

## News Release

For immediate release

### **Natural brain protection against the spread of Alzheimer's disease**

Jerusalem, 7<sup>th</sup> June 2007 – Although numerous drugs have been developed over the years to alleviate the symptoms of Alzheimer's disease, there is still no real cure to halt this progressive, neurodegenerative disorder that causes premature death of nerve cells in the deep brain nuclei, leading to dementia and death.

A graduate student in biological chemistry at the Hebrew University of Jerusalem has, however, developed an approach that holds out promise of providing natural brain protection against the spread of this disease. For his work, Erez Podoly, a joint student of Dean of Science Prof. Hermona Soreq and the head of the Wolfson Center for Applied Structural Biology, Prof. Oded Livnah, has been named one of the winners of this year's Kaye Innovation Awards, which were presented on June 6 during the 70th meeting of the Hebrew University Board of Governors.

Alzheimer's Disease afflicts 12 million people worldwide, and this figure is expected to almost double over the next 25 years, due to prolonged life expectancy. Alzheimer disease patients develop neurotoxic precipitates ("plaques"), composed of the amyloid beta (A $\beta$ ) peptide, which spread as fibrils in the brain and destroy nerve cells. (A peptide is short chain of amino acids).

The several drugs that have been developed for Alzheimer's disease serve to enhance neuronal function, suppress inflammation, block or reduce the generation of oxidative stress in the brain, or minimize cognitive damage. Unfortunately, however, it is still unknown as to how to halt the spread of the neurotoxic plaques.

Podoly, 34, a native New Yorker, and his colleagues set out to design a blocker for the neurotoxic effects of the A $\beta$  peptide, using the Butyrylcholinesterase (BChE) protein, which was cloned and engineered in their lab. BChE's brain concentration increases with age, a fact overlooked so far, but which for Podoly and his colleagues seemed highly relevant to the progress of Alzheimer's. The researchers set out in their laboratory to see if they could chemically improve and intensify BChE's effect on the brain fibrils.

The researchers were indeed able to show in the lab that BChE purified from human blood and short synthetic peptides of BChE were able to reduce fibril formation. However, supply limitations and health risks limit the value of blood serum-derived human BChE.

Fortunately, a breakthrough was achieved when PharmAthene Inc., an American company, was able to produce engineered human BChE that was introduced into the milk of transgenic goats. Recently, in collaboration between the Hebrew University, Yisum – the technology transfer company of the university -- and PharmAthene, Podoly and his colleagues have succeeded in demonstrating by several independent methods that the goat-derived BChE efficiently interacts with and reduces amyloid fibrils formation. They anticipate that recombinant human BChE produced in the milk of transgenic goats and/or synthetic peptides derived from BChE can become novel prophylactic or therapeutic agents for slowing the progression of senile plaque formations in the brain of Alzheimer's patients. Further research, leading to clinical tests on humans, is planned for the future.

The Kaye Innovation Awards at the Hebrew University have been awarded annually since 1994. Isaac Kaye of England, a prominent industrialist in the pharmaceutical industry, established the awards to encourage faculty, staff, and students of the University to develop innovative methods and inventions with good commercial potential that have benefited or will benefit the University and society.

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**About the Hebrew University**

With 24,000 full-time students, the Hebrew University of Jerusalem is Israel's pre-eminent institute of higher education. Its faculty members pursue projects that are both essential to Israel's future and the benefit of humanity. It is a centre of international repute, with formal and informal ties extending to and from the worldwide scientific and academic community. Students come from all over Israel and across the Middle East to study in an atmosphere of academic and research excellence.

**About the British Friends of the Hebrew University**

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