Circulation

Mechanistic role of β_2 adrenergic receptor in glucose homeostasis

Gaetano Santulli and Guido Iaccarino

Published on April 24, 2017

Mechanistic role of β_2 adrenergic receptor in glucose homeostasis

Gaetano Santulli, Physician Scientist, Columbia University - New York, NY Other Contributors: Guido Iaccarino, Physician Scientist, Salerno University – Salerno, Italy

Wang, Liu, Fu and colleagues report that β_2-adrenergic receptor (β2AR) plays a key role in hyperinsulinemia-induced cardiac dysfunction (1). Overall, the data are very interesting and compelling. However, we noticed that in this paper β2AR-/- mice do not exhibit glucose intolerance; in fact, they seem to have a response to intraperitoneal glucose that is even better than wild-type mice (though a statistical analysis comparing these two groups is not provided). Although surprisingly not reported by the Authors, mounting evidence indicates that the deletion of β2AR has detrimental effects on glucose metabolism (2-4). Indeed, we have demonstrated that β2AR$^{-/-}$ mice display impaired insulin release and significant glucose intolerance (2). Muzzin and colleagues found that the ablation of βARs mechanistically underlies impaired glucose homeostasis (3). Other groups have confirmed these results, also showing that β2AR$^{-/-}$ mice develop diabetic-related microvascular complications (i.e. retinopathy) (4). Nonetheless, the Authors fail to at least discuss previous relevant literature describing the alterations in glucose metabolism observed in β2AR$^{-/-}$ mice and do not accurately circumstantiate their findings. Furthermore, the Authors do not provide any measurement (not in vivo nor in isolated islets) of insulin levels following glucose challenge, showing just baseline serum levels. We believe that for the sake of scientific appropriateness the Readers of *Circulation* will appreciate a clarification, in particular regarding the fact that pertinent literature in the field has been overlooked.

References

1. Inhibiting Insulin-Mediated beta2-Adrenergic Receptor Activation Prevents Diabetes-Associated Cardiac Dysfunction. Circulation. 2017;135:73-88.
2. Age-related impairment in insulin release: the essential role of beta(2)-adrenergic receptor. Diabetes. 2012;61:692-701.
3. The lack of beta-adrenoceptors results in enhanced insulin sensitivity in mice exhibiting increased adiposity and glucose intolerance. Diabetes. 2005;54:3490-5.
4. Beta2-adrenergic receptor knockout mice exhibit A diabetic retinopathy phenotype. PLoS One. 2013;8:e70555.

Competing Interests: None declared.