

Metabolism
 Cancer
 Cardiovascular Disease
 Cytokines, Chemokines,
 Growth Factors
 Neurology
 Diabetes
 Infectious Disease
 Inflammation
 Signal Transduction

Bio-Plex Pro™ RBM Human Metabolic and Hormone Panels

AAT, AGP-1, ANGPTL3, Chemerin, Cortisol, C-Peptide, DPP4, FGF-21, FGF-23, FSH, Galectin-3, GH, Hemopexin, IGF-1, IGF-2, IGFBP-1, IGFBP-2, IGFBP-3, IGFBP-4, IGFBP-5, IGFBP-6, IGFBP-7, LH, Omentin-1, Pancreatic polypeptide, Pentraxin-3, Peptide YY, PON-1, Proinsulin, Prolactin, Protein S, RBP-4, SEPP, sLeptin R, Transferrin, Transthyretin, TSH, Vaspin, VDBP

MAGNETIC SEPARATION ENABLED

- All-in-one premixed kits
- Optimized for lot-to-lot reproducibility
- 2-level quality controls
- Magnetic workflow



High-Performance Multiplex Immunoassays for Research

The Bio-Plex Pro RBM Human Metabolic and Hormone Panels, developed in partnership with Myriad RBM®, comprise a highly relevant set of protein biomarkers for the study of metabolic disorders, cardiovascular disease risk factors, and hormonal control of growth and metabolism (Table 1). Myriad RBM's collaboration with Sanofi and the Population Health Research Institute (PHRI) on testing samples from the ORIGIN diabetes clinical trial was instrumental in the selection of markers in these panels (Table 2). These magnetic assays, based on Luminex xMAP technology, are validated to rigorous analytical standards and are ideal for investigating biomarker profiles associated with the following research areas:

- Gut hormones and adipokines
- Pituitary hormones
- Diabetes, type 1 and type 2
- Metabolic syndrome
- Obesity
- Cardiovascular disease
- Inflammation

Assay Features

- Analytically validated to standards set forth by the Clinical and Laboratory Standards Institute (CLSI)
- Manufactured in accordance with GMP guidelines
- Lot-to-lot correlation specification of $R^2 \geq 0.9$ for reproducible results
- 2-level quality controls with lot-specific ranges
- Assay quick guide to get you started right away
- Fastest available assay protocols
- Compatible with the Bio-Plex® 200 and Bio-Plex 3D Systems and the Bio-Plex® MAGPIX™ Multiplex Reader
- Magnetic beads for simplified plate processing

Table 1. Overview of the Bio-Plex Pro RBM Human Metabolic and Hormone Panels.

Panel	Plex	Analyte summary	Dilution factor*
Metabolic panel 1	5	Gut hormones involved in glucose metabolism; cortisol	1:5
Metabolic panel 2	8	Adipokines; cardiovascular and inflammation markers	1:5
Metabolic panel 3	7	Binding proteins; cardiovascular and inflammation markers	1:500,000
Metabolic panel 4	5	Cardiovascular and inflammation markers; DPP4	1:500
Hormone panel 1	5	Pituitary hormones	1:5
IGFBP panel	7	IGFBP family proteins	1:20
IGF panel	2	IGF family proteins	1:30

* Recommended for serum and plasma samples.



Table 2. Description of markers included in the Bio-Plex Pro RBM Human Metabolic and Hormone Panels.

Human Metabolic Panel 1		
Analyte	UniProt ID	Description
C-Peptide	P01308	Connecting peptide (C-Peptide) is produced by the beta cells of the pancreas as part of the proinsulin molecule (insulin precursor). It links the alpha (A) and beta (B) chains of proinsulin and is released by proteolytic cleavage during the formation of mature insulin. C-Peptide and insulin are released into the bloodstream in equal amounts. The half-life of C-Peptide in the blood (~30 min) is approximately five times that of insulin, which accounts for the higher levels of C-Peptide than insulin in sera. C-Peptide levels are increased in type 2 diabetes and insulin resistance and decreased in type 1 diabetes. High levels of C-Peptide can occur in insulin-producing tumors.
Cortisol	N/A	Cortisol is a corticosteroid hormone produced by the adrenal cortex that is often referred to as the stress hormone. Cortisol increases blood pressure and blood sugar levels and has an immunosuppressive function. In pharmacology, the synthetic form of cortisol is referred to as hydrocortisone and is used as an antagonist in the treatment of allergies and inflammation as well as a replacement therapy in cortisol production deficiencies. Cortisol is metabolized by the 11-beta hydroxysteroid dehydrogenase system (11 β -HSD). Dysfunctional 11 β -HSD1 has been implicated in the pathogenesis of obesity, hypertension, and insulin resistance.
Pancreatic polypeptide	P01298	Pancreatic polypeptide (PP) is a 36-amino acid polypeptide released by the ileum. Although its functions are not fully known, evidence suggests that it suppresses pancreatic secretions, stimulates gastrointestinal secretions, and influences hepatic glycogen levels. Release of PP is increased after protein ingestion, fasting, exercise, and acute hypoglycemia and decreased by somatostatin and intravenous glucose.
Proinsulin	P01308	Proinsulin consists of the A and B insulin peptide chains linked by C-Peptide. Proteolytic cleavage of C-Peptide is required for the formation of mature insulin. Insulin's primary function is to decrease blood glucose levels after a meal. From a metabolic perspective, insulin increases cell permeability to monosaccharides, amino acids, and fatty acids and accelerates glycolysis and glycogen synthesis in the liver. Chronically low insulin production results in type 1 diabetes, while insensitivity to insulin results in type 2 diabetes. Serious long-term complications of diabetes include cardiovascular disease, renal failure, retinopathy, and neuropathy.
Peptide YY	P10082	Peptide YY (PYY) is an appetite-suppressing protein produced in the small intestine and colon in response to a meal. It is a linear polypeptide consisting of 36 amino acids with structural homology to neuropeptide Y (NPY) and pancreatic polypeptide (PP). PYY exerts its action through NPY receptors, inhibiting gastric motility and increasing water and electrolyte absorption in the colon. Studies have shown that PYY might suppress pancreatic secretions and be useful in reducing aluminum accumulation in the brain.

