ABSTRACT

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Title of diploma thesis: The mechanism of vasodilation effect of 4-methylcatechol *ex vivo*

Keywords: rat, aorta, flavonoids, 4-methylcatechol, vascular smooth muscle, vasodilation

Flavonoids belong to the group of polyphenolic bioactive substances found abundantly in plants, fruits and vegetables. Thanks to their pharmacological and biochemical effects, they play a crucial role for human health, especially in the prevention of numerous diseases – metabolic syndrome, osteoporosis, atherosclerosis and also diseases of a cardiovascular system.

The aim of the diploma thesis was to determine the mechanism of the vasorelaxant effect of one of the most important metabolites of flavonoids – 4-methylcatechol. For the research we used a standardized *ex vivo* method on isolated Wistar rat aortic rings. We were able to confirm the vasodilatory effects of 4-methylcatechol. We also confirmed the fact that the flavonoid metabolite directly affects a vascular smooth muscle.

Furthermore, we found that the tested compound potentiates the vasodilatory activity of sodium nitroprusside and forskolin, and that vasodilation depends on the activity of voltage-gated membrane K_v channels, especially the K_v7 subtype. On the other hand, we excluded a direct effect of 4-methylcatechol on membrane channels BK_{Ca}, K_{ir} and K_{ATP}. We also excluded direct activation of soluble guanylate cyclase and protein kinase G in smooth muscle.