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Intranasal Insulin Prevents Anesthesia-Induced Cognitive Impairment

FEATURES

Elderly individuals are at increased risk of cognitive decline after anesthesia. General anesthesia is believed to be one of the risk factors for Alzheimer's disease (AD), the most common cause of dementia in adults. Recent studies suggest that anesthesia may increase the risk for cognitive decline and Alzheimer's disease through promoting abnormal modifications of a critical neuronal protein called tau. In the present invention, we discovered a simple and non-invasive method to prevent the abnormal modification of tau induced by anesthesia. We found that daily intranasal delivery of insulin (1.75U/day) for one week, which can be easily administered by using a nasal spray, attenuated anesthesia-induced abnormal modification of tau and other brain alterations. Our findings demonstrate that pretreatment with intranasal insulin prevents Alzheimer-like tau modifications. Thus, intranasal insulin administration is a potential treatment for the prevention of anesthesia-induced cognitive decline and increased risk for Alzheimer's and dementia.

BENEFITS

This invention could benefit anyone who is at risk for cognitive impairment or dementia and who needs to receive general anesthesia for surgical purposes, including the elderly and those who are genetically susceptible for dementia or who have existing medical conditions, such as diabetes, that increase their risk for cognitive impairment and dementia.

Companies that may benefit from this invention include: pharmaceuticals that make insulin preparations and companies that make special nasal spray or any device that facilitates intranasal administration of drugs.

INTELLECTUAL PROPERTY STATUS

Patent Pending

PUBLICATION/S:

"Intranasal insulin prevents anesthesia-induced hyperphosphorylation of tau in 3xTg-AD mice" – *Frontiers in Aging Neuroscience*: May 30th, 2014. *Yanxing Chen, Xiaoqin Run, Zhihou Liang, Yan Zhao, Chun-ling Dai, Khalid Iqbal, Fei Lie, and Chen-Xin Gong*
http://journal.frontiersin.org/Journal/10.3389/fnagi.2014.00100/abstract

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