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Research Article

Metabolic Roles of the M₃ Muscarinic Acetylcholine Receptor Studied with M₃ Receptor Mutant Mice: A Review

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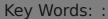
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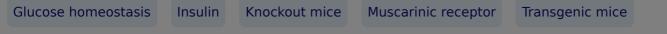
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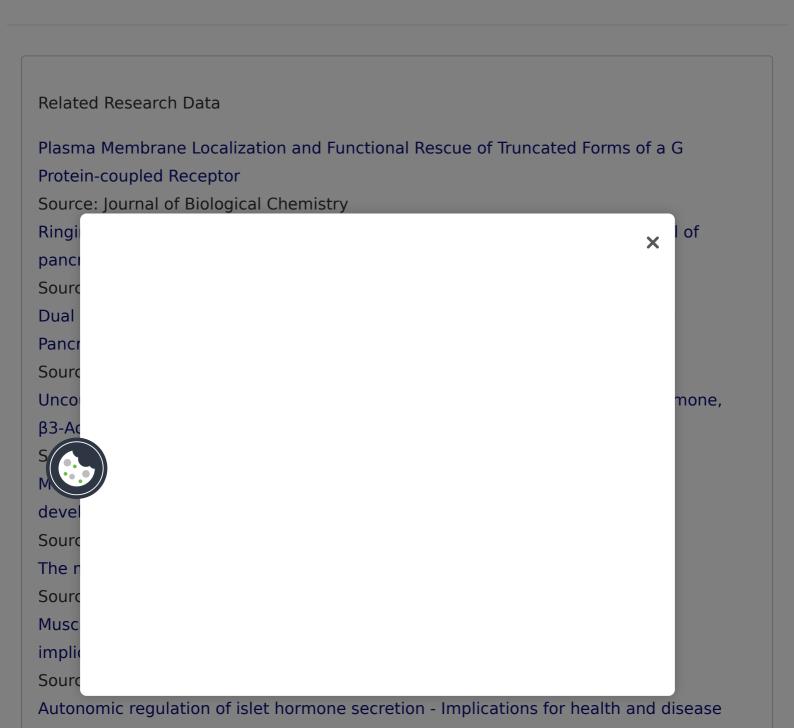
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receptors protected mice against various forms of experimentally or genetically induced obesity and obesity-associated metabolic deficits. Under all experimental conditions tested, M₃ receptor-deficient mice showed greatly ameliorated impairments in glucose homeostasis and insulin sensitivity, reduced food intake, and a significant elevation in basal and total energy expenditure, most likely due to increased central sympathetic outflow and increased rate of fatty acid oxidation. These findings are of potential interest for the development of novel therapeutic approaches for the treatment of obesity and associated metabolic disorders.







Source: Diabetologia Localization of muscarinic M3 receptor protein and M3 receptor binding in rat brain Source: Neuroscience Cholinergic Stimulation of Salivary Secretion Studied with M₁ and M₃ Muscarinic Receptor Single- and Double-Knockout Mice Source: Molecular Pharmacology Invited Review: Uncoupling proteins and thermoregulation Source: Journal of Applied Physiology Uncoupling Protein-2 and -3 Messenger Ribonucleic Acids in Adipose Tissue and Skeletal Muscle of Healthy Males: Variability, Factors Affecting Expression, and Relation to Measures of Metabolic Rate* Source: The Journal of Clinical Endocrinology & Metabolism Beneficial metabolic effects of M3 muscarinic acetylcholine receptor deficiency Source: Cell Metabolism Physiological Role of UCP3 May Be Export of Fatty Acids from Mitochondria When Fatty Acid Oxidation Predominates: An Hypothesis Source: Experimental Biology and Medicine Muscarinic Receptor Subtype Pharmacology and Physiology Source: Unknown Repository Uncoupling proteins 2 and 3: potential regulators of mitochondrial energy metabolism. Source: Diabetes ChemInform Abstract: Therapeutic Opportunities for Muscarinic Receptors in the Centr X Sourc Regu ylation Sourc Cellu Sourc Musc Source Sourc Incre :al musc Sourc Mice Sourc

