

# Research Tools for Metabolic Disorders



Metabolic diseases arise from disruptions in the balance between energy intake, utilization, and storage. Disruptions in glucose and/or lipid metabolism are implicated in the pathogenesis of many metabolic conditions, including diabetes, obesity, metabolic dysfunction-associated steatotic liver disease (MASLD), metabolic dysfunction-associated steatohepatitis (MASH), and metabolic syndrome.

## Discover Tools to Target Biological Mechanisms Underlying Metabolic Disorders

- Insulin Resistance
- Dyslipidemia
- Abdominal Obesity
- Hypertension

## Hallmark Assays

### Insulin Resistance

Item No.	Product Name	Summary
10009582	Glucose Colorimetric Assay Kit	For analysis of glucose in plasma, serum, and urine
600470	Glucose Uptake Cell-Based Assay Kit	A cell-based assay for studying modulators of cellular glucose uptake
700480	Glycogen Assay Kit	A simple and sensitive tool for assaying glycogen from tissue
26619	Insulin (human) ELISA Kit	For the measurement of insulin in cell culture supernatant, serum, and plasma
589501	Insulin (mouse, rat) EIA Kit	For the measurement of insulin in rat, human, mouse, and other samples

### Dyslipidemia

Item No.	Product Name	Summary
10009381	Adipolysis Assay Kit	Screen compounds involved in lipid storage and metabolism
10007640	Cholesterol Fluorometric/Colorimetric Assay Kit	Quantitation of total cholesterol in plasma or serum
700310	Free Fatty Acid Fluorometric Assay Kit	Measure FFAs in plasma, serum, and urine
10010755	Glycerol Colorimetric Assay Kit	Measure glycerol in plasma and serum
700640	Lipase Activity Assay Kit	Detect lipase activity in plasma, serum, tissue homogenates, and cell culture samples
500001	Lipid Droplets Fluorescence Assay Kit	Detect lipid droplets, cellular organelles that are also referred to as lipid bodies, oil bodies, or adiposomes
10012643	Steatosis Colorimetric Assay Kit	Detect excessive lipid accumulation in cells
10010303	Triglyceride Colorimetric Assay Kit	Measure TG levels in plasma, serum, cell lysates, and tissue homogenates

## Target Multiple Endpoints with One Mechanism

Explore the Science Behind GLP-1, GIP, and Glucagon Receptor Agonists

[www.caymanchem.com/GLP-1R-agonists](http://www.caymanchem.com/GLP-1R-agonists)

# Insulin Resistance

## GLP-1R Agonists

Signaling through the glucagon-like peptide 1 receptor (GLP-1R) can increase glucose-dependent insulin secretion, stimulate  $\beta$ -cell proliferation, inhibit glucagon secretion, and increase satiety.

Item No.	Product Name
41269	Bamadutide <sup>†</sup>
11096	Exendin-4 (48-86) amide (acetate)
24727	Liraglutide (acetate)
39739	Lixisenatide (acetate)
39741	Orforglipron
39747	Retatrutide (sodium salt)* <sup>†</sup>
29969	Semaglutide (acetate)
40972	Survodutide <sup>†</sup>
39748	Tirzepatide (sodium salt)*

\* also has GIPR agonist activity, <sup>†</sup> also has GCGR agonist activity  
View all GLP-1R agonists at [www.caymanchem.com](http://www.caymanchem.com)

## SGLT2 Inhibitors

Sodium-glucose cotransporter 2 (SGLT2) inhibitors decrease glucose reabsorption in renal proximal tubules, which has dual effects of insulin-independent glycemic control and caloric loss.

Item No.	Product Name
11575	Canagliflozin
11574	Dapagliflozin
17375	Empagliflozin
21507	Ertugliflozin
22287	Ipragliflozin
14340	Remogliflozin A
23509	Tofogliflozin (hydrate)

View all SGLT2 inhibitors at [www.caymanchem.com](http://www.caymanchem.com)

## FAHFAs with Antidiabetic Potential

Branched fatty acid esters of hydroxy fatty acids (FAHFAs) are regulated by fasting and high-fat feeding and associated with insulin sensitivity.

