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To cite this version:

Guillaume Gautheron, Béatrice Chabi, Sylvie Péraldi-Roux, Julie N’Guyen, Estelle Youl, et al.. Galangin inhibits glucose-induced insulin secretion through the alteration of mitochondrial oxidative phosphorylation. Montpellier Diabetes Day, Nov 2019, Montpellier, France. 2019. hal-02941399

HAL Id: hal-02941399
https://hal.inrae.fr/hal-02941399
Submitted on 17 Sep 2020
Galangin inhibits glucose-induced insulin secretion through the alteration of mitochondrial oxidative phosphorylation


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Introduction

Glucose stimulates insulin secretion through a complex metabolic sequence that includes mitochondrial respiration, ATP synthesis, 

Methods

INS-1 β-cells or rat isolated pancreatic islets were incubated for 60 min in Krebs-Ringer bicarbonate buffer with or without glucose, flavonoid and secretagogues. Insulin release was quantified by the homogeneous time-resolved fluorescence (HTRF) method (Cisbio). 

Results are presented as mean ± SEM and were analyzed by one-way or two-way ANOVA and Holm-Sidak’s multiple comparisons test. n = 5.

Conclusion

Our work suggests that galangin inhibits glucose-induced insulin secretion by altering mitochondrial respiration. Indeed galangin inhibits the effect of secretagogues which need mitochondrial activity to induce insulin secretion, but has no effect on secretagogue which induce insulin secretion independently of mitochondria. Galangin behaves like the mitochondrial OXPHOS uncoupler CCCP and decreases the part of oxygen consumption dedicated to ATP synthesis. Therefore, we are currently investigating whether galangin impairs mitochondrial glucose-stimulated ATP synthesis.