Human Metabolic Panel 2

Analyte	UniProt ID	Description
FGF-21	Q9NSA1	Fibroblast growth factor 21 (FGF-21) is a member of the fibroblast growth factor (FGF) family. FGF family members engage in a wide assortment of mitogenic and cell survival activities and are involved in a variety of biological processes, including embryonic development, cell growth, morphogenesis, tissue repair, tumor growth, and invasion. FGF-21 stimulates glucose uptake in differentiated adipocytes via induction of the expression of the glucose transporter SLC2A1/GLUT1.
FGF-23	Q9GZV9	Like other FGF family members, fibroblast growth factor 23 (FGF-23) is involved in embryonic development, cell growth, morphogenesis, tissue repair, and tumor growth. Additionally, it may also play a role in insulin resistance. FGF-23 is produced by osteocytes and osteoblasts in response to high circulating levels of phosphate or parathyroid hormone. Plasma FGF-23 levels are known to increase during early stages of kidney malfunction.
Galectin-3	P17931	Lectin, galactoside-binding, soluble, 3 (galectin-3) is a galactose-specific lectin that binds IgE. It is widely expressed and shown to be involved in chemoattraction, cell growth and differentiation, the cell cycle, and apoptosis. It may play a role in cancer metastasis, inflammation and fibrosis, heart disease, stroke, and tissue repair. Furthermore, evidence suggests that cleaved galectin-3 could serve as a diagnostic marker and therapeutic target for prostate cancer.
sLeptin R	P48357	Binding of leptin to its receptor plays a role in the regulation of fat metabolism as well as hematopoietic pathways. The circulating soluble leptin receptor (sLeptin R) plays a role in regulating free leptin, and its levels are indirectly proportional to adiposity. sLeptin R is upregulated in chronic heart failure, renal disease, and anorexia.
Omentin-1	Q8WWA0	Omentin-1, also known as intelectin-1, is an adipokine that is prevalent in visceral (omental) fat. Low plasma omentin levels are associated with obesity and insulin resistance, dyslipidemia, high blood pressure, and glucose intolerance.
Pentraxin-3	P26022	Pentraxins are a superfamily of acute phase reactants, characterized by a pentameric structure, which are produced in the liver in response to inflammatory mediators. Pentraxin-3 is a long pentraxin, released by a variety of cell types including immune, smooth muscle, alveolar epithelium, and glial cells. Pentraxin-3 is elevated in critically ill patients with systemic inflammatory response syndrome, septic shock, and several other diseases.
PON-1	P27169	Paraoxonases, including serum paraoxonase-1 (PON-1), PON-2, and PON-3, are a family of enzymes that break down organophosphates. PON-1 is produced in the liver and increases with inflammation. PON-1 and PON-3 both prevent the formation of oxidized LDL, which lowers the risk of atherosclerosis by reducing plaque buildup.
Vaspin	Q8IW75	Visceral adipose tissue-derived serine protease inhibitor (vaspin), an insulin-sensitizing adipokine, is a secreted member of the α 1-antitrypsin (clade A) subfamily of the serpin superfamily of protease inhibitors. It is produced by visceral adipocytes and may be associated with obesity, diabetes, insulin resistance, and glucose metabolism. In insulin resistance, diabetes, and atherosclerosis, vaspin may be an important link between the endocrine and immune systems.

Table 2. Description of markers included in the Bio-Plex Pro RBM Human Metabolic and Hormone Panels, cont.

