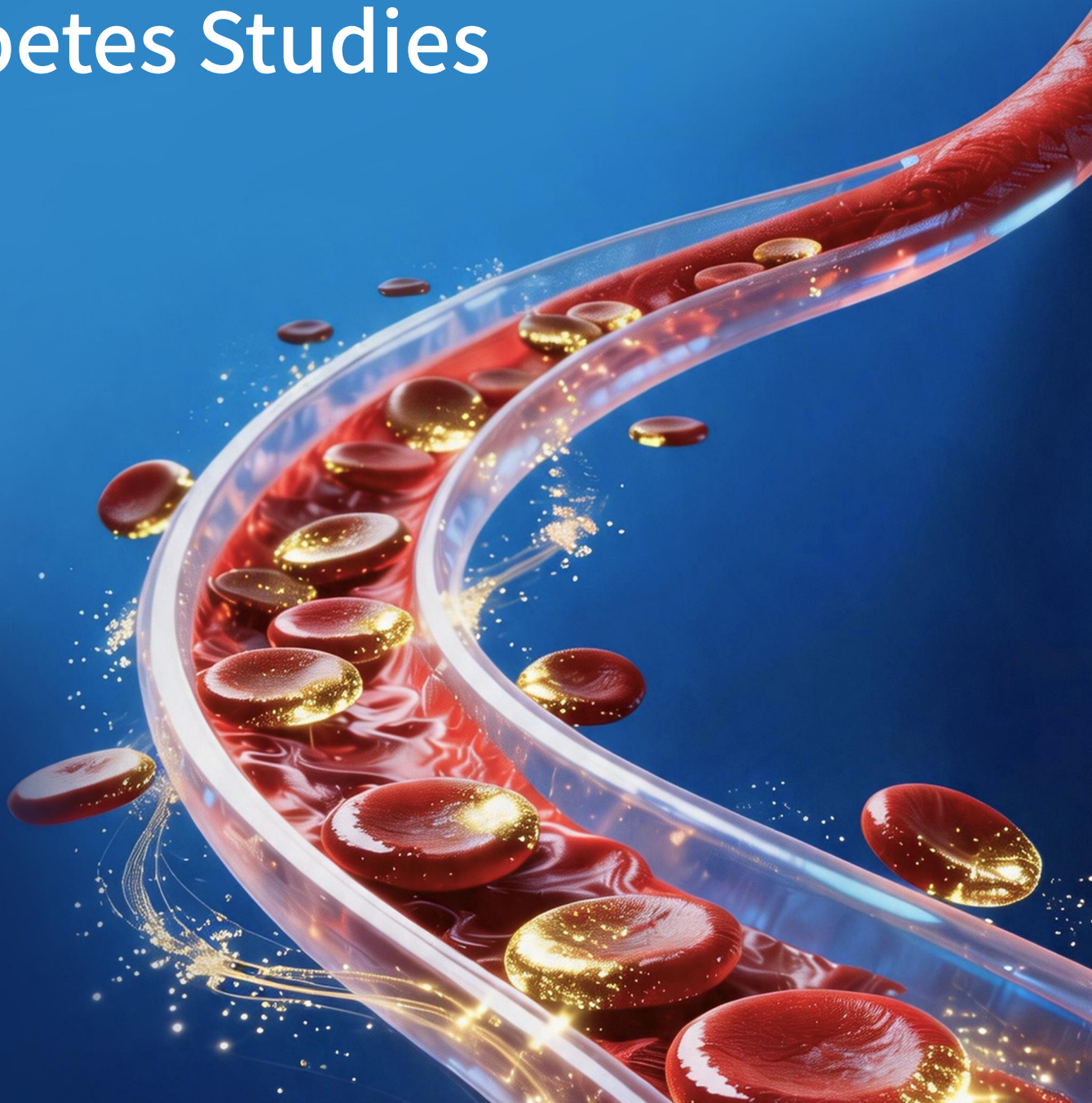


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The Science of Glucose: End-to-End Solutions for Diabetes Studies



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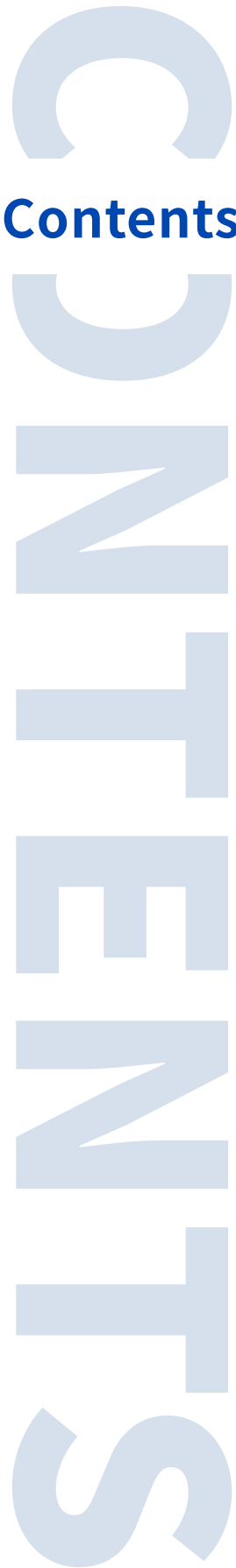
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Countries and
Regions Worldwide

5

Technical
Platforms





Contents

01 Diabetes Types and Classifications ----- 01

02 Mechanisms of Diabetes Pathophysiology ----- 01

Core Pathophysiological Framework ----- 01

Insulin-Mediated Glucose Homeostasis in Physiological Conditions ----- 01

Vicious Cycle of Metabolic Deterioration ----- 02

03 Diabetes-Related Complications ----- 02

04 Approaches in Diabetes Research ----- 03

Commonly Used Experimental Models ----- 03

Key Detection Indicators in Diabetes Research ----- 03

- Glucose Metabolism Research Tools ----- 03
- Insulin Production Research Tools ----- 05
- Lipid Homeostasis Research Tools ----- 06
- Oxidative Stress Research Tools ----- 07
- Liver and Kidney Function Research Tools ----- 08
- Cytokine and Inflammation Research Tools ----- 10
- Drug Target Inhibitor Screening ----- 11

05 Product Citations ----- 12

01 Diabetes Types and Classifications

Diabetes mellitus (DM) is a group of chronic metabolic disorders characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Persistent hyperglycemia disrupts carbohydrate, lipid, and protein metabolism leading to long term damage and dysfunction of multiple organs and tissues. Based on its etiology and pathophysiology DM is classified into four major categories: type 1 diabetes mellitus (T1DM), type 2 diabetes mellitus (T2DM), gestational diabetes mellitus (GDM), and other specific types of diabetes resulting from identifiable genetic, endocrine, pancreatic, drug-induced, or other underlying causes.

