ABSTRACT

The study uses a multidisciplinary approach, incorporating computational, and experimental techniques to enhance the understanding of development of new antimicrobial agents for *Salmonella*. This bacterial species comprises a group of gram-negative bacteria known to cause various diseases, ranging from gastroenteritis to more severe conditions like typhoid fever and sepsis. The emergence of antibiotic-resistant strains has created a pressing need for new therapeutic approaches. Among the potential solutions, drug repositioning has emerged as a promising strategy. This approach involves screening FDA-approved drugs and natural products for their efficacy against *Salmonella* infections. In this thesis, the use of *in silico* and *in vitro* methods for drug repositioning were explored, highlighting notable examples of FDA-approved drugs and natural extracts with potential anti-*Salmonella* activity. An *in-silico* analysis was conducted to explore the antimicrobial potential of FDA-approved drugs against the *Salmonella* strain, providing insights into potential new treatment options. In addition to pharmaceutical drugs, the *in-silico* analyses were extended to evaluate the effects of various herbal compounds, seeking alternative, natural remedies for *Salmonella* infections. Promising candidates from the *in-silico* analyses were subjected to *in vitro* experiments to validate their effectiveness against the isolated *Salmonella* strain.