

## **ABSTRACT**

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Title of Diploma thesis: **Metabolomic analysis of bile acids in various biological samples**

This thesis aimed to establish a suitable qualitative and quantitative analysis of selected bile acids in mouse liver, human plasma and especially in human hair. Nine selected bile acids were analyzed (cholic acid, deoxycholic acid, chenodeoxycholic acid, ursodeoxycholic acid, lithocholic acid, taurocholic acid, taurodeoxycholic acid, glycocholic acid and glycochenodeoxycholic acid). An identification and a quantification of the bile acids have been performed by UHPLC with two types of hybrid mass spectrometers (Quadrupole connected to Time of Flight and Quadrupole connected to Orbitrap). We tried to develop a method that allows a detection of both unconjugated bile acids and their glycine- and taurine-conjugates in biological samples. To develop and optimize this method, mouse liver and human plasma were used. Afterwards, the method was used to detect bile acids in human hair, because the bile acids could serve as potential biomarkers for the cholestasis. Hair samples obtained from different patients were used for analysis: hair samples from mothers suffering from obstetric cholestasis and from their neonates, and from men without any information about their diagnosis. All studied bile acids, except chenodeoxycholic and lithocholic acid, were detected in hair samples obtained from the neonates. Some of them were also found in hair obtained from the mothers suffering from obstetric cholestasis. The hair samples from the men were bile acids negative. The developed method will be used for further analyses of bile acids in various biological samples.

**Key words:** bile acids, UHPLC, MS, mouse liver, human plasma, human hair, cholestasis