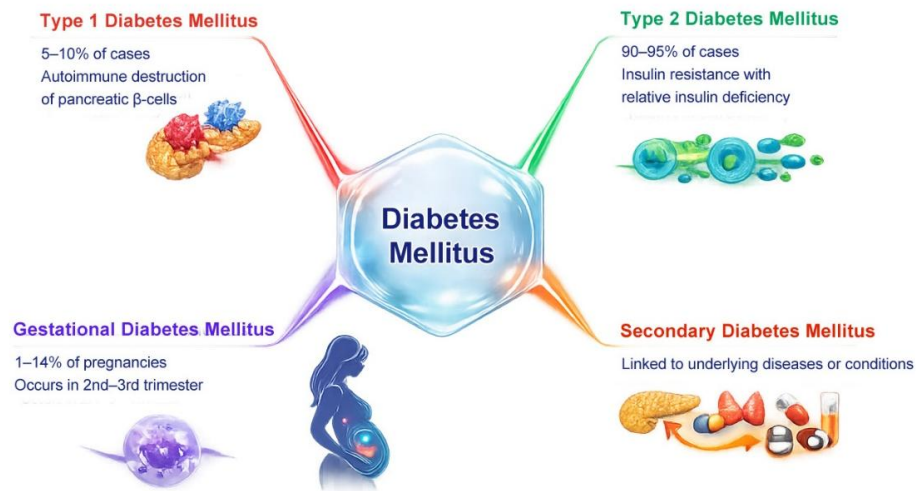


Fig. 1. Clinical Classification of Diabetes Mellitus

02 Mechanisms of Diabetes Pathophysiology

■ Core Pathophysiological Framework

Insulin is the key endocrine regulator of systemic glucose homeostasis. In diabetes mellitus, disruption of insulin signaling or secretion impairs coordinated metabolic control, resulting in dysregulated glucose handling and altered energy metabolism across major tissues.

■ Insulin-Mediated Glucose Homeostasis in Physiological Conditions

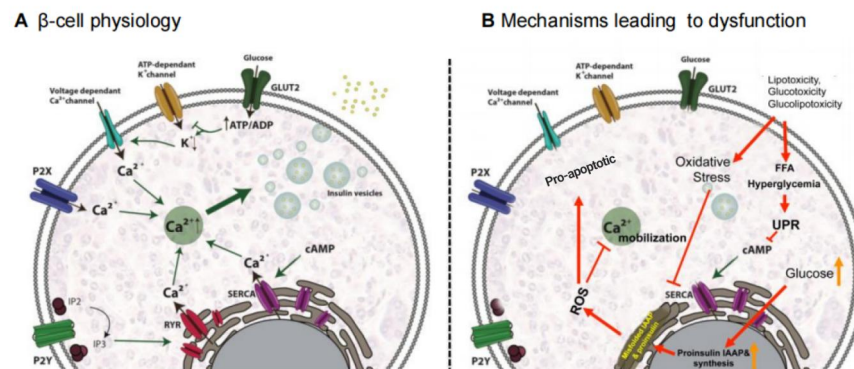
- ① Peripheral glucose uptake: Insulin promotes glucose uptake in skeletal muscle and adipose tissue, supporting energy utilization and storage.
- ② Regulation of Hepatic glucose output: Insulin inhibits glycogenolysis and gluconeogenesis, thereby reducing endogenous glucose output.

Table 1. Key Pathogenic Mechanisms of Major Diabetes Subtypes

Type	Core Pathology	Metabolic Outcome
T1DM	Autoimmune destruction of pancreatic β -cell	Absolute insulin deficiency
T2DM	Insulin resistance with progressive β -cell dysfunction	Impaired glucose utilization and chronic hyperglycemia

■ Vicious Cycle of Metabolic Deterioration

Chronic hyperglycemia further exacerbates both insulin resistance and pancreatic β -cell dysfunction. This creates a self-reinforcing pathogenic loop in which impaired insulin action and declining insulin secretion progressively worsen glycemic control, accelerating disease progression in diabetes mellitus.

Fig. 2. Insulin Secretion and β -Cell Dysfunction in Diabetes Mellitus

03 Diabetes-Related Complications

Chronic hyperglycemia drives the formation of advanced glycation end products (AGEs), dysregulates metabolic pathways, and triggers systemic inflammation. These processes collectively contribute to multi-organ damage, affecting microvascular, macrovascular, and nervous systems, impairing immune function, and leading to serious complications including nephropathy, retinopathy, cerebrovascular disease and cerebrovascular events.

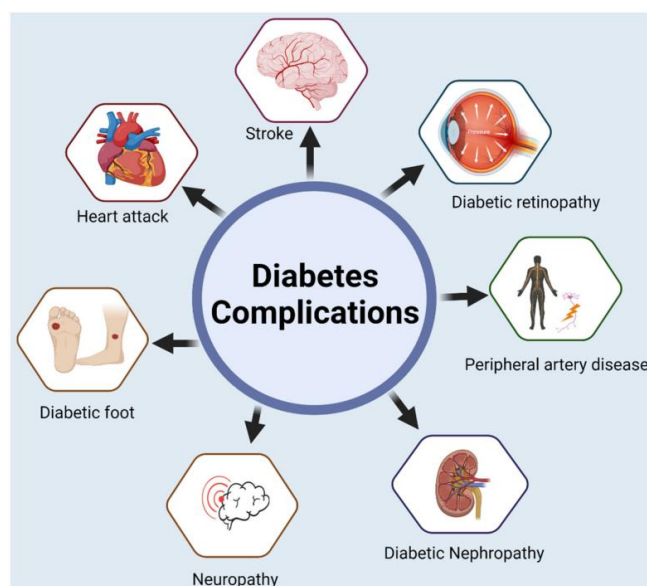


Fig. 3. Multi-Organ Complications Associated with Diabetes

04 Approaches in Diabetes Research

Commonly Used Experimental Models

Diabetes research primarily focuses on understanding glucose and lipid metabolism and the developing strategies to prevent or mitigate diabetes-related complications. To achieve these research goals, researchers employ a range of *in vivo* and *in vitro* experimental models, each with distinct advantages and limitations.

Table 2. Experimental Models Commonly Used in Diabetes Research

Category	Model	Induction	Key Advantages	
In Vivo	db/db mice	Leptin receptor mutation	Stable hyperglycemia and development of complications; ideal for drug screening	
	GK rat	Spontaneous β -cell dysfunction	Natural disease progression	High maintenance cost; late-onset phenotype
	HFD-induced	Insulin resistance via high-fat diet	Models obesity-driven T2DM	Slow onset (8–12 weeks); inter-individual variability
	STZ-induced	β -cell ablation by streptozotocin	Rapid onset; low cost; high reproducibility; dose-tunable	
	MIN6 cells	Glucose-responsive mouse β -cell line	Functional GSIS studies; drug screening	Requires functional validation
	INS-1 cells	Rat insulinoma cell line	Human-relevant signaling studies; stable insulin production	Phenotypic drift in culture
	3T3-L1 adipocytes	Differentiated mouse adipocytes	Models insulin resistance; easy expansion	Reduced complexity compared with <i>in vivo</i> models

Key Detection Indicators in Diabetes Research

Glucose Metabolism Research Tools

Accurate assessment of insulin and glucose metabolism is fundamental in diabetes research. Measuring insulin secretion, glucose uptake, and glycogen synthesis allows researchers to characterize insulin resistance, β -cell dysfunction, and metabolic responses, supporting mechanistic studies and development of antidiabetic therapeutics.

