficient (R^2) value reflects the linearity of dilution for the assay. Representative results are shown. Plasma (■), $R^2 = 0.9963$; serum (◆), $R^2 = 0.9994$.

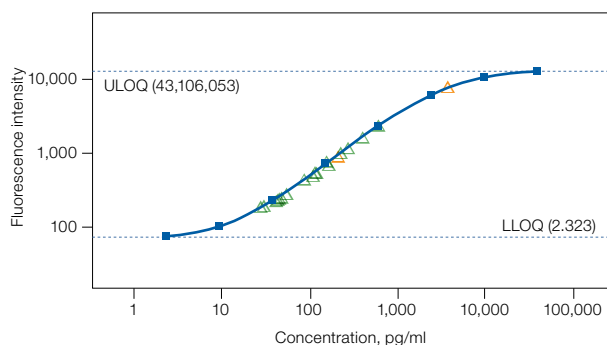


Fig. 3. sCD40L standard curve with human serum and plasma samples. Data were analyzed using Bio-Plex Manager Software version 6.0. Recovery range specification was set to 80–120%. Standard (■); unknown (△); control (▲).

Flexible Ordering Options

For more information see Table 2.

Premixed 15-Plex Panel

This option provides excellent value and performance as well as fast delivery. The full panel is available as an all-in-one assay kit, which includes a flat bottom plate so that you can take advantage of magnetic assay processing.

Note: IL-17A/F is available only as a singleplex set and cannot be mixed with IL-17A or IL-17F assays.

x-Plex Custom Assays (we mix)

This option is a great choice for premium custom-mixed assays. Use the online Bio-Plex Assay Builder at bio-rad.com/assaybuilder to select your analytes of interest and plate type. Assays are mixed for you at Bio-Rad and delivered as an all-in-one kit.

Express Custom Assays (you mix)

These assays are an economical choice with fast delivery. Simply select up to ten singleplex analytes of interest and plate type using the Bio-Plex Assay Builder. Assays are delivered as individual sets of coupled beads and detection antibodies in an all-in-one kit, ready for you to mix.

Individual Components

For your convenience, a host of singleplex sets and individual assay components are also available. Go to bio-rad.com/bio-plex or see the ordering information provided in this bulletin.

Note: The quality controls provided in premixed assay kits are not sold separately.

Table 2. Comparison of features for each ordering option.

	Premixed 15-Plex Panel	x-Plex Custom Assay (we mix)	Express Custom Assay (you mix)	Singleplex/Individual Components
All-in-one kit	•	•	•	
2-level quality controls	•	•		
Flat bottom plate only	•			
Choice of plate type		•	•	•
Choice of analytes		•	•	•
Detailed product data sheet	•	•		
Assay quick guide*	•	•	•	
Faster delivery	•		•	•
Premium performance	•	•		

* Printed guide included in assay kits. The guide is also available at bio-rad.com/bio-plex.

Ordering Information

Catalog# Description

Human Th17 Cytokine Assays

Human Th17 Premixed All-In-One Kit

171AA001M **Bio-Plex Pro Human Th17 Cytokine 15-Plex Panel**, 1 x 96-well, includes premixed coupled magnetic beads, detection antibodies, standards, 2-level controls, detection antibody diluent, standard diluent HB, sample diluent HB, assay buffer, wash buffer, streptavidin-phycoerythrin, 96-well flat bottom plate, sealing tape, and instructions for detecting IL-1 β , IL-4, IL-6, IL-10, IL-17A, IL-17F, IL-21, IL-22, IL-23, IL-25, IL-31, IL-33, IFN- γ , sCD40L, TNF- α . IL-17A/F not included

Human Th17 Singleplex Sets, 1 x 96-well*

171BA001M IL-1 β
171BA002M IL-4
171BA003M IL-6
171BA004M IL-10
171BA005M IL-17A
171BA006M IL-17F
171BA007M IL-21
171BA008M IL-22
171BA009M IL-23
171BA010M IL-25
171BA011M IL-31
171BA012M IL-33
171BA013M IFN- γ
171BA014M sCD40L
171BA015M TNF- α
171BA016M IL-17A/F**

Reagent Kit for Use with Human Th17 Assays

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 and wash buffers, streptavidin-phycoerythrin, flat bottom plate, and sealing tape, for magnetic separation methods

Human Th17 Standards

171DA0001 **Bio-Plex Pro Human Th17 Cytokine Standard**, pkg of 1 vial, lyophilized mixture of 16 standard antigens
171DA0501 **Bio-Plex Pro Human Th17 Cytokine Standard**, pkg of 50 lot-matched vials, lyophilized mixture of 16 standard antigens

Additional Th17 Pathway Assays

TGF- β All-In-One Kit

171W4001M **Bio-Plex Pro TGF- β 3-Plex Panel**, 1 x 96-well, includes premixed coupled magnetic beads and detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-phycoerythrin, flat bottom plate, sealing tape, standard diluent, sample diluent, and instructions for the detection of TGF- β 1, TGF- β 2, and TGF- β 3

TGF- β Singleplex Sets, 1 x 96-well***

171V4001M TGF- β 1
171V4002M TGF- β 2
171V4003M TGF- β 3

Catalog# Description

TGF- β Standards

171X40001 **Bio-Plex Pro TGF- β Standard**, pkg of 1 vial, TGF- β standard for detecting TGF- β 1, TGF- β 2, and TGF- β 3 analytes
171X40501 **Bio-Plex Pro TGF- β Standard**, pkg of 50 lot-matched vials, TGF- β standard for detecting TGF- β 1, TGF- β 2, and TGF- β 3 analytes

Reagent Kit for Use with TGF- β Assays

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 and wash buffers, streptavidin-phycoerythrin, flat bottom plate, and sealing tape, for magnetic separation methods

Wash Stations

30034376 **Bio-Plex Pro Wash Station**, includes magnetic plate carrier, waste bottle, 2 buffer bottles

Accessories

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**, 40 x 96-well plates
171304500 **Bio-Plex Wash Buffer**, 1.5 L
171304502 **Filter Plate**, pkg of 1, 96-well plate with clear plastic lid and tray, for Bio-Plex Assays using the vacuum wash method; sealing tape not included

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**, Bio-Plex Data Pro Software (5 seats), for multi-experiment analysis and advanced data visualization
171STND01 **Bio-Plex Manager Software**, 1-user desktop license to analyze Bio-Plex data and generate protocols, does not operate the instrument

* Singleplex sets include coupled magnetic beads and detection antibodies. Human Th17 Sets also require Bio-Plex Pro Reagent Kit III (171304090M) and Human Th17 Standards to run an assay.

** IL-17A/F cannot be mixed with IL-17A or IL-17F Assays.

*** TGF- β singleplex sets require Bio-Plex Pro Reagent Kit III (171304090M) and TGF- β Standards to run an assay.

Visit bio-rad.com/HumanTh17 for more information.

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