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Application of Molecular Topology to the Analysis of Antimalarial Activity of 4-Aminobicyclo[2.2.2]Octan-2-yl 4-Aminobutanoate and their Equivalents Ethanoates and Propanoates

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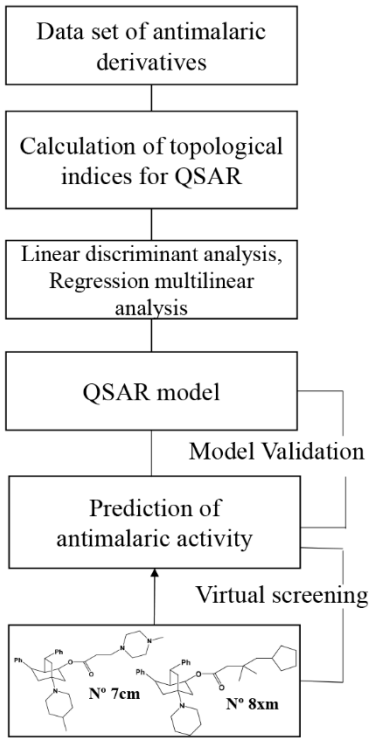
.Graphical Abstract



Steps to follow in the search of QSAR prediction models by molecular topology

Abstract

Malaria causes one of the highest mortality rates worldwide. Malaria cases and malaria deaths are still increasing due to, among other factors, the resistance that the parasite has developed to treatments. New molecules have been studied to be used as treatment for this disease. The present study analyzed the antiplasmodial activity of the Aminobicyclo[2.2.2]octan-2-yl 4-aminobutanoates and their ethanoates and propanoates analogs using molecular topology to develop a quantitative structure-activity relation (QSAR) model. Linear discriminant analysis was used to find a mathematical statement able to classify 32 of 35 compounds accurately by their antiplasmodial activity. The model classified 82.35% of molecules considered active with experimental methods, and differentiated 100% of the inactive molecules as such. Multilinear regression analysis was applied to find an equation with the ability to predict the antiplasmodial activity of each compound in terms of pIC_{50}. Crossvalidation technique and randomness test were used to validate this model. After the analysis, new potential antiplasmodial molecules were suggested.

References

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