

# Voltage control of calcium transients elicited by caffeine and tetracaine in cultured rat muscle cells

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Cultured hind limb skeletal muscle cells from newborn rats were used to study the effect of caffeine and tetracaine upon intracellular  $\text{Ca}^{2+}$  release under voltage or current clamp conditions. Free  $[\text{Ca}^{2+}]_i$  was measured using the fluorescent calcium-sensitive dye Fluo-3. A field containing one or several myotubes was observed with a video camera and image analysis of fluorescence changes was performed. Addition of 100-500  $\mu\text{M}$  tetracaine to the external saline elicited strong fluorescence responses in non-clamped cells, but significantly lower responses in cells clamped at -90 mV. At the same time, tetracaine inhibited voltage induced calcium release. Voltage and tetracaine modulation over the action of caffeine (500  $\mu\text{M}$ ) was also observed. Pretreatment of cells with 10  $\mu\text{M}$  nifedipine abolished the caffeine induced fluorescence response in non-clamped cells. These findings suggest that, in cultured muscle cells, calcium release through the caffeine and tetracaine sensitive pathways is control