Human Metabolic Panel 3		
Analyte	UniProt ID	Description
AAT	P01009	Alpha-1 antitrypsin (AAT) is a protease inhibitor produced in the liver that belongs to the serpin superfamily of proteins. It protects tissues from enzymes secreted by inflammatory cells, especially neutrophil elastase. Lower plasma concentrations of AAT have been reported in obesity and type 1 and type 2 diabetes. AAT has shown promise as a potential treatment for diabetes.
AGP-1	P02763	Alpha-1-acid glycoprotein (AGP-1), also known as orosomucoid, is an acute phase protein produced in the liver. It acts as a carrier of lipophilic and basic drugs, steroids, and protease inhibitors. Urinary AGP-1 is associated with the development and progression of diabetic neuropathy.
Hemopexin	P02790	Hemopexin is a liver-expressed acute phase reactant that binds and neutralizes prooxidant free heme, binding heme with the highest affinity of any known protein. Hemopexin is also found in the central and peripheral nervous system and retina, and its levels are increased in the diabetic eye. Increased serum hemopexin levels have been associated with iron-related neurodegenerative diseases, cirrhosis, type 1 diabetes, and liver cancer. Decreased levels are a sign of anemia.
RBP-4	P02753	Retinol-binding protein 4 (RBP-4) belongs to the lipocalin family and is the specific carrier protein for retinol (vitamin A), delivering retinol from liver stores to peripheral tissues. The RBP-4-retinol complex interacts with transthyretin, which increases the serum half-life of RBP-4. RBP-4 promotes hyperglycemia through downregulation of the glucose transporter GLUT4 in adipocytes, upregulation of phosphoenolpyruvate carboxykinase, and attenuation of insulin receptor signaling in skeletal muscle. Serum RBP-4 levels are elevated in type 2 diabetes and obesity.
Transferrin	P02787	Serotransferrin (transferrin) is an abundant blood plasma glycoprotein produced by the liver. Its main function is to bind and transport iron throughout the body. Increases in transferrin levels are seen in conjunction with low iron levels and iron deficiency anemia. Decreased transferrin levels can be found during infection, inflammation, low nutritional status, liver diseases, cancer, and other chronic disease states.
Transthyretin	P02766	Transthyretin (TTR), also known as prealbumin, is a thyroid hormone-binding protein that transports thyroxine from the bloodstream into the brain. TTR is highly expressed in choroid plexus epithelial cells, the retina pigment epithelium, and liver. Less than 1% of plasma TTR molecules are normally involved in thyroxine transport. About 40% of plasma transthyretin circulates in a tight protein-protein complex with the plasma retinol-binding protein (RBP). The formation of the complex with RBP stabilizes the binding of retinol to RBP and decreases the glomerular filtration of RBP.
VDBP	P02774	Vitamin D-binding protein (VDBP) is a multifunctional protein found in plasma, ascitic fluid, cerebrospinal fluid, urine, and on the surface of many cell types. In plasma, it carries the vitamin D sterols and prevents polymerization of actin by binding its monomers. VDBP associates with membrane-bound immunoglobulin on the surface of B-lymphocytes and with IgG Fc receptors on T-lymphocyte membranes. Originating in the liver, it has a strong homology with serum albumin and α -fetoprotein.
Human Metabolic Panel 4		
Analyte	UniProt ID	Description
ANGPTL3	Q9Y5C1	Angiopoietin-like 3 (ANGPTL3) is a secreted glycoprotein structurally related to the angiopoietins, consisting of a signal peptide, N-terminal coiled-coil domain, and C-terminal fibrinogen (FBN)-like domain. ANGPTL3 is predominantly expressed in the liver and plays a role in regulating triglyceride metabolism by inhibiting lipolysis of triglyceride-rich lipoproteins.
Chemerin	Q99969	Chemerin, also known as retinoic acid receptor responder protein 2 (RARRES2), is a novel chemoattractant protein secreted as an 18-kDa inactive pro-protein. Active chemerin is abundant in ascites fluid of ovarian cancer patients and synovial fluid of patients with arthritis. Signaling by chemerin is mediated by chemokine-like receptor 1 or chemerinR. Chemerin expression both stimulates lipolysis and dramatically increases during the differentiation of adipocytes.
DPP4	P27487	Dipeptidyl peptidase-4 (DPP4), also known as CD26, is an antigenic enzyme expressed on the surface of most cell types and is associated with immune regulation, signal transduction, and apoptosis. Its substrates include growth factors, chemokines, neuropeptides, and vasoactive peptides. DPP4 plays a major role in glucose metabolism and is responsible for the degradation of circulating incretins such as GLP-1.
Protein S	P07225	Vitamin K-dependent protein S (VKDPS), also known as PROS1, serves as an anticoagulant plasma protein and as a cofactor to activated protein C in the degradation of coagulation factors Va and VIIIa. It also binds to negatively charged phospholipids, displayed by apoptotic cells. VKDPS acts as a bridge between macrophages and apoptotic cells, reducing the inflammatory effects of apoptosis. Deficiency of VKDP is considered a risk factor for vascular thrombosis.
SEPP	P49908	Selenoprotein P (SEPP) is an abundant extracellular glycoprotein, rich in selenocysteine. It functions as one of the key proteins in selenium homeostasis and oxidant defense.

