

Irradiation Effect in Ciprofloxacin-sulfadiazine *Escherichia coli* Treated Strains [†]

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Abstract: The use of combinations of antibacterial agents that generate synergism is one of the strategies employed to combat antimicrobial resistance. There are also approaches where antimicrobial photodynamic therapy (aPDT) is combined with antibacterials and antifungals to attack microorganisms. In this work, the antibacterial effects of the combination ciprofloxacin (CIP) - sulfadiazine (SDZ) were evaluated against 3 strains: *E. coli* ATCC 25922, *E. coli* with intermediate resistance (*E. coli* IR) and *E. coli* with extended-spectrum beta-lactamases (*E. coli* ESBL) with and without irradiation with white LED light. In non-irradiated checkers, partially synergistic effects (PSE) were observed for *E. coli* ATCC 25922 and *E. coli* IR. In the irradiated checkerboards, an improvement in the antibacterial activity of the combinations were observed concerning the non-irradiated checkerboards, obtaining a synergistic effect for *E. coli* ATCC 25922, and a PSE for *E. coli* IR. In the case of *E. coli* ESBL, the effect is indifferent in both the irradiated and non-irradiated checkers, possibly due to the high levels of resistance of this strain. The cooperative effect of the combinations and the aPDT contributes to increasing the antibacterial activity of each drug.

Keywords: ciprofloxacin; sulfadiazine; synergism; photodynamic therapy.

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Conflicts of Interest

The authors declare no conflict of interest.