

PhD position to defend at the chemistry/biology interface

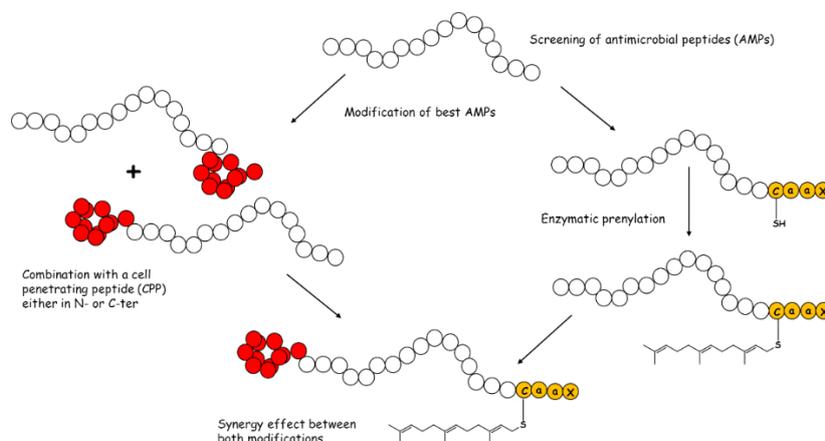
Ecole Doctorale des Sciences Chimiques ED250 – Aix-Marseille Université

Development and improvement of natural antimicrobial peptide: a new hope to fight against mycobacterial respiratory diseases

Description: Humankind is actually facing such a public health challenge related to antibiotic resistance, that it becomes mandatory to develop new therapeutics options to treat multi-resistant infectious strains. This statement is particularly true in the case of tuberculosis (the deadliest infectious disease in the world), a respiratory disease caused by *Mycobacterium tuberculosis* (*M.tb*), whose resistance to traditional antibiotic treatment has been increasingly growing in recent years to become a source of major threat for public health worldwide.

This context of multi-drug resistance strain emergence related to *M.tb*, have paved the way to the development of new antimicrobial agents able to act through different mechanisms, and thus to offer new therapeutic options. To address these issues, naturally occurring antimicrobial peptides (AMPs), found in all living organisms, are of particular interest. In this way, we have already identified a few natural AMPs that are as active as reference antibiotics against *M.tb*, making them promising anti-TB candidates.

In this project, the PhD student will first test numerous peptides available in the lab in order to find the most active ones against *M.tb*. Then, the most effective peptides will be (bio)chemically modified by adding either a cell penetrating (CP) sequence in order to facilitate peptide cell penetration, or by enzymatic prenylation in order to address the modified peptide to the cell membrane for longer residence time and action. The different peptides thus obtained will be tested against extracellular and intracellular *M.tb* growth and compared to unmodified peptides.



If the two strategies (addition of CP and farnesylation) lead peptides with improved activity, then the two modifications will be combined to further increase the effectiveness of these peptides *via* synergistic effects.

Profile: Strongly motivated student with a Master 2 research degree in chemistry, chemical-biology or biological chemistry (with distinction: AB (minimum), B or TB), with good knowledge in chemistry and biology, curious, with teamwork spirit and able to conduct research independently in two labs of the Marseille area.

Requirements: The PhD student will have to defend the project orally in front of the doctoral school of chemistry (ED250) of Aix-Marseille University and the attribution of the scholarship will depend on her/his ranking (**9 allocations** – 18 candidates). The candidate's file (a CV, a cover letter, transcripts and copies of diplomas (Bachelor and Master), a letter of recommendation from the internship supervisor or the master thesis supervisor), must be submitted before May 10th and **the defense will take place on May 21st**.

Contacts:

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