Item No.	Product Name
17039	9-OAHSAs
17038	9-PAHPAs
17037	9-PAHSAs
19974	10-POHSAs
17108	12-OAHSAs

View all FAHFAs at [www.caymanchem.com](http://www.caymanchem.com)

## Featured Assay

### GLP-1 Receptor (human) Reporter Assay Kit

Item No. 702940

- Screen compounds for GLP-1R activity
- Compatible with HEK293T/17 cells
- Rapid assay; get results within 24 hours
- Plate-based SEAP activity readout

View GLP-2R and GIPR assays at [www.caymanchem.com](http://www.caymanchem.com)

## Biguanides

Biguanides are used for type 2 diabetes to improve insulin sensitivity and decrease glucose production.

Item No.	Product Name
18507	Buformin (hydrochloride)
13118	Metformin (hydrochloride)

View all biguanides for metabolic diseases at [www.caymanchem.com](http://www.caymanchem.com)

## Peptide Hormones in Metabolism

Peptide hormones regulate energy metabolism, growth and development, and food intake and satiety.

Item No.	Product Name
24275	Amylin (rat, mouse) (trifluoroacetate salt)
23371	CCK Octapeptide (sulfated) (sodium salt)
24458	Ghrelin (rat) (trifluoroacetate salt)
15069	GLP-1 (7-36) amide (human, bovine, guinea pig, mouse, rat) (trifluoroacetate salt)
24204	Glucagon (hydrochloride)
15071	Neuropeptide Y (human, rat)
15073	Orexin A amide (bovine, human, mouse, rat) (trifluoroacetate salt)

View all peptide hormones at [www.caymanchem.com](http://www.caymanchem.com)

## DPP (IV) Inhibitors & Assay

Dipeptidyl peptidase (DPP) IV degrades incretins such as GLP-1. DPP (IV) inhibitors can reduce glucagon and glucose levels and increase insulin secretion.

Item No.	Product Name
28014	Diprotin A
23306	Linagliptin
13252	(-)-Sitagliptin (phosphate)
14705	Vildagliptin
700210	DPP (IV) Inhibitor Screening Assay Kit

View all DPP (IV) inhibitors at [www.caymanchem.com](http://www.caymanchem.com)

# Lipid Homeostasis Research Tools

## De Novo Lipogenesis

*De novo* lipogenesis contributes to dyslipidemia through the formation of new fatty acids. New fatty acids are formed from non-lipid energy sources such as glucose, which is elevated by insulin resistance. Glucose is converted to acetyl-CoA, which is elongated into fatty acids via the fatty acid synthase (FASN) pathway, ultimately producing triglycerides (TGs), which are stored in lipid droplets.

## De Novo Lipogenesis Inhibitors

### DGAT-1 inhibitors

Item No.	Product Name
42025	LCQ-908
16425	PF-04620110
25807	T-863

### ACC inhibitors

Item No.	Product Name
34764	ND-646
36856	PF-05221304

### FASN inhibitors

Item No.	Product Name
10005270	(±)-C75
35703	TVB-2640

### SCD1 inhibitors

Item No.	Product Name
19123	A-939572
33349	MF438
19379	SW203668 (trifluoroacetate salt)

View all small molecule inhibitors of fatty acid metabolism at [www.caymanchem.com](http://www.caymanchem.com)

## Lipid Droplet Fluorescent Probes

Item No.	Product Name
25892	BODIPY 493/503
25893	BODIPY 505/515
30787	Nile Red

View all lipid droplet fluorescent probes at [www.caymanchem.com](http://www.caymanchem.com)

## AMPK Activators

AMP-activated protein kinase (AMPK) pathway activators inhibit *de novo* lipogenesis, increase fatty acid oxidation, and promote mitochondrial function in adipose tissue.

Item No.	Product Name
11900	A-769662
10010241	AICAR
10006726	PD 98059

View all AMPK activators at [www.caymanchem.com](http://www.caymanchem.com)

## Targeting Metabolic Factors in MASLD & MASH

A guide to the strategies and research tools used to study metabolic dysfunction in steatotic liver disease.

