

ABSTRACT

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Biochemical Sciences

Candidate: Barbora Wengrynová

Supervisor: doc. Ing. Petra Matoušková, Ph.D.

Title of diploma thesis: Plasmid construction for expression of UDP-glucosyltransferase from *Haemonchus contortus*

The barber's pole worm (*Haemonchus contortus*), like other organisms, uses biotransformation enzymes to metabolize exogenous and endogenous substances. Important representatives of these enzymes are also UDP-glycosyltransferases, which catalyze the formation of a covalent bond between hexose activated by uridine diphosphate and the metabolized compound, thus helping to eliminate undesirable substances. Increased attention to these enzymes is due to the involvement of UDP-glycosyltransferases in the development of resistance to anthelmintics, which are used to treat hemonchosis. The study of their properties and functions can significantly help in solving resistance issues.

UGTs are divided into several families and subfamilies depending on sequence similarities. This work focuses on three representatives of UGT in the *Haemonchus contortus*, UGT24C1, UGT365B6 a UGT368B2.

The theoretical part of the diploma thesis includes knowledge about the *Haemonchus contortus*, hemonchosis and its treatment, biotransformation enzymes and also includes an explanation of the used methods.

The aim of this work was to prepare a plasmid with a cloned gene encoding UGT, to confirm its correct sequence and to verify its functionality, so that it can be used for further study of enzyme activity.