DEUTERIUM OXIDE SLOWS SODIUM CHANNEL GATING CURRENTS IN SQUID GIANT AXONS

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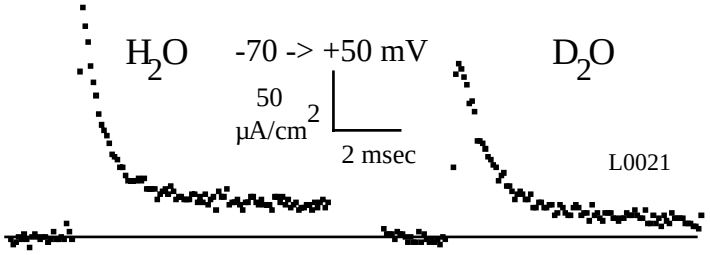
In the absence of tetrodotoxin the outward 'gating' current that preceded the ionic sodium current was shown to be reduced by D_2O (Landowne *Biol Bull* **199**, in press). In the presence of tetrodotoxin D_2O can be seen to slow the fast relaxation of the gating current as well as reduce the amplitude. D_2O also reduces the 'pedestal current'. If the pedestals are subtracted the time integral of remaining currents are approximately equal.

The fast relaxations of the gating current were fit by single exponentials. With 28 comparisons, D_2O reduced the rate of relaxation to 0.66±0.04 times the rate in H_2O. Between 0 and +75 mV these rates were fit with $k = k_0 e^{z'eV/kT}$. D_2O reduced k_0 to 0.74±0.19 times the H_2O value. In H_2O, z' = 0.18±0.03(7); in D_20, z' = 0.26±0.05 (6).

The results will be discussed in terms of channel deuteration and stabilization of hydrogen bonds.

Measured at 3-4° C using P/8, a -140 mV SHP and 100 nM TTX



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