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The beta-1 adrenergic receptor and RAGE work together to break hearts

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Cardiomyopathies result from a remodeling process that can be initiated by a variety of pathological stresses. Activation of the β-1 adrenergic receptor (β1AR) typically occurs in response to stress to rapidly increase cardiac output; however, prolonged stimulation of this receptor results in cardiomyocyte death and maladaptive cardiac remodeling. Studies have also shown that the pattern recognition receptor RAGE is activated in the heart following ischemic injury.

A new study in the inaugural issue of *JCI Insight* uncovers an interaction between β1AR and RAGE that mediates myocardial injury and progression to cardiomyopathy.

Rui-Ping Xiao and Yan Zhang of Peking University in Beijing, China and colleagues demonstrated that β1AR stimulation induces cardiomyocyte cell death in a RAGE-dependent manner, and reciprocally, RAGE-induced cardiomyocyte cell death requires β1AR signaling.

Additionally, in mice, blocking RAGE signaling following β-adrenergic agonist-induced heart failure mitigated myocardial cell death and restored cardiac function. This study provides new insight into the processes that promote cardiomyopathy.

More information: Weizhong Zhu et al. Interaction of β1-adrenoceptor with RAGE mediates cardiomyopathy via CaMKII signaling, *JCI Insight* (2016). DOI: 10.1172/jci.insight.84969

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