Pre-Germinated Brown Rice May Possibly Benefit Alzheimer’s Patients

Researchers from the Japanese cosmetics and supplements company FANCL have found that the consumption of pre-germinated brown rice can help act against onset of Alzheimer’s disease, the common illness that causes dementia in the elderly.

The new study suggests that brown rice soaked in water to induce slight germination contains around 15 times the gamma-aminobutyric acid (GABA) and 13 times the amount of oryzanol present in polished rice. A steady diet of brown rice has improved the learning ability of mice and prevented impairment of spontaneous alternation behavior in the animals.

As Alzheimer’s disease is characterized by numerous senile plaques resulting in neuronal loss, the beta-amyloid peptide that makes up these plaques has been shown to lead to brain dysfunction, causing learning and memory impairment.

There are currently about 18 million people suffering from dementia in the world and the most common cause of this dementia is Alzheimer’s disease. By 2025, it is believed that the numbers will rise to 34 million, with 71% of the patients likely to be living in developing countries.

The FANCL researchers, who are collaborating with scientists from Meijo University, believe GABA perform as an inhibitory neurotransmitter and can enhance glutamate release and the sensitivity of the N-methyl-D-aspartate (NMDA) receptors when used in large amounts. In essence, the activation of the NMDA receptors is thought to dictate learning and memory. GABA is prescribed sometimes to improve sleep quality and is used increasingly in bodybuilding supplements for its effect on growth hormone levels.

On the other hand, Oryzanol also contains ferulic acid ester, which may fight oxidative stress that could possibly leads to the beta-amyloid damage. The researchers published their findings in an early online publication of the Biological & Pharmaceutical Bulletin, published by the Pharmaceutical Society of Japan. And the research team will compare between the effects of consuming normal brown rice with pre-germinated brown rice to confirm the findings made.
Genetically Engineered Plants for Preventing Diabetes

Researchers from Ontario, Canada are banking on a breakthrough in their study of diabetes, where proteins made in genetically engineered plants are used to prevent Type I diabetes in mice. They found that by feeding mice prone to diabetes with insulin-producing cells of the pancreas, they were able to prevent the mice from developing the disease.

The proteins fed to the mice was glutamic acid decarboxylase (GAD), which is thought to trigger factor for Type I diabetes. Type I diabetes develops when the body’s immune system starts to damage insulin-producing cells in the pancreas.

Anthony Jevnikar, program director of transplantation, immunity and regenerative medicine at the Lawson Health Research Institute, explained that when the proteins are part of the diet, the immune system is reprogrammed not to attack the cells. This mechanism is known as oral immune tolerance.

The Canadian scientists were in the process of developing a treatment method known as oral tolerance therapy — by which the induction of specific immunological unresponsiveness by feeding protein antigens is termed as oral tolerance, and may be used as a potential therapy for autoimmune diseases such as diabetes.

The problem these researchers encountered was that despite the relative simplicity and effectiveness of the oral tolerance therapy, the large amounts of protein needed — therapeutic proteins which remain biologically active when orally administered — meant that clinical trials are often limited.

Now that transgenic plants have displayed their utility as molecular factories to produce the large amounts of therapeutic proteins needed, oral tolerance therapy has become more viable instantly. The researchers published their work in the Proceedings of the National Academy of Sciences.
GENE THERAPY — A NOVEL TREATMENT FOR ALZHEIMER’S

In a preliminary clinical trial, researchers have found tentative evidence that transplanting genetically modified skin cells into the brain might slow the progression of Alzheimer’s disease. The small study of eight patients has shown that the innovative technique is safe to use and may reduce the mental decline that characterizes the degenerative disease. The findings were reported at the American Academy of Neurology meeting in San Francisco.

Mark Tuszynski from the University of California, San Diego, and his colleagues removed samples of skin cells from Alzheimer’s patients and genetically modified them in cultures to produce Nerve Growth Factor (NGF), a naturally occurring protein that prevents cell death in the brain. The team then injected up to 10 million NGF-producing cells into 10 different brain sites, hoping that the transplanted cells would prevent vulnerable neurons from dying, and thus slow progression of dementia.

A year later, the patients’ rate of mental decline was halved. By comparison, the best drug therapies available offer only a 5% decrease in the rate of decline, said Tuszynski. “If these effects are borne out in larger, controlled trials, this could be a significant advance in therapies for Alzheimer’s disease.”

Brain scans also showed improved blood circulation around the brains, indicating that the injected cells were still alive and efficacious even a year after the injections.

Admittedly, the study is small and hence, results should be interpreted with caution. However, it represents a very promising new therapy, heralding the era of gene therapy for the brain.
Scientists, from LCT BioPharma and the Medical College of Georgia, have discovered a cell-based treatment that greatly decreases the brain damage caused by stroke. They have found strong evidence that cells from the choroid plexus (a region that supplies nutrients to the brain and spinal cord) are able to supply damaged brain tissue with factors needed for regeneration of the damaged neurons.

LCT provided the choroid plexus cells packaged inside capsules made of a polymer from algae (called alginate), which effectively forms a barrier between the transplanted cells and the immune system of the recipient. The alginate encapsulation allows the passage of small molecules in and out of the implanted cells while protecting the cells from destruction by larger antibodies from the host immune system that could result in transplant rejection.

Dr. Cesario Borlongan, first author of the paper and a neuroscientist at the Medical College of Georgia, said, “This is the first indication that the choroid plexus may play a major role in the stimulation of damaged cells and/or the secretion of protective factors. This novel therapy appears to harness the healing response of the choroid plexus.”

The scientists now aim to repeat the study on a primate model. Much work still remains in exploring the potential of this therapy in human stroke patients, including the best means of delivery.

Dr. Dwaine Emerich, VP of Research for LCT BioPharma, said that this findings also has potential applications for other neurodegenerative diseases such as Huntington's and traumatic brain injury.

**About Living Cell Technologies Ltd.**

Living Cell Technologies Ltd. (LCT) was established in 1987 to develop and commercialize cell therapies for the treatment of a wide variety of diseases. The company’s headquarters are in Adelaide, South Australia, with a research and technology unit in New Zealand, and a product development unit in Rhode Island, US. They also have an exclusive alliance with the University of Perugia in Italy for the development of the alginate encapsulation technology. LCT’s technology has potential application for the treatment of any condition caused by a deficiency of specific cell function. The company has 3 products under development - NeurotrophinCell for Huntington’s and stroke, Fac8Cell for hemophilia, and DiabeCell for diabetes.

LCT is listed on the Newcastle Stock Exchange (NSX:LCT) and will list on the Australian Stock Exchange in mid-2004.

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