Table 3. Recommended Assay Kits for Glucose Metabolism Studies

Target	Product Name	Cat. No.
6-PGDH	6-Phosphogluconate Dehydrogenase (6-PGDH) Activity Colorimetric Assay Kit	E-BC-K1150-M
α -Glucosidase	α -Glucosidase (α -GC) Activity Assay Kit	E-BC-K821-M
β -Glucosidase	β -Glucosidase (β -GC) Activity Assay Kit	E-BC-K822-M
ECAR	Extracellular Acidification Rate (ECAR) Fluorometric Assay Kit	E-BC-F069
F-6-P	Fructose-6-Phosphate (F-6-P) Fluorometric Assay Kit	E-BC-F087
Fructose	Fructose Fluorometric Assay Kit	E-BC-F080
G6P	Glucose-6-phosphate (G6P) Colorimetric Assay Kit	E-BC-K011-M
G-6-PD	Glucose-6-Phosphate Dehydrogenase (G-6-PD) Activity Assay Kit	E-BC-K056-M
Glucokinase	Glucokinase (GCK) Activity Colorimetric Assay Kit	E-BC-K768-M

Target	Product Name	Cat. No.
Glucose	Glucose (GLU) Fluorometric Assay Kit	E-BC-F037
	Glucose (Glu) Colorimetric Assay Kit (GOD-POD Method)	E-BC-K234-M
Glucose Oxidase	Glucose Oxidase (GOD) Activity Assay Kit	E-BC-K520-M
Glucose Uptake	Glucose Uptake Fluorometric Assay Kit	E-BC-F041
Glycogen	Glycogen Fluorometric Assay Kit	E-BC-F040
Hexokinase	Hexokinase (HK) Activity Assay Kit	E-BC-K610-M
Lactate	D-Lactic Acid/Lactate(LA)Colorimetric Assay Kit	E-BC-K002-M
L-Lactic Acid	L-Lactic Acid (LA) Colorimetric Assay Kit	E-BC-K044-M
PFK	Phosphofructokinase (PFK) Activity Assay Kit	E-BC-K612-M
PGI	Phosphoglucose Isomerase (PGI) Activity Colorimetric Assay Kit	E-BC-K770-M
Sucrose	Sucrose Fluorometric Assay Kit	E-BC-F042
UGP	Uridine Diphosphate Glucose Pyrophosphorylase (UGP) Activity Assay Kit	E-BC-K857-M

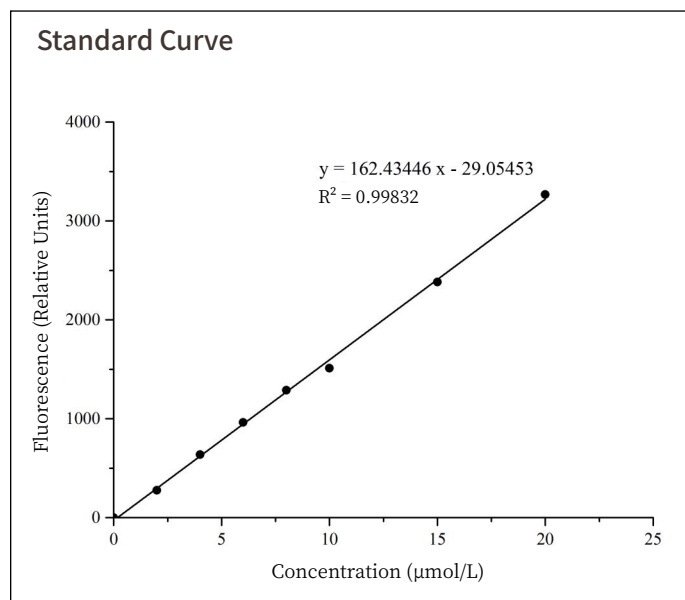
Recommended Product



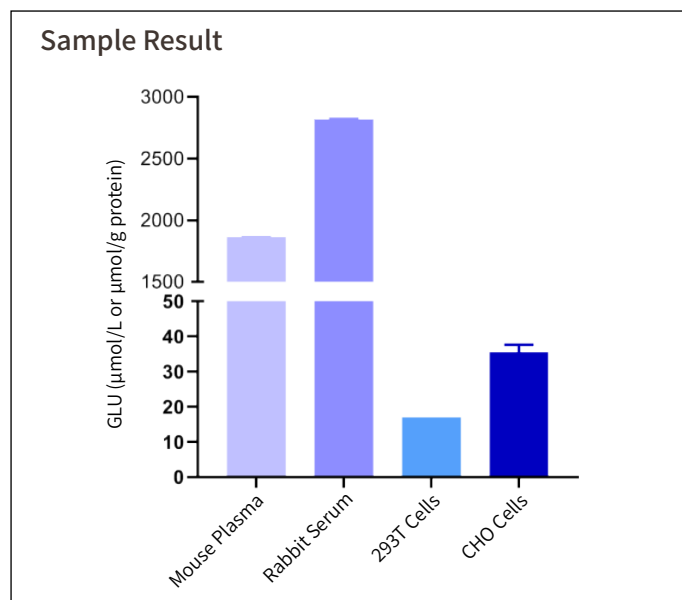
Glucose (GLU) Fluorometric Assay Kit (E-BC-F037)

Key Features

- Broad dynamic range: 0.1-20μmol/L for sensitive detection
- Versatile sample compatibility: Suitable for cell culture supernatant, serum, and plasma



A 50 μmol/L glucose standard enables sensitive quantification across a broad concentration range using 50 μL reaction aliquots.



Glucose levels quantified across diverse biological samples, including mouse plasma, rabbit serum, 293T cells, and CHO cells.

Product Citation

- **Glucose Uptake Fluorometric Assay Kit (E-BC-F041)**
Kdm2a inhibition in skeletal muscle improves metabolic flexibility in obesity, *Nature Metabolism*, 2025.
- **Glucose (GLU) Fluorometric Assay Kit (E-BC-F037)**
Low dose of micro-/nano-plastics mixture induced cardiac hypertrophy and reductive stress: The liver-heart crosstalk and hepatic-cardiac organoids-on-a-chip, *Journal of Hazardous Materials*, 2025.

Insulin Production Research Tools

Accurate measurement of insulin and related peptide hormones is essential for studying β -cell function, hormone secretion dynamics, and the effects of antidiabetic interventions. The following ELISA and activity assay kits provide sensitive, species-specific detection of insulin, C-peptide, glucagon, incretins, and insulin-like growth factors.

