

Neural stem cells and the promotion of healthy brain aging

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Research Abstract

Aging and Alzheimer's disease have developed into major social and economic burdens throughout the developed world. They are associated with an abnormally rapid deterioration in cognitive functions, termed dementia. In North America, for example, the incidence of Alzheimer-associated dementia rises from 10% at 60 years of age to 50% by 85 years; hence, understanding how aging and Alzheimer's alter brain function is of growing importance. Our recent work indicates that stem cells within the adult brain are a major target of both aging and Alzheimer's disease. The normal function of these stem cells is to produce new brain cells that are required for multiple types of learning and memory processes. However, the numbers and activity of brain stem cells steadily decline as we age, and since human lifespans have been

steadily increasing, this means that more of us are likely to develop learning and memory defects as we get older. This problem is compounded in Alzheimer's disease, which accelerates the loss of brain stem cells. We believe that maintaining youthful levels of brain stem cell activity is one of the keys to promoting healthy brain aging. In this research proposal, we focus on identifying the cellular and molecular processes by which the brain stem cell system is suppressed during normal aging and during Alzheimer's disease. Our experiments will be carried out using innovative and powerful animal models, which will provide us with fundamental new insights into how stem cells can be activated within the aging brain. It is our hope that this will contribute to the development of therapeutic approaches for using the brain's own stem cell system in order to promote healthy brain aging.

Further information available at:

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