Summary

Bile acids act as important fat emulsifiers in the human body. However, it is increasingly becoming apparent that they also play a role as important signalling molecules. Bile acids are a relatively heterogeneous group differing also in their metabolic effects. Their individual proportion in the body is highly variable and strongly influenced by the composition of the microbiome. The importance of individual bile acids is not yet well enough described to be fully exploited in clinical practice. For this reason, the determination of bile acids by enzymatic methods seems to be considered sufficient in most departments. Another and more reliable option is the increasingly widespread use of liquid chromatography-tandem mass spectrometry (LC-MS/MS).

The aim of my work was to test the reliability of the enzymatic method and to introduce a method for the determination of bile acids, including the measurement of such atypical ones for example microbial conjugates and keto- and isoderivatives. Moreover, I aimed to test sample preparation for the measurement of 7α-hydroxy-4-cholesten-3-one, the bile acid biosynthesis marker.

We used these methods to investigate the changes in bile acid composition changes in iron overload rats. In this rat model of genetically determined disorders of iron metabolism, bile acid metabolism was previously unknown. In our next study, we focused on the interaction between *Eggerthella lenta* and bile acids, using determination of atypical bile acids, especially their ketoderivatives. Finally, we were interested in a diagnostic potential of bile acids. We found, that taurochenodeoxycholic acid could serve as a reliable marker of clinically significant portal hypertension.