**Abstract**

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Title of diploma thesis: Flow-cytometric analysis of inhibitory effect of novel targeted drugs on the activity of ABC drug efflux transporters

Cancer is the second leading cause of death. Cancer treatment often combines conventional chemotherapy, radiation therapy and surgery. More recent approach to treatment is the use of targeted cancer therapy with a greater specificity towards cancer cells. Development of resistance is a major obstacle in the success of chemotherapy. Multidrug resistance (MDR) can be acquired through various mechanisms e.g. overexpression of efflux transporters. ATP binding cassette (ABC) transporters represents a large family of transmembrane proteins that use ATP to pump molecules across the membrane. The three main ABC proteins related to MDR are: P-glycoprotein (ABCB1), multidrug resistance-associated protein 1 (ABCC1) and breast cancer resistance protein (ABCG2). Use of ABC transporter inhibitors increases the amount of chemotherapeutical substrates accumulated within the cells. In this study we evaluated interactions of six synthetic small molecule inhibitors (alisertib, ensartinib, entrectinib, talazoparib, tepotinib, vistusertib) with ABC transporters measuring intracellular drug accumulation in Madin-Darby Canine Kidney II (MDCKII) cell lines. Most of the drugs inhibited all three of the transporters with different affinity. Our results can be possibly further exploited to overcome resistance to chemotherapeutics or as a valuable background for understanding of the occurrence of possible drug-drug interactions perpetrated by tested drugs.