# Abstract

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Title of diploma thesis: Study of substance transport via membrane transporters

Wide range of specialized transport proteins expressed mainly in the kidney proximal tubule ensures the excretion of endogenous and exogenous substances. OCT2 (organic cation transporter 2) is localized on the basolateral membrane of the kidney proximal tubule, the transporter transports broad spectrum of structurally different substances. Drug-drug interactions may occur at the level of this transporter due to its broad substrate specificity.

Within this diploma thesis the accumulation of the radiolabeled antiviral agent [$^3$H]lamivudine and the model hOCT2 substrate [$^3$H]MPP$^+$ was evaluated using accumulation and transport studies. The canine kidney cells MDCKII or human cell line HeLa were used as model cell lines. Mentioned cell lines expressed the human OCT2 transporter stably or transiently. The antibacterial chemotherapy agent trimethoprim was used as competitive inhibitor of OCT2 transporter.

The results indicate the lamivudine accumulation in the cells with OCT2 is low compared to accumulation of MPP$^+$. Accumulation studies showed that lamivudine had a higher affinity to OCT1 transporter compared to OCT2 transporter. With simultaneous application of trimethoprim, there was only a slight decrease in lamivudine accumulation compared to control cells. Despite known facts, lamivudine was identified as weak substrate of OCT2 transporter under our laboratory conditions. Therefore it is not suitable substrate for conducting experiments that would reveal drug-drug interactions at the OCT2 transporter level.