# 2022 CATALOG

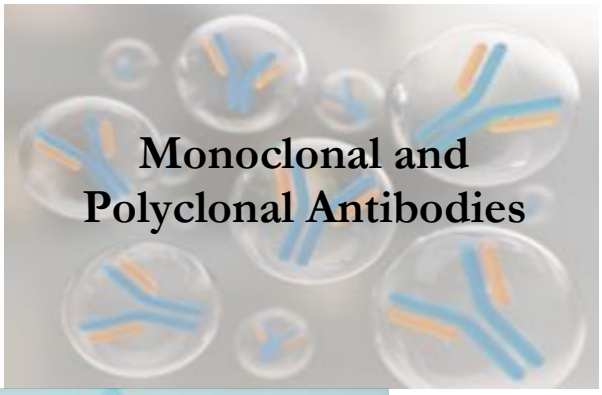
## ELISA Kits

Research Topics: Diabetes, Obesity, Metabolism, Cardiovascular Disease, Renal Disease, Liver Disease, Bone Metabolism, Inflammation

# About Us

**ImmunoDiagnostics Limited (IMD)** is a spin-off biotech company from The University of Hong Kong, and has R&D activities in both Toronto, Canada and Hong Kong. The founders of IMD are academic professoriates with strong research background in immunology, metabolism, cardiovascular medicine, and antibody and protein engineering. The company has over 13 years of experience in biomarker discovery and development of highly-specific immunoassays for both research & *in vitro* diagnostics (IVD) for major infectious diseases, cardiometabolic disorders and autoimmune diseases.

IMD has established state-of-the-art platforms for expression, purification and functional characterization of bioactive proteins from different sources (E. coli, yeast, insect cells and mammalian cells), generation and validation of both polyclonal and monoclonal antibodies, identification and cloning of genes encoding monoclonal antibodies specific to a target of interest using Next Generation Sequencing. Furthermore, our immunoassays have been validated in a large number of unique clinical biobanks in Asia, Europe and North America. Thus far, IMD has developed several hundreds of research products, including bioactive proteins, validated antibodies and immunoassays, which have been widely used in over 30 countries, such as the United States, Canada, United Kingdom, China, Australia and Singapore. IMD products have been cited by many publications in prestigious journals including Cell, Cell Metabolism, Nature Series, JCI, PNAS.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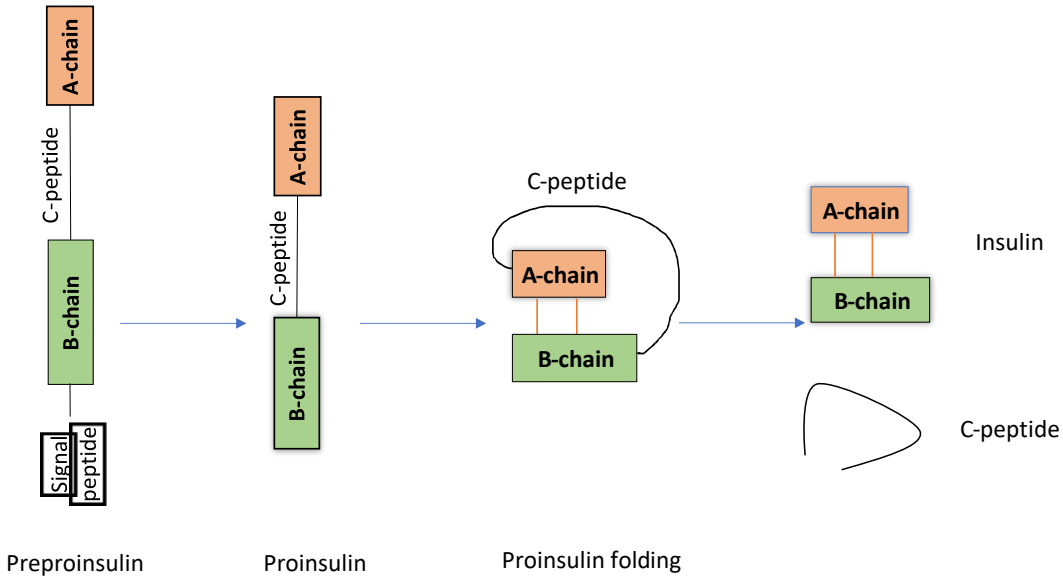
# General Introduction to Insulin

Insulin is a polypeptide hormone predominantly produced by the pancreatic b-cells. It consists of A chain and B chain linked with one intra and two inter-disulfide bonds. Insulin production is initiated by the synthesis of a single-chain precursor called preproinsulin (*see diagram below*) in the b-cells of pancreatic islets. This precursor is translocated into the rough endoplasmic reticulum and the signal peptide of preproinsulin is cleaved to form proinsulin. In the final step, proinsulin is transported to golgi apparatus and C-peptide is proteolytically cleaved off to form insulin. The insulin formed has two polypeptide chains (A and B chain) with a molecular weight of approximately 5.8 kDa. It is responsible for maintaining the blood glucose levels. Measuring the concentration of insulin, proinsulin and C-peptide can help to assess bcell function as well as precision diagnosis of diabetes.




IMD has developed a comprehensive range of assays for quantitative measurement of insulin, C-peptide and proinsulin in different species with high sensitivity, high specificity and superior reproducibility. All these assays have been fully validated in preclinical and clinical samples. IMD insulin ELISA kits have a high customer demand, has been used by many academics and R & D researchers globally in the past decade.

| IMD Insulin & C-peptide ELISA kits | | | |
|---|---|---|---|
| Cat. No. 31380 | Human insulin ELISA | Cat. No. 31780 | Human C-peptide ELISA |
| Cat. No. 32270 | High-sensitive mouse insulin ELISA | Cat.No. 33270 | High-sensitive rat insulin ELISA |
| Cat. No. 32393 | High-sensitive plus mouse ELISA | Cat. No. 33100 | Wide range rat insulin ELISA |
| Cat. No. 32100 | Wide range mouse insulin ELISA | Cat. No. 33380 | Ultra-sensitive rat ELISA |
| Cat. No. 32380 | Ultra-sensitive mouse ELISA | Cat.No. 36780 | Mouse/rat C-peptide ELISA |

# Human Insulin & Human C-peptide ELISA Kits

**(Cat. No. 31380; 31780)**

**INTRODUCTION:** Human insulin consists of two peptide chains, A chain (21 amino acids) and B-chain (30 amino acids) linked by disulfide bonds. The sequence of human insulin is as shown below:

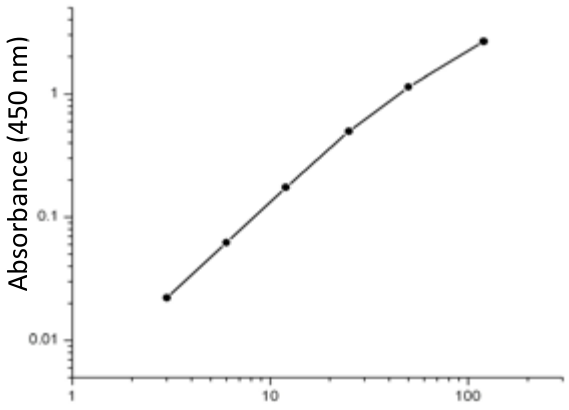

C-peptide is a part of proinsulin which is proteolytically cleaved out during insulin formation. It consists of 31 amino acid residues (*see the sequence below*). The half -life of C-peptide (20-30 min) is longer than that of insulin (3-5 min). Therefore, C-peptide is a more stable parameter for assessing b -cell function.


IMD has developed monoclonal antibody-based ELISA for specific measurements of insulin and Cpeptide in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical representation of standard curve

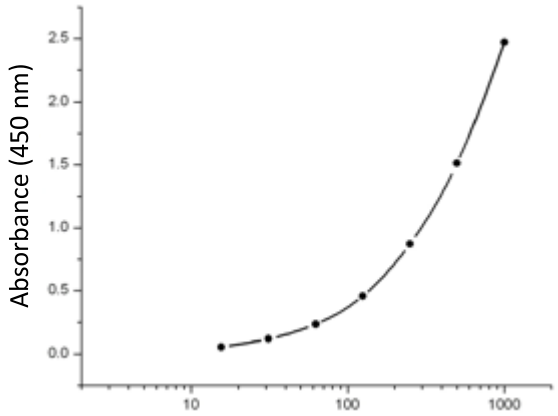
Insulin standard curve (log-log)




Concentration(µU/ml)

**B. Sensitivity:** 3µU/mL.
**C. Assay range**: 3-120µU/mL
**D. Precision:** Intra-assay CV < 6%
Inter-assay CV <6%
**E. Recovery:** > 92%.

Human C-peptide standard (4-parameter)




Concentration (pg/mL)

**B. Sensitivity:** 15.6 pg/mL.
**C. Assay range:** 15.6-1000 pg/mL
**D. Precision:** Intra-assay CV< 6%.
Inter-assay CV< 6%.

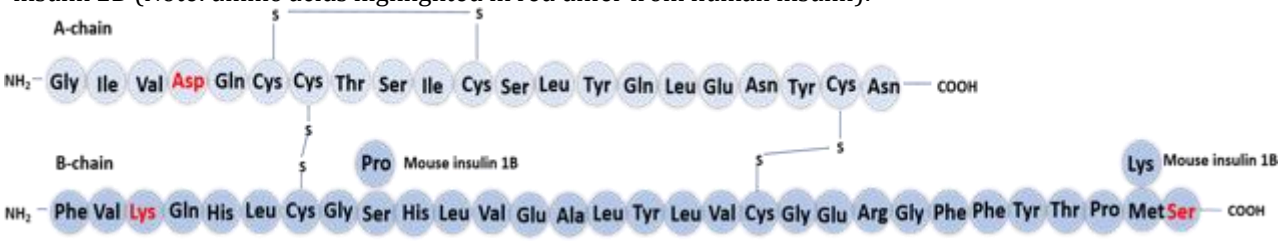
**References:**


- Cheng, Sam Tsz Wai, et al. ***PLoS One.***2016; 11(1):e0147391.
- Lin Z, Pan X, Wu F, et al. ***Circulation.***2015; 131(21):1861-71.
- Wang, Lin, et al. ***Pancreas.***2017; 46(3):395-404. ❖
- Li X, Cheng K. K, Liu Z, et al. ***Nat Commun.***2016; 7:11740.
- Shu L, Hoo R L C, Wu X, et al. ***Nat Commun.***2017; 8:14147.
- Wang, Lin, et al. ***Pancreas.***2017; 46(3):395-404.

# Mouse/Rat Insulin ELISA Kits

**(Cat. No. 32270; 32100; 32380; 32393; 33270; 33100; 33380)**

**INTRODUCTION:** Mouse and rat produce two insulins, insulin I and insulin II due to the two-gene insulin system present in these rodents. Insulin consists of two peptide chains, A chain (21 amino acids) and B-chain (30 amino acids) linked by disulfide bonds. The amino acid sequence of insulins from both rodents are same however, two amino different in B chain of insulin I and II. The figure below represents mouse insulin 2B (Note: amino acids highlighted in red differ from human insulin).

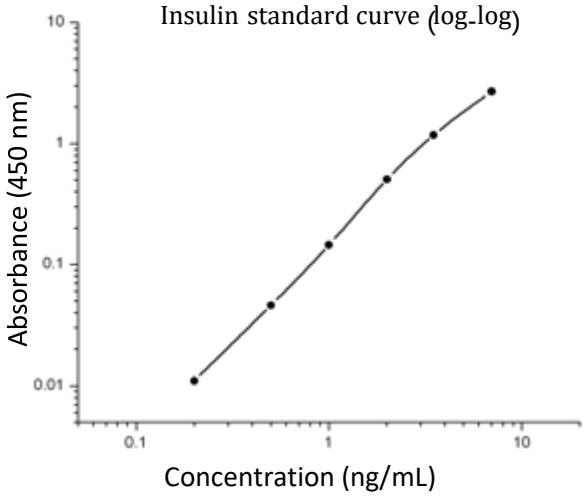



IMD has developed monoclonal antibody-based ELISA for specific measurements of insulin in mouse/rat plasma, serum or other biological samples.

