

## Poster

**In vitro activity of piperazine derivatives against multidrug-resistance bacteria**

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**ABSTRACT**

**Motivation:** The increasing prevalence of multidrug-resistance represent a serious challenge for clinical management and public health. Multidrug-resistant (MDR) bacteria is a common cause of infections, especially in immunocompromised patient. Nowadays, colistin has re-emerged as one of the last therapeutic option against these kinds of infections, but colistin resistant strains have been reported, leaving no alternative of treatment. The aim of this work is to study in vitro the activity of piperazine derivatives against MDR and colistin resistant bacteria.

**Methods:** Clinical and standard strains: MDR: *Acinetobacter baumannii* (Ab; n=1), *Klebsiella pneumoniae* carbapenemases producing (n=4), *Pseudomonas aeruginosa* (Pa; n=2), *Escherichia coli* ATCC 25922 (n=1), colistin resistant *A. baumannii* (n=13). Piperazine derivatives: four different families were tested: 1, 2, 3, and 4. The derivatives were synthesized in the Pharmacy Faculty of Seville. A) Inhibition screening: all strains at a concentration of 5x10<sup>5</sup> CFU/mL were tested at 50 µM of each derivative. B) Minimal Inhibitory Concentration (MIC): were calculated for the derivatives that inhibit the bacterial growth. C) Time-kill curves: were performed for six derivatives against two colistin resistant *A. baumannii* clinical strains.

**Results:** A) Inhibition was observed only in colistin resistant *A. baumannii* clinical strains. B) Family 1, inhibited the growth of 46 % (6/13) of the strains. Family 2, inhibited the growth of 30% (4/13) of the strains. Family 3, inhibited the growth of 30% (4/13) of the strains. Family 4, inhibited the growth of 38% (5/13) of the strains. C) Family 1: MIC range was 50-3.12 µM. Family 2: MIC range was 50-6.25 µM. Family 3: MIC range was 50-1.56 µM. Family 4: MIC range was 50-3.12 µM. D) One piperazine derivatives presented bactericidal activity at 24 hours against one of the tested strains.

**Conclusions:** Piperazine derivatives showed in vitro activity against colistin resistant *A. baumannii* clinical strains. Further studies, in vitro and in vivo need to be performed in order to confirm the activity of the piperazine derivatives against infections due to these kinds of infections.

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