

Bio-Plex Pro™ Human Diabetes Assays

MAGNETIC SEPARATION ENABLED

Adiponectin, Adipsin, C-Peptide, Ghrelin, GIP, GLP-1, Glucagon, Insulin, Leptin, PAI-1, Resistin, Visfatin

- Fast time to results
- Convenient All-in-One kit format
- Available as premixed panels or singleplex assays
- Automatable wash steps
- Mixable with Bio-Plex Pro cytokine, chemokine, and growth factor assays



Reliable Performance and Convenient Format for Human Diabetes and Obesity Markers

Bio-Plex Pro human diabetes assays are magnetic bead-based multiplex assays that offer best-in-class performance for the detection of multiple diabetes and obesity biomarkers in a single experiment, using as little as 12.5 μ l of sample. These assays have been developed to deliver accurate and reproducible measurements with complete flexibility to meet all your research needs.

- Increased productivity — measure up to 10 diabetes and obesity markers in 3 hours
- Option to simplify the assay preparation workflow with magnetic wash steps
- Flexible ordering options — order a premixed kit or select only desired biomarkers to multiplex
- Broad assay working ranges
- Option to expand your biomarker profile by multiplexing with Bio-Plex Pro cytokine, chemokine, and growth factor assays
- Tested for robustness in serum and plasma matrices

Refer to Table 1 for representative assay performance characteristics.

Assay Performance Definitions

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 quantitation (LLOQ) and the upper limit of quantitation (ULOQ)

Precision — the coefficient of variation (%CV) at concentrations within the assay working range

Accuracy — ratio of the observed concentration versus the expected concentration of a known amount of spiked analyte within the assay working range

Sensitivity (limit of detection, LOD) — the concentration of analyte for which the fluorescence intensity signal is two standard deviations above the background signal

Benefits of Magnetic Bead-Based Assays

Magnetic bead-based assays allow optional magnetic separation during wash steps by using an automated magnetic bead washer. This innovation greatly simplifies assay processing, eliminating the need for a vacuum manifold. Many users also see significantly improved reproducibility.

Table 1. Representative assay working ranges, assay sensitivity, and precision.

Targets	Assay Working Ranges, pg/ml		Assay Sensitivity, pg/ml	Assay Precision	
	LLOQ	ULOQ	LOD	Intra-assay %CV	Inter-assay %CV
2-Plex Assays					
Adiponectin	160	218,485	32.7	4	2
Adipsin	43	14,513	17.0	6	4
10-Plex Assays					
C-Peptide	22.4	10,031	14.5	5	4
Ghrelin	16.6	8,502	1.2	4	2
GIP	11.2	22,895	0.8	3	4
GLP-1	31.3	16,000	5.3	6	3
Glucagon	15.7	3,500	4.9	5	6
Insulin	1.7	3,541	1.0	3	5
Leptin	11.5	129,107	3.1	3	4
PAI-1	8.8	47,850	2.2	5	4
Resistin	2.3	4,739	1.3	3	4
Visfatin	51.3	280,266	37.1	4	3

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are mean data determined from three independent multiplex assays in 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 10% intra-assay CV, 15% inter-assay CV, and recovery range of 80–120%. Exception is noted for GLP-1 with one point exhibiting 12% intra-assay CV; one standard point of Leptin exhibited 17% inter-assay CV. Data were generated using the magnetic workflow with the Bio-Plex Pro II wash station.

