TITLE: MOLECULAR DOCKING OF *Escherichia coli* SdiA PROTEIN WITH NONSTEROIDAL ANTI-INFLAMMATORY DRUGS

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ABSTRACT:
Enterohemorrhagic *Escherichia coli* (EHEC) is an important pathogen that can cause diarrhea or hemorrhagic colitis in humans and complications that can lead to death. Important phenotype such as biofilm formation in this pathogen can regulated by quorum sensing (QS). The QS system mediated by autoinducer-1 (AI-1) is incomplete in *E. coli* due to the absence of a LuxI homologue, which is responsible for the synthesis of the AI-1 acyl homoserine lactone (AHL). However, it has been shown that *E. coli* can respond to AHLs produced by other bacteria. The aim of this study was to evaluate the binding of nonsteroidal anti-inflammatory drugs (NSAIDs) to the AI-1 receptor protein SdiA from *E. coli* by molecular docking. This in silico approach aims to suggest substances with quorum quenching potential in order to reduce the pathogenicity of *E. coli*. Molecular docking was performed in SdiA protein from EHEC available in the Protein Data Bank (PDB: 4Y13) with the NSAIDs derivatives of anilinonicotinic acid and with AHLs and furanones. Molecular docking was performed with the use of CLC Drug Discovery Workbench 3.0.2 software. The highest binding score for the EHEC SdiA protein was the autoindutor-1 N-(3-oxododecanoyl)-L-homoserine lactone, -76.65.Among the NSAIDs evaluated, the niflumic acid had the highest binding score, -70.47. The other compound that presented a good score was flunixin (-65.11), being greater than the binding score obtained with furanones which are recognized QS inhibitors. In addition, the compounds clonixin and morniflumate were also able to bind to SdiA but with a weaker binding scores of -56.74 and -50.72, respectively. The results of the present study indicate that all the NSAIDs evaluated were able to bind to the EHEC SdiA protein, confirming a potential to be used as a possible QS inhibitors. Thus, the structure of these molecules can be modified to improve their anti-QS effect and, consequently, to inhibit the phenotypes regulated by this mechanism in EHEC.

Keywords: inhibitors, anilinonicotinic acid derivative, EHEC, quorum sensing, quorum quenching.

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