## Assay performance & characteristics (*high-sensitive mouse insulin* as an example*)

### A. Typical representation of standard curve

| Insulin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.052 | 0 |
| 0.2 | 0.063 | 0.011 |
| 0.5 | 0.098 | 0.046 |
| 1.0 | 0.197 | 0.145 |
| 2.0 | 0.558 | 0.506 |
| 3.5 | 1.23 | 1.178 |
| 7 | 2.731 | 2.679 |




**B. Sensitivity:** 0.2 ng/mL.

**C. Precision:** Intra-assay C.V <6.1%
Inter-assay C.V. <2.9%

**D. Recovery:** >91%.

| Cat. No. | Name of immunoassay kit | Assay range | Application |
|---|---|---|---|
| **32393** | High-sensitive plus mouse insulin | 0.2-7 ng/mL | suitable for obese mice (sample volume: 5µL ) |
| **32100**<br>**33100** | Wide range mouse insulin<br>Wide range rat insulin | 1 -50 ng/mL | suitable for cell culture studies |
| **32380**<br>**33380** | Ultra-sensitive mouse insulin<br>Ultra-sensitive rat insulin | 0.025-1.5 ng/mL | suitable for lean and healthy mice<br>suitable for lean and healthy rat |
| **33270** | High-sensitive rat insulin | 0.2-7 ng/mL | suitable for obese rat (sample volume :10µL) |

*suitable for obese mice (sample volume :10µL)

# Mouse/Rat C-peptide ELISA Kit

**(Cat. No. 36780)**

**INTRODUCTION:** Mouse and rat produce two types of C-peptides, C-peptide I (C-I) and C-peptide II (C-II). Mouse C-I (29 amino acids) has three amino acids different from C-II (31 amino acids). However, both C-peptides from rat consist of 31 amino acid residues with a difference in two amino acids (see the sequence below):

Mouse C1: EVEDPQVEQLELGGSPG--DLQTLALEVARQ
Mouse CII: EVEDPQVAQLELGGGPGAGDLQTLALEVAQQ

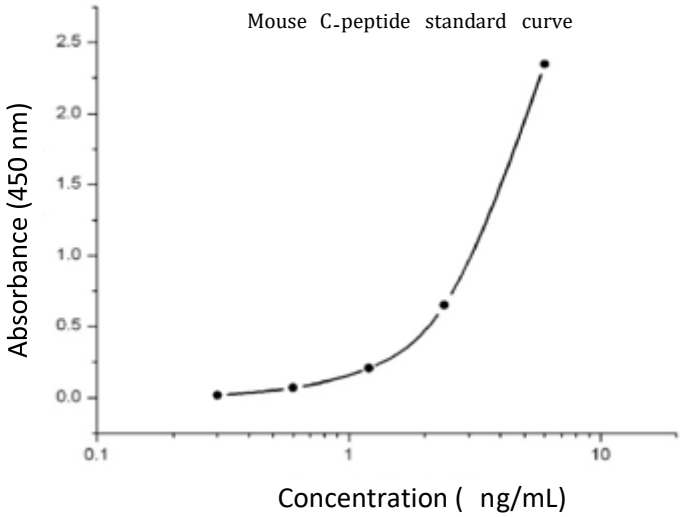
Rat C1: EVEDPQVPQLELGGGPEAGDLQTLALEVARQ
Rat CII: EVEDPQVAQLELGGGPGAGDLQTLALEVARQ

IMD has developed monoclonal antibody-based ELISA for specific measurements of C-peptide I and II in mouse/rat plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical representation of standard curve (4-parameter)

| C-peptide (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.133 | 0 |
| 0.3 | 0.151 | 0.018 |
| 0.6 | 0.203 | 0.07 |
| 1.2 | 0.338 | 0.205 |
| 2.4 | 0.783 | 0.65 |
| 6 | 2.479 | 2.346 |




**B. Sensitivity** : 0.3 ng/ ml

**C. Precision** : Intra-assay C.V <4.2%.
Inter-assay C.V <7.5%.

**References:**


- So, W. Y., et al. ***Cell Death Dis.***2015; 6:e1707.
- Liang Q, Zhong L, Zhang J, et al. ***Diabetes.***2014; 63(12): 4064-4075.
- Wang, Lin, et al. ***PLoS One.*** 2015; 10(6):e0128216.
- Cheng K.K, Lam KS, et al. ***Proc Natl Acad Sci U S A.*** 2012; 109(23):8919-24.
- Cheng K.K, et al. ***Diabetes.*** 2014; 63(11): 3748-58.
- Lin Z, Tian H, et al. ***Cell Metab.***2013; 17(5):779-89.
- Liang Q, Zhong L, Zhang J, et al. ***Diabetes.***2014; 63(12): 4064-4075.
- Cheng, Sam Tsz Wai, et al. ***PLoS One.***2016; 11(1):e0147391.

# Human Proinsulin ELISA Kit

## (Cat. No. 31420)

**INTRODUCTION:** Human proinsulin is a precursor of insulin which consists of A chain and B chain connected by C- peptide (*see diagram below*). It is a polypeptide composing of 86 amino acids, produced after cleavage of signal peptide from pre-proinsulin in pancreatic b-cells. Elevated proinsulin level in circulation is observed during aging process or in subjects with impaired insulin maturation. Additionally, patients with type 2 diabetes and metabolic syndrome also have higher circulating proinsulin levels than healthy individuals.

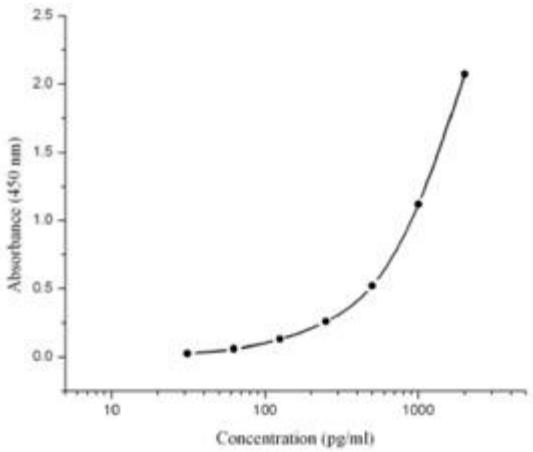

IMD has developed monoclonal antibody-based ELISA for specific measurements of human proinsulin in plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical representation of standard curve

Human proinsulin standard (4-parameter)

| Human proinsulin (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.096 | 0 |
| 31.2 | 0.122 | 0.026 |
| 62.5 | 0.154 | 0.058 |
| 125 | 0.225 | 0.129 |
| 250 | 0.354 | 0.258 |
| 500 | 0.616 | 0.520 |
| 1000 | 1.214 | 1.118 |
| 2000 | 2.168 | 2.072 |




| Diabetes serum sample | Concentration(pg/mL) |
|---|---|
| Sample 1 | 226 |
| Sample 2 | 40 |

**B. Sensitivity:** 31.2 pg/ml

**C. Precision:**
Intra-assay Precision C.V.< 6.5%.
Inter-assay Precision C.V.< 7.3%.

**D. Recovery:** 89.9%

**E. Linearity:** 98-113%

# High-sensitive Human CRP ELISA Kit

**(Cat. No. 31220)**

**INTRODUCTION:** C-reactive protein (CRP) or Pentraxin 1, is a circulating protein mainly secreted by liver. It consists of five identical non-glycosylated subunits of 23 kDa, that give rise to a symmetrically arranged globular protein with molecular weight of approximately 120 kDa. In 2003, the Centre for Disease Control and Prevention (CDC) and the American Heart Association (AHA) issued a statement that identified CRP as the inflammatory marker best suited for use in current clinical practice to assess cardiovascular risk. Many epidemiologic studies have demonstrated that CRP is a strong independent predictor of future cardiovascular events, such as myocardial infarction, ischemic stroke, peripheral vascular disease, and sudden cardiac death. The CDC/ AHA guidelines support the use of CRP in primary prevention and set cut-off points according to relative risk categories: low risk (<1.0 mg/L), average risk (1.0-3.0 mg/L), and high risk (>3.0 mg/L).

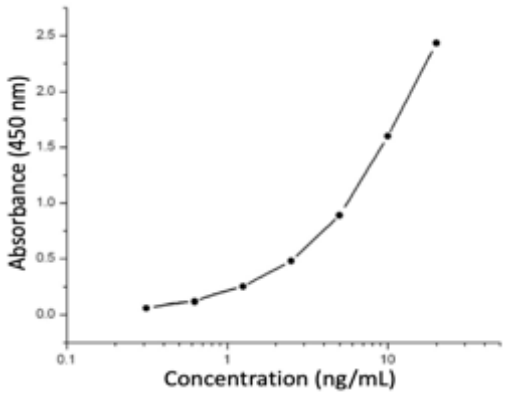
IMD has developed a monoclonal antibody pair-based ELISA for quantitative determination of CRP in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| CRP (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.066 | 0 |
| 0.312 | 0.125 | 0.059 |
| 0.625 | 0.183 | 0.117 |
| 1.25 | 0.317 | 0.251 |
| 2.5 | 0.545 | 0.479 |
| 5 | 0.955 | 0.889 |
| 10 | 1.665 | 1.599 |
| 20 | 2.498 | 2.432 |

Human CRP standard curve (4-parameter)




**B. Sensitivity:** 0.312 ng/mL.

**C. Precision**: Intra-assay C.V. 4.3%; Inter-assay C.V. 5.9%.

**D. Recovery:** 98%.

**E. Specificity:** The antibody pair used in this assay is specific to human CRP and does not cross-react with mouse and rat CRP, and other cytokines or hormone molecules.

**References:**


1. Chow, W.S. *et al.* (2013) J. Am. Heart Assoc. **2(1)**: e004176
2. Festa, A. *et al.* (2002) Diabetes **51**:1131-1137.
3. Verma, S. & Yeh, E.T. (2003) Am. J. Physiol. **285**:R1253-R1258.
4. Jialal, I. *et al.* (2004) Hypertension **44**: 6-11.
5. Liu, M.M. *et al*. (2009) *Chest.* **135(4)**:950-956

# Mouse IL-33 ELISA Kit
**(Cat. No. 32750)**

**INTRODUCTION:** Interleukin 33 (IL-33) is a nuclear cytokine composed of a precursor protein (166 amino acid) and hydrophobic signal peptide (26 amino acid). It is released from tissues/cells during damage or injury and binds to the receptors ST2 (also known as IL1RL1) and IL-1 Receptor Accessory Protein (IL1RAP), activating intracellular molecules in the NF-κB and MAP kinase signaling pathways that drive production of type 2 cytokines (e.g. IL-5 and IL-13) from polarized $Th_2$ cells. Altered IL-33 levels have been associated with several diseases such as asthma and allergy, and chronic inflammatory conditions.

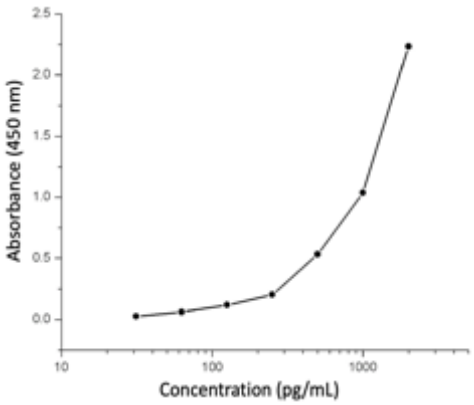
IMD has developed monoclonal antibody-based ELISA for specific measurements of IL-33 in mouse plasma, serum or other biological samples.

## Assay performance and characteristics

### A. Typical standard curve

| Mouse IL-33 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.11 | 0 |
| 31.25 | 0.145 | 0.027 |
| 62.5 | 0.179 | 0.062 |
| 125 | 0.236 | 0.118 |
| 250 | 0.319 | 0.202 |
| 500 | 0.65 | 0.532 |
| 1000 | 1.2 | 1.083 |
| 2000 | 2.35 | 2.233 |

Mouse IL-33 standard curve (4 parameters)




**B. Sensitivity:** 6.5 pg/mL.

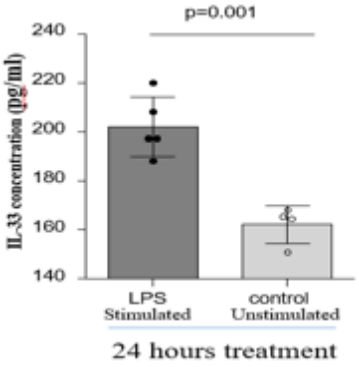
**C. Precision:** Intra-assay C.V. <6.5%.; Inter-assay C.V. <10%.

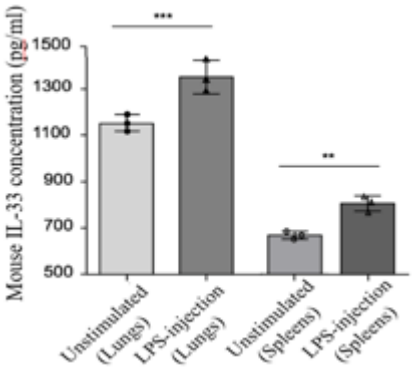
**D. Spiking:** The recovery rate of spiked samples ranges from 101.8-115.6%.