Learn more at [www.caymanchem.com/MASLD-guide](http://www.caymanchem.com/MASLD-guide)

# Hormones & Receptors

Peroxisome proliferator-activated receptors (PPARs) and free fatty acid receptors (FFARs) have critical roles as master regulators of carbohydrate and lipid metabolism.

## PPAR Agonists

Item No.	Product Name (Target)
10004272	GW 501516 <sup>†</sup>
10008613	GW 7647 <sup>*</sup>
25572	Lanifibranor <sup>*,z</sup>
22263	Pioglitazone (hydrochloride) <sup>z</sup>
71740	Rosiglitazone <sup>z</sup>
16791	Tesaglitazar <sup>*,z</sup>
71750	Troglitazone <sup>z</sup>
70730	Wy 14643 <sup>*</sup>

<sup>\*</sup> PPAR $\alpha$  agonist, <sup>†</sup> PPAR $\delta$  agonist, <sup>z</sup> PPAR $\gamma$  agonist  
View all PPAR agonists at [www.caymanchem.com](http://www.caymanchem.com)

## FFAR Agonists

Item No.	Product Name (Target)
17531	AR-420626 <sup>†</sup>
16624	GPR120 Compound A <sup>z</sup>
10008907	GW 9508 <sup>*</sup>
17335	TAK-875 <sup>*</sup>
17035	TUG-891 <sup>z</sup>

<sup>\*</sup> GPR40/FFAR1 agonist, <sup>†</sup> GPR41/FFAR3 agonist, <sup>z</sup> GPR120/FFAR4 agonist  
View all FFAR agonists at [www.caymanchem.com](http://www.caymanchem.com)

# Bile Acid Signaling

G protein-coupled bile acid-activated receptor (TGR5 or GP-BAR1) and farnesoid X receptor (FXR) have roles as regulators of carbohydrate and lipid metabolism as well as glucose homeostasis. Bile acids are major endogenous agonists of TGR5 and FXR.

## TGR5 Agonists

Item No.	Product Name
17678	INT-777
27998	SB-756050
16291	TGR5 Receptor Agonist

## FXR Agonists

Item No.	Product Name
11031	6-ECDCA
17369	Fexaramine
25748	Tropifexor

Explore over 160 bile acids, metabolites, and conjugates at [www.caymanchem.com](http://www.caymanchem.com)

# Cholesterol Synthesis & Signaling

Cholesterol can be targeted by modulating its synthesis through HMG-CoA reductase inhibitors or targeting downstream signaling receptors like liver X receptors (LXRs).

## HMG-CoA Reductase Inhibitors

Item No.	Product Name
10493	Atorvastatin (calcium salt hydrate)
10010338	Lovastatin
15414	Pitavastatin (calcium salt)
12029	Rosuvastatin
10010344	Simvastatin

View all HMG-CoA reductase inhibitors at [www.caymanchem.com](http://www.caymanchem.com)

## LXR Modulators

Item No.	Product Name
27339	BMS 779788
10054	GW 3965 (hydrochloride)
18771	SR9238
18420	SR9243
71810	T0901317

View all LXR modulators at [www.caymanchem.com](http://www.caymanchem.com)

## Lipid Resource Center

Discover Products & Resources for Lipid Research in Metabolic Disorders

[www.caymanchem.com/metabolic-disorders](http://www.caymanchem.com/metabolic-disorders)

# Hypertension

Angiotensin-converting enzyme (ACE) inhibitors reduce the production of angiotensin II, lowering blood pressure.

## ACE Inhibitors

Item No.	Product Name
15313	Captopril
22186	DX600 (trifluoroacetate salt)
16041	Enalapril (maleate)
16833	Lisinopril
31327	MLN4760
15557	Ramiprilat

View all ACE inhibitors at [www.caymanchem.com](http://www.caymanchem.com)

### Featured Assay

#### ACE2 Inhibitor Screening Assay Kit

Item No. 502100

- Screen potential inhibitors for human ACE2
- Run 43 samples in duplicate
- Rapid assay; get results in 30 minutes
- Plate-based fluorescent readout