

New research identifies key contributor to Alzheimer's disease process

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Walter J. Lukiw, PhD, Associate Professor of Neuroscience and Ophthalmology at LSU Health Sciences Center New Orleans, is the lead author of a paper identifying, for the first time, a specific function of a fragment of ribonucleic acid (RNA), once thought to be no more than a byproduct, in regulating inflammation and the development of Alzheimer's disease.

The paper, An NF-kB-sensitive micro RNA-146a-mediated inflammatory circuit in Alzheimer's disease and in stressed human brain cells, will be published in the November 14, 2008 issue of The Journal of Biological Chemistry.

Dr. Lukiw's lab at the LSU Health Sciences Center New Orleans Neuroscience Center of Excellence has shown that this tiny piece of RNA, or microRNA, called miRNA-146a is found in increased amounts in stressed human brain cells and in Alzheimer's disease, and that it plays a crucial role in the regulation of inflammation and disease-related neuropathology thought to be integral to the Alzheimer's disease process.

Dr. Lukiw's research team, which also included LSUHSC's Jian Guo Cui, MD, PhD and Yuhai Zhao, a post doctoral student in the lab, demonstrated in human brain cells in primary culture that MiRNA-146a targets the messenger RNA of an important anti-inflammatory regulator called complement factor H (CFH). Testing both control cells and Alzheimer's disease-affected tissues, they found that miRNA-164a appears to reduce the amount and bioavailability of CFH, promoting the

inflammation of brain cells and contributing to the development of Alzheimer's disease.

The most common form of dementia, Alzheimer's Disease is a fatal, age-related neurodegenerative disorder characterized clinically by the progressive erosion of cognition and memory, and neuropathologically by defective gene expression and increased inflammatory cell signaling. According to the Alzheimer's Foundation of America, it is estimated that Alzheimer's disease currently affects more than 5 million Americans and it is projected that the number could more than triple to 16 million by mid-century.

"The goal of these neuroscience research studies is to further our understanding of the molecular biology and genetic mechanisms associated with Alzheimer's Disease and to advance the design of therapeutic strategies to counteract this common and tragic neurological disorder," said Dr. Lukiw.

Source: Louisiana State University Health Sciences Center

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