

## **ABSTRACT**

Charles University

Faculty of Pharmacy in Hradec Králové

Department of Pharmacology and Toxicology

Student: Linda Tamášiová

Supervisor: doc. PharmDr. František Trejtnar, CSc.

Title of diploma thesis: In vitro evaluation of novel Toll-like receptor ligands III

Research on new ligands with potential immunomodulatory activity is a tool for the development of new immunological adjuvants for use in vaccines, or as separate immunomodulators in the treatment of various diseases. The aim of this thesis was to analyze the ability of new ligands to stimulate toll-like receptors 4 (TLR4) and to assess the potential for further use of these substances based on established immunomodulatory activity. The analysis was performed on modified TLR4-expressing cell lines whose activation was subsequently detected using a colorimetric-enzymatic reaction. Sixteen new substances were tested for TLR4 receptor activation in comparison with a standard agonist. The results showed a significant TLR4 agonistic activity in several of the test substances, suggesting that they are activating ligands of the receptor tested. However, due to their low solubility, some of these substances are not suitable candidates for further use and testing. Taking all parameters into consideration, among of all of the evaluated substances that showed agonistic activity, ligands SB003 and SB010 appear to be perspective ligands for further evaluation. Substance SB005 exhibited partial antagonistic activity and is therefore a suitable candidate for further investigation of TLR4 antagonistic potential of the tested group of compounds.

### **Key words**

adjuvants, TLR4, vaccines, immunomodulators