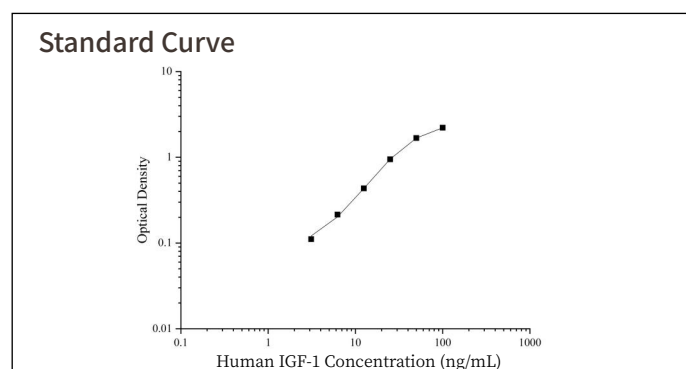
Table 4. Insulin Production Product Recommendation

Target	Product Name	Cat. No.
C-P	Human C-P(C-Peptide) ELISA Kit	E-EL-H6020
	Mouse C-P(C-Peptide) ELISA Kit	E-EL-M0354
	Rat C-P(C-peptide) ELISA Kit	E-EL-R3004
DPP4	Dipeptidyl Peptidase IV (DPP4) Activity Assay Kit	E-BC-F053
GC	Human GC(Glucagon) ELISA Kit	E-EL-H2237
	Mouse GC(Glucagon) ELISA Kit	E-EL-M0555
	Rat GC(Glucagon) ELISA Kit	E-EL-R0425
GIP	Human GIP (Gastric Inhibitory Polypeptide) ELISA Kit	E-EL-H2061
	Mouse GIP (Gastric Inhibitory Polypeptide) ELISA Kit	E-EL-M0539
	Rat GIP (Gastric Inhibitory Polypeptide) ELISA Kit	E-EL-R0407
GLP-1	Human GLP-1 (Glucagon Like Peptide 1) ELISA Kit	E-EL-H6025
	Mouse GLP-1(Glucagon Like Peptide 1) ELISA Kit	E-EL-M3108
	Rat GLP-1 (Glucagon Like Peptide 1) ELISA Kit	E-EL-R3007
IGF-1	Human IGF-1(Insulin-like Growth Factor 1) ELISA Kit	E-EL-H0086
	Mouse IGF-1 (Insulin-like Growth Factor 1) ELISA Kit	E-EL-M3006
	Rat IGF-1 (Insulin-like Growth Factor 1) ELISA Kit	E-EL-R3072
	Monkey IGF-1 (Insulin-like Growth Factor 1) ELISA Kit	E-EL-MK2290
	Mini Sample Mouse IGF-1 (Insulin-like Growth Factor 1) ELISA Kit	E-MSEL-M0013
	QuickKey Pro Human IGF-1 (Insulin-like Growth Factor 1) ELISA Kit	E-OSEL-H0012
INS	Human INS(Insulin) ELISA Kit	E-EL-H2665
	Mouse INS (Insulin) ELISA Kit	E-EL-M3119
	Rat INS(Insulin) ELISA Kit	E-EL-R2466
	Rat INS (Insulin) ELISA Kit	E-EL-R3034
	CellaQuant™ Mouse INS (Insulin) ELISA Kit	CQM010
	QuickKey Pro Human INS (Insulin) ELISA Kit	E-OSEL-H0019

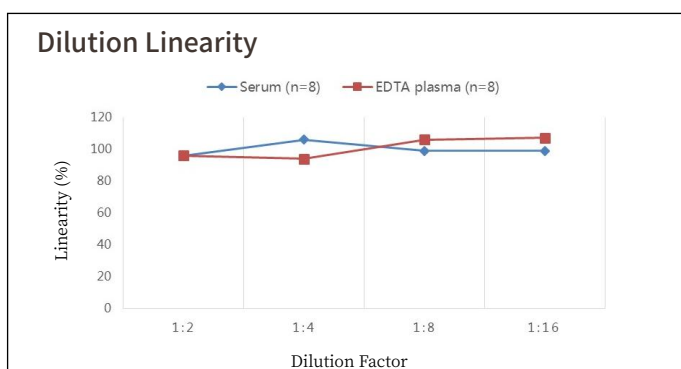
Recommended Product



QuickKey Pro Human IGF-1 (Insulin-like Growth Factor 1) ELISA Kit (E-OSEL-H0012)



IGF-1 standards were serially diluted from a 100 ng/mL stock to generate a concentration-dependent optical density response.



Serial dilutions of serum and EDTA plasma (1:2–1:16; n=8) demonstrated consistent dilution linearity for IGF-1 quantification across both sample matrices.

Product Citation

- **Mouse INS(Insulin) ELISA Kit (E-EL-M1382)**

Selenium nanodots (SENDS) as antioxidants and antioxidant-prodrugs to rescue islet β cells in type 2 diabetes mellitus by restoring mitophagy and alleviating endoplasmic reticulum stress, *Advanced Science*, 2023.

- **Mouse GLP-1(Glucagon Like Peptide 1) ELISA Kit (E-EL-M3108)**

- **Mouse GC(Glucagon) ELISA Kit (E-EL-M0555)**

Light modulates glucose metabolism by a retina-hypothalamus-brown adipose tissue axis, *Cell*, 2023.

- **Rat INS(Insulin) ELISA Kit (E-EL-R2466)**

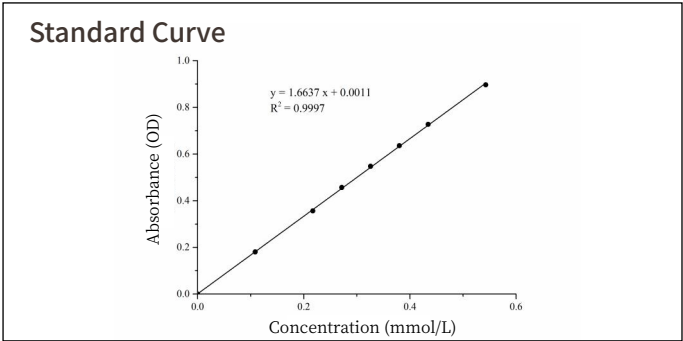
Exposure to fluoride exacerbates the cognitive deficit of diabetic patients living in areas with endemic fluorosis, as well as of rats with type 2 diabetes induced by streptozotocin via a mechanism that may involve excessive activation of the poly(ADP ribose) polymerase-1/P53 pathway, *Science of the Total Environment*, 2024.

Lipid Homeostasis Research Tools

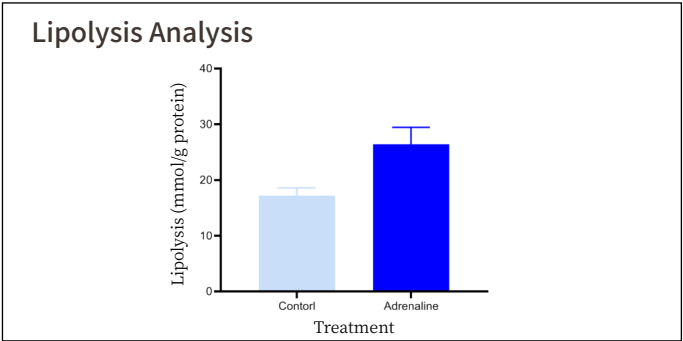
Dysregulation of lipid metabolism is a hallmark of diabetes, often presenting as elevated triglycerides (TG), total cholesterol (TC), low-density lipoprotein (LDL), and non-esterified fatty acids (NEFA), as along with reduced high-density lipoprotein (HDL). Monitoring these lipid parameters is critical for understanding disease mechanisms and evaluating therapeutic interventions.

