

ABSTRACT

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Title of diploma thesis: Experimental approaches for studying hepatic enzyme induction mediated by pregnane X receptor

The thesis focuses on hepatic pregnane X receptor (PXR)-mediated induction of biotransformation enzymes. Emphasis is placed on experimental models and methods which are used for the assessment of enzyme induction. In addition to summarizing its well-established role as a xenobiotic-sensing receptor, PXR is also presented as a transcription factor with an important role in endogenous pathways. Furthermore, cell and animal models are evaluated in terms of expression and function of PXR and its target xenobiotic-metabolising enzymes. Primary human hepatocytes in 2D cultures are considered to be the gold standard of *in vitro* hepatic models. However, 3D technologies are expected to be increasingly used in the future. The use of animal models is limited due to pronounced interspecies differences in PXR activation. Thus, humanized models have been established to overcome these limitations. Next, this thesis comments screening methods for an assessment of interaction between PXR and candidate drugs. Moreover, the polymerase chain reaction (PCR) and its modifications are described as methods which allow to quantify the induction of biotransformation enzymes. Altogether, this thesis brings an overview of experimental models and current methodical trends in the field of PXR studies.