Table 2. Description of markers included in the Bio-Plex Pro RBM Human Metabolic and Hormone Panels, cont.

Human Hormone Panel 1		
Analyte	UniProt ID	Description
FSH	P01225	Follicle stimulating hormone (FSH) is a glycoprotein containing two polypeptide units, alpha and beta. The alpha subunit is identical to that of other glycoprotein hormones, including luteinizing hormone (LH), thyroid stimulating hormone (TSH), and human chorionic gonadotropin (hCG), while the beta subunit varies between the four hormones and determines biological function. FSH is synthesized and secreted by the anterior pituitary gland and stimulates the maturation of germ cells. In women, FSH is involved in the control of the menstrual cycle and egg production in the ovaries. In men, FSH controls the production of sperm. FSH concentration is typically reported as mIU/ml.
GH	P01241	Human growth hormone-1 (GH; hGH; somatotropin) is released from the acidophilic cells of the anterior pituitary gland. Basal levels of GH in normal individuals are usually less than 2 ng/ml and are stable throughout the day. Normal elevations in GH occur following meals, after exercise, and during sleep. GH deficiency in children results in short stature. Abnormal GH expression may be the direct result of neoplastic or infiltrative disease of the pituitary. Thyroid hormones work in concert with GH and insulin-like growth factors (IGFs) to regulate muscle and long bone growth.
LH	P01229	Luteinizing hormone (LH) is a glycoprotein containing two polypeptide units, alpha and beta. The alpha subunit is identical to that of FSH, TSH, and hCG, while the beta subunit varies between the four hormones and determines biological function. LH is synthesized and secreted by the anterior pituitary gland and is necessary for proper reproductive function. LH triggers ovulation in females and initiates the conversion of residual follicles into the corpus luteum, producing progesterone and preparing the endometrium for possible pregnancy. In males, LH stimulates the production of testosterone.
Prolactin	P01236	Prolactin (PRL) is a single chain polypeptide hormone of 199 amino acids, secreted by the anterior pituitary gland. During breastfeeding, a suckling infant stimulates the production of prolactin, which fills the breast with milk. Prolactin acts like a cytokine through the prolactin receptor and various other cytokine receptors. It has been shown to inhibit apoptosis as well as influence hematopoiesis, angiogenesis, and blood clotting.
TSH	P01222	Thyroid stimulating hormone (TSH), or thyrotropin, is a glycoprotein secreted by the anterior pituitary gland. It stimulates synthesis and secretion of the thyroid hormones, thyroxine (T4) and triiodothyronine (T3). TSH synthesis and release are regulated via a negative feedback mechanism by the level of thyroid hormones. The serum TSH concentration is inversely proportional to free T4 (FT4) levels, making TSH a sensitive marker for monitoring thyroid hormone replacement therapy. Thyroid hormones work in concert with GH and insulin-like growth factors (IGFs) to regulate muscle and long bone growth.

Human IGFBP Panel

Analyte	UniProt ID	Description
IGFBP-1	P08833	Insulin-like growth factor binding proteins (IGFBPs) are found in serum, follicular fluid, seminal fluid, interstitial fluid, and synovial fluid. They function to prolong the half-life of IGF-1 and IGF-2 and have been shown to either inhibit or stimulate the growth promoting effects of IGFs. As such, they work in concert with thyroid hormones, growth hormones, and IGFs to regulate overall metabolism and bone growth.
IGFBP-2	P18065	
IGFBP-3	P17936	
IGFBP-4	P22692	
IGFBP-5	P24593	
IGFBP-6	P24592	
IGFBP-7	Q16270	

Human IGF Panel

Analyte	UniProt ID	Description
IGF-1	P05019	As the name insulin-like growth factor-1 implies, IGF-1 is structurally related to insulin and is capable of binding the IGF-1 receptor as well as the insulin receptor, albeit at lower affinity than insulin. IGF-1 is produced by the liver and target tissues in response to growth hormone and is suppressed by poor nutrition. A large fraction of circulating IGF-1 is complexed with IGFBPs. IGF-1 is closely related to a second protein, IGF-2. IGF-1 is produced throughout life with high expression during puberty and low expression during infancy and old age.
IGF-2	P01344	Insulin-like growth factor-2 (IGF-2) is produced by the liver and is thought to be an important fetal growth factor. A large fraction of circulating IGF-2 is complexed with IGFBPs. IGF-2 binds to both the IGF-1 and IGF-2 receptors, and mediates growth in the same way that IGF-1 does. The IGF-2 receptor, also called the mannose-6 phosphate receptor, appears to have no signaling function.

