

NANOMEDICINES FOR INFECTIOUS DISEASES

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1 FORMAMP

Innovative nanoformulation of antimicrobial peptides to treat bacterial infectious diseases

2 NAREB

Nanotherapeutics for antibiotic resistant emerging bacterial pathogens

3 PneumoNP

Nanotherapeutics to treat antibiotic resistant Gram-Negative *Pneumonia* infections via inhalation

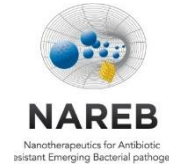
23

M€

41

partners

2014 - 2018



Pseudomonas aeruginosa

MultiDrug Resistant
Tuberculosis MDR-TB

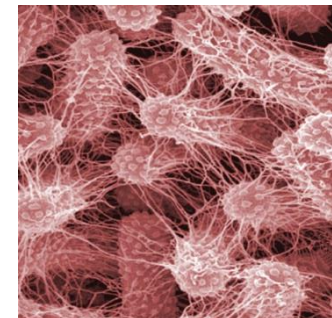
Multidrug resistant Gram-
negative bacteria

*Methicillin-resistant
Staphylococcus
Aureus (MRSA)*

*Methycillin Resistant
Staphylococcus Aureus
(MRSA)*

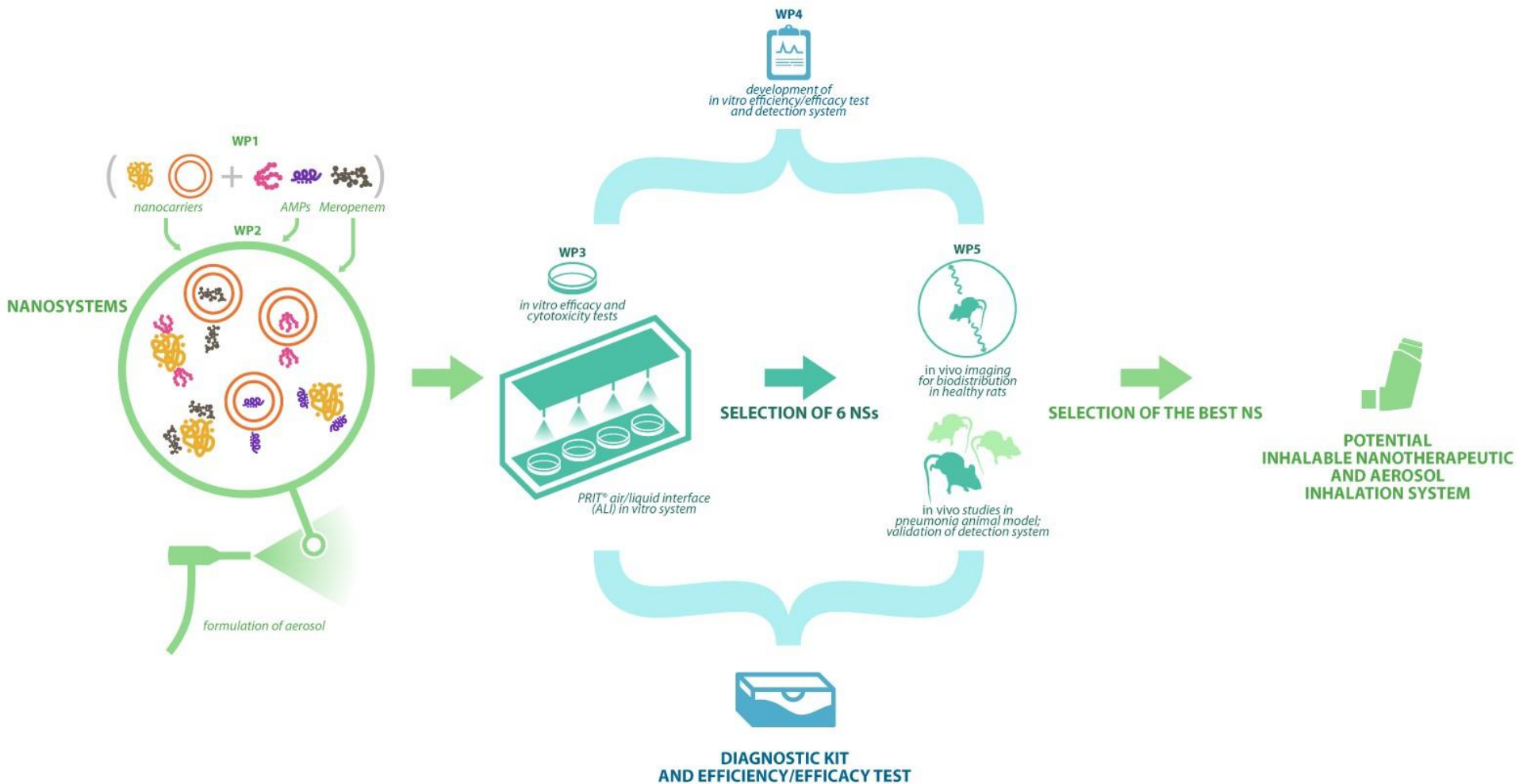
*Klebsiella pneumoniae (K.
pneumoniae)(model)*