Table 5. Recommended Assay Kits for Lipid Homeostasis Studies

Target	Product Name	Cat. No.
ACC	Acetyl-CoA Carboxylase (ACC) Activity Assay Kit	E-BC-K508-M
Acrp30	Human ADP/Acrp30 (Adiponectin) ELISA Kit	E-EL-H6122
	Mouse ADP/Acrp30 (Adiponectin) ELISA Kit	E-EL-M0002
	Rat ADP/Acrp30 (Adiponectin) ELISA Kit	E-EL-R3012
Adipogenesis	Adipogenesis Fluorometric Assay Kit	E-BC-F065
β -Hydroxybutyrate	β -Hydroxybutyrate (Ketone Body) Colorimetric Assay Kit	E-BC-K785-M
Cholesterol	Total Cholesterol and Cholesteryl Ester Fluorometric Assay Kit	E-BC-F032
Cholesterol Uptake	Cholesterol Uptake Fluorometric Assay Kit	E-BC-F089
Fatty Acid Uptake	Fatty Acid Uptake Fluorometric Assay Kit	E-BC-F067
FGF21	Human FGF21(Fibroblast Growth Factor 21) ELISA Kit	E-EL-H0074
	Mouse FGF21(Fibroblast Growth Factor 21) ELISA Kit	E-EL-M0029
Free Cholesterol	Free Cholesterol (FC) Colorimetric Assay Kit	E-BC-K004-M
Free Fatty Acids	Free Fatty Acids (NEFA/FFA) Colorimetric Assay Kit (Enzyme Method)	E-BC-K792-M
	Free Fatty Acids (NEFA/FFA) Fluorometric Assay Kit	E-BC-F039
HDL-C	High-Density Lipoprotein Cholesterol (HDL-C) Fluorometric Assay Kit	E-BC-F035
Irisin	Human Irisin ELISA Kit	E-EL-H5735
	Mouse Irisin ELISA Kit	E-EL-M2743
	Rat Irisin ELISA Kit	E-EL-R2625
LEP	Human LEP (Leptin) ELISA Kit	E-EL-H6017
	Mouse LEP (Leptin) ELISA Kit	E-EL-M3008
	Rat LEP (Leptin) ELISA Kit	E-EL-R0582
	Mini Sample Mouse LEP (Leptin) ELISA Kit	E-MSEL-M0033
Lipase	Lipase (LPS) Activity Assay Kit	E-BC-K786-M
Lipolysis	Lipolysis Colorimetric Assay Kit	E-BC-K798-M
Total Cholesterol	Total Cholesterol (TC) Colorimetric Assay Kit	E-BC-K109-M
Triglyceride	Triglyceride (TG) Colorimetric Assay Kit	E-BC-K261-M
	Triglyceride (TG) Fluorometric Assay Kit	E-BC-F033



Highly linear glucose quantification across the assay range, established using serially diluted 0.5 mmol/L standards and 20 μ L reaction aliquots.



Sensitive detection of adrenaline-induced lipolysis in 293T cells following 6 h treatment at 37 °C, with results normalized to total protein content.

Product Citation

- **Triglyceride (TG) Colorimetric Assay Kit (Single Reagent, GPO-PAP Method) (E-BC-K261-M)**
Hepatocyte NLRP3 interacts with PKC ϵ to drive hepatic insulin resistance and steatosis, *Science Bulletin*, 2023.
- **Triglyceride(TG) Fluorometric Assay Kit (E-BC-F033)**
Inhibition of fatty acid uptake by TGR5 prevents diabetic cardiomyopathy, *Nature Metabolism*, 2024.
- **Mini Sample Mouse LEP (Leptin) ELISA Kit (E-MSEL-M0033)**
Leptin enhances the intracellular thyroid hormone activation in skeletal muscle to boost energy balance, *Cell Metabolism*, 2025.
- **Human Irisin ELISA Kit (E-EL-H5735)**
Discriminative value of serum irisin in prediction of heart failure with different phenotypes among patients with type 2 diabetes mellitus, *Cells*, 2022.

Oxidative Stress Research Tools

Oxidative stress mediates insulin resistance, glucose intolerance, and diabetes related complications. Quantitative assessment of reactive oxygen species (ROS), lipid peroxidation products, antioxidant enzymes, and glutathione status provides critical mechanistic insights into hyperglycemia-induced oxidative damage and supports the development of antioxidant-based therapeutic strategies and pathophysiological research.

Table 6. Recommended Assay Kits for Oxidative Stress Studies

Target	Product Name	Cat. No.
ATP	Enhanced ATP Chemiluminescence Assay Kit	E-BC-F201
	ATP Chemiluminescence Assay Kit (Double Reagent)	E-BC-F300
	Enhanced ATP Chemiluminescence Assay Kit	E-BC-F201
Catalase	Catalase (CAT) Activity Assay Kit	E-BC-K031-M
	Catalase (CAT) Activity Assay Kit	E-BC-K031-S
	Catalase (CAT) Activity Fluorometric Assay Kit	E-BC-F006
Glutathione	Total Glutathione (T-GSH)/Oxidized Glutathione (GSSG) Colorimetric Assay Kit	E-BC-K097-M
GPX1	Human GPX1 (Glutathione Peroxidase 1) ELISA Kit	E-EL-H5410
	Rat GPX1 (Glutathione Peroxidase 1) ELISA Kit	E-EL-R2491
Lipid Peroxide	Lipid Peroxide (LPO) Colorimetric Assay Kit	E-BC-K176-M
	Lipid Peroxide (LPO) Fluorometric Assay Kit	E-BC-F003
MDA	Malondialdehyde (MDA) Colorimetric Assay Kit	E-BC-K025-M
	Malondialdehyde (MDA) Fluorometric Assay Kit	E-BC-F007
Protein Carbonyl	Protein Carbonyl Colorimetric Assay Kit	E-BC-K117-M
Reduced Glutathione	Reduced Glutathione (GSH) Colorimetric Assay Kit	E-BC-K030-M
ROS	Reactive Oxygen Species (ROS) Fluorometric Assay Kit (Red)	E-BC-F005
Superoxide	Mitochondrial Superoxide Fluorometric Assay Kit	E-BC-F008