Assay Performance Definitions

The following parameters are indicative of assay performance as shown in Table 3.

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 two standard deviations above the background signal

Table 3. Representative performance characteristics.

Panel	Analyte	Alternative Names	Bead Region	Assay Working Ranges		Assay Sensitivity	Units	Assay Precision	
				LLOQ	ULOQ	LOD		Intra-Assay %CV	Inter-Assay %CV
Human metabolic panel 1	C-Peptide	Connecting peptide	45	2.1	2,100	0.92	pg/ml	2	5
	Cortisol		12	2,877	107,873	298	pg/ml	11	16
	Pancreatic polypeptide	PP	52	1.6	940	0.44	pg/ml	3	5
	Proinsulin		67	51	23,765	14	pg/ml	3	5
	Peptide YY	PYY	55	58	26,750	12	pg/ml	3	6
Human metabolic panel 2	FGF-21	Fibroblast growth factor 21	63	25	18,000	11	pg/ml	16	19
	FGF-23	Fibroblast growth factor 23	47	24	12,000	5.8	pg/ml	10	16
	Galectin-3	Galactoside-binding, soluble, 3	46	54	15,000	36	pg/ml	11	20
	sLeptin R	Soluble leptin receptor	27	382	495,000	321	pg/ml	8	9
	Omentin-1	Intelectin-1	20	10,277	13,500,000	6,407	pg/ml	13	15
	Pentraxin-3	PTX-3	44	18	22,000	14	pg/ml	7	12
	PON-1	Serum paraoxonase-1	53	8,343	12,150,000	6,300	pg/ml	8	8
	Vaspin	Visceral adipose tissue-derived serine protease inhibitor	34	2.3	1,950	1.4	pg/ml	10	13
Human metabolic panel 3*	AAT	Alpha-1 antitrypsin	26	0.22	90	0.04	ng/ml	6	7
	AGP-1	Alpha-1-acid glycoprotein	57	0.0041	9	0.0037	ng/ml	7	11
	Hemopexin		35	0.26	200	0.086	ng/ml	8	8
	RBP-4	Retinol-binding protein-4	43	0.014	10	0.0076	ng/ml	6	9
	Transferrin	Serotransferrin	61	0.64	520	0.24	ng/ml	4	6
	Transthyretin	TTR	13	0.013	5	0.0014	ng/ml	6	6
	VDBP	Vitamin D-binding protein	28	0.17	90	0.061	ng/ml	4	7
Human metabolic panel 4	ANGPTL3	Angiopietin-like 3	66	0.018	40	0.018	ng/ml	8	10
	Chemerin		42	0.026	12.8	0.015	ng/ml	5	9
	DPP4	Dipeptidyl peptidase-4	25	0.033	22	0.012	ng/ml	7	8
	Protein S	Vitamin K-dependent protein S	62	0.061	80	0.037	ng/ml	8	9
	SEPP	Selenoprotein P	36	2.0	1,415	0.90	ng/ml	9	16
Human hormone panel 1	FSH	Follicle-stimulating hormone	18	0.071	115	0.046	mIU/ml	7	8
	GH	Human growth hormone-1	38	0.023	20	0.0076	ng/ml	6	7
	LH	Luteinizing hormone	15	0.14	100	0.044	mIU/ml	4	6
	Prolactin	PRL	19	0.018	19	0.0077	ng/ml	7	8
	TSH	Thyroid-stimulating hormone	22	0.017	16	0.0044	µIU/ml	5	7

* The product datasheet supplied with metabolic panel 3 provides performance values as well as standard S1 and control values in µg/ml. Values here are in ng/ml for display purposes.

Table 3. Representative performance characteristics, cont.

Panel	Analyte	Alternative Names	Bead Region	Assay working Ranges		Assay Sensitivity		Assay Precision	
				LLOQ	ULOQ	LOD	Units	Intra-Assay %CV	Inter-Assay %CV
Human IGFBP panel	IGFBP-1	Insulin-like growth factor binding proteins	48	0.014	25	0.011	ng/ml	4	7
	IGFBP-2		65	1.2	750	0.41	ng/ml	6	12
	IGFBP-3		33	1.2	1,020	0.96	ng/ml	4	13
	IGFBP-4		76	0.24	370	0.17	ng/ml	4	11
	IGFBP-5		51	1.3	187	0.23	ng/ml	5	14
	IGFBP-6		78	0.63	200	0.37	ng/ml	7	11
	IGFBP-7		37	0.53	165	0.32	ng/ml	5	9
Human IGF panel	IGF-1	Insulin-like growth factor	21	0.25	87	0.10	ng/ml	2	6
	IGF-2		54	0.19	35	0.13	ng/ml	2	4

The LLOQ, ULOQ, LOD, and inter-assay precision %CV are mean data determined from three independent multiplex assays in a serum-based matrix. LLOQ and ULOQ are the lower and upper limits of quantification where measurements are both accurate (80–120% and 70–130% recovery, respectively) and precise (≤ 30 %CV and ≤ 20 %CV, respectively).