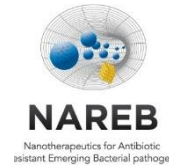
*Mycobacterium
tuberculosis.*



- 1 **Select the most appropriate combinations of therapeutics / nanocarrier**
- 2 **Formulate, characterise and manufacture the selected nanosystems**
- 3 **Perform**
 - activity studies in vitro, ex vivo
 - efficacy studies in vivo
 - regulatory toxicity studies
- 4 **Initiate the Product Development Plan and the regulatory submission**







Lipid nanocapsules

Lipidots® nano emulsion

Single-chain polymer NP

Liquid crystalline NP

PACA NP

Liposomes

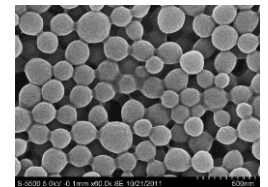
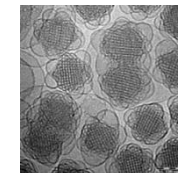
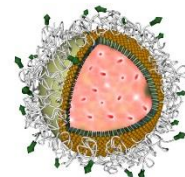
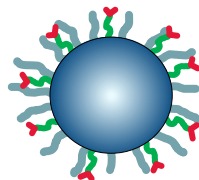
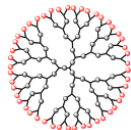
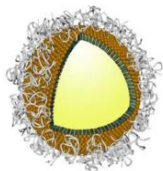
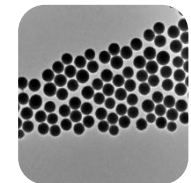
Nanogels

PHMGLA NP

Dendrimers

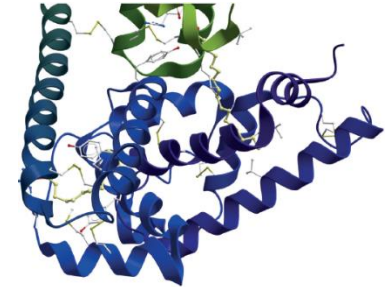
Chitosan

Mesoporous silica NP

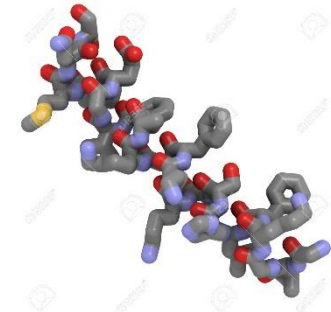




- Antimicrobial Peptides AMP



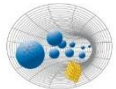
- Antimicrobial Peptide AMPs
- TFD Transcription Factor Decoy
- 12 Antibiotics
 - From pharma industry (GSK)
 - From R&D labs (Pasteur)
 - Vancomycin, Bedaquilin, Daptomycin...



- Antimicrobial Peptide AMPs
- Meropenem (control)



- Cream for topical administration
- Aerosol



NAREB
Nanotherapeutics for Antibiotic-resistant Emerging Bacterial pathogen

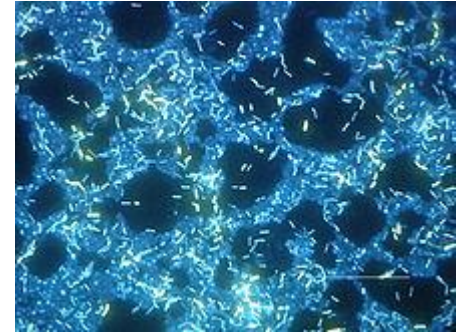
- Aerosol



- Injectable
- Oral form
- Aerosol



- Biofilm penetration
- Loading and release of AMPs
- In vitro, ex vivo and in vivo evaluation
- Process development towards GMP manufacturing
- Preparation of regulatory files



- **Numerous combination drug/carriers have been evaluated in vitro**
- **New AMPs have been developed and are being tested**
- **Cytotox assays on going**
- **Dosage forms have been selected**
- **Formulation work have been initiated to develop the selected dosage forms.**

- **1st Joint meeting**
 - Brussels, 3rd April 2014
 - AMR workshop “Antibiotics and their alternatives - fixing and feeding the pipeline”

- **2nd Joint meeting**
 - Bremen, Jacobs University, July 10-15th 2016
 - In cooperation with IMI « New drugs for bad bugs” initiative



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Thank you for your attention

Merci de votre attention

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