

Antibiotic Resistant Gram-Negative Pneumonia Infections

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Introduction

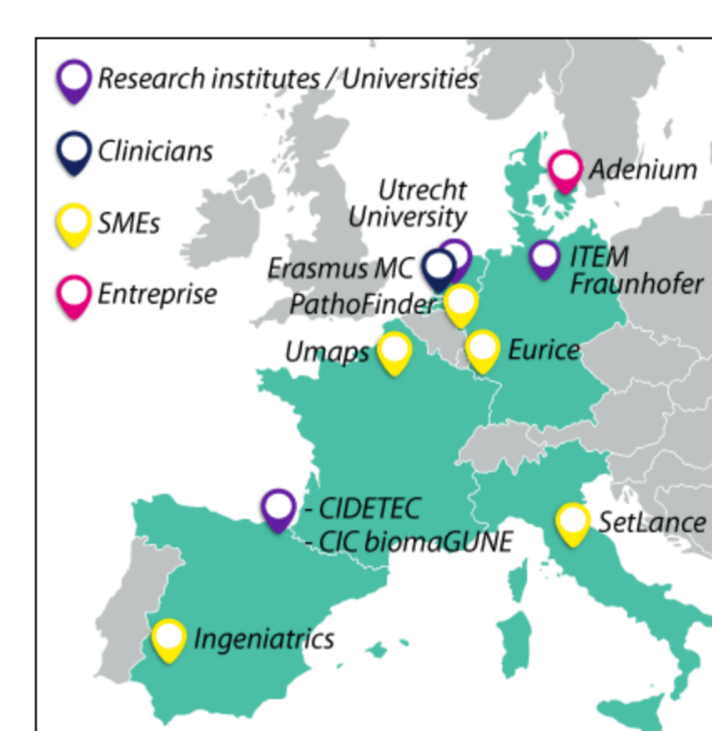
- Antibiotic resistance is a global phenomenon and new types of therapy are urgently required if we are to successfully treat multi-resistant bacteria in the hospital environment.
- Pneumonia associated with Gram-negative bacterial infections is one of the major sources of nosocomial infections.
- The rapid and early detection of infection - combined with the development of novel antibiotics and delivery systems - will radically improve the success of treatment for hospitalized patients.
- PneumoNP will develop such a theragnostic system for the treatment of pulmonary infections associated with Gram-negative bacteria.
- As a proof of concept PneumoNP will focus its attention on multi-resistant (ESBL and carbapenem resistant) *Klebsiella pneumoniae*.
- A diagnostic kit will be developed to enable rapid identification and quantification of respiratory bacterial pathogens, as well as a nanotherapeutic based inhalable antibiotic system based on a nanocarrier combined with an antimicrobial peptide.

Comments

- Antimicrobial peptides show promise as novel antibiotics as the growth of many species of Gram negative bacteria are inhibited by these compounds.
- Pulmonary drug-delivery systems will greatly increase the surface area available for antibiotic delivery and distribution during infection.
- Rapid detection and quantification of bacterial load will allow the physician to quickly assess the success of therapeutic interventions.

The Consortium

- The PneumoNP project is an ambitious project involving 11 partners from 6 European countries



- The PneumoNP project is completing early phase development,
- News will be published on our website (www.pneumonp.eu).

Methodology

- The PneumoNP methodology is divided into distinct, but interdependent, developmental stages and work packages :

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| <ol style="list-style-type: none"> 1) Development of Nanocarriers:
both single-chain polymers and liposomes 2) Use of Novel Therapeutic Agents:
antimicrobial peptides and meropenem 3) Generation of Nanosystems
combining a nanocarrier with a therapeutic agent 4) Aerosol applicator development for the nanosystems | <ol style="list-style-type: none"> 5) <i>in vitro</i> testing using an air-liquid interface model 6) <i>in vivo</i> biodistribution studies using SPECT imaging technique 7) <i>in vivo</i> Proof-of-Concept studies
using an <i>in vivo Klebsiella pneumoniae</i> model of pneumonia 8) Rapid Diagnostic Assay development |
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