Working Range

The assay working range should encompass the biological range of expression in order to be useful in research. Bio-Plex Pro RBM Panels 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 1).

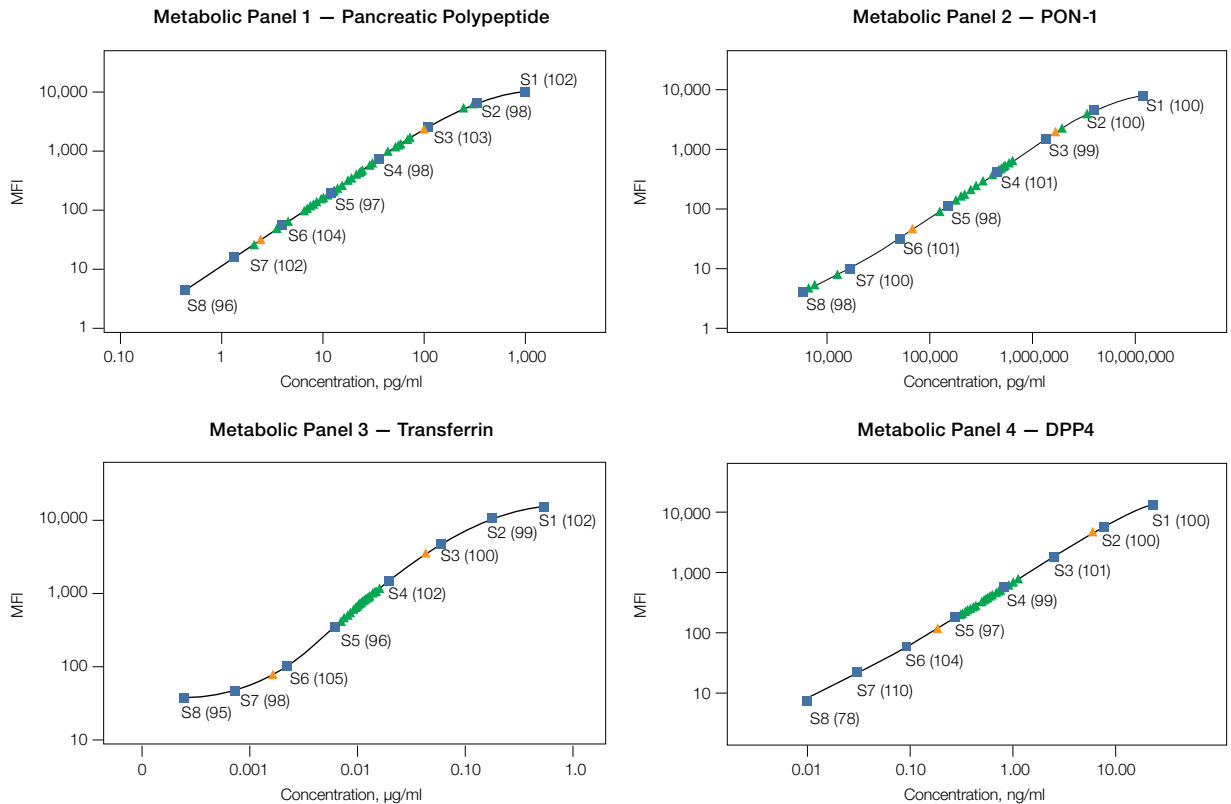


Fig. 1. Standard curves with assay controls and serum samples. The eight-point curves were prepared by 1:3 serial dilutions of the reconstituted standards provided in each kit. Curves are plotted in Bio-Plex Manager™ Software using a 5-PL curve fit, with % recovery (■), samples (▲), and controls (△). The figure shows representative data to illustrate the broad assay working ranges. MFI, median fluorescence intensity.

Alignment of the Bio-Plex Pro RBM IGF Panel with WHO/NIBSC Standards

The WHO/NIBSC standards provide a reference for researchers around the world to standardize biological materials. These standards, based on international scientific consensus, were used to demonstrate the accuracy of the Bio-Plex Pro RBM Human IGF Panel. The standards for IGF-1 (NIBSC code 02/254) and IGF-2 (NIBSC code 96/538) were reconstituted and serially diluted using sample buffer to generate five concentrations. The Bio-Plex Pro assays showed strong correlation between the observed and expected concentrations, with R^2 values of 0.991 and 0.942, respectively (data not shown).

Bio-Plex Pro Assays Provide More Reliable Detection of IGFBPs

The Bio-Plex Pro RBM assays were compared to assays from another Luminex assay vendor to highlight more reliable detection of analytes in serum (Figure 2).

