Title: The effects of glibenclamide on the kinetic parameters of esterase activity of human carbonic anhydrase II

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Abstract: Carbonic anhydrases (CAs, EC 4.2.1.1) are widespread zinc containing metalloenzymes found in animals, plants, and bacteria. The enzyme catalyzes the reversible inter-conversion of CO$_2$ and HCO$_3^-$. This reaction is the main role of CA enzymes in physiological conditions. Most of the CAs can be inhibited by sulfonamides and their derivatives which are specific and strong inhibitors of CAs.

In this study, we used UV-Vis spectroscopy to investigate the effects of glibenclamide, a sulphonylurea drug, on the kinetic parameters of human carbonic anhydrase II (hCA II) esterase activity. The results showed that glibenclamide is able to inhibit carbonic anhydrase activity in the range of 10-400 µM with the IC$_{50}$ of 82 µM. Analysis of the Lineweaver–Burk plot revealed that glibenclamid inhibition is competitive. By plotting $K_m$ against different concentrations of the drug, the $K_i$ was determined as 22.90±2.64 µM.