

Letter to the Editors

Epigenetic drugs for Alzheimer's disease

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I enjoyed reading the article by Salomone *et al.* [1] in which they reviewed new pharmacological strategies for treating Alzheimer's disease, the most common age-related dementia, focusing on disease modifying drugs. I wish to discuss the role of a group of drugs which were not mentioned by the authors, epigenetic drugs, in treating this disease.

Epigenetics, the study of heritable changes in gene expression not involving changes in DNA sequence, involves molecular mechanisms like DNA methylation and modifications of histones (DNA packaging proteins). Epigenetics and the ageing process are known to be intimately linked with each other, and epigenetic patterns in an individual are known to change during the individual's lifetime [2]. Epigenetics is also known to play a major role in cognitive processes including learning and memory [3], and is increasingly known to play a role in the pathogenesis of Alzheimer's disease [4]. In fact, epigenetic changes in gene expression are thought to underlie the main pathological feature of Alzheimer's disease, amyloid plaques [5].

Histone acetylation, a well studied epigenetic mechanism, is thought to play a critical role in cognitive abilities like learning and memory, and many learning and memory disorders are associated with impaired histone acetylation [3]. Preclinical studies have suggested that epigenetic drugs that increase histone acetylation by inhibiting histone deacetylase (HDAC inhibitors) could be useful in the treatment of Alzheimer's disease [6, 7]. Another well studied epigenetic mechanism, DNA methylation, also plays a critical role in learning and memory and several genes have been found to be hypomethylated in Alzheimer's disease [3]. Hence, epigenetic drugs like the nutrients which donate methyl groups in the body resulting in methylation of DNA, S-adenosylmethionine and L-methylfolate, could help in the prevention and treatment of Alzheimer's disease [3, 8]. Since, as alluded to above, epigenetics is thought to be involved in the pathogenesis of Alzheimer's disease, epigenetic drugs are likely to act as disease modifying drugs in the management of this

disease. In the light of the preceding information, I suggest that epigenetic drugs should be given due attention during the development of disease modifying drugs for the treatment of Alzheimer's disease.

Competing Interests

There are no competing interests to declare.

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