



## Influential Research into an Enzyme that Degrades Peptides

Collaboration between researchers at the Department of Biochemistry and Biophysics and their colleagues at Karolinska Institutet has resulted in discoveries that may contribute significantly to our understanding of the mechanisms that lie behind Alzheimer's disease.

"One of our discoveries is that a mitochondrial enzyme, which we have called 'PreP', breaks down amyloid beta peptides", says Professor Elisabet Glaser at the Department of Biochemistry and Biophysics. The research group published their work earlier this year in the highly respected American journal "The Journal of Biological Chemistry", and the journal awarded the paper the title of "Paper of the Week" in September. The article, "Degradation of the amyloid beta-protein by the novel mitochondrial peptidase, PreP" is considered to be so interesting that it was selected as one of 5-100 such articles, from the



From left: Hans Bäckman, Dr Pavel Pavlov, Paula Sanchez Carasco, Stefan Nilsson, Nyosha Alikhani, Anna-Karin Berglund, MSc. Shashi Bhushan, Prof. Elisabet Glaser (Photo: Filipa Stenberg)

more than 6,600 that are published each year.

Alzheimer's disease (AD) can be described in simple terms as arising when amyloid beta peptides form insoluble fibrils, in what are known as "plaques" in the brain, and this leads to the atrophy of nerve cells in the memory centre of the brain. Most molecular studies that have aimed at mapping AD have focused on these extracellular accumulations. But more researchers are now starting to look at what is happening inside the cells, and one recent result has been the discovery that amyloid beta peptide is also present in the mitochondria in the brain of patients with AD.

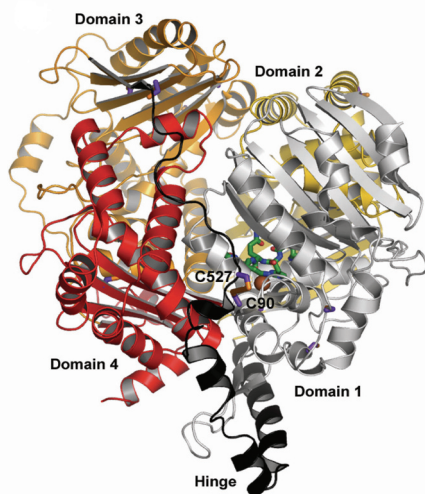
Elisabet Glaser's group describes in the article how hPreP, which is the human form of PreP, degrades, or "cleans up" small peptides that function as "address labels" for the import of proteins into mitochondria. It also degrades unstructured peptides such as amyloid beta protein.

The researchers discovered while working with hPreP that the degradation of the amyloid beta peptide was fully inhibited in the presence of antibodies against hPreP, which suggests strongly that hPreP is the enzyme that is responsible for degrading the amyloid beta peptide in mitochondria.

"We believe that continued study of PreP can contribute to increasing our understanding of the mechanisms behind Alzheimer's disease", says Elisabet Glaser. "It's reasonable to believe that the harmful concentrations of the amyloid beta peptide in AD can in some cases be related to age-dependent changes in the activity of hPreP in the human brain. That's why the next step in our research will be investigate whether such relationships exist."

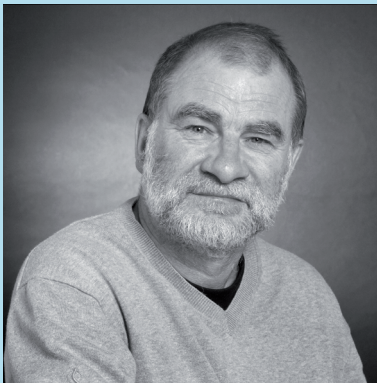
MARLENE LINGARD

More information can be found at:  
<http://www.jbc.org/cgi/content/abstract/281/39/29096>



The 3D structure of hPreP, based on the 3D structure of Arabidopsis PreP (from Falkevall et al., 2006).

## The Dean's Discourse



### A New Dawn, or ... ?

Sweden has a new Minister for Education and Science, and we are, of course, wondering: Are the government's education and research policies really going to change? Are resources to be increased? All we know at the moment is that the budget keeps the promises made during the election campaign, but obviously it's too soon to expect any major changes.

The expansion in undergraduate education planned by the previous government will not take place now, the resources will be placed into focused quality measures to be announced later. The 1.12% increase that was promised last year will be granted.

Increased resources within research and research education, in contrast, are clear. SU will receive an additional SEK 20 million above the approximately SEK 4 million that was promised by the previous government's White Paper on Research. This is just the first stage of an increase in funding for the faculty grants that will amount to approximately SEK 900 million. It's not clear how much of this will be awarded to SU. The exact framework for the faculties will be decided by the meeting of the university board on 10 November, while the faculty boards will decide the framework for the sections and departments on 29 November. In summary, grants for the faculties will probably increase to a certain degree, while undergraduate education will remain the same. We have, unfortunately, another hard year to face.

The faculty boards have approved the new educational programmes at Bachelor and Master levels. I'm truly grateful for the fantastic job that the departments have done during this process, which was both extensive and urgent. I am convinced that we can increase the quality of our education if we carry out all of the courses and programmes that are planned. Let us together try to find new ways and new methods for recruiting the very best students.

Finally, the new strategic plan will soon be available on the university's website and as a printed document. I hope that it will provide inspiring reading in the autumn gloom that is becoming evermore gloomy. Please make your ideas and views known, helping us together to improve and develop the faculty.

Stefan Nordlund, Dean  
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## Earth and Environmental Sciences at Slovenian Festival



The Earth and Environmental Sciences Forum took the "Puzzle of the Earth" to the Slovenian Science Festival. (Photo: Minna Severin)

### Slovenian Science Festival

Linda Klein and Minna Severin of the Earth and Environmental Sciences Forum represented Stockholm University at the Slovenian Science Festival in October. The festival was part of the first European Science Festival, WONDERS, that started in Vienna in February and will end in Finland in December. The activities that the Earth and Environmental Sciences Forum orga-

nised included the "Puzzle of the Earth", in which the students try to reconstruct the supercontinent Pangea. Students also investigated how the difference in density between warm water and cold water affects ocean currents and winds. More information about Wonders can be found at: <http://www.wonders.at>

### Faculty Activities

Ragnar Elmgren at the Department of Systems Ecology has been awarded the Kazimierz Demel medal by the Sea Fisheries Institute in Gdynia.

We congratulate Christine Chi-Chen Chang, Beatrice Crona, Anneli Ehlerding, Janik Kailasvuori and Sara Light, who have all been awarded post-doctoral fellowships for 2007.

The autumn version of Living Answers will be held in Aula Magna on 8 November. Over one thousand excited 12-year-olds will meet a panel of nine researchers from different scientific fields, who will try to answer as best they can a selection of the tricky questions posed.

### New Co-worker at the Faculty Office

Andreas Bergfeldt, temporary replacement for Lotta Tomasson (who is, in turn, temporary replacement for Ylva Carlheim-Gyllensköld) until 31 May 2007. Telephone: 08-163904, [andreas.bergfeldt@natkan.su.se](mailto:andreas.bergfeldt@natkan.su.se).

### STOCKHOLM TOOLS OF SCIENCE

The "Stockholm Tools of Science" is a joint information platform between KI, KTH and SU. The aim of the Tools platform is to spread information about available equipment, skills, and core facilities within the life sciences at the three universities.

More information is available at <http://www.stockholmtoolsofscience.se>.