

ON THE MECHANISM OF REGULATION BY CYCLIC AMP OF
CARDIAC CHLORIDE CHANNEL

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Summary

Using the double patch method, single Cl^- channel currents were recorded from guinea-pig ventricular myocytes in cell-attached mode. The cells were dialyzed through a second patch pipette with cyclic AMP (0.1 - 0.5 mM)-containing medium. With progression of the cell dialysis, appearance of the Cl^- channel activity could be observed in the on-cell patches. At the time of its appearance, the Cl^- channel activity showed an already high (>0.5) open probability (P_o), and the P_o value did not further increase thereafter even when the whole cell Cl^- current was increasing with time. In some patches, an increase in the number of active channels was observed during the cell dialysis. In such cases, the newly activated channel also seemed to have a high P_o . Channel activity showing a low (<0.4) P_o at the beginning of its appearance was never observed. These results suggest that the cyclic AMP system, by phosphorylation, creates an available state of the channel without influencing its kinetic behavior. Thus cyclic AMP appears to gate the cardiac Cl^- channel, that intrinsically possesses a high P_o .