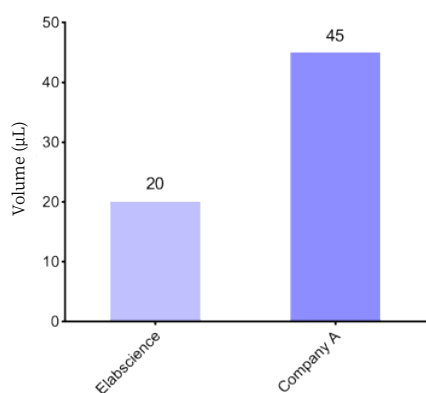
Target	Product Name	Cat. No.
TAS	Total Antioxidant Status (TAS) Colorimetric Assay Kit	E-BC-K801-M
TOS	Total Oxidant Status (TOS) Colorimetric Assay Kit	E-BC-K802-M
Total Superoxide Dismutase	Total Superoxide Dismutase (T-SOD) Activity Assay Kit (Hydroxylamine Method)	E-BC-K019-M
	Total Superoxide Dismutase (T-SOD) Activity Assay Kit (WST-1 Method)	E-BC-K020-M

Recommended Product Total Oxidant Status (TOS) Colorimetric Assay Kit (E-BC-K802-M)

Key Features

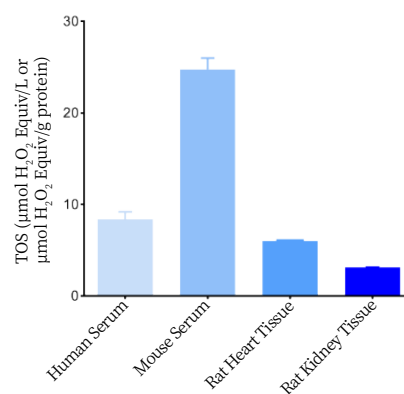
- Rapid assay: Results in just 5 minutes for high-throughput screening applications
- Minimal sample requirement: Only 20 μL per test, conserving valuable biological material

Sample Volume Comparison



Elabscience requires only 20 μL of sample, compared with 45 μL for Company A, enabling reduced sample consumption for TOS detection.

TOS Across Diverse Sample Matrices



TOS was successfully quantified across diverse biological matrices, including human serum, mouse serum, rat heart tissue, and rat kidney tissue.

Product Citation

- **CuZn/Mn Superoxide Dismutase (CuZn-SOD/Mn-SOD) Activity Assay Kit (Hydroxylamine Method) (E-BC-K022-S)**
Antioxidative, antidiabetic, and hypolipidemic properties of probiotic-enriched fermented camel milk combined with *Salvia officinalis* leaves hydroalcoholic extract in streptozotocin-induced diabetes in rats, *Antioxidants*, 2022.
- **Malondialdehyde (MDA) Colorimetric Assay Kit (TBA Method) (E-BC-K025-M)**
Lactoferrin decorated bilosomes for the oral delivery of quercetin in type 2 diabetes: In vitro and in vivo appraisal, *International Journal of Pharmaceutics*, 2023.
- **Rat GPX1 (Glutathione Peroxidase 1) ELISA Kit (E-EL-R2491)**
Determination of metabolomics profiling in BPA-induced impaired metabolism, *Pharmaceutics*, 2022.

Liver and Kidney Function Research Tools

Diabetes can cause progressive liver and kidney damage. Renal injury, often accompanied by proteinuria, is evaluated by measuring blood urea nitrogen (BUN), creatinine, uric acid (UA), and urinary albumin (Alb) as early biomarkers. Hepatic injury, resulting from metabolic disturbances, is assessed through alanine aminotransferase (ALT) and aspartate aminotransferase (AST) levels.

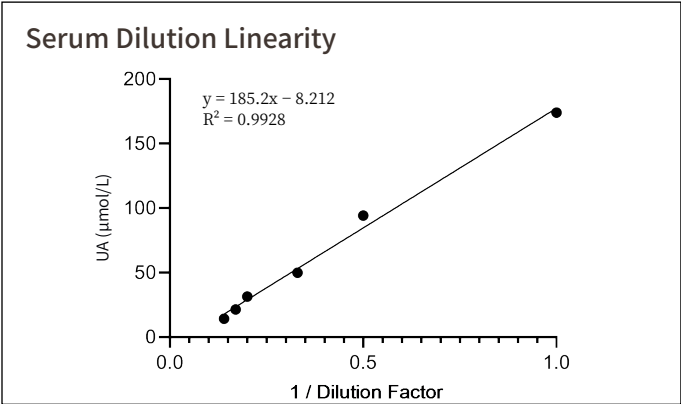
Table 7. Recommended Assay Kits for Liver and Kidney Function Studies

Target	Product Name	Cat. No.
Albumin	Albumin (ALB) Colorimetric Assay Kit	E-BC-K057-M
ALP	Alkaline Phosphatase (ALP) Activity Assay Kit (PNPP method)	E-BC-K009-M
	Alkaline Phosphatase (ALP) Activity Assay Kit	E-BC-K091-M
ALT	Alanine Aminotransferase (ALT/GPT) Activity Fluorometric Assay Kit	E-BC-F038

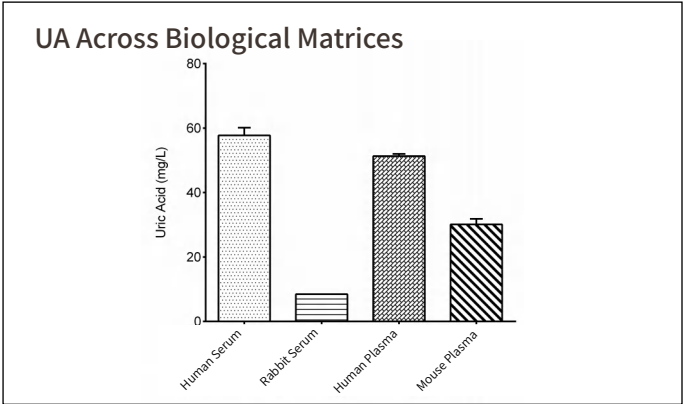
Target	Product Name	Cat. No.
ALT	Alanine Aminotransferase (ALT/GPT) Activity Assay Kit	E-BC-K235-M
AST	Aspartate Aminotransferase (AST/GOT) Activity Assay Kit	E-BC-K236-M
	Aspartate Aminotransferase (AST/GOT) Activity Fluorometric Assay Kit	E-BC-F043
Creatinine	Creatinine (Cr) Colorimetric Assay Kit	E-BC-K188-M
DBIL	Direct Bilirubin (DBIL) Colorimetric Assay Kit	E-BC-K761-M
KIM-1	Human KIM-1(Kidney Injury Molecule 1) ELISA Kit	E-EL-H6029
	Mouse KIM-1(Kidney Injury Molecule 1) ELISA Kit	E-EL-M3039
	Rat KIM-1(Kidney Injury Molecule 1) ELISA Kit	E-EL-R3019
MAU	Human MAU (Microalbuminuria) ELISA Kit	E-EL-H6018
	Mouse MAU (Microalbuminuria) ELISA Kit	E-EL-M0792
	Rat MAU (Microalbuminuria) ELISA Kit	E-EL-R0025
TBA	Total Bile Acid (TBA) Colorimetric Assay Kit	E-BC-K181-M
TBIL	Total Bilirubin (TBIL) Colorimetric Assay Kit	E-BC-K760-M
Urea	Urea (BUN) Colorimetric Assay Kit	E-BC-K183-M
Uric Acid	Uric Acid (UA) Fluorometric Assay Kit	E-BC-F018
	Uric Acid (UA) Colorimetric Assay Kit	E-BC-K016-M
	Uric Acid (UA) Colorimetric Assay Kit	E-BC-K897-M
Urine Protein	Urine Protein Colorimetric Assay Kit	E-BC-K252-M
γ-GT	γ-Glutamyl Transferase (GGT/γ-GT) Activity Assay Kit	E-BC-K126-M

Recommended Product

Uric Acid (UA) Colorimetric Assay Kit (E-BC-K897-M)



Serial dilution of human serum with double-distilled water demonstrated excellent linearity for uric acid quantification.