Source: Nature

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Mechanisms and Physiological Significance of the Cholinergic Control of Pancreatic -Cell Function Source: Endocrine Reviews A critical role for β cell M3 muscarinic acetylcholine receptors in regulating insulin release and blood glucose homeostasis in vivo Source: Cell Metabolism Role of Muscarinic Receptor Subtypes in the Constriction of Peripheral Airways: Studies on Receptor-Deficient Mice Source: Molecular Pharmacology The muscarinic receptor subtype in mouse pancreatic B-cells Source: FEBS Letters Pronounced pharmacologic deficits in M2 muscarinic acetylcholine receptor knockout mice Source: Proceedings of the National Academy of Sciences Effects of muscarinic receptor type 3 knockout on mouse islet secretory responses Source: Biochemical and Biophysical Research Communications New insights into sympathetic regulation of glucose and fat metabolism Source: Diabetologia Thermogenic response to epinephrine in the forearm and abdominal subcutaneous adipose tissue Source: AJP Endocrinology and Metabolism Hyperphagia and Weight Gain after Gold-Thioglucose: Relation to Hypothalamic Neuro rom the X Child C.V.M.). Sourc in M3 Musc Musc Sourc Musc the M1 Recei Sourc Enha musc Sourc Delin Sourc

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Receptor Knockout Mice

Source: Molecular Pharmacology

Muscarinic Acetylcholine Receptor Knockout Mice: Novel Phenotypes and Clinical

Implications

Source: The Annual Review of Pharmacology and Toxicology

Alteration of heart uncoupling protein-2 mRNA regulated by sympathetic nerve and

triiodothyronine during postnatal period in rats

Source: Biochimica et Biophysica Acta (BBA) - Molecular Cell Research

Functional Role of the Third Cytoplasmic Loop in Muscarinic Receptor Dimerization

Source: Journal of Biological Chemistry

Muscarinic acetylcholine receptor subtypes in cerebral cortex and hippocampus

Source: Unknown Repository

Molecular Biology of Muscarinic Acetylcholine Receptors

Source: Critical Reviews in Neurobiology

The Biology of Mitochondrial Uncoupling Proteins

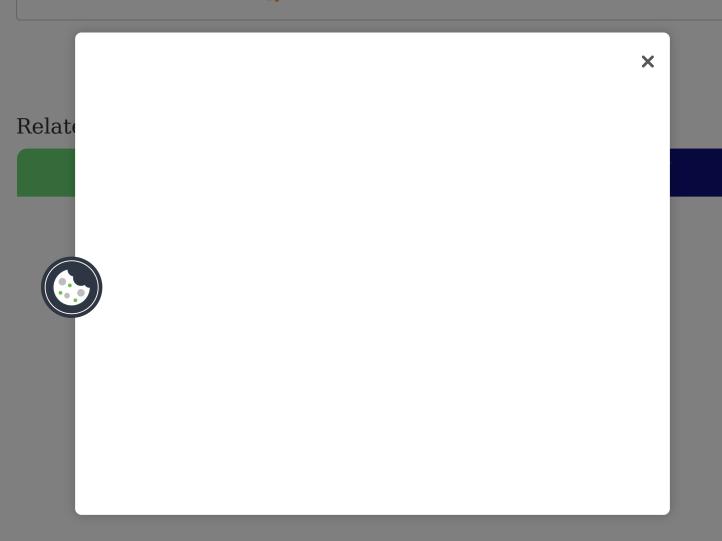
Source: Diabetes

Peripheral, But Not Central, Administration of Adiponectin Reduces Visceral Adiposity and Upregulates the Expression of Uncoupling Protein in Agouti Yellow (Ay/a) Obese

Mice

Source: Diabetes

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