Microwave-mediated synthesis of N-allyl/propargyl derivatives : enzymatic analysis as a potential factor Xa (FXa) inhibitor, theoretical and computational molecular docking

Potential FXa inhibitors were developed by a rational design in the first instance, focusing on a key pharmacophore, present in gold standard drugs Rivaroxaban and Apixaban. The phenyl lactam scaffold filling one of the subsites in the catalytic site, S4 pocket, with significant aromatic π-π stacking interactions, allows this frame to be invariably located with accuracy, because of the six membered lactam ring attached to an aromatic benzene ring. We anticipated that the addition of an alkyne unit would enable the exploration of the first section of S1 pocket, in this way producing a better molecule optimizing binding between our potential inhibitor and the active site of FXa. A fluorimetric assay was performed to determine IC50 values on the proposed molecules. All these findings were rationalized by docking energy delta and theoretical structure, vibrational and reactivity analysis to formulate a more accurate explanation about which structure has is the optimal inhibitor for this therapeutic target in the blood coagulation cascade.

Fabián Santana-Romo, Yorley Duarte, Francisco Castillo, Miguel A. Maestro, and Flavia C. Zacconi, "Microwave-Mediated Synthesis of N-allyl/Propargyl Derivatives: Enzymatic Analysis as a Potential Factor Xa (FXa) Inhibitor, Theoretical and Computational Molecular Docking," *International Journal of Chemical Engineering and Applications* vol. 11, no. 1, pp. 34-41, 2020.