Uric acid was successfully quantified across diverse biological matrices using the UA Assay Kit (E-BC-K897-M).

Product Citation

- **Urea (BUN) Colorimetric Assay Kit (Urease Method) (E-BC-K183-M)**
A novel antidiuretic hormone governs tumour-induced renal dysfunction, *Nature*, 2023.
- **Mouse KIM-1(Kidney Injury Molecule 1) ELISA Kit (E-EL-M3039)**
Deficiency of thiosulfate sulfurtransferase mediates the dysfunction of renal tubular mitochondrial fatty acid oxidation in diabetic kidney disease, *Cell Death & Differentiation*, 2024.
- **Human KIM-1(Kidney Injury Molecule 1) ELISA Kit (E-EL-H6029)**
Serum high mobility group box 1 as a potential biomarker for the progression of kidney disease in patients with type 2 diabetes, *Frontiers in Immunology*, 2024.
- **Mouse MAU(Microalbuminuria) ELISA Kit (E-EL-M0792)**
Long-term statins administration exacerbates diabetic nephropathy via ectopic fat deposition in diabetic mice, *Nature Communications*, 2023.

Cytokine and Inflammation Research Tools

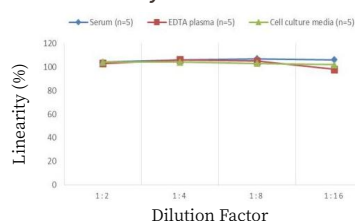
Cytokine profiling is a key approach in diabetes research. Measuring inflammatory markers such as TNF- α , IL-6, IL-10 IL-1 β , and MCP-1 provides mechanistic insights into inflammation-driven insulin resistance and progression of diabetes-related complications. These assays also support preclinical drug development and mechanistic studies by offering reliable quantitative data.

Table 8. Recommended Assay Kits for Cytokine and Inflammation Studies

Target	Product Name	Cat. No.
CRP	Human CRP (C-Reactive Protein) ELISA Kit	E-EL-H0043
	Mouse CRP (C-Reactive Protein) ELISA Kit	E-EL-M0053
	Rat CRP (C-Reactive Protein) ELISA Kit	E-EL-R0506
hs-CRP	Human hs-CRP (high-sensitivity C-Reactive Protein) ELISA Kit	E-EL-H5134
	Mouse hs-CRP (high-sensitivity C-Reactive Protein) ELISA Kit	E-EL-M0677
	Rat hs-CRP (high-sensitivity C-Reactive Protein) ELISA Kit	E-EL-R3002
IL-1 β	Human IL-1 β (Interleukin 1 Beta) ELISA Kit	E-EL-H0149
	Mouse IL-1 β (Interleukin 1 Beta) ELISA Kit	E-EL-M0037
	Rat IL-1 β (Interleukin 1 Beta) ELISA Kit	E-EL-R0012
IL-6	Human IL-6 (Interleukin 6) ELISA Kit	E-EL-H6156
	Mouse IL-6 (Interleukin 6) ELISA Kit	E-EL-M0044
	Rat IL-6 (Interleukin 6) ELISA Kit	E-EL-R0015
	QuickKey Pro Human IL-6 (Interleukin 6) ELISA Kit	E-OSEL-H0001
IL-8	Human IL-8(Interleukin 8) ELISA Kit	E-EL-H6008
IL-10	Human IL-10(Interleukin 10)ELISA Kit	E-EL-H6154
	Mouse IL-10(Interleukin 10) ELISA Kit	E-EL-M0046
	Rat IL-10(Interleukin 10) ELISA Kit	E-EL-R0016
IL-18	Human IL-18(Interleukin 18) ELISA Kit	E-EL-H0253
	Mouse IL-18(Interleukin 18) ELISA Kit	E-EL-M0730
	Rat IL-18(Interleukin 18) ELISA Kit	E-EL-R0567
MCP-1	Human MCP-1 (Monocyte Chemotactic Protein 1) ELISA Kit	E-EL-H6005
	Mouse MCP-1 (Monocyte Chemotactic Protein 1) ELISA Kit	E-EL-M3001
	Rat MCP-1 (Monocyte Chemotactic Protein 1) ELISA Kit	E-EL-R0633
	Monkey MCP-1 (Monocyte Chemotactic Protein 1) ELISA Kit	E-EL-MK2292
TNF- α	Mouse TNF- α (Tumor Necrosis Factor Alpha) ELISA Kit	E-EL-M3063
	Rat TNF- α (Tumor Necrosis Factor Alpha) ELISA Kit	E-EL-R2856
	High Sensitivity Mouse TNF- α (Tumor Necrosis Factor Alpha) ELISA Kit	E-HSEL-M0009
TGF- β 1	TGF- β 1(Transforming Growth Factor Beta 1) ELISA Kit	E-EL-0162

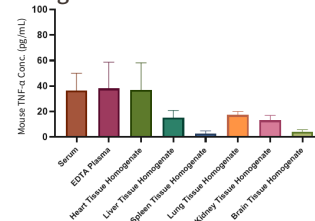
Recommended Product High Sensitivity Mouse TNF- α (Tumor Necrosis Factor Alpha) ELISA Kit (E-HSEL-M0009)

Sample Dilution Linearity



Consistent TNF- α quantification across serial dilutions of serum, EDTA plasma, and cell culture medium, demonstrating reliable dilution linearity (n=5 per matrix).

TNF- α Across Biological Matrices



Mouse serum, EDTA plasma and various tissue homogenates were subjected to TNF- α quantification using the detection kit.

Product Citation

- Mini Sample Mouse IL-6 (Interleukin 6) ELISA Kit (E-MSEL-M0001)
- High Sensitivity Mouse TNF-α (Tumor Necrosis Factor Alpha) ELISA Kit (E-MSEL-M0009)
Gut microbiota modulate distal symmetric polyneuropathy in patients with diabetes, *Cell Metabolism*, 2023.
- Human hs-CRP(high-sensitivity C-Reactive Protein) ELISA Kit (E-EL-H5134)
Progressive resistance training ameliorates deteriorating cardiac autonomic dysfunction, subclinical inflammation and endothelial dysfunction in type 2 diabetes mellitus: A randomized control trial, *Diabetology & Metabolic Syndrome*, 2023.
- Mouse IL-10(Interleukin 10) ELISA Kit (E-EL-M0046)
Multifunctional DNA-based hydrogel promotes diabetic alveolar bone defect reconstruction, *Small*, 2024.