**E. Linearity:** The recovery ranges from 92.4-98.6%.

**F. Validation:**

Cell culture supernatants:




**References:**


1. Schrader, J.W. (1986) Annu. Rev. Immunol. **4**:205
2. Fung, M.C. *et al.* (1984) Nature **307**:233
3. Zeyda, M. *et al.* (2013) Int. J. Obes. **37**: 658-665
4. Miller, A.M. *et al.* (2010) Circ. Res. **107(5)**: 650-8
5. Giannoudaki, E. *et al.* (2019) Nat. Commun. **10**:4003
6. Duffen, J. *et al.* (2018) J. Immunol. **200(4)**:1347-1359

# Mouse Major Urinary Protein-1 (MUP1) ELISA Kit

**(Cat. No. 32150)**

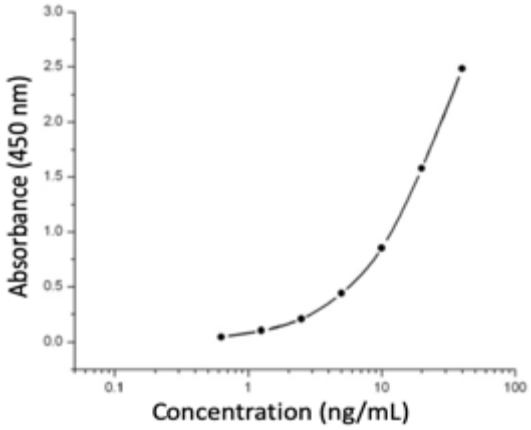
**INTRODUCTION:** Major urinary protein 1 (Mup1), also known as Mup7, Up-1, Ltn-1, Mup-1, Mup-a, Mup10 and Lvtn-1, is a low molecular weight secretory protein produced predominantly from the liver. Structurally it belongs to the lipocalin family, which carries small hydrophobic ligands such as pheromones. It has been demonstrated that Mup1 is an important player in regulating energy expenditure and metabolism in mice. Circulating Mup1 is markedly decreased in db/db mice with obesity and diabetes. MUP1 treatment decreases glucose intolerance as well as insulin resistance in obese/diabetic mice.

## Assay performance & characteristics

### Typical standard curve

| Mup1 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.071 | 0 |
| 0.625 | 0.117 | 0.046 |
| 1.25 | 0.174 | 0.103 |
| 2.5 | 0.279 | 0.208 |
| 5 | 0.512 | 0.441 |
| 10 | 0.927 | 0.852 |
| 20 | 1.65 | 1.579 |
| 40 | 2.555 | 2.484 |

Mouse Mup 1 standard curve (4-parameter)




Sensitivity: 0.2 ng/mL.; Intra-assay C.V. <5.3%.; Inter-assay C.V. <4.4%

**References for MUP-1:**


1. McIntosh, I. and Bishop, J.O. (1989) Mol. Cell. Biol. **9**:2202-2207.
2. Hui, X. *et al.* (2009) J. Biol. Chem. **284(21)**:14050-7.
3. Zhou, Y. *et al.* (2009) J. Biol. Chem. **284(17)**:11152-9.
4. Chen, C.C. *et al.* (2015) Biochem. Biophys. Res. Commun. **460(4):**1063-8.

# Mouse Proteinase 3 (PR3) ELISA kits

**(Cat. No. 32300)**

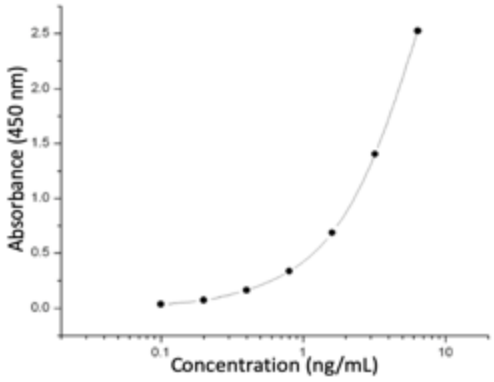
**INTRODUCTION**: Proteinase 3 (PR3), also known as myeloblastin, Wegener autoantigen, azurophil granule protein-7 or p29b, is one of the hematopoietic serine proteases localized in the primary granules of polymorphonuclear neutrophils (PMNs). It is a 29 kDa glycoprotein made of 222 amino acids and is released during neutrophilic inflammation. The primary function of PR3 is to participate in direct intracellular killing of phagocytosed pathogens in phagolysosomes and degradation of extracellular matrix components at inflammatory sites. PR3 has also been shown to process some pro-inflammatory cytokines, activate mitogen activated protein kinase (MAPK) signalling through proteinase activated receptor-1 (PAR1), and induce endothelial cell apoptosis through NF-κB signalling pathways. PR3 is identified as the target autoantigen of anti-neutrophil cytoplasmic autoantibodies (ANCA) in Wegener granulomatosis. Increased PR3 levels have been reported in patients with acute myocardial infarction, and in subjects with type 1 diabetes.

## Assay performance & characteristics

### Typical standard curve

| Mouse PR3 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.08 | 0 |
| 0.1 | 0.117 | 0.037 |
| 0.2 | 0.154 | 0.074 |
| 0.4 | 0.243 | 0.163 |
| 0.8 | 0.416 | 0.336 |
| 1.6 | 0.766 | 0.686 |
| 3.2 | 1.483 | 1.403 |
| 6.4 | 2.604 | 2.524 |

Mouse PR3 standard curve (4-parameter)




Sensitivity: 0.1 ng/mL.; Intra-assay C.V. <10%.; Inter-assay C.V. <10%

# Human P1NP ELISA Kit
**(Cat. No. 31109)**

**INTRODUCTION:** Procollagen type 1 N-terminal propeptide (P1NP) is the N-terminal extension of procollagen type 1 found in bone. During collagen formation, this N-terminal is proteolytically removed along with the C-terminal extension. P1NP is usually secreted into blood stream as unstable trimeric structure which subsequently undergo thermal degradation to form a stable monomeric structure. The International Osteoporosis Foundation recommends P1NP as a bone formation biomarker. Various studies of hormone replacement therapy in postmenopausal women portrayed the significance of P1NP as biomarker for bone formation. Additionally, P1NP was observed as good indicator for fibrogenesis in rats and osteoblastic metastases in prostate carcinoma patients.

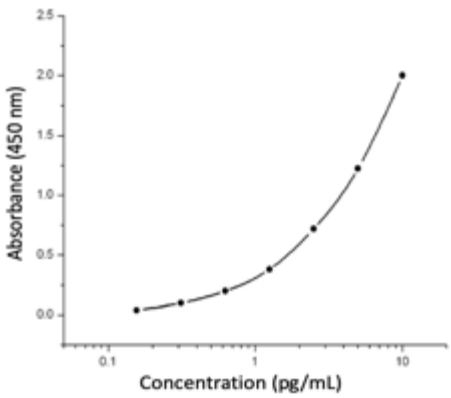
IMD has developed a monoclonal antibody pair-based ELISA for specific measurements of P1NP in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human P1NP (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.094 | 0 |
| 62.5 | 0.133 | 0.039 |
| 125 | 0.187 | 0.093 |
| 250 | 0.293 | 0.199 |
| 500 | 0.474 | 0.38 |
| 1000 | 0.812 | 0.718 |
| 2000 | 1.317 | 1.223 |
| 4000 | 2.096 | 2.002 |

Human P1NP standard curve (4-parameter)




**B. Sensitivity:** 62.5 pg/mL.

**C. Precision:** Intra-assay C.V.< 3.3%; Inter-assay C.V. < 5.1%

**References:**

1. Garnero, P. *et al.* (2008) Clin. Chem. **54(1)**:188-196
2. Kuo, T.R. and Chen, C.H. (2017) Biomark. Res. **5**:18
3. Hannon, R. *et al.* (2009) J. Bone Miner. Res. **13**:7
4. Eastell, R. *et al.* (2005) Curr. Med. Res. Opin. **22(1)**:61-6
5. Vasikaran, S. *et al.* (2010) Osteoporos Int. **22(2)**:391-420
6. Funck-Brentano, T. *et al.* (2011) Semin. Arthritis Rheum. **41(2)**:157-69

# Human PLAC9 ELISA Kit

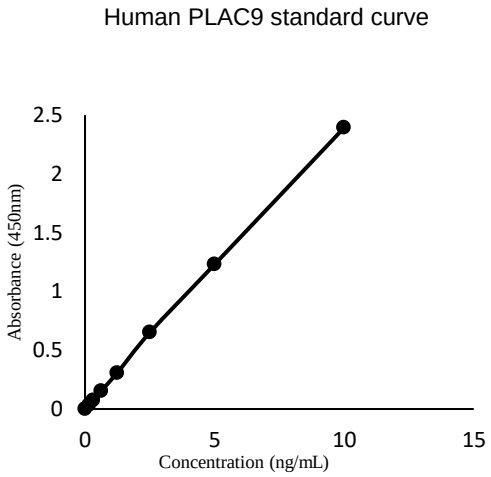
**(Cat. No. 31990)**

**INTRODUCTION:** Placenta-specific protein 9 (PLAC9) is a putative secreted protein highly enriched in placenta. It plays a major role in embryonic development. During human embryogenesis, PLAC9 levels were upregulated at 8-9 weeks. PLAC9 was found to be involved in protein interactions in human liver. Overexpression of PLAC9 inhibited cell proliferation capacity in hepatic cells by modifying cell cycle related proteins.

## Assay performance & characteristics

### A. Typical standard curve

| Human PLAC9 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.108 | 0 |
| 0.156 | 0.126 | 0.018 |
| 0.312 | 0.157 | 0.049 |
| 0.625 | 0.306 | 0.198 |
| 1.25 | 0.648 | 0.540 |
| 2.5 | 1.107 | 0.999 |
| 5 | 1.584 | 1.476 |
| 10 | 2.192 | 2.084 |




**B. Sensitivity:** 0.156 ng/mL.

**References:**

1. Galaviz-Hernandez C., et al., (2003) *Gene*, 309(2):81-9
2. Yi H., et al., (2010) *FASEB J.*, 24(9): 3341–3350
3. Xue L., et al., (2011) *Int J Biol Sci,* 7(7):1068-1076
4. Wang J., et al., (2011) *Mol Syst Biol.,* 7: 536

# Human Adiponectin ELISA Kit
**(Cat. No. 31010)**

**INTRODUCTION:** Adiponectin, also known as apM1, Acrp30, adipoQ and GBP28 , is a circulating hormone predominantly produced from adipose tissue. It is a glycoprotein with molecular weight of approximately 30 kDa and have circulating levels of 2-30 μg/mL in humans. Structurally it resembles complementary factor C1q. During assembly, adiponectin form complexes of different molecular weight and function. Adiponectin has anti-diabetic, insulin-sensitizing and anti-inflammatory properties. Decreased circulating levels of plasma adiponectin (hypoadiponectinemia) are associated with increased body mass index (BMI), and decreased insulin sensitivity. A large number of longitudinal studies in different ethnic groups uniformly demonstrated that circulating adiponectin levels are decreased significantly in type 2 diabetes (T2D) and related complications**,** and low circulating adiponectin levels indicate the increased risk for the development of T2D**.**

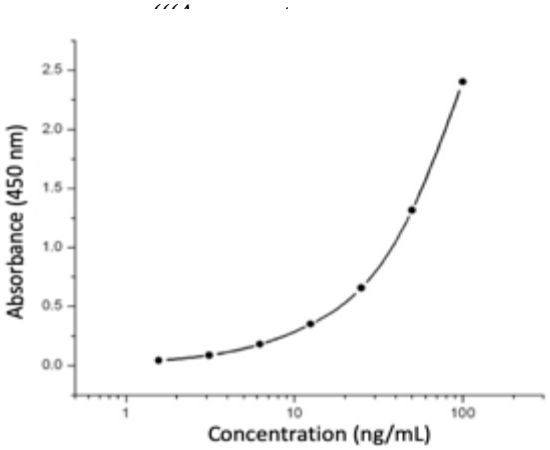
IMD has developed monoclonal antibody-based ultrasensitive ELISA for specific measurements of adiponectin in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Adiponectin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.068 | 0 |
| 1.56 | 0.112 | 0.044 |
| 3.12 | 0.156 | 0.088 |
| 6.25 | 0.248 | 0.18 |
| 12.5 | 0.418 | 0.35 |
| 25 | 0.724 | 0.656 |
| 50 | 1.384 | 1.316 |
| 100 | 2.469 | 2.401 |

Human adiponectin standard curve (4-parameter)




**B. Sensitivity:** 1.56 ng/mL.
**C. Precision**: Intra-assay C.V.< 4.18%.; Inter-assay C.V.< 5.01%.
**D. Recovery:** 97-105%.
**E. Specificity:**
The antibody pair used in this assay is specific to human adiponectin and does not cross-react with mouse and rat adiponectin, and other cytokines or hormone molecules including human resistin, TNFα, ANGPTL4, insulin, leptin and IL6.

