

NAREB: a EU-funded research project for combating antibiotic resistance

18th November 2015: European Antibiotic Awareness Day [1]

The **World Health Organization** has declared **antibiotic resistance** as one of the three greatest threats to human health [2]. This has promoted extensive efforts world wide in order to, for example, implement strategies for a rational use of already existing antibiotics, aimed at stopping and reversing the increasing incidence of infections caused by drug resistant microorganisms, such as **methicillin resistant *Staphylococcus aureus*** (MRSA) and **multi-drug resistant *Mycobacterium tuberculosis*** (MDT-TB).

In the **European Union**, the ECDC has alerted on the increase of antibiotic resistance rates [3], especially on certain pathogens such as MRSA (which have incident rates above 25% in some European countries) and MDR-TB [4].

Infections caused by MRSA or MDR-TB are often difficult to treat, usually require intensive care treatment with a long hospitalization, have increased morbidity and mortality rates, and overall, have a great economic impact in both developed and developing countries. Then, **novel therapeutic strategies are urgently needed**. It is widely accepted that the problem of antimicrobial resistance needs for **international cooperation**, as well as concerted efforts at the national level.

The research project **NAREB (Nanotherapeutics for Antibiotic Resistant Emerging Bacterial Pathogens, [5])** is a multinational consortium (15 EU partners) funded by the European Union 7th Framework Programme, aimed to fight against MDR-TB and MRSA. NAREB is coordinated by Professor Brigitte Gicquel at the Institut Pasteur supported by Inserm Transfert [6] as the partner in charge of the project management and communication.

NAREB project proposes **nanotechnology solutions** based on the design, the preparation and the optimization of several nanoformulations of current antibiotics and novel antibacterial drugs, which are expected to have improved efficiency for treating drug resistance infections. Coordinated work has resulted in the development of several nanoformulations containing drugs used for the treatment of MDR-TB or MRSA, which are currently being characterised *in vitro* and *in vivo*. Activities for the following years will assess safety, regulatory and production (GLP/GMP) aspects for the most promising nanoformulations, and to establishing the Clinical Development Plan for the preparatory work for the subsequent clinical testing of the selected nanoformulations.

[1] European Antibiotic Awareness Day

<http://ecdc.europa.eu/en/eaad/>

[2] World Health Organization

<http://www.who.int/drugresistance/en/>

[3] European Centre for Disease Prevention and Control
http://ecdc.europa.eu/en/healthtopics/antimicrobial_resistance/

[4] European Centre for Disease Prevention and Control
<http://ecdc.europa.eu/en/healthtopics/Tuberculosis/Pages/mdr-xdr-tb.aspx>

[5] NAREB (Nanotherapeutics for Antibiotic Resistant Emerging Bacterial Pathogens)
<http://www.nareb.eu/>

[6] Inserm Transfert
<http://www.inserm-transfert.fr/>

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