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TI

Specific inhibition of hormone-sensitive lipase improves lipid profile while reducing plasma glucose.

AU

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SO

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DT

Article

LA

English

ED

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AB

Elevation of plasma free fatty acids has been linked with insulin resistance and diabetes. Inhibition of lipolysis may provide a mechanism to decrease plasma fatty acids, thereby improving insulin sensitivity. Hormone-sensitive lipase (HSL) is a critical enzyme involved in the hormonally regulated release of fatty acids and glycerol from adipocyte lipid stores, and its inhibition may thus improve insulin sensitivity and blood glucose handling in type 2 diabetes. In rat adipocytes, forskolin-activated lipolysis was blocked by in vitro addition of a potent and selective HSL inhibitor or by prior treatment of the animals themselves. Antilipolytic effects also were demonstrated in overnight-fasted mice, rats, and dogs with species-dependent effects on plasma free fatty acid levels but with similar reductions in plasma glycerol being observed in all species. Inhibition of HSL also reduced hyperglycemia in streptozotocin-induced diabetic rats. The data support a connection between adipose tissue lipolysis and plasma glucose levels.

CC

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IT

Major Concepts  
Pharmacology; Enzymology (Biochemistry and Molecular Biophysics);  
Endocrine System (Chemical Coordination and Homeostasis)

IT

Parts, Structures, & Systems of Organisms  
plasma: blood and lymphatics

IT

Diseases  
insulin resistance syndrome: endocrine disease/pancreas, metabolic disease  
Insulin Resistance (MeSH)

IT

Diseases

type 2 diabetes: endocrine disease/pancreas, metabolic disease, drug  
therapy, chemically-induced  
Diabetes Mellitus, Non-Insulin-Dependent (MeSH)

IT

Chemicals & Biochemicals  
glucose; glycerol; streptozotocin; hormone-sensitive lipase:  
inhibition; hormone-sensitive lipase inhibitor: enzyme inhibitor-drug

ORGN

Classifier  
Canidae 85765  
Super Taxa  
Carnivora; Mammalia; Vertebrata; Chordata; Animalia  
Organism Name  
dog (common): breed-beagle, male  
Taxa Notes  
Animals, Carnivores, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman  
Mammals, Vertebrates

ORGN

Classifier  
Muridae 86375  
Super Taxa  
Rodentia; Mammalia; Vertebrata; Chordata; Animalia  
Organism Name  
Wistar rat (common): male  
rat (common): strain-Sprague-Dawley, male  
mouse (common): strain-Balb/C, male  
3T3-L1 cell line (cell\_line): murine adipocyte cells  
Taxa Notes  
Animals, Chordates, Mammals, Nonhuman Vertebrates, Nonhuman Mammals,  
Rodents, Vertebrates

RN

58367-01-4 (glucose)  
56-81-5 (glycerol)  
18883-66-4 (streptozotocin)  
9001-62-1 (hormone-sensitive lipase)