**References:**

1. Trujillo, M.E. and Scherer, P.E. (2005) J. Intern. Med. **257**:167-175
2. Robinson, K. *et al*. (2011) Crit. Care **15(2)**:221
3. Berg, A.H. *et al*. (2001) Nat. Med. **7**:947-953.
4. Yamauchi, T. *et al*. (2001) Nat. Med. **7**:941-946.
5. Xu, A. *et al*. (2003) J. Clin. Invest. **112**:91-100.
6. Lin, Z. *et al*. (2013) Cell. Metab. **17(5)**:779-89

# Rapid Human Adiponectin ELISA Kit
## (Cat. No. 31012)

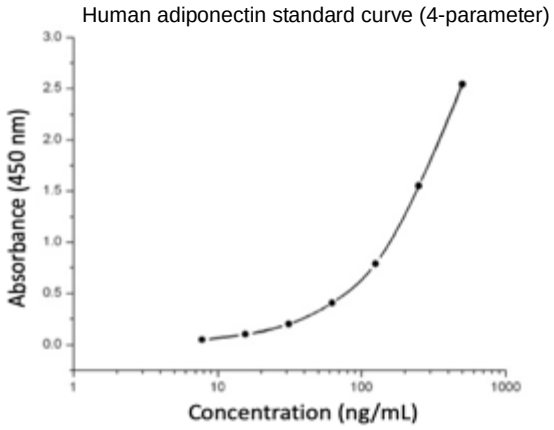
**INTRODUCTION:** Adiponectin, also known as apM1, Acrp30, adipoQ and GBP28, is a circulating hormone predominantly produced from adipose tissue. It is a glycoprotein with molecular weight of approximately 30 kDa and have circulating levels of 2-30 μg/mL in humans. Structurally it resembles complementary factor C1q. During assembly, adiponectin form complexes of different molecular weight and function. Adiponectin has anti-diabetic, insulin-sensitizing and anti-inflammatory properties. Decreased circulating levels of plasma adiponectin (hypoadiponectinemia) are associated with increased body mass index (BMI), and decreased insulin sensitivity. A large number of longitudinal studies in different ethnic groups uniformly demonstrated that circulating adiponectin levels are decreased significantly in type 2 diabetes (T2D) and related complications, and low circulating adiponectin levels indicate the increased risk for the development of T2D.

IMD has developed monoclonal antibody-based ELISA for rapid, specific measurements of adiponectin in human plasma, serum or other biological samples within 90 minutes.

## Assay performance & characteristics

### A. Typical standard curve

| Adiponectin (ng/mL) | Absorbance (450 nm) | Blanked absorbance |
|---|---|---|
| 0 | 0.056 | 0 |
| 7.8 | 0.105 | 0.049 |
| 15.6 | 0.158 | 0.102 |
| 31.2 | 0.255 | 0.199 |
| 62.5 | 0.463 | 0.407 |
| 125 | 0.845 | 0.789 |
| 250 | 1.608 | 1.552 |
| 500 | 2.599 | 2.543 |




**B. Sensitivity:** 7.8 ng/mL.
**C. Precision:** Intra-assay C.V. < 4.7%; Inter-assay C.V. < 6.9%
**D. Recovery**: 91%.
**E. Specificity:**
The antibody pair used in this assay is specific to human adiponectin and does not cross-react with mouse and rat adiponectin, and other cytokine or hormone molecules including human resistin, TNFα, ANGPTL4, insulin, leptin and IL6.

**References:**


1. Trujillo, M.E. and Scherer, P.E. (2005) J. Intern. Med. **257**:167-175
2. Robinson, K. *et al*. (2011) Crit. Care **15(2)**:221
3. Berg, A.H. *et al*. (2001) Nat. Med. **7**:947-953.
4. Yamauchi, T. *et al*. (2001) Nat. Med. **7**:941-946.
5. Xu, A. *et al*. (2003) J. Clin. Invest. **112**:91-100.
6. Lin, Z. *et al*. (2013) Cell. Metab. **17(5)**:779-89

# Mouse Adiponectin ELISA Kit

**(Cat. No. 32010)**

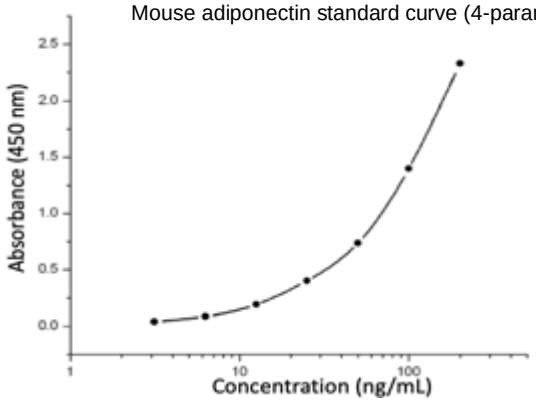
**INTRODUCTION:** Refer Cat. No. 31010 for more information.

## Assay performance & characteristics

### Typical standard curve

| Adiponectin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.064 | 0 |
| 3.12 | 0.105 | 0.041 |
| 6.25 | 0.151 | 0.087 |
| 12.5 | 0.257 | 0.193 |
| 25 | 0.467 | 0.403 |
| 50 | 0.801 | 0.737 |
| 100 | 1.463 | 1.399 |
| 200 | 2.393 | 2.329 |

Mouse adiponectin standard curve (4-parameter)




Sensitivity: 2 ng/mL; Intra-assay C.V. <7.6%., Inter-assay C.V. <6.4%.; Recovery: 95%

**References for Adiponection Assay:**


1. Xu, A. *et al.* (2004) Endocrinology **145(2)**:487-94.
2. Xu, A. *et al.* (2005) J. Biol. Chem. **280(18)**: 18073-80.
3. Palanivel, R. *et al.* (2007) Cardiovasc. Res. **75(1)**: 148-57.
4. Wong, J.T. *et al.* (2011) Cell Metab. **14(1)**:104-15.
5. Lin, Z. *et al.* (2014) J. Hepatol. **61(4)**:825-31.
6. Hui, X. *et al.* (2015) Cell Metab. **22(2)**:279-90.


# Mouse/Rat FGF-21 ELISA Kit

**(Cat. No. 32180)**

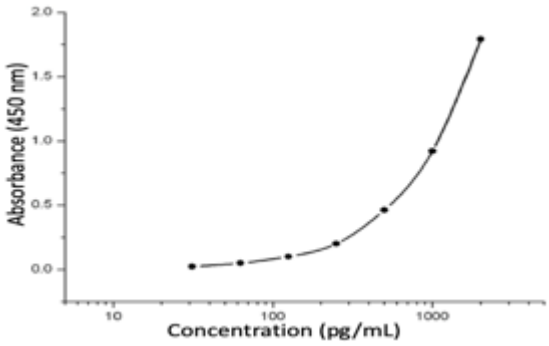
**INTRODUCTION:** Refer Cat. No. 31180 for more information.

## Assay performance & characteristics

### Typical standard curve

| Mouse FGF-21 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.109 | 0 |
| 31.2 | 0.132 | 0.023 |
| 62.5 | 0.158 | 0.049 |
| 125 | 0.209 | 0.1 |
| 250 | 0.309 | 0.2 |
| 500 | 0.571 | 0.462 |
| 1000 | 1.031 | 0.992 |
| 2000 | 1.9 | 1.791 |

Mouse FGF-21 standard curve (4-parameter)




Sensitivity: 31.2 pg/mL; Intra-assay C.V. <5.6%, Inter-assay C.V. <7.1%.; Recovery: 96%.

**References for FGF-21 Assay:**


1. Chen, W. *et al.* (2011) J. Biol. Chem. **286(40)**:34559-66.
2. Li, H. *et al.* (2012) Diabetes **61(4)**:797-806.
3. Lin, Z. *et al.* (2013) Cell Metab. **17(5)**:779-89.
4. Huang, Z. *et al.* (2017) Cell Metab. **26(3)**:493-508.
5. Pan, X. *et al.* (2018) Cell Metab. **27(6)**:1323-1337

# Human FGF-21 ELISA Kit

**(Cat. No. 31180)**

**INTRODUCTION:** Fibroblast growth factor 21 (FGF-21) is an endocrine member of the FGF superfamily produced predominantly from the liver. Additionally, it is also expressed in several other metabolically active organs such as adipose tissues, pancreatic islets and skeletal muscle. FGF-21 is a potent metabolic regulator with therapeutic benefits on obesity and its related metabolic complications, partly by induction of adiponectin. Paradoxically, circulating levels of FGF-21 are elevated in obesity, type-2 diabetes and related complications, possibly due to FGF-21 resistance or compensatory responses. Prospective studies in different ethnic groups have identified high level of serum FGF-21 as an independent predictor for type-2 diabetes and atherosclerosis.

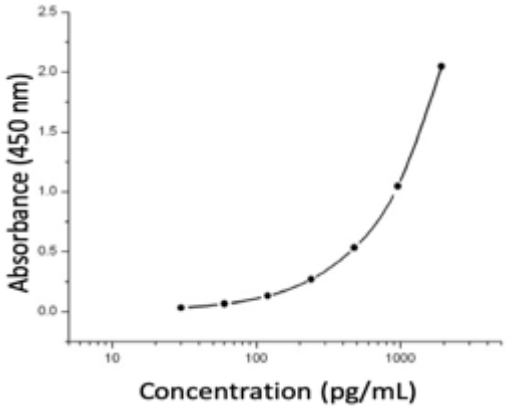
IMD has developed a highly sensitive ELISA for specific measurements of FGF-21 in human plasma, serum or other biological samples, which have been used widely for clinical research.

## Assay performance & characteristics

### A. Typical standard curve

| Human FGF-21 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.094 | 0 |
| 30 | 0.127 | 0.033 |
| 60 | 0.158 | 0.064 |
| 120 | 0.224 | 0.13 |
| 240 | 0.362 | 0.268 |
| 480 | 0.626 | 0.532 |
| 960 | 1.141 | 1.047 |
| 1920 | 2.14 | 2.046 |

Human FGF-21 standard curve (4-parameter)




**B. Sensitivity:** 30 pg/mL.
**C. Precision:** Intra-assay C.V. < 5.1%; Inter-assay C.V. < 4.6%
**D. Specificity:**
The recombinant protein does not cross-react with mouse FGF-21, human FABP4, human LCN2, human adiponectin and human ANGPL4
**E. Linearity:**

| Dilution | Measured (pg/mL) | Expected (pg/mL) | Recovery (%) |
|---|---|---|---|
| None | 448 | 448 | 100 |
| 1/2 | 245 | 224 | 109 |
| 1/4 | 123 | 112 | 109 |
| 1/8 | 63.6 | 56 | 113 |

**References:**

1. Zhang, X. (2008) Diabetes **57(5)**:1246-53.
2. Yu, H. (2011) Clin. Chem. **57(5)**:691-700
3. Li, H. J. (2013) Hepatol. **58(3)**:557-63
4. Ong, K.L. (2015) Diabetologia. **58(9)**:2035-44.
5. Lee, C.H. (2017) J. Am. Heart Assoc. **6(6)**: e005344

# Human FGF-19 ELISA Kit
**(Cat. No. 31200)**

**INTRODUCTION:** FGF-19 and its mouse ortholog FGF-15 is a hormone-like molecule predominantly expressed in the distal small intestine. It is an important regulator of bile acid homeostasis, through its actions in the liver, where it binds to its receptor complex comprising of FGFR4 and the single transmembrane co-receptor β-klotho. FGF-19 has also been shown to possess potent beneficial effects on glucose metabolism. Transgenic mice expressing FGF-19 had increased energy expenditure and improved glucose tolerance, and administration of recombinant FGF-19 protein prevented the development of glucose intolerance in both high-fat-fed mice and leptin-deficient mice. Decreased circulating level of FGF-19 is observed in patients with metabolic syndrome, impaired glucose tolerance and type-2 diabetes.

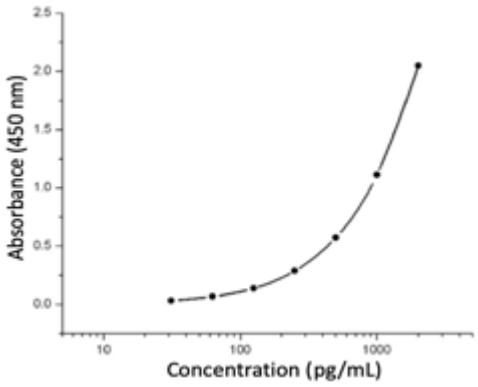
IMD has developed a highly specific antibody-based ELISA for accurate measurements of FGF-19 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human FGF-19 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.088 | 0 |
| 31.2 | 0.121 | 0.033 |
| 62.5 | 0.155 | 0.067 |
| 125 | 0.225 | 0.137 |
| 250 | 0.374 | 0.286 |
| 500 | 0.66 | 0.572 |
| 1000 | 1.201 | 1.113 |
| 2000 | 2.136 | 2.048 |

Human FGF-19 standard (4-parameter)




**B. Sensitivity :** 31.2 pg/mL.

**C. Precision**: Intra-assay C.V.< 4.5%; Inter-assay C.V.< 5.6%.

**D. Specificity:**

The antibodies used in this assay are specific to human FGF-19 and do not cross-react with human adiponectin, FGF-21, FABP4, LCN2, RBP4 and PAI-1.