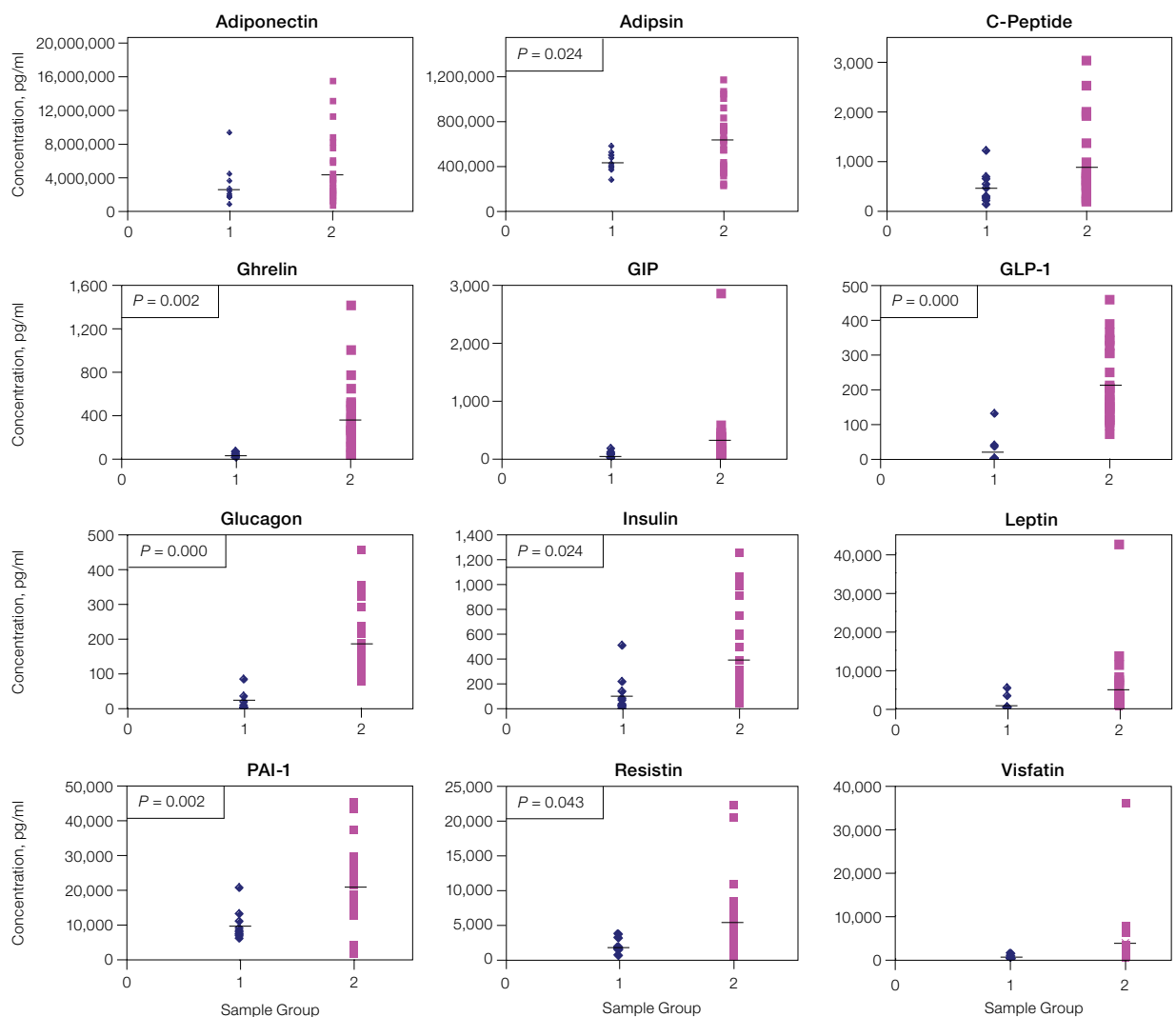


Fig. 1. Levels of biomarkers in sera of normal (◆) and type II diabetic (■) groups. A student's *t*-test was used to determine statistical significance between groups. Black lines denote mean values. *P* values are indicated for markers that were significantly different from normal samples ($P < 0.05$).

Assay Validation

All Bio-Plex Pro assays are put through a rigorous evaluation that includes these assay parameters:

- Specificity and cross reactivity testing
- Accuracy evaluation in key sample matrices
- Inter- and intra-assay precision
- Sensitivity (LOD)
- Assay range evaluation (LLOQ/ULOQ)
- Linearity of dilution
- Parallelism and matrix effect validation
- Sample analyses ensuring normal and disease samples fall within the assay range

Figures 2 and 3 are examples of linearity of dilution and confirmation of samples falling in the assay range, representing the careful work that is done to ensure you get the most accurate results possible.

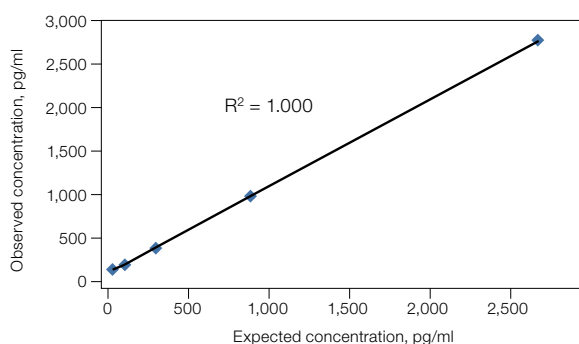


Fig. 2. Linearity of dilution. Linearity of analyte measurements in either serum or plasma (3-fold) were measured using linear regression analysis. Result is shown for the glucagon assay diluted in human plasma. R^2 value was 0.98 or higher within the assay working range for all 12 assays in both serum and plasma.

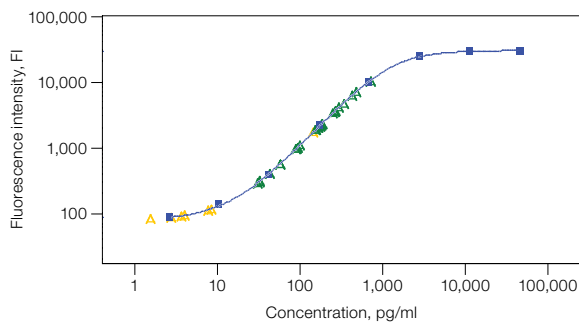


Fig. 3. Assay working ranges span the measured concentration ranges of a typical set of unknown samples. Data were analyzed using Bio-Plex Manager™ software version 6.0, using the standard curve optimization function. Recovery range specification was set to 80–120%. ■, standard points; ▲, type II diabetes samples; ◆, normal samples. Result is shown for ghrelin.

