

RHEOGENIC L-ALANINE TRANSPORT IN CULTURED HEPATOCYTES OF THE
LITTLE SKATE (RAJA ERINACEA)

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Transmembrane potentials (V_m) of skate (Raja erinacea) hepatocytes were measured in vitro. Cells were isolated by perfusing liver at 15°C with elasmobranch Ringer's solution plus collagenase (1 mg/ml). Hepatocytes were selected from cell suspensions by differential sedimentation, and they were plated in Ringer's solution into tissue culture plates containing glass coverslips. Cells adhered to the coverslips for 4 hr prior to micropuncture and electrical measurements. V_m was measured with glass microelectrodes filled with 0.5 M KCl (100 to 240 megaohms in Ringer's solution) and equaled -61 ± 1.9 mV ($n = 68$). V_m decreased when external K^+ concentration was increased by substituting external NaCl with equivalents of KCl. The slope of the linear portion (> 140 mM $[K^+]_o$) of V_m vs $\log_{10} [K^+]_o$ was 60 ± 7.1 mV/tenfold change in $[K^+]_o$, which indicates that membrane K^+ conductance, gK , contributes substantially to V_m . KCN (10^{-4} M) and ouabain (10^{-3} M) decreased V_m by 13 ± 2.3 mV and 9 ± 0.5 mV, respectively, which is consistent with an electrogenic Na-K pump component to V_m . L-alanine decreased V_m immediately by 18 ± 0.8 mV and 7 ± 1.3 mV at 10 and 1 mM, respectively, Fig. 1, and this effect of L-alanine on V_m was Na-dependent. V_m did not repolarize to control value until L-alanine was washed away from the hepatocytes. In contrast, D- and β -alanine had no effect on V_m , Fig. 1. Thus, we conclude that L-alanine transport into skate hepatocytes is rheogenic.

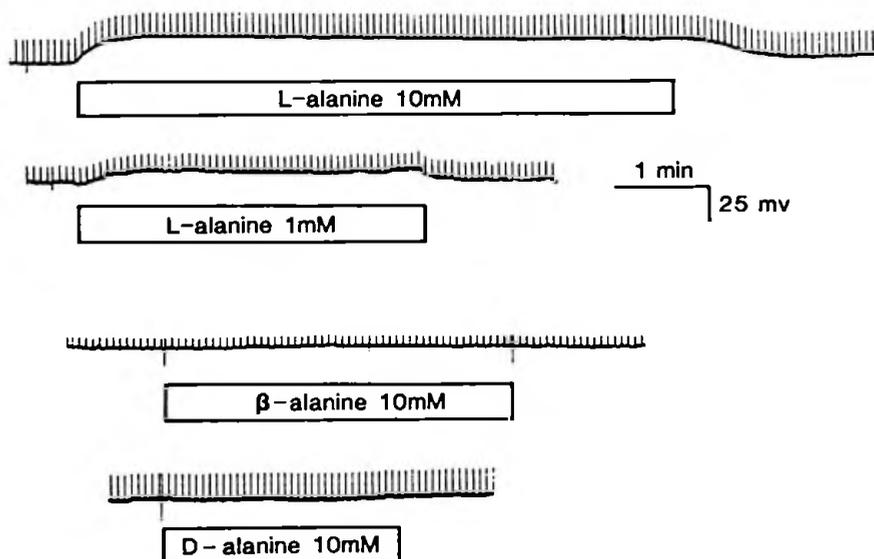


Fig. 1

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