**References:**


1. Dolegowska, K. *et al.* (2019) J. Physiol. Biochem. **7(5):**229-240
2. Nishimura, T. *et al.* (1999) Biochem. Biophys. Acta. **1444**:148
3. Degirolamo, C. *et al.* (2015) Nat. Rev. Drug Discov. 1**5**:51-69
4. Beenken, A. *et al.* (2009) Nat. Rev. Drug Discov. **8**: 235-253.
5. Zhang, J. *et al.* (2017) Sci. Rep. **7(1**):6042.
6. Fang, Q. *et al.* (2013) Diabetes Care **36(9)**: 2810-2814.

# Human Autotaxin ELISA Kit

**(Cat. No. 31770)**

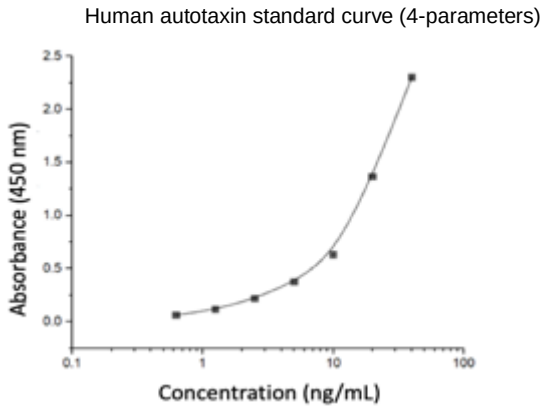
**INTRODUCTION:** Autotaxin, also known as ENPP2 (ectonucleotide pyrophosphatase/phosphodiesterase 2), is a secreted glycoprotein which belongs to the ectonucleotide pyrophosphatase/phosphodiesterase (NPP) family. Autotaxin exhibits unique lysophospholipase D activity which allows formation of lysophosphatidic acids (LPA) and choline from lysophosphatidylcholine. Autotaxin is highly expressed in adipose tissues and its expression is markedly elevated during adipogenesis. Increased circulating level of autotaxin is associated with obesity-related metabolic complications. Additionally, elevated autotaxin levels are observed in patients with breast and lung carcinomas, tumor metastasis and liver fibrosis.

IMD has developed a highly specific-ELISA for accurate measurements of autotaxin in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human autotaxin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.061 | 0 |
| 1.56 | 0.141 | 0.08 |
| 3.12 | 0.222 | 0.161 |
| 6.25 | 0.368 | 0.307 |
| 12.5 | 0.656 | 0.595 |
| 25 | 1.191 | 1.13 |
| 50 | 2.355 | 2.294 |




**B. Sensitivity:** 0.78 ng/mL.

**C. Precision:** Intra-assay C.V. <7%.; Inter-assay C.V. <7%.

**D. Spiking:** The recovery of human autotaxin spiked to 0, 5, 10 ng/mL falls in the range 90-110%.

**E. Linearity:**

| Dilution | Measured ng/mL | Expected ng/mL | Recovery % |
|---|---|---|---|
| 1:40 | 1284 | 1284 | 100 |
| | 856.8 | 856.8 | 100 |
| | 1151 | 1151 | 100 |
| 1:80 | 1337.1 | 1284 | 104.1 |
| | 881 | 856.8 | 102.8 |
| | 1216 | 1151 | 105.6 |

**References:**


1. Cimpean, A. *et al.* (2017) Biochem. J. **474(24)**: 4273.
2. Okudaira, S. (2010) Biochimie **92(6)**: 698-706.
3. Umezu-Goto, M. *et al.* (2002): J. cell biol. **158(2):** 227-233.
4. D'Souza, K. *et al.* (2018) J. Lipid Res. **59(10):**1805-1817.
5. Lee, D. *et al.* (2018) Cancer Metastasis Rev. **31(2-3)**:509-518.
6. Brandon, J.A. *et al.* (2019) PLoS One **7**:14(2).

# Mouse Autotaxin ELISA Kit
**(Cat. No. 32770)**

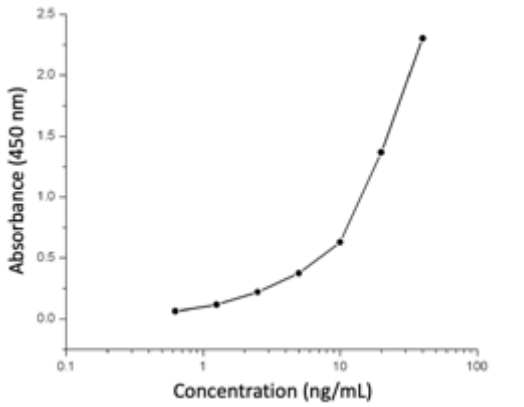
**INTRODUCTION:** Refer Cat. No. 31770 for more information. & 31700

## Assay performance & characteristics

### Typical standard curve

| Mouse autotaxin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.078 | 0 |
| 0.625 | 0.141 | 0.063 |
| 1.25 | 0.194 | 0.116 |
| 2.5 | 0.297 | 0.219 |
| 5 | 0.452 | 0.374 |
| 10 | 0.708 | 0.63 |
| 20 | 1.446 | 1.368 |
| 40 | 2.381 | 2.303 |

Mouse autotaxin standard curve (4-parameters)




Sensitivity:0.312 ng/mL; Intra-assay C.V. <10%, Inter-assay C.V. <10%; Recovery: 80-120%.

# Mouse PM20D1 ELISA Kit
**(Cat. No. 32700)**

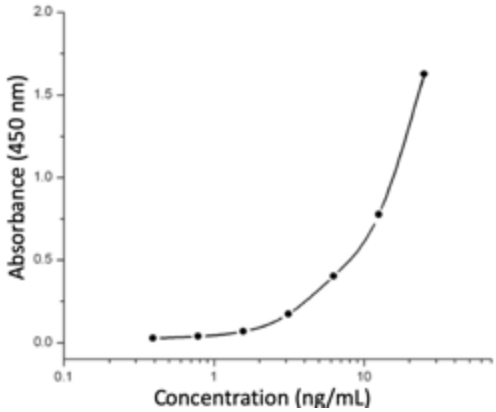
**INTRODUCTION:** Refer Cat. No. 31770 for more information.

## Assay performance & characteristics

### Typical standard curve

| Mouse PM20D1 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.075 | 0 |
| 0.312 | 0.107 | 0.032 |
| 0.625 | 0.141 | 0.066 |
| 1.25 | 0.205 | 0.13 |
| 2.5 | 0.35 | 0.275 |
| 5 | 0.596 | 0.521 |
| 10 | 1.189 | 1.114 |
| 20 | 2.054 | 1.979 |

Mouse PM20D1 standard curve (4-parameters)




Sensitivity: 0.156 ng/mL; Intra-assay C.V. <3.8% Inter-assay C.V. <4.9%; Recovery: 93%-115%

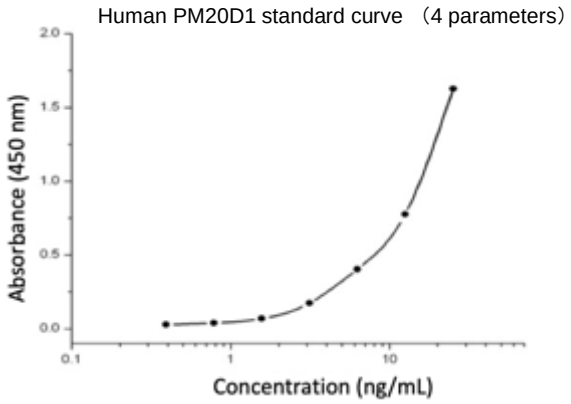
# Human PM20D1 ELISA Kit
**(Cat. No. 31700)**

**INTRODUCTION:** Peptidase M20 domain containing 1 (PM20D1), also known as bidirectional N-fatty-acyl amino acid synthase/hydrolase, regulates the production of N-fatty-acyl amino acids. In brown and beige adipocytes, these metabolites may act as endogenous chemical uncouplers of mitochondrial respiration in an uncoupling protein 1-independent manner. Mice with increased circulating PM20D1 have augmented respiration and increased N-acyl amino acids in blood. Lastly, administration of N-acyl amino acids to mice improves glucose homeostasis and increases energy expenditure. Natural human genetic variation determines basal and inducible expression of PM20D1, an obesity-associated gene. PM20D1 is a quantitative trait locus associated with Alzheimer's disease.
IMD has developed a highly specific antibody-based ELISA for quantitative measurements of PM20D1 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human PM20D1 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.105 | 0 |
| 0.39 | 0.131 | 0.03 |
| 0.78 | 0.139 | 0.043 |
| 1.56 | 0.162 | 0.079 |
| 3.125 | 0.25 | 0.202 |
| 6.25 | 0.505 | 0.404 |
| 12.5 | 0.846 | 0.809 |
| 25 | 1.74 | 1.615 |




**B. Sensitivity**: 0.209 ng/mL.
**C. Precision**: Intra-assay C.V. < 3.7%;
Inter-assay C.V. < 3.8%
**D. Spike:**

| Spike level | Expected (ng/mL) | Observed (ng/mL) | Recovery (%) |
|---|---|---|---|
| Low spike (1.25 ng/mL) | 1.25 | 1.22 | 98 |
| Medium spike (5 ng/mL) | 5 | 5.32 | 106.5 |
| High spike (20 ng/mL) | 20 | 18.65 | 93.2 |

**E. Specificity**: No cross reactivity with recombinant mouse PM20D1 protein.
**F. Linearity:**

| Dilution | Measured (ng/ml) | Expected (ng/ml) | Recovery (%) |
|---|---|---|---|
| 1/2 | 10.11 | 9.51 | 106.3 |
| 1/4 | 4.91 | 4.9 | 100.2 |
| 1/8 | 2.56 | 2.69 | 95.2 |

**References:**

1. Long, J.Z. *et al.* (2016) Cell **166(2):**424-435
2. Sanchez-Mut, J.V. (2018) Nat. Med. **24(5):**598-603
3. Long, J.Z. *et al.* (2018) PNAS **115(29)**: E6937-E6945
4. Benson, K.K. *et al.* (2019) PNAS **116(46)**:23232 23242

# Human Alpha-1 Antitrypsin (A1AT) ELISA Kit
**(Cat. No. 31390)**

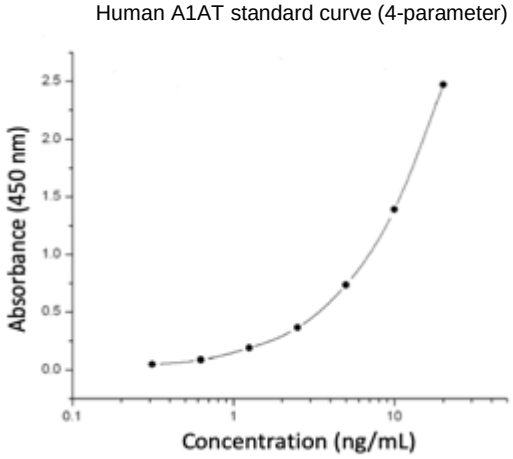
**INTRODUCTION:** Alpha-1 antitrypsin (A1AT), also known as alpha-1 protease inhibitor or SERPINA1, is a 52 kDa serine protease inhibitor, which is mainly synthesized in the liver and is also produced in monocytes, macrophages, dendritic cells, etc. The primary function of A1AT is to inhibit the actions of proteolytic enzymes, such as neutrophil elastase (NE), proteinase 3 (PR3) and cathepsin G (CG), and to provide essential protection to host tissues from non-specific injury during periods of inflammation. A1AT has also been reported to regulate neutrophil chemotaxis, enhance insulin secretion and protect β-cells against cytokine-induced apoptosis. It possesses anti-inflammatory as well as immunomodulatory properties. Systemic deficiency of A1AT due to genetic mutations can result in a number of diseases, such as chronic obstructive pulmonary disease (COPD), systemic sclerosis, liver injury, cirrhosis and hepatocellular carcinoma. Furthermore, A1AT disorder has also been known to be involved in the development of diabetes mellitus.