Drug Target Inhibitor Screening

Targeting key bottlenecks in insulin resistance and associated metabolic disorders, the study of metabolic enzymes is of paramount importance for therapeutic discovery. High-throughput inhibitor screening kits serve as a powerful tool to accelerate target validation and lead compound optimization in antidiabetic drug development.

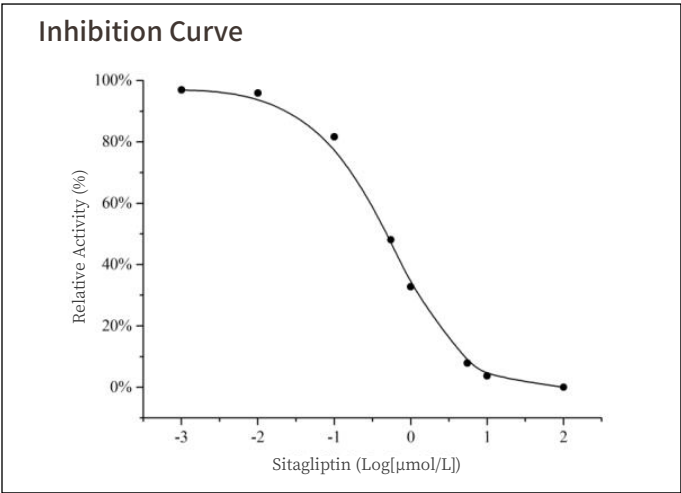
Table 9. Recommended Assay Kits for Drug Target Inhibitor Screening

Target	Product Name	Cat. No.
Alpha-Amylase	Alpha-Amylase Inhibitor Screening Kit	E-BC-D018
Alpha-Glucosidase	Alpha-Glucosidase Inhibitor Screening Kit	E-BC-D017
DPP4	Dipeptidyl Peptidase IV (DPP4) Inhibitor Screening Assay Kit	E-BC-D007

Recommended Product Dipeptidyl Peptidase IV (DPP4) Inhibitor Screening Assay Kit (E-BC-D007)

Key Features

- Highly specific substrate: Ensures high specificity and a broad linear range for accurate screening.
- Included positive control: Supplied with a validated inhibitor for reliable assay performance and quality control



Sitagliptin produced concentration-dependent inhibition of DPP4 activity, with relative enzyme activity plotted against logarithmic sitagliptin concentrations.

Product Citation

- Dipeptidyl Peptidase IV (DPP4) Inhibitor Screening Assay Kit (E-BC-D007)
Screening and Assessment of Hypoglycemic Active Peptide from Natural Edible Pigment Phycobiliprotein Based on Molecular Docking, Network Pharmacology, Enzyme Inhibition Assay Analyses, and Cell Experiments, *Marine Drugs*, 2025.

05 Product Citations

Target	Citation Information	Cat. No.
cGMP(Cyclic GMP) Mouse ADH Mouse ALB Mouse BMG/ β -MG	A novel antidiuretic hormone governs tumour-induced renal dysfunction. <i>Nature</i> , 2023, 624(7991): p. 425-432.	E-EL-0083 E-EL-M3032 E-EL-M0106 E-EL-M2411 E-BC-K188-M E-BC-K183-M
Mouse CORT NA/NE LA Mouse GH Mouse GLP-1	Light modulates glucose metabolism by a retina-hypothalamus-brown adipose tissue axis. <i>Cell</i> , 2023, 186(2): p. 398-412.e17.	E-EL-0161 E-EL-0047 E-BC-K044-M E-EL-M0060 E-EL-M3012
Human INS	A bioinspired polymeric membrane-enclosed insulin crystal achieves long-term, self-regulated drug release for type 1 diabetes therapy. <i>Nature Nanotechnology</i> , 2025, 20(5): p. 697-706.	E-MSEL-H0001
Human INS	An orally administered glucose-responsive polymeric complex for high-efficiency and safe delivery of insulin in mice and pigs. <i>Nature Nanotechnology</i> , 2024, 19(12): p. 1880-1891.	E-EL-H2665
ALP TBIL	Hyodeoxycholic acid alleviates non-alcoholic fatty liver disease through modulating the gut-liver axis. <i>Cell Metabolism</i> , 2023, 35(10): p. 1752-1766.e8.	E-BC-K091-S E-BC-K760-M
Mouse LBP Mouse TNF- α Mouse IL-6	Gut microbiota modulate distal symmetric polyneuropathy in patients with diabetes. <i>Cell Metabolism</i> , 2023, 35(9): p. 1548-1562.e7.	E-EL-M2686 E-EL-M3063 E-EL-M0044
Human INS	Week-long normoglycaemia in diabetic mice and minipigs via a subcutaneous dose of a glucose-responsive insulin complex. <i>Nature Biomedical Engineering</i> , 2024, 8(10): p. 1214-1225.	E-EL-H2665
LA	Glucose metabolism controls human $\gamma\delta$ T-cell-mediated tumor immunosurveillance in diabetes. <i>Cellular & Molecular Immunology</i> , 2022, 19(8): p. 944-956.	E-BC-K044-M
ALT/GPT AST/GOT Mouse INS TC TG	Hepatocyte NLRP3 interacts with PKC ϵ to drive hepatic insulin resistance and steatosis. <i>Science Bulletin</i> , 2023, 68(13): p. 1413-1429.	E-BC-K235-M E-BC-K236-M E-EL-M1382 E-BC-K109-M E-BC-K261-M
Glucose Uptake	Kdm2a inhibition in skeletal muscle improves metabolic flexibility in obesity. <i>Nature Metabolism</i> , 2025, 7(2): p. 383-400.	E-BC-F041
TNF- α TGF- β 1 IL-10	Su, J., X. Dong, C. Xu, Z. Wang, C. Liu, H. Yang, D. Zhang and A. Yu, ROS-Responsive Hydrogel Enables Drug/Ion/Gas Co-Delivery for Improving Survival of Multi-Territory Perforator Flap in Diabetes. <i>Advanced Functional Materials</i> , 2025, 35: p. 2570149.	E-HSEL-M0009 E-EL-M0051 E-HSEL-M0004
AST	Xia, H., C. Scholtes, C.R. Dufour, C. Ouellet, M. Ghahremani and V. Giguère, Insulin action and resistance are dependent on a GSK3 β -FBXW7-ERR α transcriptional axis. <i>Nature Communications</i> , 2022, 13: p. 2105.	E-BC-K236-M
Insulin	Wang, S., C. Yang, W. Zhang, S. Zhao, J. You, R. Cai, H. Wang, Y. Bao, Y. Zhang, J. Zhang, K. Ji and Y. Zhang, Glucose-Responsive Microneedle Patch with High Insulin Loading Capacity for Prolonged Glycemic Control in Mice and Minipigs. <i>ACS Nano</i> , 2024.	E-EL-H2665



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