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**Manuscript Type:** REVIEW

**Renal gluconeogenesis in insulin resistance: A culprit for hyperglycemia in diabetes**

Sharma R *et al.* Renal gluconeogenesis in metabolic syndrome

Rajni Sharma, Swasti Tiwari

### Abstract

Renal gluconeogenesis is one of the major pathways for endogenous glucose production. Impairment in the pathway may contribute to hyperglycemia in insulin resistance and diabetes. We reviewed pertinent studies to understand renal gluconeogenesis regulation in insulin and diabetes resistance. A consensus on the suppressive effect of insulin on kidney gluconeogenesis has started to build up. Insulin-resistant models exhibit reduced insulin receptor (IR) expression and/or post-receptor

### Match Overview

1	Crossref 158 words Sarojini Singh, Rajni Sharma, Manju Kumari, Swasti Tiwari. "Insulin receptors in the kidneys in health and disease",	5%
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**Gluconeogenesis** in the liver is a major factor in the fasting hyperglycemia of diabetes, but there is also increased renal gluconeogenesis. Gluconeogenesis is the result of multiple endocrine disturbances including insulin resistance and deficiency, increased glucagon levels, and enhanced delivery of substrates (fatty acids, lactate, glycerol, and amino acids) to the liver.

[Insulin Resistance - an overview | ScienceDirect Topics](#)

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and renal gluconeogenesis, resulting in systemic insulin resistance. In contrast, in streptozotocin-treated mice, although insulin action was impaired in the PTs, the gluconeogenic gene expression was

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Molecular Signaling Mechanisms of Renal Gluconeogenesis in ...

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Abstract. The kidneys are as involved as the liver in gluconeogenesis which can significantly contribute to hyperglycemia in the diabetic condition. Substantial evidence has demonstrated the overexpression of rate-limiting gluconeogenic enzymes, especially phosphoenolpyruvate carboxykinase and **glucose 6** phosphatase, and the accelerated glucose release both in the isolated proximal tubular cells and in the ...

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Renal Gluconeogenesis | Diabetes Care

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Feb 01, 2001 - The process could involve shunting precursors away from the gluconeogenic pathway and into the oxidative pathway, thus compensating for the decreased availability of **free fatty acids** as an oxidative fuel during the infusion of insulin. Because insulin reduces renal **free fatty acid** uptake , and since free fatty acids have been shown to stimulate renal gluconeogenesis in vitro , insulin ...

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Renal gluconeogenesis: an underestimated role of the ...

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Nov 28, 2020 - Considering the renal effect of insulin on gluconeogenesis, one could hypothesize an **increase in renal glucose production in obesity** through insulin resistance. Mice with proximal tubule deletion of the insulin receptor displayed higher fasting glucose levels associated with elevated activity of G6P in renal cortex homogenates, which could be related to enhanced gluconeogenesis [ 117 ].

Gluconeogenesis and risk for fasting hyperglycemia in ...

https://pubmed.ncbi.nlm.nih.gov/30232289

Black women, compared with White women, have high rates of whole-body **insulin resistance** but a lower prevalence of fasting **hyperglycemia** and hepatic steatosis. This dissociation of whole-body **insulin resistance** from fasting **hyperglycemia** may be explained by racial differences in **gluconeogenesis**, hepatic fat, or tissue-specific **insulin** sensitivity.

Cited by: 14      Author: Stephanie T. Chung, Amber B. Courville, An...  
Publish Year: 2018

Dual Regulation of Gluconeogenesis by Insulin ... - Diabetes

https://diabetes.diabetesjournals.org/content/66/9/2339 ▾

Sep 01, 2017 - The knockout mice showed **renal** and systemic **insulin resistance** and enhanced **renal gluconeogenesis**, phenotypes that were compatible with the phenotypes of  $\gamma$ -glutamyl transferase-driven PT-specific IR knockout mice , suggesting that **insulin** signaling through IRS1 and IRS2 in the PTs plays important roles in systemic glucose homeostasis. These phenotypes are not ...

Cited by: 33      Author: Motohiro Sasaki, Takayoshi Sasako, Naoto ...  
Publish Year: 2017

Gluconeogenesis in moderately and severely hyperglycemic ...

https://www.ncbi.nlm.nih.gov/pubmed/11120655

**Gluconeogenesis** in moderately and severely hyperglycemic patients with type 2 **diabetes** mellitus. ... (r = 0.70) and with GNG (r = 0.50) or EGP (r = 0.45). We conclude 1) that peripheral **insulin resistance** is at least as important as GNG (and EGP) as a cause of postabsorptive **hyperglycemia** in T2DM and 2) that GNG and EGP in T2DM are increased ...

Cited by: 197      Author: Guenther Boden, Xinhua Chen, T. Peter Stein  
Publish Year: 2001

Disturbances in Insulin–Glucose Metabolism in Patients ...

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Abstract	Role of New Technologies in ...	Conclusion	Acknowledgment
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Chronic kidney disease (CKD) is a common and growing condition that affects 15% of the US population (30 million individuals) and >50 million people worldwide (1, 2). Diabetic kidney disease (DKD) refers to CKD in patients with type 1 and type 2 diabetes mellitus (T1DM, T2DM) and is usually detected by the

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