IMD has developed a highly specific antibody-based ELISA for specific measurements of A1AT in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human A1AT (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.08 | 0 |
| 0.312 | 0.129 | 0.049 |
| 0.625 | 0.166 | 0.086 |
| 1.25 | 0.267 | 0.187 |
| 2.5 | 0.445 | 0.365 |
| 5 | 0.816 | 0.736 |
| 10 | 1.47 | 1.39 |
| 20 | 2.55 | 2.47 |




**B. Sensitivity**: 0.312 ng/mL

**C. Precision**: Intra-assay C.V. 4.9%, inter-assay C.V. 5.3%

**References**:

1. Janciauskiene, S.M. *et al.* (2011) Respir. Med. **105**:1129-1139.
2. Miravitlles, M. (2012) Curr. Opin. Pharmacol. **12**:309-314.
3. Wang, Y. *et al.* (2014) Diabetes **63(12)**:4239-48.
4. Sandstrom, C.S. *et al.* (2008) Diabet. Med. **25(11)**:1370-3
5. Weir, G.C. *et al.* (2018) Pediatr. Diabetes **19(5)**:945-954
6. Mitchell, E.L. & Khan, Z. (2018) Curr. Pathobiol. Rep. **6(1)**:97
7. Takei, N. *et al.* (2019) Int. J. Chron. Obstruct. Pulmon. Dis. **14**:2885-2893

# Mouse GDF-15 ELISA Kit
**(Cat. No. 32980)**

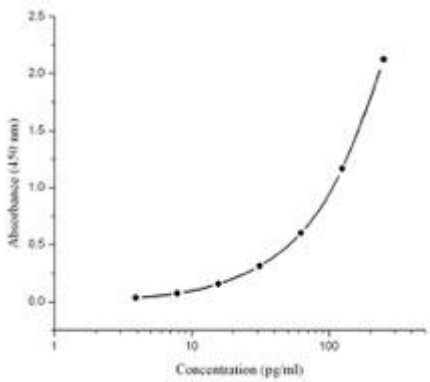
**INTRODUCTION:** Refer Cat. No. 31980 for more information about GDF-15.

## Assay performance & characteristics

### Typical standard curve

| Mouse GDF-15 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.091 | 0 |
| 3.9 | 0.126 | 0.035 |
| 7.8 | 0.164 | 0.073 |
| 15.6 | 0.246 | 0.155 |
| 31.2 | 0.404 | 0.313 |
| 62.5 | 0.692 | 0.601 |
| 125 | 1.259 | 1.168 |
| 250 | 2.216 | 2.125 |

Mouse GDF-15 standard curve (4-parameter)




Sensitivity: 3.9 pg/mL; Intra-assay C.V. < 2.9%, Inter-assay C.V.< 6.1%.; Recovery: 82-101%

# Mouse CYSTM1 ELISA Kit
**(Cat. No. 32280)**

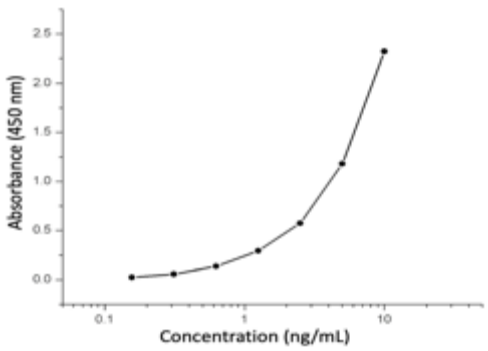
**INTRODUCTION:** Cysteine-rich transmembrane module containing 1 (CYSTM1) also known as C5orf32, ORF1-FL49, belongs to CYSTM family which is a part of tail-anchored membrane proteins in eukaryotes. It consists of 104 and 97 amino acids in mouse and human, respectively. CYSTM1 is a transmembrane protein and based on Gene Ontology (GO) the function of CYSTM1 is classified as neutrophil degranulation. CYSTM1 was also reported as one of the candidate biomarkers for Huntington's disease.

## Assay performance & characteristics

### Typical standard curve

| CYSTM1 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.137 | 0 |
| 0.156 | 0.162 | 0.025 |
| 0.312 | 0.194 | 0.057 |
| 0.625 | 0.273 | 0.136 |
| 1.25 | 0.429 | 0.292 |
| 2.5 | 0.71 | 0.573 |
| 5 | 1.316 | 1.179 |
| 10 | 2.458 | 2.321 |

Mouse CYSTM1 standard curve (4-parameter)




Sensitivity: 0.156 ng/mL; Intra-assay C.V. < 5%, Inter-assay C.V. <5.5%.; Recovery: 82-101%

**References:**

1. Mastrokolias, A, *et al.* (2015) Eur. J. of Hum Genet. **23(10)**: 1349-1356.
2. Xu, Y. *et al.* (2018) Plant Cell Physiol. **59(2)**: 423-438.

# Human GDF-15 ELISA Kit

**(Cat. No. 31980)**

**INTRODUCTION:** Growth differentiation factor 15 (GDF-15), also known as macrophage inhibiting cytokine 1 (MIC-1), placental transformation growth factor (PTGF-β), prostate derived factor (PDF), placental bone morphogenetic protein (PLAB), NSAID activated gene-1 (NAG-1) and PL74, belongs to the transforming growth factor β superfamily. GDF-15 is synthesized as a 62 kDa precursor protein, which, after cleavage by furin-like protease, is secreted as 25-kDa disulfide-linked dimer. GDF-15 is an important regulator of appetite and energy homeostasis. It exerts its effects via its receptor called glial-derived neurotrophic factor (GDNF) receptor alpha-like (GFRAL). GDF-15 expression and serum levels increase in response to many stimuli that initiate cell stress and as a part of a wide variety of disease processes, most prominently cancer, diabetes and cardiovascular disease. Circulating GDF-15 is a promising prognostic marker for heart failure and cancer.

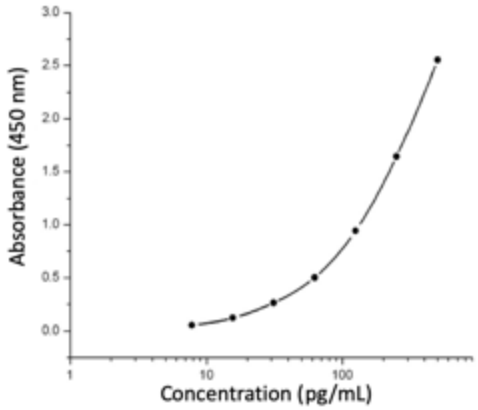
IMD has developed highly sensitive monoclonal antibody-based ELISA for specific measurements of GDF-15 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human GDF-15 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.074 | 0 |
| 7.8 | 0.13 | 0.056 |
| 15.6 | 0.197 | 0.123 |
| 31.2 | 0.338 | 0.264 |
| 62.5 | 0.577 | 0.503 |
| 125 | 1.017 | 0.943 |
| 250 | 1.719 | 1.645 |
| 500 | 2.626 | 2.552 |

Human GDF-15 standard curve (4-parameter)




**B. Sensitivity:** 7.8 pg/mL.

**C. Precision:** Intra-assay C.V. <10%.; Inter-assay C.V. <10%.

**References:**


1. Adela, R. & Banerjee, S.K. (2015) J. Diabetes Res**. 2015**:1-14
2. Baek, S.J. & Eling, T. (2019) Pharmacol. Ther. **198**:46-58
3. Bootcov, M.R. *et al.* (1997) Proc. Natl. Acad. Sci. U S A **94**:11514-11519.
4. Welsh, J.B. *et al.* (2003) Proc. Natl. Acad. Sci. U S A **100**:3410-3415.
5. Chrysovergis, K. *et al.* (2014) Int. J. Obes. **38**:1555-1564
6. Wang, T.J. *et al.* (2012) Circulation **126**:1596-1604.
7. Emmerson, P.J. *et al.* (2017) Nat. Med. **23**:1215-1219
8. Nair, V. *et al.* (2017) J. Am. Soc. Nephol. **28**:2223-2240.
9. Hsu, J.Y. *et al.* (2017) Nature **550***:* 255-259.

# Human RBP4 ELISA Kit
## (Cat. No. 31060)

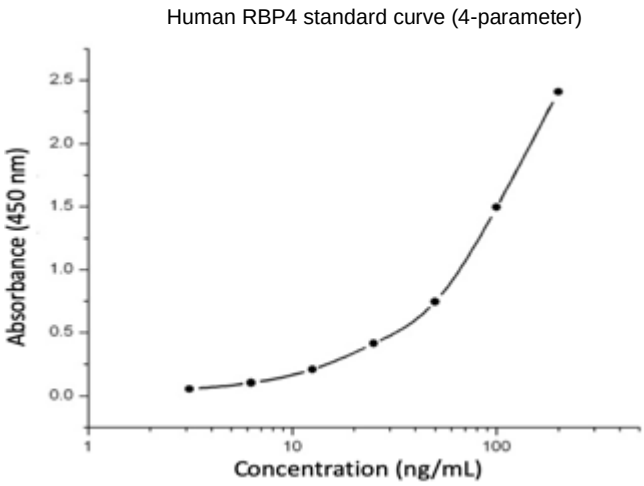
**INTRODUCTION:** Retinol binding protein 4 (RBP4) is a member of lipocalin family which transport small hydrophobic molecules. It is an adipocyte-secreted adipokine functionally involved in the transport of retinol and insulin resistance. RBP4 has a molecular mass of ~21kDa and composed of 201 amino acids. Half-life of RBP4 in serum is increased due to the interaction of RBP4-retinol complex with prealbumin and transthyretin. Elevated circulating level of RBP4 is observed in obese individuals and patients with insulin resistance, type 2 diabetes and atherosclerosis.

IMD has developed monoclonal antibody pair-based ELISA for specific measurements of RBP4 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human RBP4 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.091 | 0 |
| 3.12 | 0.146 | 0.055 |
| 6.25 | 0.194 | 0.103 |
| 12.5 | 0.30 | 0.209 |
| 25 | 0.504 | 0.413 |
| 50 | 0.836 | 0.745 |
| 100 | 1.586 | 1.495 |
| 200 | 2.499 | 2.408 |




**B. Sensitivity**: 3.12 ng/mL.

**C. Precision:** Intra-assay C.V. < 3.63%; Inter-assay C.V. < 4.35%.

**D. Recovery:** 92-115%

**E. Specificity:**

The antibody pair used in this assay is specific to human RBP4 and does not cross-react with mouse and rat RBP4, and other cytokines or hormone molecules.

**References:**


1. Ong, K.L. (2012) J. Clin. Endocrinol. Metab. **97(12)**:4701-8.
2. Zabetian-Targhi, F. *et al.* (2015) Adv. Nutr. **6(6)**:748-762
3. Xiao, Y. (2013) PLoS One **8(6)**: e66607.
4. Graham, T.E. *et al.* (2006) N. Engl. J. Med. **354**: 2552–2563
5. Ingelsson, E. *et al.* (2009) Diabetes Care **32**: 733-735
6. Wong, Y.K. *et al.* (2018) Arterioscler Thromb Vasc Biol. **38(10):**2519-2527.
7. Jüllig, M. *et al.* (2014) PLoS One **9(5)**: e96489.
8. Alkharfy, K.M. *et al.* (2012) PLoS One **7(10)**: e48612

# Human FABP4 ELISA Kit

**(Cat. No. 31030)**

**INTRODUCTION:** Fatty-acid binding protein 4 (FABP4), also known as adipocyte fatty-acid binding protein (A-FABP) or adipocyte protein 2 (aP2), is a member of intracellular lipid chaperone. It is highly expressed in adipocytes and has a molecular weight of approximately 15 kDa. FABP4 is secreted from adipose tissue into bloodstream and act as a pro-inflammatory adipokine contributing to obesity-related cardiometabolic syndrome. Serum level of FABP4 increases during obesity, metabolic syndrome, non-alcoholic fatty liver disease and other cardiovascular disease. Increased expression of FABP4 is also observed during the progression of various cancers. Furthermore, high serum FABP4 is a predictor for type 2 diabetes and cardiovascular mortality.

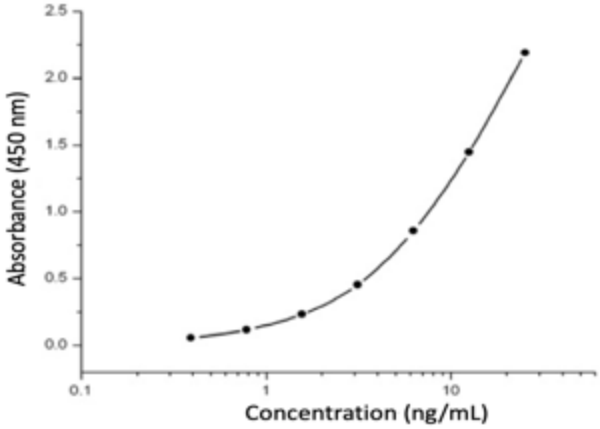
IMD discovered the circulating form of FABP4 and has developed a monoclonal antibody-based ELISA for specific measurements of FABP4 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| FABP4 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.1 | 0 |
| 0.39 | 0.158 | 0.058 |
| 0.78 | 0.228 | 0.118 |
| 1.56 | 0.332 | 0.232 |
| 3.12 | 0.554 | 0.454 |
| 6.25 | 0.957 | 0.857 |
| 12.5 | 1.547 | 1.447 |
| 25 | 2.289 | 2.189 |

Human FABP4 standard curve (4-parameter)




**B. Sensitivity:** 0.39 ng/mL.

**C. Precision**: Intra-assay C.V.< 4.1%; Inter-assay C.V.< 4.5%

**D. Specificity:**

The antibodies used in this assay are specific to human FABP4 and do not cross-react with mouse and rat FABP4, and other cytokines or hormone molecules.

