Train2Target –
An integrated multidisciplinary approach towards a new generation of antibiotics: Targeting function and cross-talk of bacterial envelope protein machineries

2 Early Stage Researchers positions available as PhD scholarships, at the University of Milano

Job Summary:
Train2Target is a multidisciplinary European Training Network funded by the European Commission under the Horizon 2020 Marie Skłodowska-Curie Action (no. 721484). Eleven research groups from academia and private sector have come together to address the challenge of the discovery of innovative antimicrobials. In the context of Train2Target network the Department of Pharmacological and Biomolecular Sciences at the University of Milano has vacancies for 2 Early Stage Researchers (ESRs, PhD students). The ESRs will be offered an interdisciplinary education programme that includes a PhD trajectory with training-through-research in individual projects, secondments at research groups of other network partners, and a variety of local and network-wide courses and workshops.

Job Description:
Infectious diseases are still among the top 10 causes of death worldwide. The most relevant factor accounting for the high incidence of infectious diseases is the increase and spread of multi drug resistant (MDR) strains, which is leaving clinicians with very limited options to treat infections especially those from Gram-negative pathogens. The bacterial cell envelope is still one of the best targets for antimicrobial discovery. Train2Target is an interdisciplinary project aiming at dissecting the biogenesis of the cell envelope of Gram-negative bacteria, in particular peptidoglycan biosynthesis and outer membrane assembly whose assembly is carried out by sophisticated molecular machines. The Train2Target project aims at dissecting at the molecular level the function and coordination of core envelope machineries by using interdisciplinary approaches. Innovative in vivo and in vitro assays will be also developed to find molecules that alter the function and/or disrupt the coordination of envelope machineries thus providing new drugs to be developed as innovative antibiotics.

The international consortium consists of partners with excellent scientific qualifications in multiple disciplines allowing interdisciplinary research. In total there are 15 open ESR positions within the Train2Target program. During the research secondments will be performed at the premises of other partners to ensure multidisciplinary training, knowledge transfer within the partners, and close collaborations.

2 PhD positions available (ESR), at the University of Milano – PhD Molecular and Cell Biology

Research Training projects
The Lpt transport system is a molecular machine consisting of 7 proteins located in the inner membrane in the periplasm and in the outer membrane. These proteins are essential for bacterial survival and form a complex that ensure the continuous export of lipopolysaccharide to the cell surface. Several molecular details of such process are still unknown namely how the Lpt machine is assembled and how the lipopolysaccharide export is coordinated with peptidoglycan growth.

Project 1: the selected PhD candidate will use genetic and biochemical approaches to study the assembly of wild type and mutated Lpt machineries both in *Escherichia coli* and *Pseudomonas aeruginosa*. He/She will also explore how lipopolysaccharide biogenesis is coordinated with peptidoglycan growth.
Project 2: the selected PhD candidate will develop tools to set up genetic and biochemical screens to identify molecules that inhibit the assembly of the Lpt multiprotein machinery. The identified molecules will also be used as probes to structurally characterize the target protein(s) by defining their mode of action. Possible resistance mechanisms will also be explored.

Benefits:
Salary and additional benefits are according to EU-standards for Marie Curie ESRs. Additional benefits are foreseen for mobility and family allowance (if applicable).

Eligibility criteria:
Master degree (M.Sc. or equivalent graduation). Applicants must not yet been awarded a PhD degree and must be in the first 4 years (full-time equivalent) of their research careers prior to the recruitment. They must not have resided or carried out their main activity (work, studies, etc.) in Italy for more than 12 months in the 3 years immediately prior to the recruitment.

Application:
Applicants have a master degree (M.Sc. or equivalent graduation) in Biology, Biochemistry or related area and are interested in multi-disciplinary research.

To apply please send following documents in one PDF-file to alessandra.polissi@unimi.it
1. Personal statement/motivation letter (up to 2 pages) about the applicants’ experience and interests
2. A complete CV (personal details academic/education history, research experience, experimental skills, publications etc.)
3. Proficiency of English language skills corresponding to at least level B2 on the Common European Framework of Reference for Languages
4. Official list of grades obtained during the applicant’s bachelor and master studies
5. Names and contact information of at least two academic referees who could write a letter of recommendation

Please note that only complete application sets will be considered.

Application deadline: 28th March 2017

Start date (planned): June 1st 2017

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