

# FEMS 2017

7<sup>TH</sup> CONGRESS OF EUROPEAN MICROBIOLOGISTS

JULY 9-13, 2017 VALENCIA, SPAIN

ABSTRACT BOOK



Scan this QR code  
to view the FEMS 2017 App



In Association with



26<sup>th</sup> Congress of the Spanish Society for Microbiology

**FEMS7-1229**

**Physiology / Biochemistry / Molecular Microbiology**

**FLUOROQUINOLONE RESISTANCE, DNA-CLEAVAGE, REACTIVE OXYGEN SPECIES PRODUCTION, AND PHAGE INDUCTION AFFECTS THE POST-ANTIBIOTIC EFFECT OF LEVOFLOXACIN IN STREPTOCOCCUS PNEUMONIAE**

*M.V. Valenzuela<sup>1</sup>, M.J. Ferrández<sup>2</sup>, A.G. de la Campa<sup>2</sup>, M.T. García-Esteban<sup>1</sup>*

<sup>1</sup>*Universidad Complutense de Madrid, Microbiología III, Madrid, Spain*

<sup>2</sup>*Centro Nacional de Microbiología. Instituto de Salud Carlos III, Unidad de Genética Bacteriana, Majadahonda Madrid, Spain*

**Backgrounds**

The fluoroquinolone levofloxacin (LVX) is currently used for treatment of pneumococcal infections. The post-antibiotic effect (PAE) has a clinical impact on antibacterial dosing regimens. LVX acts via the formation of DNA-LVX-topoisomerase complexes, with the subsequent generation of detrimental double-stranded DNA breaks. Its lethality is enhanced by the production of reactive oxygen species (ROS), via the up-regulation of genes that stimulate the Fenton reaction. In addition, LVX causes bacterial lysis by phage induction

**Objectives**

To study the factors get involved in the PAE of LVX

**Methods**

Susceptible and resistant pneumococcal strains were analyzed during the postantibiotic phase. Growth curves, level of chromosome fragmentation, and ROS production were determined. In addition, isogenic isolates with prophages inducible or non inducible by LVX were studied

**Conclusions**

Treatment of 1 h with LVX at 2.5× MIC induced EPAs between 0.22±0.05 and 1.41±0.21 h. Treatment with 10× MIC induced longer EPAs (between 0.56±0.11 and 2.06±0.35 h). EPA values were lower in LVX-resistant strains. In pneumococcal cultures treated with LVX (2.5× MIC, 1 h), after 4 hours of removing the antibiotic, bacteria viability increased by 10-fold, while ROS level decreased by 10-fold, and DNA breakage decreased by 7-fold. EPA induced in an isolate carrying an inducible prophage was 3-fold longer than in a non-inducible isolate. LVX induces significant EPAs in *S. pneumoniae*, which were related with the resistance of the strain, ROS production, DNA cleavage and presence of LVX-inducible prophages