**References:**


1. Furuhashi, M. *et al.* (2014) Clin. Med. Insights Cardiol. **8**:23-33
2. Lee, C.H. *et al.* (2018) Clin. Chem. **64(10)**:1496-1504.
3. Xu, A. *et al.* (2006) Clin. Chem. **52(3)**:405-13.
4. Xu, A. *et al.* (2007) Circulation **115**:1537-1543.
5. Rhee, E.J. *et al.* (2009) Eur. J. Endocrinol.**160(2)**:165-72.
6. Tso, A.W. *et al.* (2007) Diabetes Care **30(10)**:2667-72
7. Hyun, K. J. *et al.* (2009) Diabetes Care **32(1)**: 147-152.

# Human Galectin-3 ELISA Kit
## (Cat. No. 31690)

**INTRODUCTION:** Galectin-3 is a member of the β-galactoside-binding lectins family which has conserved carbohydrate recognition domain (CDR). It is a 35 kDa protein located in cytoplasm, nucleus and extracellular spaces. It is also also a member of the beta-galactoside-binding protein family that plays an important role in cell-cell adhesion, cell matrix interactions, macrophage activation, angiogenesis, apoptosis and insulin resistance. Elevated serum galectin-3 levels were observed in Behcet's disease, thyroid, Alzheimer's disease, cardiovascular disease such as left atrial appendage (LAA) stroke and in several types of cancers especially when it is metastatic. Moreover, circulating levels of galectin-3 were higher in obese patients and it is an indicator of insulin resistance.

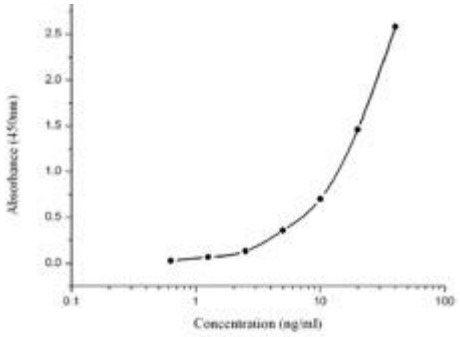
IMD has developed a highly specific antibody-based ELISA for quantitative measurements of galectin-3 in human plasma, serum or other biological samples.

### Assay performance & characteristics

#### A. Typical standard curve

| Human galectin-3 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.082 | 0 |
| 0.625 | 0.111 | 0.029 |
| 1.25 | 0.15 | 0.068 |
| 2.5 | 0.213 | 0.131 |
| 5 | 0.404 | 0.357 |
| 10 | 0.782 | 0.70 |
| 20 | 1.542 | 1.46 |
| 40 | 2.663 | 2.581 |

Human galectin-3 standard curve （4 parameters）




**B. Sensitivity:** 0.145 ng/mL.
**C. Precision:** Intra-assay C.V. <5.5%; Inter-assay C.V. < 6.2%
**D. Recovery:** 74-91%

**References:**

1. Dumic, J. *et al.* (2006) Biochim Biophys Acta. **1760(4)**:616-35.
2. Wang, X. *et al.* (2015) Am. J. Alzheimers Dis. Other Demen. **30(8):**729-32.
3. He, X.W. *et al.* (2017) Sci. Reports **7**: 40994.
4. Nangia-Makker, P. *et al.* (2007) Cancer Res. **67(24)**:11760-8
5. Li, P. *et al.* (2017) Cell. **167(4)**:973-984.
6. Dong, R. *et al.* (2018) Int. J. Mol. Med. **41(2):**599-614.
7. Li, Y. *et al.* (2020) J Biochem Mol Toxicol. **30**: e22463.

# Human Haptoglobin ELISA Kit
## (Cat. No. 31400)

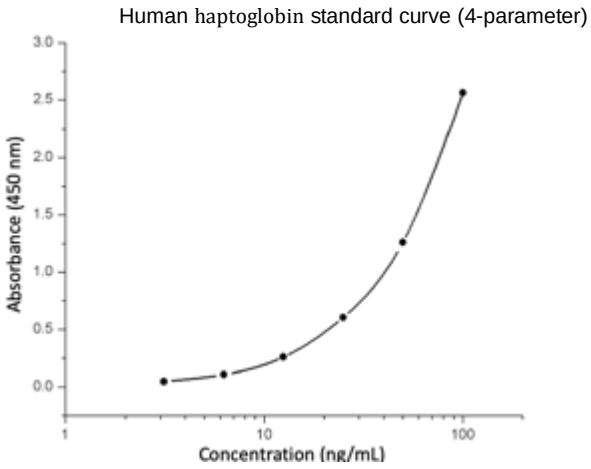
**INTRODUCTION:** Human haptoglobin is an acute-phase glycoprotein produced predominantly by liver. It is composed of two α subunits (M.W. 16-23 kDa) and two β subunits (M.W. 35-40 kDa). Haptoglobin can bind to free hemoglobin released from lysed erythrocytes and prevent the formation of free radical superoxide that can be formed by the reaction of oxygen and iron from hemoglobin. It is also known to be involved in immune regulation and anti-inflammation. Elevated amount of haptoglobin is observed during infections and inflammations, obesity, tissue damage etc. Hence, haptoglobin is used as a biomarker to detect acute allograft rejection, proliferative diabetic retinopathy (PDR) and diabetic kidney disease (DKD). Additionally, low haptoglobin levels are mainly observed during hemolytic anemia.

IMD has developed a highly specific-ELISA for accurate measurements of haptoglobin in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human haptoglobin (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.087 | 0.000 |
| 3.12 | 0.135 | 0.048 |
| 6.25 | 0.194 | 0.107 |
| 12.5 | 0.347 | 0.260 |
| 25 | 0.692 | 0.605 |
| 50 | 1.349 | 1.262 |
| 100 | 2.650 | 2.563 |




**B. Sensitivity:** 1.56 ng/mL

**C. Precision:** Intra-assay C.V. <5.63%.; Inter-assay C.V <1%.

**D. Spiking:** The recovery of human haptoglobin spiked at 5 ng/mL is 104.4%.

**E. Linearity:**

| Sample Dilution | Absorbance (450 nm) | Concentration (ng/mL) | Recovery (%) |
|---|---|---|---|
| 1:2 | 0.601 | 5.843 | 95.37 |
| 1:4 | 0.269 | 6.010 | 98.10 |
| 1:8 | 0.116 | 6.790 | 110.82 |

**References:**

1. Andersen, C.B. *et al.* (2012) Nature **489**:456.
2. Shin, A.W. *et al.*(2014) Am. J. Hematol. **89(4)**:443-7
3. Körmöczi, G.F. *et al.* (2016) Eur. J. Clin. Invest. **36(3)**:202-9.
4. Chiellini, C. *et al.* (2004) J. Clin. Endocrinol. Metab. **89(6)**:2678-83.
5. Maffei, M. *et al.* (2016) Endocr. Rev. **37(4)**:403-16
6. Yang, J.K. *et al.* (2017) Diabetes Care **40(2)**:253-260

# Human PAI-1 ELISA Kit

**(Cat. No. 31070)**

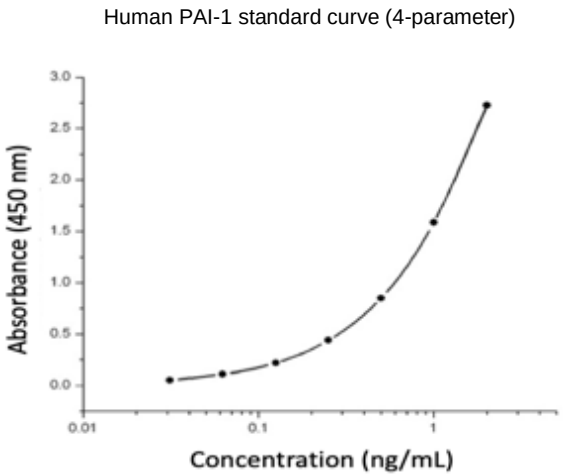
**INTRODUCTION:** Plasminogen activator inhibitor-1 (PAI-1), also known as Serpin E1, belongs to serine protease inhibitor family and its primary function is to inhibit tissue-type as well as urokinase-type plasminogen activator. PAI-1 is a secretory protein abundantly expressed in adipose tissue (therefore classified as adipokines), with a molecular weight of 43 kDa. Active form of PAI-1 is unstable and hence undergoes conformational change to inactive form. Circulating PAI-1 level is closely associated with obesity-related insulin resistance, metabolic syndrome, breast cancer, depression and asthma. Additionally, absence of PAI-1 is linked to abnormal bleeding.

IMD has developed monoclonal antibody-based ELISA for specific measurements of PAI-1 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| PAI-1 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.070 | 0 |
| 0.031 | 0.123 | 0.053 |
| 0.062 | 0.181 | 0.111 |
| 0.125 | 0.289 | 0.219 |
| 0.25 | 0.511 | 0.441 |
| 0.5 | 0.921 | 0.851 |
| 1.0 | 1.658 | 1.588 |
| 2.0 | 2.798 | 2.728 |




**B. Sensitivity:** 0.031 ng/mL.

**C. Precision:** Intra-assay C.V.< 3.02%; Inter-assay C.V. < 5.63%.

**D. Recovery:** 88-114%

**E. Specificity:**

The antibodies used in this assay are specific to human PAI-1 and do not cross-react with mouse and rat PAI-1, and other cytokines or hormone molecules including human resistin, TNFα, ANGPTL4, insulin, leptin and IL6.

**References:**


1. Vousden, K.A. *et al.* (2019) Sci. Rep. **9**:1605
2. Vaughan, D.E. *et al.* (2017) Arteroscler. Thromb. Vasc. Biol. **37**:8
3. Wong, I.K. *et al.* (2018) Arterioscler. Thromb. Vasc. Biol. **38(10)**:2519-2527
4. Vague, P. *et al.* (1986) Metabolism **35**: 250-253
5. Sobel, Be. *et al.* (2003) Arterioscler. Thromb. Vasc. Biol. **23:** 1979-198.
6. Heilbronn, L.K. *et al.* (2013) PLoS One **8(10):** e78864.
7. Chen, B. *et al.* (2006 ) Biochem. Biophys. Res. Commun. **341(2):**549-56

# Human Thrombospondin-2 ELISA Kit

**(Cat. No. 31101)**

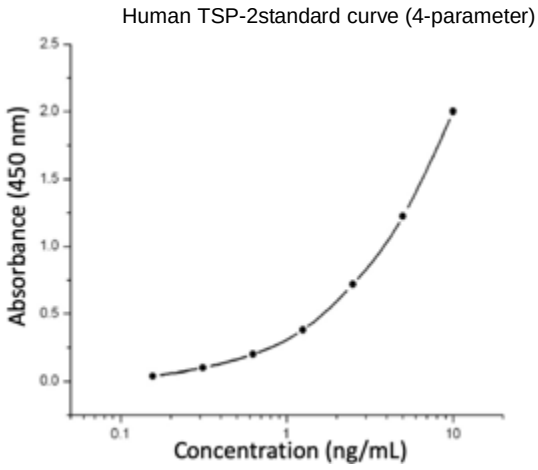
**Introduction:** Thrombospondin-2 (TSP-2/THBS-2) is a 150 kDa secreted calcium-binding glycoprotein involved in regulation of proliferation, aggregation, motility, angiogenesis, tumor progression, and wound healing. It has been implicated in regulating cardiovascular inflammation and the immune response and maintaining the integrity and function of cardiac structures. TSP-2 is known to modulate cellular interactions with extracellular matrix, and as such, is considered a matricellular protein. Elevated TSP-2 expression has been observed in many types of cancers. Serum TSP-2 is a promising diagnostic biomarker for early non-small-cell lung cancer and liver fibrosis and is also a predictor for response to treatment with intravenous immunoglobulin in children with Kawasaki disease.

