Received: 1 December 2018 | Revised: 11 January 2019 | Accepted: 25 March 2019

DOI: 10.1002/jbt.22340

WILEY

Tannic acid as a natural antioxidant compound: Discovery of a potent metabolic enzyme inhibitor for a new therapeutic approach in diabetes and Alzheimer's disease

Fikret Türkan[1] | Parham Taslimi[2] | Fatma Zerrin Saltan[3]

[1]Health Services Vocational School, Iğdır University, Iğdır, Turkey

[2]Department of Biotechnology, Faculty of Science, Bartin University, Bartin, Turkey

[3]Department of Pharmacognosy, Faculty of Pharmacy, Anadolu University, Eskisehir, Turkey

Correspondence
Fikret Türkan, Health Services Vocational School, Igdır University, 76000-Iğdır, Turkey.
Email: fikret.turkan@gmail.com

Abstract

Multiple studies have been recorded on the synthesis and design of multi-aim anti-Alzheimer molecules. Using dual butyrylcholinesterase/acetylcholinesterase inhibitor molecules has attracted more interest in the therapy for Alzheimer's disease. In this study, a tannic acid compound showed excellent inhibitory effects against acetylcholine esterase (AChE), α-glycosidase, α-amylase, and butyrylcholinesterase (BChE). IC_{50} values of tannic acid obtained 11.9 nM against α-glycosidase and 3.3 nM against α-amylase, respectively. In contrast, K_i values were found of 50.96 ± 2.18 μM against AChE and 53.17 ± 4.47 μM against BChE. α-Glycosidase inhibitor compounds can be utilized as a novel group of antidiabetic drugs. By competitively decreasing glycosidase activity, these inhibitor molecules help to hamper the fast breakdown of sugar molecules and thereby control the blood sugar level.

KEYWORDS

anticholinergics, antidiabetic, enzyme inhibition, metabolic enzymes, tannic acid