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## **Peculiar effects of muscarinic M1, M2, and M3 receptor blockers on cardiac chronotropic function in neonatal rats**

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### **Abstract**

Department of Anatomy, Physiology, and Human Health Protection, Kazan (Volga Region) Federal University, Russia The effects of muscarinic M1, M2, and M3 cholinergic receptor blockade on the regulation of chronotropic function of the heart were studied in vivo in 7-day-old rat pups. Intravenous injection of M2 receptor blocker gallamine produced no changes in cardiac chronotropy. In contrast, M1 receptor blocker pirenzepine and M3 receptor blocker 4DAMP provoked bradycardia. These data attest to the involvement of M1 and especially M3 cholinergic receptors in the regulation of cardiac chronotropy in rat pups, which confirms the view on pronounced species-specific and age-related peculiarities in the heart control mechanisms. © 2012 Springer Science+Business Media New York.

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### **Keywords**

heart, muscarinic M1-, M2-, and M3- cholinoreceptors, ontogeny, rat, vagus