TITLE: STUDIES OF SOS RESPONSE INDUCTION BY CIPROFLOXACIN IN PSEUDOMONAS AERUGINOSA

AUTHORS: LIMA-NORONHA, M.A.; VALENCIA, E.Y.; GALHARDO, R.S.

INSTITUTION: INSTITUTO DE CIÊNCIAS BIOMÉDICAS, DEPARTAMENTO DE MICROBIOLOGIA - UNIVERSIDADE DE SÃO PAULO (AV. PROF. LINEU PRESTES, 1374 – SALA 246-A, CEP: 05508-000, CIDADE UNIVERSITÁRIA - SÃO PAULO, BRAZIL)

ABSTRACT:
Pseudomonas aeruginosa is a gammaproteobacteria found in several environments. It is a species of medical importance, since it is an opportunistic pathogen considered as a serious public health problem due to the high incidence of isolates showing multiresistance. In addition to the natural resistance to several classes of antimicrobials, many factors may favour the emergence of resistance in *P. aeruginosa* populations, and the SOS response has been well characterized as one such mechanism. This is a response that controls genes directly involved in mutagenesis and may have an increased activity in the presence of antimicrobials, which contributes to the emergence of mutations that may be selected for the emergence of resistance to several types of drugs. Moreover, this response controls several key mechanisms for bacterial physiology, such as DNA repair, homologous recombination, control of cell division and formation of biofilms. Many antimicrobials are inducers of the SOS response. Ciprofloxacin, one of the drugs of choice for treatment of *P. aeruginosa* infections, is a potent inducer of this response, in such a way that sub-MIC concentrations of the drug elevate mutagenesis in a SOS-dependent manner. In this work, we aimed to identify genes that can modify the SOS response dynamics of *P. aeruginosa,* and characterize them functionally. We used a *P. aeruginosa* PAO1 derivative bearing a chromosomal P*recA*::*lux* reporter previously constructed in our laboratory, in which luciferase activity is controlled by the SOS response. We designed a screening of a transposon library, in which we analysed the behaviour of mutant strains in the presence of ciprofloxacin. So far, we identified two mutants affected in the SOS response dynamics. One of them displays enhanced SOS response in the presence of ciprofloxacin and the other one appears to decrease the SOS response in the presence of the drug. With the completion of the screening and identification of the genes interrupted by the transposon insertions in the mutants, we hope to get a better understanding of the factors affecting the cellular response to ciprofloxacin.

Keywords: SOS response; Antibiotic resistance; Ciprofloxacin; *Pseudomonas aeruginosa.*

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E-mail: marco.noronha@usp.br