

Evaluation of in vitro angiotensin-converting enzyme inhibitory activity of Psidium guajava Linn. leaf extract and a study on enzyme kinetics

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Psidium guajava Linn leaf is used traditionally in Indian medicine to control hypertension in human. The aim of this work was to study the hypotensive effect of Psidium guajava Linn. leaf extract in human. Hypertension is due to the activity of the Angiotensin-Converting Enzyme that catalyzes the conversion of the inactive Angiotensin I to the active Angiotensin II. Angiotensin II functions as a potent vasoconstrictor causing hypertension. Hence, ACE inhibitors are considered to be the first choice treatment of hypertension. The ACE inhibitory activity of Psidium guajava Linn. leaf extract in human was studied by its in vitro inhibitory effect on human serum-ACE using the substrate FA-PGG (N-(3-(2-Furyl) acryloyl)-L-phenylalanyl-glycyl-glycine). The enzyme kinetics of ACE inhibition was investigated by Michaelis-Menten kinetics and Lineweaver-Burk graph and Vmax and Km values were calculated. The results show that there is a decrease in both Vmax and Km values in the presence of Psidium guajava leaf extract. The decreased Vmax and Km seen with Psidium guajava indicates that Psidium guajava binds to other alternative sites rather than the active site of the ACE and hence the inhibition is uncompetitive. The decreased Vmax/Km value indicates decreased catalytic ability/affinity of enzyme-substrate due to the presence of the inhibitor Psidium guajava leaf extract. From these we could conclude that P. guajava Linn leaf extract inhibit human serum-ACE uncompetitively and it has hypotensive effects in human.

Biography

Jomon Sebastian has completed his B.Tech in Biotechnology from Sathyabama University, Chennai and he is currently doing his M.Tech in Biotechnology and Biochemical Engineering at Sree Buddha College of Engineering, Alappuzha which is affiliated to Kerala University.

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In silico studies on flavonoids against prostatic acid phosphatase receptor

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Ridge gourd is a common vegetable in India and many other South Asian countries. It has a high water and nutrient content, thus having a low percentage of fats and cholesterols. It also has a high nutritive value, and is often called a nutrition powerhouse because of its rich and varied nutrient content. Review of literature reveals that two flavonoids are isolated from above mentioned vegetable. Prostatic acid phosphatase (PAP) is a valuable marker and the key enzyme involved in prostate cancer. Though its secretory level increases, its cellular form decreases in prostate cancer patients. Cellular prostatic acid phosphatase (cPAP) functions as a tyrosine phosphatase of oncoproteins associated with prostate carcinogenesis. Thus, cPAP whose expression diminishes with the progression of prostate cancer is selected as the drug target. Ligands that can enhance the activity of cPAP may have potential applications for prostate cancer therapy. This work involves an in silico study on the enhancing effect of anti-cancer flavonoids of Ridge gourd on the activity of cPAP. In our research work we have taken the Prostatic acid phosphatase (PAP) receptor of PDB ID [1CVI] and the Flavonoids (Myricetin and Quercetin) from PubChem database against Prostate cancer. The Binding site was predicted using Q-sitefinder. The receptor was docked to the above said Flavonoids and the energy value obtained as follows: myricetin(-7.74kcal/ mol), quercetin(-8.39kcal/ mol) using the ArgusLab docking software. The interaction between the ligand and the protein were then viewed in pyMol viewer. Hence these compounds hold a good prospective of being used as medicine, which targets the PAP receptors.

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