

FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Immunoregulatory microbial compounds; Chemical synthesis, functional analysis, and new regulatory-molecule complex

Name: Yukari FUJIMOTO

Institution: Osaka University

1. Background of research

Some of major health issues in modern society have correlations to the immune system; the recent increase of allergic diseases has links to the immune system development in early childhood, and cancers or vascular diseases originated from chronic inflammation link to the functions of immune system. In the modulation of the immune system, microorganisms such as bacteria (including resident microbiota) play important roles, but the molecular bases of these functions are not well known yet.

2. Research objectives

Development of novel synthetic methods to obtain structure-determined microbial components that have immunomodulatory activities, will be achieved. A compound library of the immunomodulatory compounds will be also build with the established methods. Having these library compounds, the derivatives and also the labeled compounds, we will analyze the structures of bacterial-related immune stimulatory activities in the environments and functional analysis of the immune system. Novel immunomodulatory-compound complex will be also developed using with the synthesized library compounds to contribute to the treatment of diseases.

3. Research characteristics (incl. originality and creativity)

The development of organic chemical syntheses for the microbial immunomodulatory components will contribute for building useful bioactive molecule library, which will also be applicable for the functional analysis of immune system. Designing novel molecule structures for the immune modulation, along with their analysis and the precise syntheses will pioneer a new field.

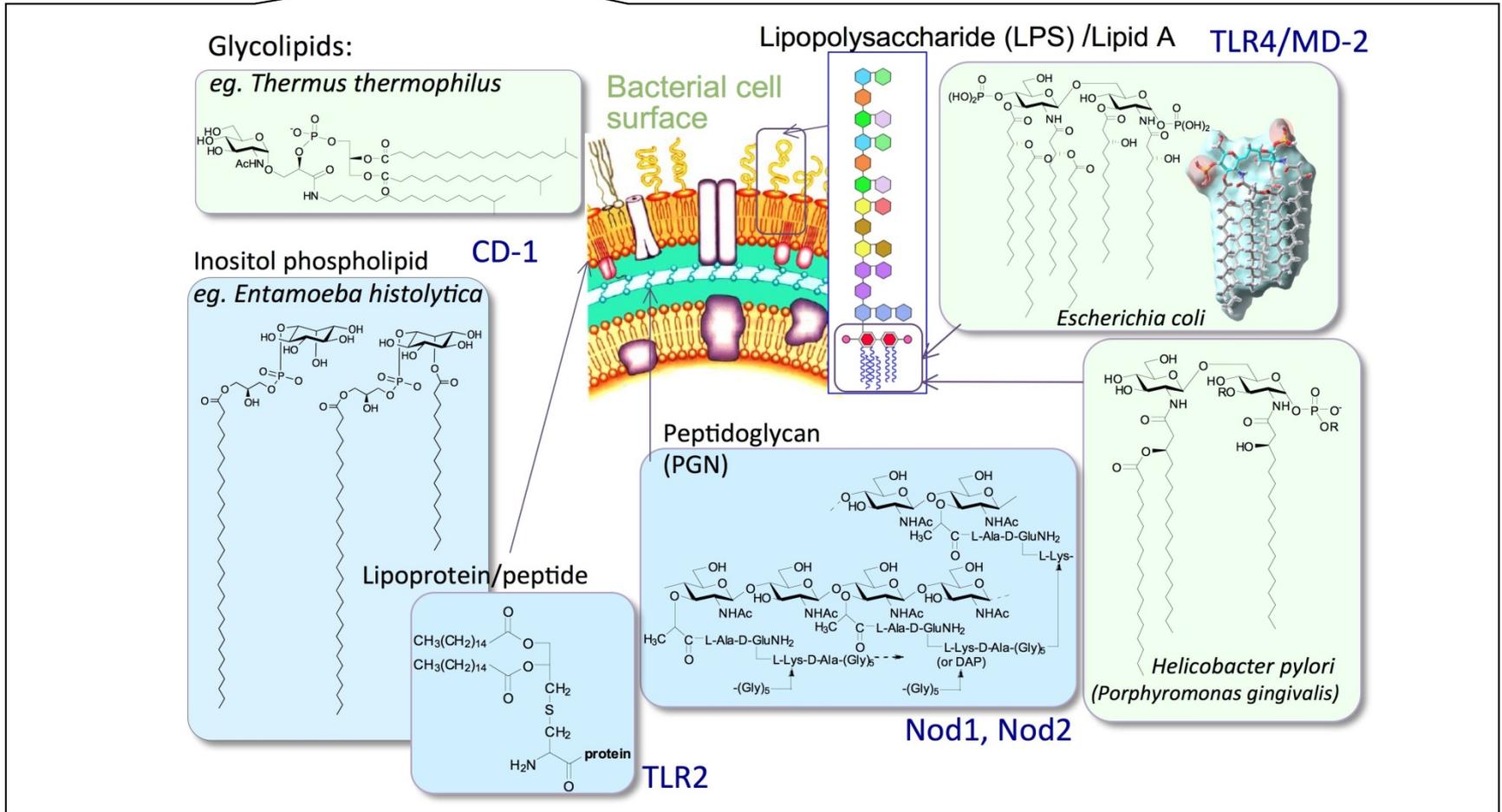
4. Anticipated effects and future applications of research

Expected contributions include understanding the molecular basis for preventing allergic diseases in the environment, focusing on microbial components. The project will also contribute to understand the causative molecules of chronic inflammation related to microbial infections, and also to develop new immunomodulatory compounds for the basis of treatment for cancer and infections diseases.

Development of chemical synthesis for immunomodulatory microbial components

Building immunomodulatory compound library

Analysis of immunomodulatory bacterial compound structures in the environment



Functional analysis with molecular probes derived from the library compounds

Development of novel immunomodulatory-compound complex