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EFFECTS OF HYPERCHOLESTERINAEMIA ON Kv1.3 CURRENTS

It is well known that the changing the cholesterol content of the cell membrane may influence the functioning of the ion channels. We reported previously that the increase of the cholesterol content of the cell membrane (in vitro) modified the biophysical parameters of the gating of Kv1.3 K⁺ ion channels in human T-lymphocytes. In our present study we aimed to determine the effect of hypercholesterolemia on the gating of Kv1.3 channels and proliferation of T cells.

T-lymphocytes were isolated from the peripheral blood of patients with cholesterol level considered normal (<5.2 mmol/l, control group) and patients with hypercholesterinaemia. We determined the kinetic characterizing the gating of Kv1.3 channels using the whole-cell configuration of the patch-clamp technique. Lymphocyte proliferation was measured using CFSE staining with and without anti-CD3 and anti-CD28 stimulation.

Our results indicate that the biophysical parameters of Kv1.3 gating are similar in the control group and in the 'hc' samples. The CFSE-based assay showed that hypercholesterolemic T cells had higher spontaneous activation rate compared to control group. However, T cells from high cholesterol level patients challenged by anti-CD3 and anti-CD28 exhibited lower proliferation rate than control cells.