Early Stage Researcher position as a PhD scholarship available at the Department of Chemistry, University of Milan (ITALY), in the framework of the EU-funded Marie Skłodowska-Curie ITN-ETN training network "GLYCOVAX: A Training Network for the Rational Design of the Next Generation of Well-Defined Glycoconjugate Vaccines".

The GLYCOVAX network
The GLYCOVAX network aims at the education of promising young scientists who will learn how to rationally design well-defined and innovative glycoconjugate vaccines to improve current preventive therapies and tackle unmet medical needs. GLYCOVAX is based on a profound interaction between the academic and industrial sectors, involving 8 academic groups and 2 industrial partners with complementary expertise in chemical/enzymatic synthesis of carbohydrates, conjugation techniques, high throughput screening technology, structural glycobiology, vaccinology and immunology. In this highly multidisciplinary environment several ESRs will be trained in the growing field of glycoscience and vaccinology, enriching their skills and combining different state-of-the-art methodologies for the rational design of innovative glycoconjugates. The research activities implemented in the 4 scientific Work Packages of GLYCOVAX will be applied to epidemiologically relevant disease areas of meningitis, neonatal infections, and nosocomial infections. For more information on GLYCOVAX network please visit: www.glycovax.eu.

Research group and general conditions
The PhD student will be placed at the Department of Chemistry, University of Milan, in the laboratory of Prof. Luigi Lay (http://users.unimi.it/luigilaygroup), and under his supervision. The recruited PhD student will be enrolled in the PhD programme in “Chemistry”, and will be covered under the social security scheme. He or she will receive a Monthly Living Allowance plus a Mobility Allowance compliant with the applicable EC Marie Skłodowska-Curie Actions-ITN general conditions. The recruited PhD student will participate in the network’s training activities and work placements at the laboratories of the participating academic and industrial partners. In addition, the training programme of the recruited ESRs will be supplemented by regular meetings and workshops within the GLYCOVAX International Training Network.

The research project

ESR15: Synthesis of Haemophilus influenzae type a oligosaccharides for vaccine development.

The synthesis of Haemophilus influenzae type a (Hia) polysaccharide fragments will be the major task of this project. Haemophilus influenzae (Hi) is a Gram negative bacterium causing, i.a., meningitis and otitis, especially in small children. Amongst 6 different capsulated strains identified for Hi, group b and a are the most virulent serotypes. Until the introduction of H. influenzae type b (Hib) polysaccharide conjugate vaccines this bacterium was the leading cause of bacterial meningitis in children in the USA. However, the massive vaccination campaign against Hib roused some concern about the possibility of serotype replacement. Although invasive infections involving Hi serotypes other than b were sporadic and rare, in recent years it has been reported that Hia can cause up to 10% of Haemophilus infections. In addition, Hia infections exhibit antimicrobial resistance to commonly used therapeutic agents, making treatment more challenging. The capsular polysaccharide (CPS) of Hia is a polymer of 4-β-D-Glc-(1→4)-D-ribitol-5-(PO4→). In spite of the
structural similarity of Hia with Hib CPS, no cross-protection has been observed to type a by immunization with Hib conjugate vaccines.

The fellow will be engaged in the first synthesis of Hia CPS repeating unit, and its oligomers (at least from 2 to 5 repeating units). These glycans will be linked to a proper protein carrier by using site-selective conjugation method in order to provide glycoconjugates with well-defined composition suitable for epitope mapping of Hia CPS.

Planned secondments are in Leiden (University of Leiden, NL) to be trained in automated glycan assembly, in Lisbon (Institute of Molecular Medicine, PT) to be trained in protein conjugation techniques, and in Siena (GSK Vaccines, IT) to perform the immunological characterization of the glycoconjugates.

Starting date of the PhD programme: July 1st 2017.

Admission criteria for doctoral education at the University of Milan
In order to apply for a place in the PhD programme, students must have a second-level degree, an equivalent qualification, or an equivalent qualification by study level (Master’s Degree) from a foreign University. In addition, English language skills at B2 level (minimum) is required to cover the position. The suitability of the foreign academic qualifications in terms of content is appraised by the Examining Board constituted for admission to each PhD programme, in compliance with the regulations in force in Italy and in the country in which the academic qualification was issued, and the international treaties or agreements pertaining to the conferment of qualifications for the continuation of studies.

Other project specific requirements
- Master degree in Chemistry or equivalent
- A suitable background for the open position includes synthesis and structural characterization of carbohydrates and oligosaccharides;
- A basic background in biochemistry will be also appreciated;
- Experience in performing laboratory work independently;
- Good collaborative and social skills and an open-minded mind-set;
- Good proficiency in written and spoken English (minimum B2 level).

Mobility eligibility requirement
The fellow must not have resided in the country where the research training activities will take place for more than 12 months in the 3 years immediately prior to the recruitment date (and not have carried out their main activity (work, studies, etc.) in that country).

Experience eligibility requirement
Eligible applicants must have less than 4 years research experience (Early Stage Researcher) at the signature of the contract (measured from the time the Master’s degree has been obtained). Eligible applicants must not have a PhD yet.

Application procedure
The applicant must send the following documents (if possible included in a single zipped file attachment) to Prof. Luigi Lay (luigi.lay@unimi.it) within 31st may 2017, clearly indicating in the subject “Application for ESR15 position”:
1) an updated CV;
2) a letter giving reason for his/her motivation for the position;
3) at least 2 reference letters (in English), at least one of them from one former supervisor and/or lecturer;
4) the scan of the degree (usually the Master Degree) which would formally entitle him/her to embark on a doctorate, either in the country in which the degree was obtained or in the country in which the researcher will be recruited. In case the degree has not been obtained yet, it is necessary to send a declaration of the university stating that the degree will be obtained before the expected starting date (see below);
5) a document indicating his/her ranking and marks within his/her last year at his/her Master Degree as well as the courses/modules they have attended (optional). This document is mandatory for applicants who do not have yet obtained the degree.
6) a summary of the Master Degree thesis or a brief description of the past scientific activity (this can also be included in the CV.

**IMPORTANT NOTE:** The applicants must assure their availability to start the PhD programme on July 1st 2017.

**Assessment criteria**
Applications must be in English and will be evaluated against the following criteria:
- Educational record;
- scientific quality of the applicant’s CV;
- expected individual impact and benefit to the fellow and to the project.
- previous experience in the subject of GLYCOVAX research programme.