ABSTRACT

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Title of diploma thesis: Effect of doxorubicin on selected mice microRNAs

Doxorubicin (DOX) belongs to the anthracycline antibiotics used by patients suffering from cancer. Its undesirable effect is cardiotoxicity. Prognostic of cardiotoxicity depends on its early detection, and therefore many studies examine the properties of microRNAs that could be appropriate biomarkers for heart failure in the future. MicroRNAs are involved in almost all processes in the human body, in development, differentiation, proliferation and apoptosis. They are also located in the extracellular space, they are stable and have many other positive properties.

My diploma thesis is focused on monitoring changes in microRNA levels that can occur in heart damage by doxorubicin. The cardiac tissues and plasma of mice treated with doxorubicin were used as samples and compared with control samples. Samples were processed and evaluated by real-time quantitative PCR (qPCR). A statistically significant increase in expression in heart tissue occurred only in miR-34a and decrease in miR-205 level. Plasma mice samples showed a statistically significant increase in expression of miR-205, miR-34a, miR-133 and miR-1. MicroRNAs could be used as a biomarkers, but they need to undergo many further studies.

In addition to new potential biomarkers, concentrations of traditional markers of cardiotoxicity, troponins, have also been observed. These proteins were processed from cardiac and mouse plasma samples. Levels of troponin concentrations T and I were increased in hearts as well as troponin T levels in mouse plasma treated with DOX.

Key words: doxorubicin, microRNA, troponins, qPCR, immunoblotting