

BREAKthrough

Breaking the barrier - An integrated multidisciplinary approach to kill Gram-negative bacteria through existing antibiotics by making their outer membrane permeable



3 PhD positions available at the University of Milano -

What we offer:

The BREAKthrough project funded under HORIZON-TMA-MSCA-DN action, aims to educate the next generation of scientists with expertise in antimicrobial resistance. Within the doctoral programmes it offers, doctoral candidates will benefit from the following:

- An extensive network-wide training programme offering courses in the areas of science and technology, business, as well as generic, transferable skills;
- The opportunity to work in a multidisciplinary team within a Europe-wide consortium of research institutions and SME/industrial partners, comprising experts in microbiology, pharmacology, and chemistry;
- Intersectoral and international experience through 2 secondments at partner organisations,
- A competitive salary including mobility and family allowances.

With the wide range of skills and experience gained in the BREAKthrough project, doctoral candidates will have broadened their career perspectives and increased their employability, whether they decide to pursue a career in academia or industry.

Project Description:

Antimicrobial resistance, which is caused by multi-drug-resistant bacterial pathogens is a global health emergency. Gram-negative bacteria notably hinder effective treatment because of their impermeable outer membrane (OM). Lipopolysaccharide (LPS), the major component of OM outer leaflet, is the key determinant of the OM barrier properties. Consequently, many standard-of-care antibiotics cannot access intracellular targets in Gram-negative species. The objective of the BREAKthrough European Training Network is to destabilize the OM to make Gram-negative bacteria sensitive to these antibiotics.

Project 1: Department of Pharmacological and Biomolecular Sciences

the selected candidate will optimise and implement novel genetic screening assays that report for the loss of OM integrity based on expression of available bio-reporters and use them for the screening of libraries to assess OM leakiness, ability to sensitise to selected antibiotics and mode of action studies.

Project 2: Department of Pharmacological and Biomolecular Sciences

the selected candidate will characterize non-essential envelope proteins whose function becomes essential when LPS biogenesis is compromised, or the OM outer leaflet disrupted. This project is expected to generate knowledge on new ways to impair cell envelope stability to be used to identify potentiators that can act in combination with standard of care antibiotics.

Project 3: Naicons – Pharma

The selected candidate will be employed for three years by Naicons (Milan, Italy; www.naicons.com), where he/she will perform most of the research work aimed at identifying and characterizing novel antibacterial agents from microbial sources. He/she is expected to perform part of the research work at secondment institutions and to register for a PhD programme at the University of Milano

Eligibility criteria:

- You have a Master degree (M.Sc. or equivalent graduation) in Biology, Biotechnology, Biochemistry or related areas.
- You have not already completed (or successfully defended) a PhD degree.
- You have not resided or carried out your main activity (work, studies, etc.) in Italy for more than 12 months in the 36 months immediately before your starting date.
- You must be proficient in English

Application:

To apply please send following documents in one PDF-file to

alessandra.polissi@unimi.it for projects 1 and 2

breakthrough@naicons.com for project 3

1. Personal statement/motivation letter (up to 2 pages) about the applicants' experience and interests
2. A complete CV (personal details, education history, research experience experimental skills, publications etc.)
3. Proficiency of English language skills (at least level B2 on the Common European Framework of Reference for Languages)

4. Official list of grades (in English) obtained during the applicant's bachelor and master studies including official description of grading scale
 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: **6 th March 2023**

Start date (planned): June 1st 2023

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