

# Functionally heterogenous ryanodine receptors in avian cerebellum

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The functional heterogeneity of the ryanodine receptor (RyR) channels in avian cerebellum was defined. Heavy endoplasmic reticulum microsomes had significant levels of ryanodine and inositol 1,4,5-trisphosphate binding. Scatchard analysis and kinetic studies indicated the existence of at least two distinct ryanodine binding sites. Ryanodine binding was calcium-dependent but was not significantly enhanced by caffeine. Incorporation of microsomes into planar lipid bilayers revealed ion channels with pharmacological features (calcium, magnesium, ATP, and caffeine sensitivity) similar to the RyR channels found in mammalian striated muscle. Despite a wide range of unitary conductances (220-500 picosiemens, symmetrical cesium methanesulfonate), ryanodine locked both channels into a characteristic slow gating subconductance state, positively identifying them as RyR channels. Two populations of avian RyR channels were functionally distinguished by single channel calcium sensitivity. One popula