

Exploring cholinergic mechanisms to understand behavioral deficits in dementia.

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Canada

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Exploring cholinergic mechanisms to understand behavioral deficits in dementia.

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CIHR

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The project/programme is most relevant to:

Alzheimer's disease and other dementias

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Research Abstract Lay Summary

Aging is the major risk-factor for a number of diseases that lead to dementia. In Canada, due to a significant aging of its population, it has been estimated that by the year 2031 there will be approximately 4 million Canadians with dementia. Behavioral and psychological symptoms of dementia include memory loss, reasoning loss, delusions, hallucinations, agitation, anxiety, irritability, depression, apathy, disinhibition, and sleep or appetite impairment. Thus, besides being debilitating for the patients and a huge health care cost, the disease also brings an enormous load on caregivers. Therefore, novel approaches are urgently needed to find more effective therapeutic interventions to decrease the burden of dementia. To communicate with each other, brain cells (or neurons) use a combination of chemical messengers called neurotransmitters. The neurotransmitter acetylcholine (ACh) seems to be an important player in dementia as dysfunction of particular groups of ACh-releasing neurons is present in a number of neurological diseases, including Alzheimer's, Parkinson's and Dementia with Lewy bodies. Here we propose to use a number of different genetically modified mouse models, each of them showing impairment in the release of ACh from different groups of ACh neurons in the brain, to define how changes in ACh release influence the regulation of brain communication circuits and behavioral manifestations related to dementia. These mice, which provide a model for chemical changes in dementia, will also be used to investigate mechanisms for novel drugs that can be used to alleviate behavioral problems in dementia. These studies will pinpoint specific molecular and behavioral abnormalities relating ACh deficits to dementia and will define novel pharmacological mechanisms tailored to improve specific ACh-mediated symptoms.

Further information available at:

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