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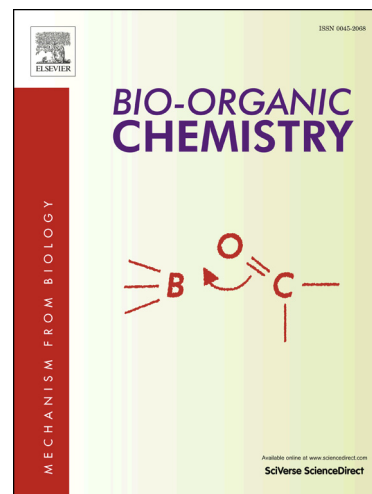
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Synthesis, *in vitro* evaluation and molecular docking studies of novel amide linked triazolyl glycoconjugates as new inhibitors of α -glucosidase

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Abstract

A series of *N*-substituted amide linked triazolyl β -D-glucopyranoside derivatives (**4a-l**) were synthesized and their *in vitro* inhibitory activity against yeast α -glucosidase enzyme [EC.3.2.1.20] was assessed. Compounds **4e** (IC_{50} =156.06 μ M), **4f** (IC_{50} =147.94 μ M), **4k** (IC_{50} =127.71 μ M) and **4l** (IC_{50} =121.33 μ M) were identified as the most potent inhibitors for α -glucosidase as compared to acarbose (IC_{50} =130.98 μ M) under the same *in vitro* experimental conditions. Kinetic study showed that both **4e** and **4f** inhibit the enzyme in a competitive manner with *p*-nitrophenyl α -D-glucopyranoside as substrate. Molecular docking studies of **4e**, **4f**, **4k** and **4l** were also carried out using homology model of α -glucosidase to find out the binding modes responsible for the inhibitory activity. This study revealed that the binding affinity of compounds **4e**, **4f**, **4k** and **4l** for α -glucosidase were -8.2, -8.6, -8.3 and -8.5 kcal/mol respectively, compared to that of acarbose (-8.9 kcal/mol). The results suggest that the *N*-substituted amide linked triazole glycoconjugates can reasonably mimic the substrates for the yeast α -glucosidase.

Keywords: amide linked glucopyranoside; diabetes; docking studies; α -glucosidase; glycoconjugate; triazole.

1. Introduction

Diabetes mellitus is a group of metabolic disorders where a person has high blood sugar levels. Changes in lifestyle and dietary habits have increased the occurrence of diabetes mellitus [1]. According to the World Health Organization, at least 2.8% of the world population suffered from type-II diabetes mellitus in 2000 and it is estimated that by 2030 this will almost double [2]. The elevated glucose levels in the patients results from the disorder in

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