Understanding the role of IKACh in cardiac function

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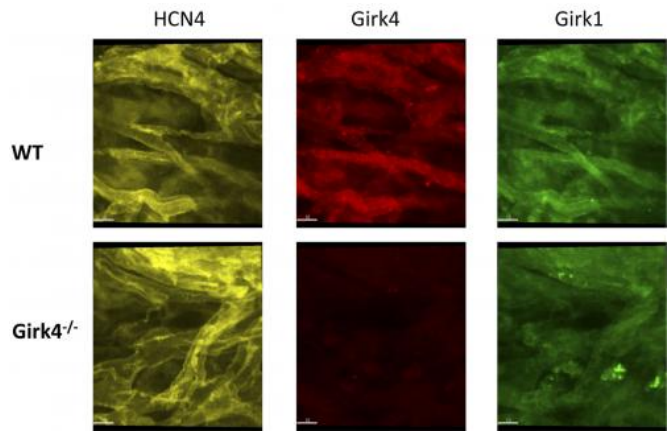

This is a close-up view of cardiac pacemaker cells within the sinoatrial node. A study in *The Journal of General Physiology* shows a novel role for I_{KACh} in cardiac pacemaker activity and heart rate regulation. Credit: Mesirca et al., 2013

Researchers have uncovered a previously unknown role for the acetylcholine-activated inward-rectifying potassium current (I_{KACh}) in cardiac pacemaker activity and heart rate regulation, according to a study in *The Journal of General Physiology*.

The heart rate increases in response to fear or exercise, when the body's sympathetic nervous system activates the "fight or flight" stress response. After sympathetic stimulation, the heart rate is brought back to normal by the parasympathetic nervous system, which regulates the body at rest. Parasympathetic regulation of the heart rate is initiated when acetylcholine released from the vagus nerve spurs a chain of events that activate I_{KACh} in the sinoatrial node—the pacemaker of the heart—to reduce the heart rate. However, the precise role of I_{KACh} is not fully understood.

To find out more, researchers used mice lacking a specific gene required for I_{KACh} to investigate the consequences of its loss. The mice showed a moderate increase in resting heart rate compared with that in a control group, and they displayed a significant delay in the recovery of resting heart rate after stress, exercise, or administration of a drug that simulated activation of the fight or flight response. The results indicate that I_{KACh} plays a critical role in both of these parasympathetic cardiac functions.

More information: Mesirca, P., et al. 2013. J. Gen. Physiol. doi:10.1085/jgp.201310996

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