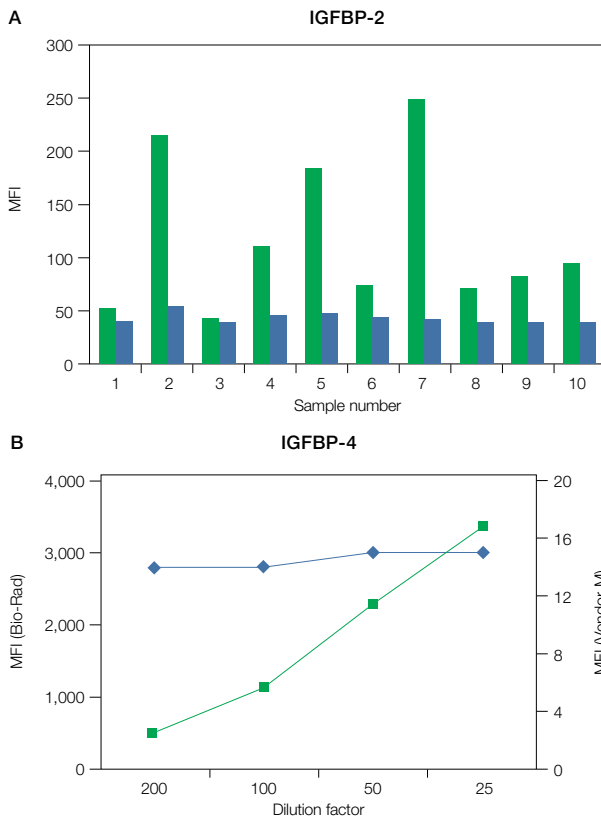


Fig. 2. Comparison of the Bio-Plex Pro RBM IGFBP Panel to another vendor's panel. **A**, serum samples (n = 10) were assayed with either the Bio-Plex Pro RBM IGFBP Panel (■) or vendor M's panel (■). The Bio-Plex Pro assays for IGFBP-1, -2, -4, and -6 gave consistently higher signal (MFI) and better discrimination between individual samples. Data shown for IGFBP-2. **B**, The dilution linearity of the same samples were then compared. Bio-Plex Pro (■); vendor M (◆). Bio-Plex Pro assays for IGFBP-2, -3, -4, and -5 demonstrated robust linearity as compared to vendor M. Data from a single IGFBP-4 sample shown. MFI, median fluorescence intensity.

Multiplex Profiling of Metabolic and Cardiovascular Markers in Serum

Serum samples from control groups and diabetes patients were assayed with Bio-Plex Pro RBM Metabolic Panels 1 and 4 to demonstrate robust detection of multiple protein biomarkers (Figure 3).

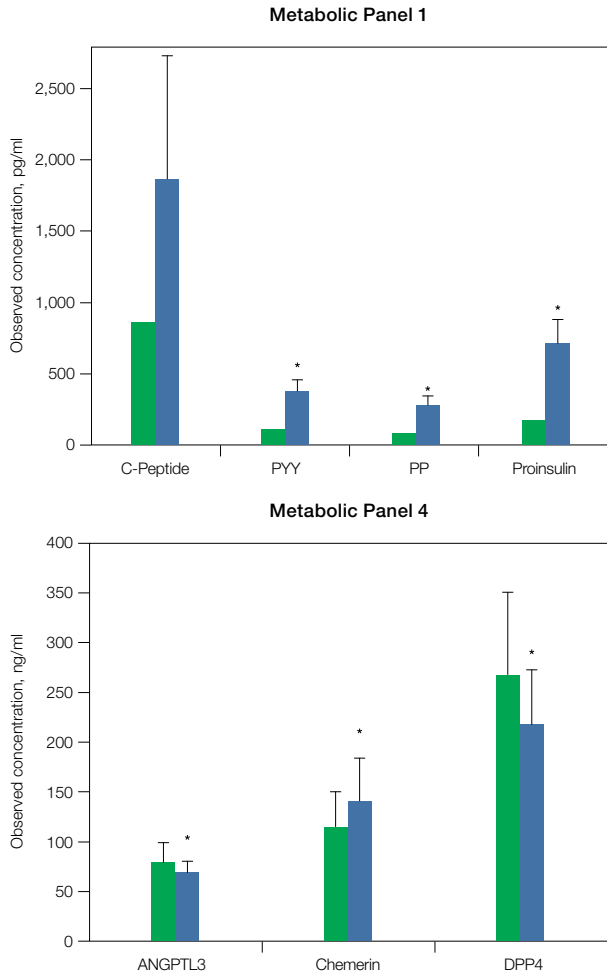


Fig. 3. Detection of metabolic and cardiovascular markers. Nonmatched serum samples from a control group (n = 44, metabolic panel 1; n = 37, metabolic panel 4) and diabetes patients (n = 15, metabolic panel 1; n = 17, metabolic panel 4) were assayed to demonstrate robust detection of multiple protein biomarkers. Control samples (■); diabetes patient samples (■). Statistical significance was determined using Student's *t*-test. *, $P < 0.05$, as compared to the control.

