

Calcium Fluxes, Ion Currents and Dihydropyridine Receptors in a New Immortal Cell Line from Rat Heart Muscle

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A cell line (RCVC) in permanent culture was developed from adult rat ventricular cells; transformation was attained by incubation with conditioned media from UCHTI, a rat thyroid cell line. Immortalized ventricular cells have a doubling time of 20 h, contact inhibition of growth, and display some muscle markers such as a high glycogen content and positive immunoreaction for myoglobin, α -sarcomeric actin, β -actin and desmin. A microsomal fraction from these cells was shown to bind ^3H -nitrendipine with a maximal capacity of 295 fmol/mg protein and an equilibrium dissociation constant of 0.7 nM. Nifedipine-sensitive $^{45}\text{Ca}^{2+}$ influx was evident in partially depolarized cells (40 mM K^+ in the incubation medium). An equivalent influx, induced by the calcium channel agonist BAYK-8644 and CGP-28392, was obtained in normally polarized cells. Patch clamp studies show slow inward currents that can be completely blocked by 5 μM nifedipine; cells were induced to further differentiation by culturing i