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New class of alpha glucosidase inhibitors and its kinetic mechanism in the management of type-II diabetes

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α-Glucosidase is a membrane bound enzyme at the epithelium of the small intestine that catalyzes the cleavage of glucose from disaccharide. α-Glucosidase enzyme inhibitors act by suppressing the digestion process of dietary carbohydrates. α-Glucosidase enzyme inhibitors (AGIs) are one of the approaches to control the blood sugar levels for type-2 diabetes. Diabetes mellitus is occurred due to the deficiency in production of insulin by the pancreas. AGIs are given with meals and they function by slowing the breakdown of the complex sugars into glucose. This cause a delay in glucose absorption and lower blood sugar levels, following meals. The AGIs may be used alone or in combination with other medications for diabetes. Inhibition of α-glucosidases causes abnormal functionality of glycoproteins because of incomplete modification of glycans. Suppressions of this process are involved expected for antiviral activity and decreasing of growth rate of the tumor. We have recently focused our efforts on the discovery of potent α-glucosidase inhibitors due to its important role in different clinical and pathological condition. As an outcome of this study, several classes of new alpha-glucosidase inhibitors from natural sources such as terpenoids, flavonoids, iridoids, phloroglucinols, anthranols, physalins and acridone alkaloids were identified. 3-dimensional structure activity relationship studies and enzymatic mechanistic studies of these new inhibitors will be discussed in detail in the presentation.

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