

# Isthmin-1

Insights into glucose uptake  
and liver fat accumulation

# General overview

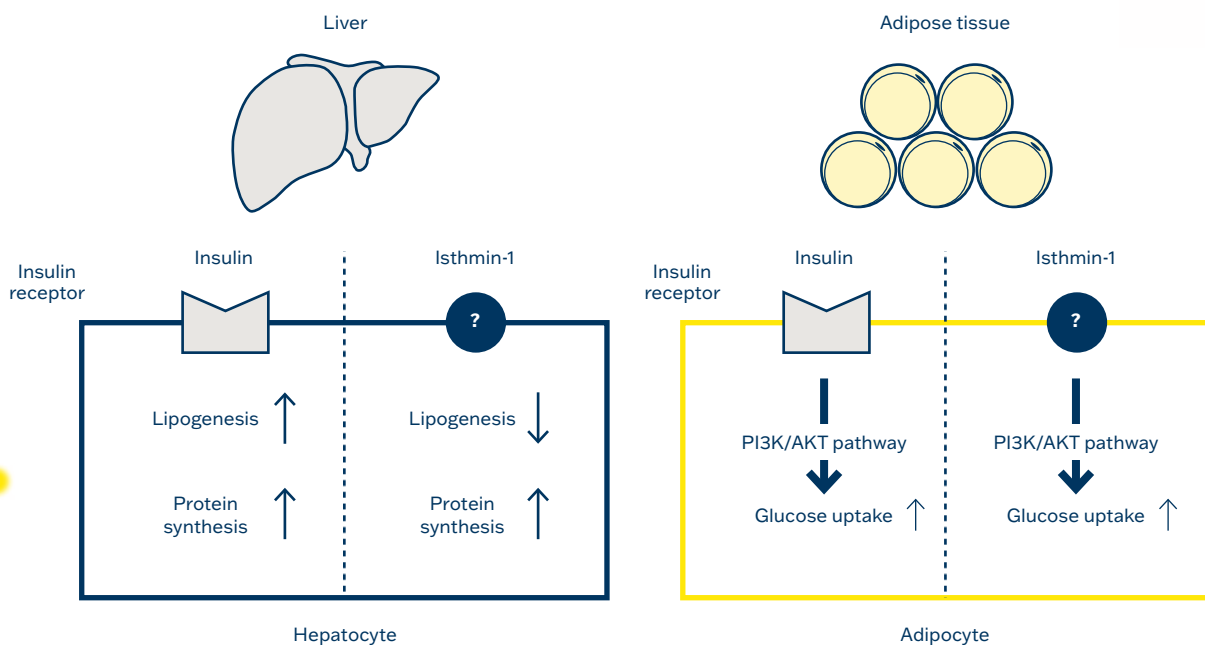
Isthmin-1 is a newly identified insulin-like adipokine

Isthmin-1 increases adipocyte glucose uptake

Isthmin-1 inhibits hepatic lipid synthesis

Isthmin-1 triggers apoptosis, and regulates cell proliferation, migration, angiogenesis, and immune microenvironments

## Insulin independent glucose uptake and liver fat reduction



**Figure 1:** Isthmin-1 suppresses lipogenesis and promotes protein synthesis in the hepatocyte, and promotes glucose uptake in the adipocyte.  
Source: Shimizu T et al. *Pick the best of both glucose and lipid metabolism. J Diabetes Investig.* 2022 Jul;13(7):1132-1133

Insulin promotes *de novo* adipogenesis in hepatocytes by upregulating the expression of lipogenic genes and proteins such as sterol regulatory element-binding protein-1c (SREBP-1c), precursor SREBP-1c, and cleaved SREBP-1c. This effect of insulin can be reversed by Isthmin-1 in a dose-dependent manner. Isthmin-1 also induces phosphorylation of S6, a kinase involved in the activation of protein synthesis, thereby shifting the cellular state towards protein synthesis. As a result, Isthmin-1 contributes to improvements in diabetes and hepatic steatosis. In adipocytes and

skeletal muscle cells, Isthmin-1 activates the PI3K-AKT pathway independently of insulin and IGF-1 receptors, promoting the translocation of GLUT4 to the plasma membrane and thereby enhancing glucose uptake. Emerging research suggests that Isthmin-1 also improves glucose tolerance via activation of mTORC1. These findings suggest novel targets for the prevention and treatment of diseases associated with dysregulated glucolipid metabolism.

# Human Isthmin-1 ELISA

<b>Cat. No.</b>	RAG031R
<b>Size</b>	1 x 96 wells
<b>Assays type</b>	Sandwich
<b>Regulatory status</b>	RUO
<b>Sample type</b>	EDTA, heparin or citrate plasma
<b>Reactivity</b>	Human, mouse
<b>Assay time</b>	3 hours
<b>Measuring range</b>	0.625 to 40 ng/ml
<b>Sensitivity</b>	0.4 ng/ml



## Product features

- Fully validated for plasma samples
- Manufactured in the EU
- High specificity and sensitivity – monoclonal antibodies are used for capture and detection
- New target in glucose and triacylglycerol regulation

## Clinical applications and therapeutic potential

### Energy metabolism and DM

- Independent protective factor against the development of T2DM
- Increases glucose uptake in adipose tissue and reduces lipogenesis in liver

### Kidney

- Associated with the severity of albuminuria
- Predicting kidney function impairment in patients with T2DM

### Cancer

- Triggers cancer cell apoptosis
- Reduces tumor angiogenesis without liver or kidney dysfunction

### Cardiovascular risk

- Prediction of IR in primary hypertension
- Endothel protection

**Isthmin-1**

# Contact us



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