Intranasal insulin, deferoxamine and therapeutic cells bypass the blood-brain barrier to treat Alzheimer’s and other brain disorders

William H Frey II
University of Minnesota, USA

Intranasal delivery provides a noninvasive method of bypassing the blood-brain barrier to deliver therapeutic agents to the brain within minutes. It also reduces unwanted side effects. This is possible because of the unique connections that the olfactory and trigeminal nerves provide between the brain and external environment. Using this delivery, targeting and treatment method which the author first invented in 1989, drugs and therapeutic proteins have been used to treat Alzheimer’s, Parkinson’s, stroke and other brain disorders in animal models. The intranasal insulin treatment for Alzheimer’s disease, which the author patented in 2001, has been shown to improve memory in normal human adults and improve memory, attention and functioning in patients with Alzheimer’s disease in multiple Phase 2 clinical trials without altering blood levels of insulin or glucose. Intranasal insulin may be able to reduce the risk of aging diabetics and others from developing Alzheimer’s disease. Iron accumulates in the brains of patients with Alzheimer’s and other neurodegenerative disorders. Intranasal deferoxamine binds iron, improves memory in normal mice and treats rodent models of Alzheimer’s, Parkinson’s and stroke. Together with Dr. Lusine Danielyan and colleagues in Germany, it was shown that intranasal therapeutic cells bypass the blood-brain barrier by migrating from the nasal mucosa along the olfactory neural pathway into the brain and spinal cord. Using intranasal therapeutic cells in animal models, the author demonstrated improvement in animal models of Alzheimer’s and Parkinson’s disease while others have reported improvement in neonatal ischemia, stroke and multiple sclerosis. Intranasal delivery is changing the way we treat brain disorders.

Biography

William H Frey II is Director of the Alzheimer’s Research Center of the Center for Memory and Aging at Regions Hospital in St. Paul, MN, Professor of Pharmaceutics and faculty member in Neurology and Neuroscience at the University of Minnesota and consultant to the pharmaceutical industry. His noninvasive intranasal method for bypassing the blood-brain barrier to target therapeutic agents to the brain while reducing systemic exposure and unwanted side effects has captured the interest of both pharmaceutical companies and scientists. The intranasal insulin treatment he developed for Alzheimer’s disease has been shown in clinical trials to improve memory in both Alzheimer’s patients and normal adults. His intranasal therapeutic cell delivery and treatment methods have been validated in animals for Parkinson’s, stroke, MS, brain tumors and other brain disorders. With over 100 publications in scientific and medical journals, he has been interviewed on Good Morning America, The Today Show, 20/20, All Things Considered. Articles about his research have appeared in the Wall Street Journal, The New York Times and other magazines and newspapers around the world. He earned his BA in Chemistry at Washington University in 1969 and PhD in Biochemistry at Case Western Reserve University in 1975.

alzheimr@gmail.com