Abstract
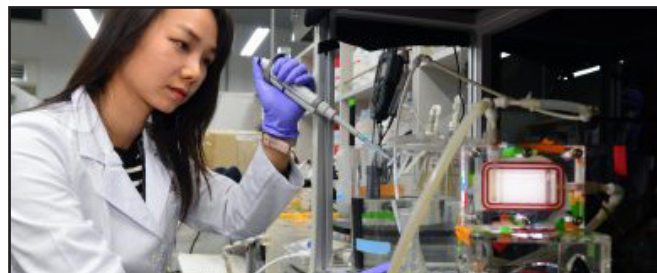
Potential of South African medicinal plants targeting reduction of Aβ42 protein as a treatment of Alzheimer's disease

Anuradha Thakur

University of Pretoria, South Africa

Abstract:

Alzheimer's disease is a slow and progressive neurodegenerative disease that destroys memory and other important mental functions. APP (Amyloid precursor protein) is an integral membrane protein expressed in higher levels in brain and its abnormal cleavage produces beta amyloid (Aβ42). Accumulation of Aβ42 in the brain produces amyloid plaques, the hallmark of the Alzheimer's disease. A literature survey was done for the selection of plants by using the keywords central nervous disorders and African medicinal plants. The plants were prioritized by a scoring system following the key criteria- plant part use, strength of the traditional use in relative to memory loss, plant toxicity, plant availability, published information against acetylcholinesterase inhibition. Different plant parts were collected from the University of Pretoria gardens and extracted with DCM:MeOH (1:1) after drying and grinding. The 33 plant extracts were screened to determine their inhibitory properties for Aβ42 production in HeLa cells stably transfected with APPsw. We found that of 33 extracts, 11 extracts were found to significantly reduce the Aβ42 level. Amongst them, three extracts of leaves of Xysmalobiumundulatum, Cussoniapaniculata and Schotiabrachypetala potently reduced the secreted level of Aβ42 by 77.3 ± 0.5%, 57.5 ± 1.3% and 44.8 ± 0.1% respectively. Thus, we selected these extracts for further study. Through bioassay guided fractionation, five pure compounds from the plant X. undulatum were isolated. Of these, four compounds were found to significantly inhibit formation of Aβ42. For the other two plant extracts, UPLC-QTOF-MS analysis was done to identify the active ingredient.

Biography:

Anuradha Thakur obtained her B.Sc degree from Himachal Pradesh University, India in 2007, B.Ed degree from Himachal Pradesh University, India in April 2008, and her MSc degree in Chemistry from Guru Nanak Dev University, India in April 2010. She submitted her PhD thesis in the Department of Chemistry at the University of Pretoria, South Africa in December 2019 working on a project in collaboration with Korean Institute of Science and Technology (KIST) aimed at identifying and developing the new natural ingredients from the South African medicinal plants for the treatment of Alzheimer's disease by targeting the reduction of Aβ42 resulting in the decreased levels of beta amyloid plaques.

Publication of speakers:

1. Adedapo, A.A., Sofidiya, M.O., Maphosa, V., Moyo, B., Masika, P.J., Afolayan, A.J., 2008. Anti-inflammatory and analgesic activities of the aqueous extract of Cussonia paniculata stem bark. Rec. Nat. Prod. 2

2. (2), 46. Adewusi, E.A., Moodley, N., Steenkamp, V., 2011. Antioxidant and acetylcholinesterase inhibitory activity of selected southern African medicinal plants. South Afr. J. Bot. 77

17th Annual Congress on Wellness & Healthcare Informatics; May 18-19, 2020; Paris, France

Citation: Anuradha ThakurPotential of South African medicinal plants targeting reduction of Aβ42 protein as a treatment of Alzheimer's disease; Euro Health-2020; May 18-19, 2020 ; Paris, France