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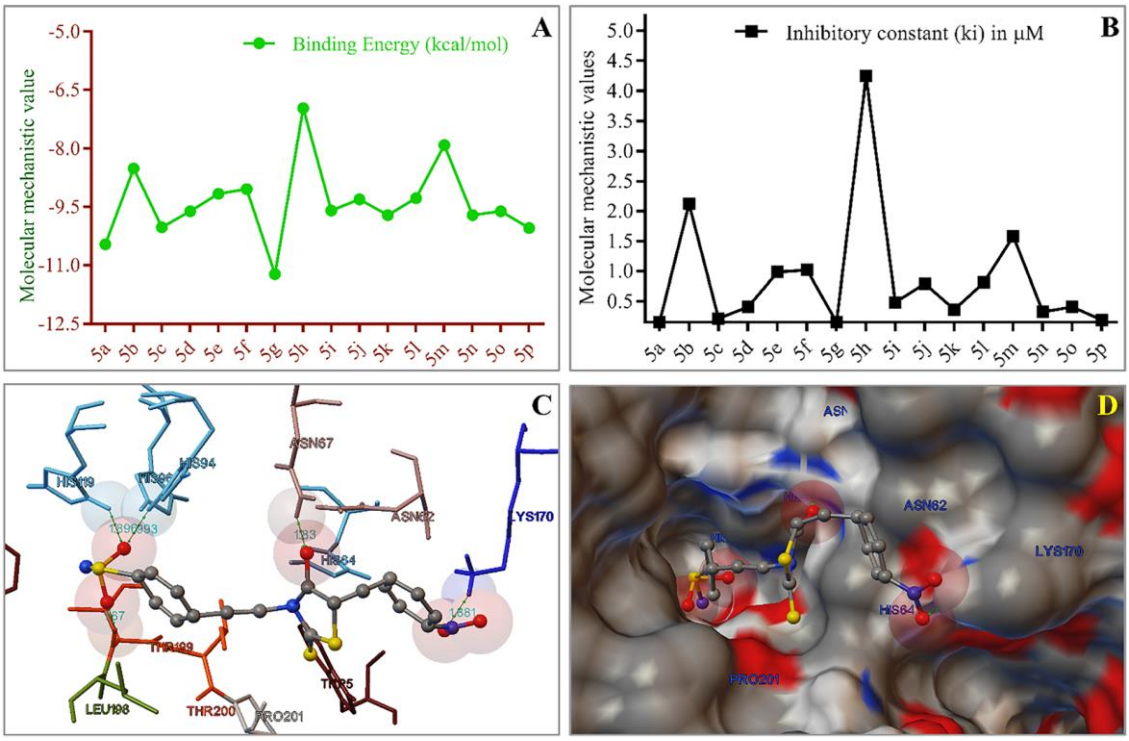
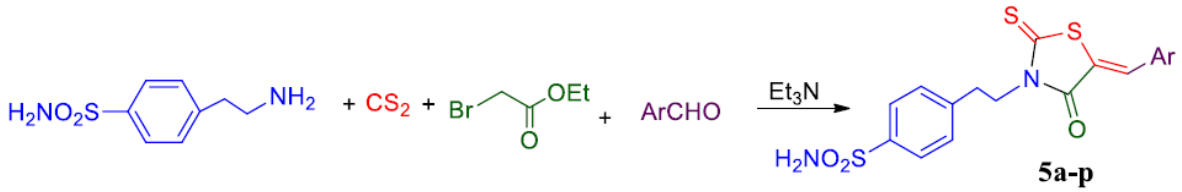
Title: **Discovery of novel sulfonamide-based 5-arylidenerhodanines as effective carbonic anhydrase (II) inhibitors: microwave-assisted and ultrasound-assisted one-pot four-component synthesis, molecular docking, and anti-CA II screening studies**





Abstract: The synthesis of N-substituted-5-arylidenerhodanines was carried out by the optimized one-pot sequential four-component procedure with the condensation between 4-aminobenzenesulfonamide, suitable aldehyde, ethyl bromoacetate, and carbon disulfide. In addition to traditional method, microwave-irradiated and ultrasound-irradiated techniques were implemented in water at ambitious conditions, and the target compounds were obtained in high yields and purity without purification methods. The enzyme inhibition activity of newly synthesized compounds on carbonic anhydrase (II) was also evaluated. The reference inhibitor molecule was sulfanilamide, the IC_{50} value of which was 3.5 μM. It was also found that the IC_{50} values of all examined molecules were in nanomolar level and much smaller than those of sulfanilamide. The inhibition between 93.5 and 99.6% was observed in the presence of new compounds synthesized in the present study at the accessible maximum concentration in the reaction mixtures. 5j, among the tested compounds possessing the lowest IC_{50} value, was found to be the most potent carbonic anhydrase (II) inhibitor.