ABSTRACT
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Title of diploma thesis: Determination of mRNA of DHRS3 enzyme in human tissues by real-time SYBR green qPCR

Dehydrogenase/reductase (SDR family) member 3 (DHRS3, also known as SDR16C1, retSDR1) is NADPH dependent carbonyl reductase, member of the short-chain dehydrogenases/reductases superfamily. DHRS3 was characterized for the first time by Haeseleer et al. as an enzyme that reduces all-trans-retinal to all-trans-retinol in the visual cycle that is localised in the outer segment of the cone photoreceptors in bovine retina. However, expression of DHRS3 was shown in some other tissues. It was proven that DHRS3 plays an important role in embryogenesis and tumour development. It was also established that DHRS3 participates in the reduction of some endogenous compounds (androstendione, estrone, DL-glyceraldehyde) and xenobiotics (acetohexamide, 4-nitroacetophenone, benzil) *in vitro*. DHRS3 seems to be an important enzyme with participation in significant metabolic pathways. Nevertheless, knowledge of some DHRS3 properties, including expression in human tissues, is quite poor. The aim of this study was to determine expression of DHRS3 at mRNA level in human tissues and thus bring new knowledge about its possible role in human organism.

A collection of properly preserved human samples was tested. Following the homogenization, RNA was isolated. Obtained RNA was used for transcription to cDNA that was utilized as a template for real-time quantitative PCR. Number of DHRS3 transcripts was determined in tissue samples.

The strongest expression of DHRS3 mRNA was detected in the thyroid. Lower number of DHRS3 transcripts was measured in liver, prostate and testes. Weak expression was observed in stomach, kidney and adrenal glands. No or very low expression was detected in heart, brain, lungs, spleen, pancreas, small intestine, large intestine, skeletal muscle and eye.