6. Summary

The aim of my stay at the research lab was (1) to obtain more insight in the pharmacological modulation of monovalent cation currents through the novel epithelial calcium channel ECaC1 and (2) to become more familiar with general techniques used in a physiology laboratory (patch clamp techniques, cell culture and transfection,...).

At the moment I joined the laboratory, preliminary results suggested that ECaC1 belonging to the transient receptor potential (TRP) gene family is a central component of transcellular calcium transport in 1,25-dihydroxyvitamin D3-responsive epithelia. Cloning and characterization of the two homologous calcium channels ECaC1 and ECaC2 suggested those to be highly calcium selective and show inward rectification and calcium dependent feedback inhibition.

The aim of my project was to investigate a number of pharmacological tools that inhibit ECaC1 currents carried by monovalent cations. To measure these currents the whole cell patch clamp technique was applied to transfected human embryonic kidney (HEK 293) cells that were visually identified by exciting green fluorescent protein (GFP) in the patch clamp set up. To prevent the fast calcium dependent inactivation of ECaC1 cells were dialyzed with 10 mM BAPTA or 10 mM EGTA.

Here several reasonably sensitive blockers of ECaC1 have been tested. Finding a specific high affinity blocker will improve our knowledge of ECaC channels in diseases caused by defective calcium reabsorption. This could possibly open up new therapeutical options in the treatment of these disorders.

Department of Physiology, Katholieke Universiteit Leuven, Faculteit Geneeskunde, Campus Gasthuisberg (O/N), Herestraat 49, B-3000 Leuven, Belgium