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Title of diploma thesis: Pharmacological and physiological characteristics of organic cation transporters (OCTs) and multidrug and toxin extrusion proteins (MATEs)

**Abstract:**

Membrane transporters are important and life-enabling proteins of the body, which facilitate the absorption, distribution, and elimination of nutrients, metabolic waste products, drugs, and xenobiotics. Multidrug and toxin extrusion proteins (MATEs) and organic cation transporters (OCTs) belong to polyspecific transporters of the solute carrier (SLC) family and form a cooperating system of excretion in the kidney and liver. The transporters are expressed in many tissues throughout the body primarily in the kidneys, liver, heart, brain, small intestine, and placenta and transmit countless molecules from the natural neurotransmitters and hormones to exogenous compounds, such as metformine, cimetidine, 1-methyl-4-phenylpyridinium (MPP), tetraethylammonium (TEA) or acyclovir. Furthermore, there are described the most recent studies in knockout mice models and genetic polymorphisms that help identify transporters activity and pharmacokinetics with altered function. They are beneficial for discovering new safer drugs or co-medication which have reduced or any adverse effects and for improvement of the drug therapy.