Flexible Ordering Options

Premixed 10-plex Panel

C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, and visfatin are available as a premixed 10-plex panel in an All-in-One kit format. Bead and detection reagents are supplied at a 20x concentration, enabling the user to multiplex with up to nine human assays from the magnetic Bio-Plex Pro cytokine assay product line. Refer to the Bio-Plex Pro diabetes assays instruction manual and bulletin 5975 for details.

Adiponectin and Adipsin

These analytes require a 400-fold sample dilution and thus can be run as either single or as a 2-plex assay. These assays are available in an All-in-One kit format containing either one or both assays and sufficient diluent for the higher sample dilutions.

Express Assay Service

Select your singleplex assays of interest by using the online Assay Builder. Assays arrive in the All-in-One kit format ready for you to combine yourself. Access the Assay Builder at www.bio-rad.com/bio-plex/x-plex.

Individual Components

For your convenience, individual components, such as singleplex assay sets of magnetic beads and detection antibodies, lyophilized standards, and reagent kits, are also available. To run an assay, singleplex sets require standards and reagent kits. Catalog numbers are provided in the ordering section.

Ordering Information

Catalog # Description

Bio-Plex Pro Human Diabetes All-in-One Kits

171-A7001M	Bio-Plex Pro Human Diabetes 10-Plex Assay , 1 x 96-well, includes premixed coupled magnetic beads and detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent for the detection of C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin
171-A7010M	Bio-Plex Pro Human Diabetes 10-Plex Assay , 10 x 96-well, includes premixed coupled magnetic beads and detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plates, sealing tape, standard diluent, sample diluent for the detection of C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin
171-A7002M	Bio-Plex Pro Human Diabetes Adipsin and Adiponectin Assays , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adiponectin and adipsin
171-A7003M	Bio-Plex Pro Human Diabetes Adiponectin Assay , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adiponectin
171-A7004M	Bio-Plex Pro Human Diabetes Adipsin Assay , 1 x 96-well, includes coupled magnetic beads, detection antibodies, standards, assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, serum-based diluent for the detection of adipsin

Catalog # Description

Bio-Plex Pro Human Diabetes Singleplex Sets*

171-B7003M	C-Peptide Set , 1 x 96-well
171-B7004M	Ghrelin Set , 1 x 96-well
171-B7005M	GIP Set , 1 x 96-well
171-B7006M	GLP-1 Set , 1 x 96-well
171-B7007M	Glucagon Set , 1 x 96-well
171-B7008M	Insulin Set , 1 x 96-well
171-B7009M	Leptin Set , 1 x 96-well
171-B7010M	PAI-1 Set , 1 x 96-well
171-B7011M	Resistin Set , 1 x 96-well
171-B7012M	Visfatin Set , 1 x 96-well

Catalog # Description

Bio-Plex Pro Human Diabetes Reagent Kits**

171-304070	Bio-Plex Pro Reagent Kit , 1 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plate, sealing tape, standard diluent, sample diluent
171-304071	Bio-Plex Pro Reagent Kit , 10 x 96-well, includes assay buffer, wash buffer, detection antibody diluent, streptavidin-PE, filter plates, sealing tape, standard diluent, sample diluent

Bio-Plex Pro Human Diabetes Standards

Standards are for the detection of adiponectin, adipsin, C-peptide, ghrelin, GIP, GLP-1, glucagon, insulin, leptin, PAI-1, resistin, visfatin

171-D70001	Bio-Plex Pro Human Diabetes Standards , 1 vial of 12 analytes
171-D70050	Bio-Plex Pro Human Diabetes Standards , 50 vials of 12 analytes

Bio-Plex Pro Wash Stations and Accessories

300-34376	Bio-Plex Pro Wash Station , includes magnetic plate carrier, waste bottle, 2 buffer bottles
300-34377	Bio-Plex Pro II Wash Station , includes magnetic plate carrier, vacuum manifold plate carrier, waste bottle, 2 buffer bottles
171-025001***	Bio-Plex Pro Flat Bottom Plates , 40 x 96-well plates
171-304500	Bio-Plex Wash Buffer , 1.5 L

* Singleplex sets include coupled beads and detection antibodies. Reagent kits and standards are required to run an assay. Due to the different dilution scheme, adiponectin and adipsin are offered in an All-in-One format only.

** Same reagent kit can be used for both diabetes and cytokine assays.

***Required when using the Bio-Plex Pro wash station

The Bio-Plex suspension array system includes fluorescently labeled microspheres and instrumentation licensed to Bio-Rad Laboratories, Inc. by the Luminex Corporation.

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