IMD has developed a monoclonal antibody-based ELISA for quantitative determination of TSP-2 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human TSP-2 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.094 | 0 |
| 0.156 | 0.133 | 0.039 |
| 0.312 | 0.187 | 0.093 |
| 0.625 | 0.293 | 0.199 |
| 1.25 | 0.474 | 0.38 |
| 2.5 | 0.812 | 0.718 |
| 5 | 1.317 | 1.223 |
| 10 | 2.096 | 2.002 |




**B. Sensitivity:** 0.156 ng/mL.

**C. Precision:** Intra-assay C.V. < 4.6%.**;** Inter-assay C.V. < 7.2%.

**References:**


1. Streit, M. *et al.* (1999) Proc. Natl. Acad. Sci. U S A **96(26)**: 14888-14893
2. Oshika, Y. *et al.* (1998) Clin. Cancer Res. **4**:1785-1788
3. LaBell, T.L. & Byers P.H. (1993) Genomics **17**:225
4. Reinecke, H. *et al.* (2013) Cardiovasc. Pathol. **22(1)**:91-95
5. Bae, O.N. *et al.* (2013) Arterioscler. Thromb. Vasc. Biol. **33(8)**:1920-7
6. Abu El-Asrar, A.M. *et al.* (2013) Acta Ophthalmol. **91(3)**: e169-77
7. Tsai, E.A. *et al.* (2016) Cell. Mol. Gastroenterol. Hepatol. **2(5)**:663-675
8. Po-Chun, C. *et al.* (2017) J. Hematol. Oncol. **10**:33
9. Liu, J.F. *et al.* (2018) Biochem. Pharmacol. **155**:537-546

# Human TIMP-1 ELISA Kit

**(Cat. No. 31103)**

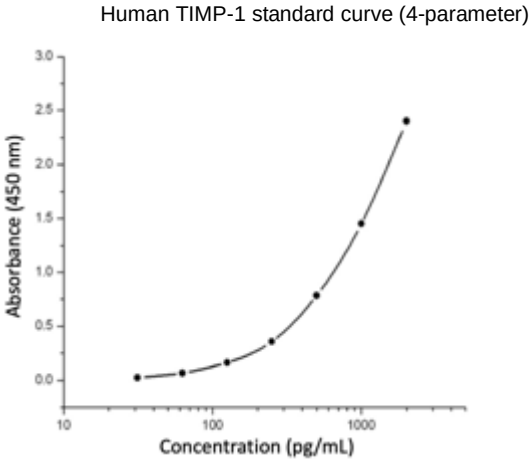
**INTRODUCTION:** Tissue inhibitor of metalloproteinases-1(TIMP-1) is an inducible protein containing 184 amino acids and widely synthesized in many cells. Production of TIMP-1 is induced by cytokines and phorbol esters. It inhibits the activity of matrix metalloproteinases (MMP) which plays a major role in the development of liver fibrosis. The catalytic site of MMP is blocked by the non-covalent binding of TIMP-1. Sites present in the N-terminal domain of TIMP-1 binds to the substrate binding site of MMP and inhibits its function. A higher liver fibrosis rate was observed in TIMP-1 knock out mice after carbon tetrachloride ($CCl_4$) injection when compared to wild mice. Due to the higher serum level of TIMP-1 in patients with non-alcoholic fatty liver disease (NAFLD), TIMP-1 was categorized as an independent predictor for fibrosis. Additionally, it was also found to inhibit B-cell apoptosis and promote erythropoiesis.

IMD has developed monoclonal antibody-based ELISA for specific measurements of TIMP-1 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human TIMP-1 (pg/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.091 | 0 |
| 31.2 | 0.118 | 0.027 |
| 62.5 | 0.161 | 0.07 |
| 125 | 0.257 | 0.166 |
| 250 | 0.449 | 0.358 |
| 500 | 0.876 | 0.785 |
| 1000 | 1.544 | 1.453 |
| 2000 | 2.494 | 2.403 |




**B. Sensitivity:** 31.2 pg/mL.

**C. Precision:** Intra-assay C.V.<5.0%; Inter-assay C.V. <3.9%.

**References:**


1. Schultz, R.M. *et al.* (1988) Cancer Res. **48**:5539
2. Gomez, D.E. *et al.* (1997) Eur. J. Cell Biol. **74:**111
3. Wang, H. *et al*. (2011) Cell Biosci. **1**:14
4. Yilmaz, Y. & Eren, F. (2019) Eur. J. Gastroenterol. Hepatol. **31(1)**:43-46
5. Knight, B.E. *et al.* (2019) Front. Mol. Neurosci. **12**:220

# Rapid Human Cystatin C ELISA Kit

**(Cat. No. 31241)**

**INTRODUCTION:** Human Cystatin C (or cystatin 3) is composed of 120 amino acid residues with a molecular weight of ~13.4 kDa. It belongs to the cystatin superfamily, which inactivates lysosomal cysteine proteinases. As a strongly cationic and low-molecular weight (13.4 kDa) protein, it is almost freely filtered across the glomerular membrane, and is therefore used as a biomarker of kidney function. A growing body of evidence suggests that cystatin C is a more reliable biomarker of glomerular filtration rate than creatinine. Additionally, increased serum levels of cystatin C are associated with several types of cardiovascular disease, including myocardial infarction, stroke, heart failure, peripheral arterial disease and metabolic syndrome.

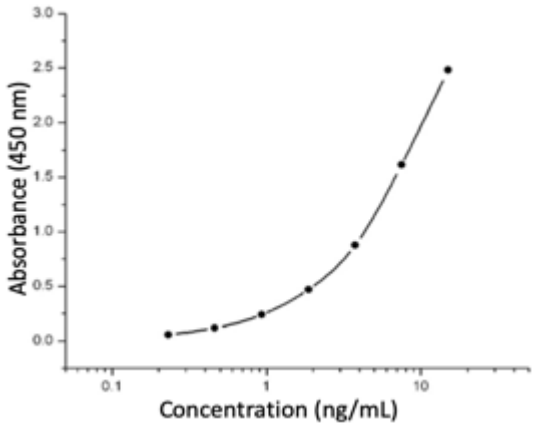
IMD has developed a highly specific antibody-based ELISA for accurate measurements of Cystatin C in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Cystatin C (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.069 | 0 |
| 0.23 | 0.127 | 0.058 |
| 0.46 | 0.187 | 0.118 |
| 0.93 | 0.309 | 0.24 |
| 1.87 | 0.539 | 0.47 |
| 3.75 | 0.946 | 0.877 |
| 7.5 | 1.685 | 1.616 |
| 15 | 2.551 | 2.482 |

Human cystatin C standard curve (4-parameter)




**B. Sensitivity:** 0.23 ng/mL.

**C. Precision**: Intra-assay C.V. 7.9%, inter-assay C.V. 7.2%.

**D. Recovery:** 94-107%

**E. Specificity:**

The antibodies used in this assay are specific to human cystatin C and do not cross-react with mouse and rat cystatin C, and other cytokines or hormone molecules.

**References:**


1. Stevens, L.A. *et al.* (2008) Am. J. Kidney Dis. **51**:395-406.
2. Zethelius, B. *et al.* (2008) N. Engl. J. Med. **358 (20)**: 2107-16.
3. Dharnidharka, V.R. *et al*. (2002) Am. J. Kidney Dis. **40 (2)**: 221-6.
4. Hermida, J. & Tutor, J.C. (2006) Ther. Drug Monit. **28 (3)**: 326-31.
5. Deo, R. *et al.* (2008) Am. Heart J. **155 (1)**: 62-8.
6. Servais, A. *et al.* (2008) Am. J. Med. **121 (5)**: 426-32.

# Mouse Lipocalin-2 ELISA Kit
## (Cat. No. 32050)

**INTRODUCTION:** Refer Cat. No. 31050 for more information.

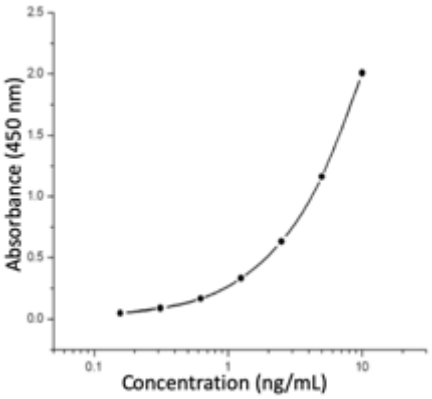
IMD has developed monoclonal antibody-based ELISA for specific measurements of lipocalin-2 in mouse plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Mouse LCN2 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.074 | 0 |
| 0.156 | 0.122 | 0.048 |
| 0.312 | 0.162 | 0.088 |
| 0.625 | 0.239 | 0.165 |
| 1.25 | 0.406 | 0.332 |
| 2.5 | 0.707 | 0.633 |
| 5 | 1.236 | 1.162 |
| 10 | 2.082 | 2.008 |

Mouse LCN2 standard curve (4-parameter)




**B. Sensitivity:** 0.156 ng/mL.

**C. Precision:** Intra assay C.V. <6.7%; Inter assay C.V. <7.2%

**D. Specificity:** The antibodies used in this assay are specific to mouse LCN2 and do not cross-react with human LCN2, and other cytokines or hormone molecules.

**References:**

1. Wang, Y. *et al*. (2007) Clin. Chem. **53(1):**34-41
2. Law, I.K. *et al.* (2010) Diabetes 59 (4)
3. Xiang, Y. *et al.* (2011) Diabetes care **34 (7):** 1639-41
4. Flo, T.H. *et al.* (2004) Nature **432**:917-21.
5. Mishra, J. *et al.* (2005*) Lancet* **365**:1231-6.
6. Yang, J. *et al.* (2009) Proc Natl Acad Sci U S A **106(10)** :3913-8.

# Human Lipocalin-2 ELISA Kit
## (Cat. No. 31050)

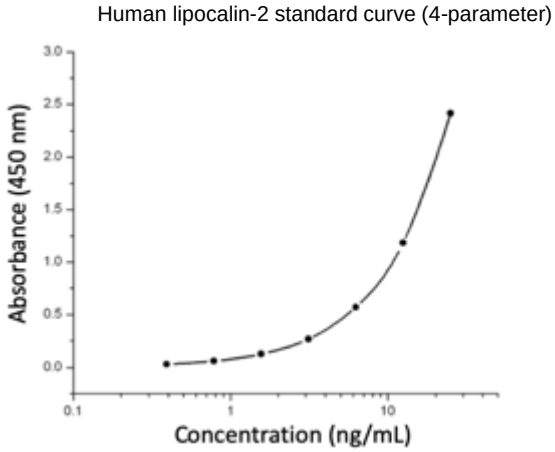
**INTRODUCTION:** Lipocalin-2(LCN2), also known as neutrophil gelatinase-associated lipocalin (NGAL), siderocalin or neutrophil lipocalin (NL), is a secretory glycoprotein covalently bound to a matrix metalloproteinase 9 (MMP9) and has a molecular weight of approximately 25 kDa. During acute kidney injury (AKI), NGAL is secreted at high levels into the bloodstream and urine within 2 hours of injury. Therefore, NGAL is a more accurate and sensitive biomarker for diagnosing AKI than serum creatinine. In fact, the increase in urinary excretion of NGAL has been proven to be due to tubular alterations which take place well before any damage that can be detected by other methods. Additionally, lipocalin-2 has been identified as an adipokine closely related to obesity-related insulin resistance, diabetes and fatty liver diseases.

IMD has developed a highly specific monoclonal antibody pair-based ELISA for quantitative measurements of lipocalin-2 in human plasma, serum or other biological samples.

## Assay performance & characteristics

### A. Typical standard curve

| Human lipocalin-2 (ng/mL) | Absorbance (450 nm) | Blanked Absorbance |
|---|---|---|
| 0 | 0.076 | 0 |
| 0.39 | 0.107 | 0.031 |
| 0.78 | 0.137 | 0.061 |
| 1.56 | 0.203 | 0.127 |
| 3.12 | 0.343 | 0.267 |
| 6.25 | 0.647 | 0.571 |
| 12.5 | 1.26 | 1.184 |
| 25 | 2.492 | 2.416 |




**B. Sensitivity:** 0.39 ng/mL.

**C. Precision**: Intra-assay C.V. 1.84%; Inter-assay C.V. 6.77%

**D. Specificity:**
The antibody pair used in this assay is specific to human lipocalin-2 and does not cross-react with mouse and rat lipocalin-2, and other cytokines or hormone molecules.

**References:**

1. Wang, Y. *et al.* (2007) Clin. Chem. **53(1)**:34-41
2. Law, I.K. *et al*. (2010) Diabetes **59 (4)**: 872-82
3. Xiang, Y. *et al.* (2011) Diabetes care **34 (7)**: 1639-41
4. Flo, T.H. *et al*. (2004) Nature **432**:917-21.
5. Mishra, J. *et al.* (2005) Lancet **365**:1231-6.
6. Yang, J. *et al.* (2009) Proc. Natl. Acad. Sci. U S A **106(10)**:3913-8.

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