Detection of Metabolic and Inflammation Markers Released from Cultured Stem Cells

Human mesenchymal stem cells were induced to differentiate into adipocytes and analyzed over a period of nine days using the Bio-Plex Pro RBM Metabolic Panels 1, 2, and 3. The release of specific markers into the culture medium relative to the undifferentiated cells is shown in Figure 4.

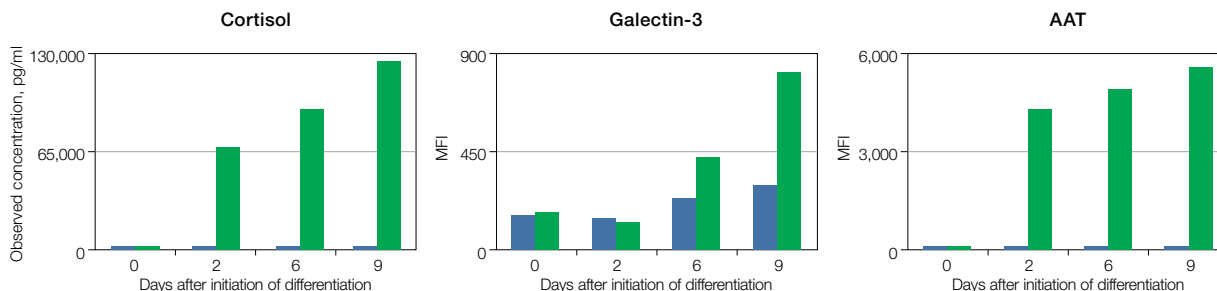


Fig. 4. Detection of metabolic and inflammation markers. Human mesenchymal stem cells were treated with proprietary differentiation reagents, and the resulting expression of cortisol, galectin-3, and AAT is shown. Undifferentiated cells (■); differentiated cells (■). MFI, median fluorescence intensity.

Ordering Information

Catalog # Description

Bio-Plex Pro RBM Human Metabolic and Hormone Premixed All-In-One Kits, includes premixed magnetic capture beads and detection antibodies, standards, 2-level controls, standard diluent, buffers (blocking, sample dilution, and 10x assay), 10x streptavidin-PE, flat bottom plate/seals, and instructions

171-AMR1CK **Bio-Plex Pro RBM Human Metabolic Panel 1**, 1 x 96-well, for the detection of the following analytes: C-Peptide, cortisol, pancreatic polypeptide, proinsulin, and peptide YY

171-AMR2CK **Bio-Plex Pro RBM Human Metabolic Panel 2**, 1 x 96-well, for the detection of the following analytes: FGF-21, FGF-23, galectin-3, sLeptin R, omentin-1, pentraxin-3, PON-1, and vaspin

171-AMR3CK **Bio-Plex Pro RBM Human Metabolic Panel 3**, 1 x 96-well, for the detection of the following analytes: AAT, AGP-1, hemopexin, RBP-4, transferrin, transthyretin, and VDBP

171-AMR4CK **Bio-Plex Pro RBM Human Metabolic Panel 4**, 1 x 96-well, for the detection of the following analytes: ANGPTL3, chemerin, DPP4, protein S, and SEPP

171-AHR1CK **Bio-Plex Pro RBM Human Hormone Panel 1**, 1 x 96-well, for the detection of the following analytes: FSH, GH, LH, prolactin, and TSH

171-AGR1CK **Bio-Plex Pro RBM Human IGFBP Panel**, 1 x 96-well, for the detection of the following analytes: IGFBP-1, IGFBP-2, IGFBP-3, IGFBP-4, IGFBP-5, IGFBP-6, and IGFBP-7

171-AFR1CK **Bio-Plex Pro RBM Human IGF Panel**, 1 x 96-well, for the detection of IGF-1 and IGF-2

Catalog # Description

Wash Stations and Accessories

300-34376 **Bio-Plex Pro Wash Station**, microplate wash station for magnetic bead-based assays, includes magnetic plate carrier, waste bottle, and two liquid bottles

171-020100 **Bio-Plex Handheld Magnetic Washer**, includes magnetic washer and adjustment hex tools for use in manual wash steps for all Bio-Plex magnetic assays

171-025001 **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

171-001510 **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

171-001513 **Bio-Plex Data Pro Software**, (5 seats), for multi-experiment analysis and advanced data visualization

171-STND01 **Bio-Plex Manager Software**, includes 1 user desktop license, for analysis of Bio-Plex data and generation of protocols; does not operate the instrument

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

Bio-Plex Pro RBM kits are manufactured by Myriad RBM.

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