



PhD in CHIMICA INDUSTRIALE E INGEGNERIA

CHIMICA / INDUSTRIAL CHEMISTRY AND CHEMICAL ENGINEERING - 37th cycle

THEMATIC Research Field: ROLE OF LIPOOLIGOSACCHARIDE ON CONFORMATION AND ACCESSIBILITY OF GRAM-NEGATIVE ANTIGENS

Monthly net income of PhDscholarship (max 36 months)

€ 1325.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity

Motivation and objectives of the research in this field

Antigenically complex vaccines based on outer membrane vesicles (OMV) may offer the greatest breadth of antigen inclusion. Bacterial outer membranes are constituted of a lipooligosaccharide (LOS) layer which is one of the most complex membrane environments. LOS are recently studied as promising components of antigenically complex vaccines because LOS variants have been shown to influence the binding of specific monoclonal antibodies. However, how LOS influences protein antigen conformation and dynamics as well as their accessibility to the immune system is still poorly understood. The objectives of this project aim to investigate how LOS influences conformation, dynamics as well as accessibility to the immune system of the main *N. gonorrhoeae*. This information would have the potential to improve the formulation of *N. gonorrhoeae* OMV-based vaccine.

Methods and techniques that will be developed and used to carry out the research

Development of new analytical methods to study outer membrane proteins in their native state and identify epitopes recognized by monoclonal and polyclonal antibodies. This activity will be performed in GSK Vaccines S.r.l., located at Via Fiorentina 1, Siena, 53100, Italy, and supervised by Nathalie Norais (nathalie.x.norais@gsk.com).

The use of an hexapeptide library for the selection of



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| | peptides with the potential to bind IgG Fc at acidic conditions and the characterization of those peptides. This activity will be performed in Dep. Chemistry, Materials and Engineering Chemistry "G. Natta" and supervised by Prof. Elisa Fasoli (elisa.fasoli@polimi.it). |
| Educational objectives | Ph.D. program gives the possibility to candidate to increase the knowledge in many different aspects of project. The candidate will have the possibility to choose many courses, organized to answer to different experimental and theoretical needs. Another opportunity is to attend training schools, dedicated to specific methodologies and technologies. In GSK, the students will participate to courses dedicated to the development of soft skills, will have the possibility to participate to seminars related to vaccine discovery and development from worldwide recognized scientists. |
| Job opportunities | The Ph.D. students will acquire experience in the field of genomics, proteomics and mass spectrometry, absolutely required in the pharmaceutical and industrial companies as well as in the medical laboratories. |
| Composition of the research group | 1 Full Professors 3 Associated Professors 2 Assistant Professors 7 PhD Students |
| Name of the research directors | Prof.ssa Elisa Fasoli Nathalie Norais, Ph.D. |

| Contacts |
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| Prof.ssa Elisa Fasoli elisa.fasoli @polimi.it Nathalie Norais nathalie.x.norais@gsk.com |

| Additional support - Financial aid per PhD student per year (gross amount) | |
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| Housing - Foreign Students | -- |
| Housing - Out-of-town residents (more than 80Km out of Milano) | -- |

| Scholarship Increase for a period abroad | |
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| Amount monthly | 566.36 € |
| By number of months | 6 |



Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Confidentiality:

since this is a thematic scholarship, the management of Confidential Information, Results and their publication is subordinate to the restrictions agreed upon with the funding company. Upon acceptance of the scholarship, the beneficiary must sign a specific commitment.

Educational activities (funding for participation in courses, summer schools, workshops and conferences) - financial aid per PhD student per year:

1st year: -

2nd year: about 1.500 euros per student

3rd year: about 1.500 euros per student

Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD student:

There are various forms of financial of for activities of support to the teaching practice. The PhD