



# THE EUROPEAN LIGHT SOURCE

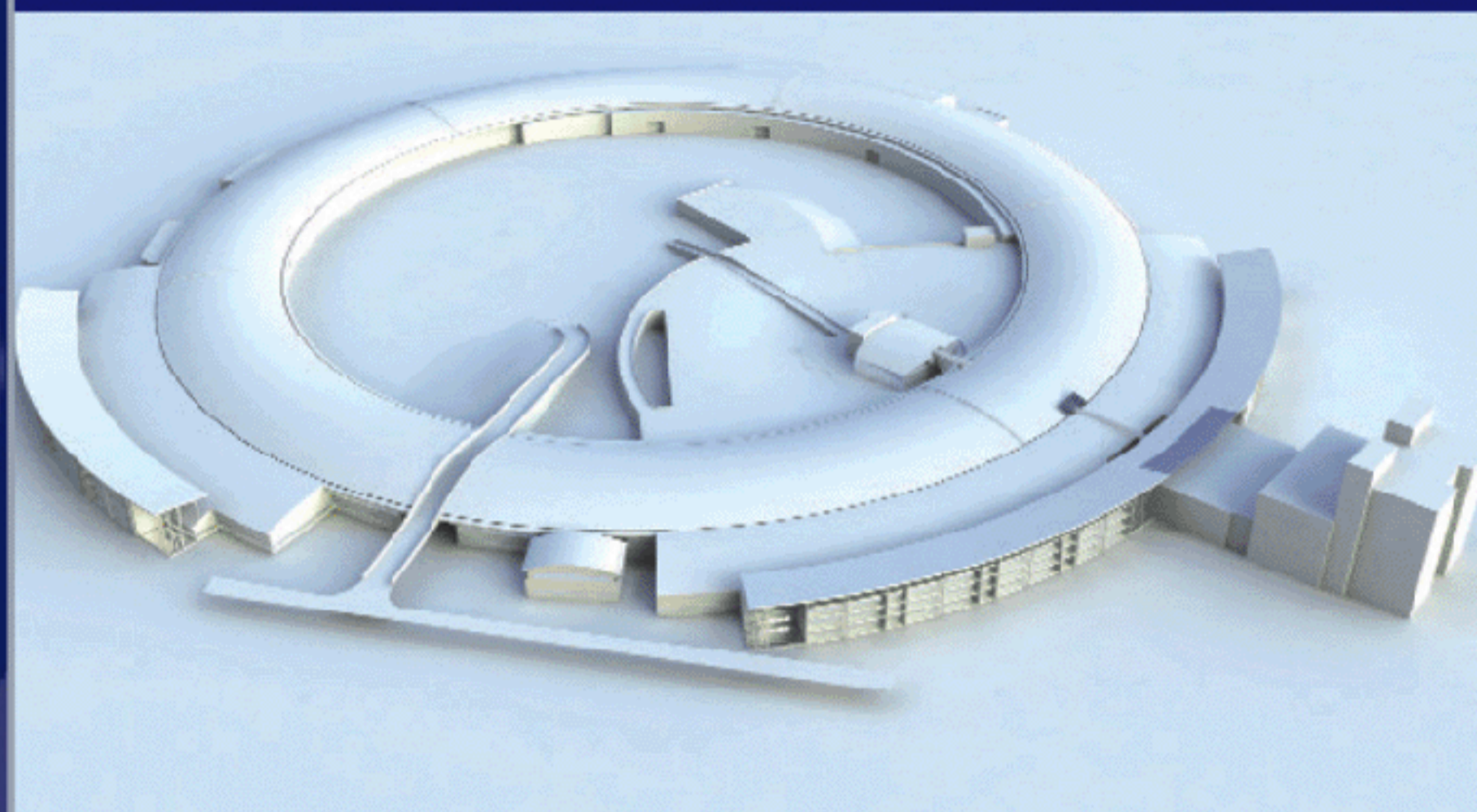
## SOME DEGENERATIVE DISEASES PROVE SIMILAR AT THE MOLECULAR LEVEL

Alzheimer's disease, Parkinson's disease, type 2 diabetes, the human version of mad cow disease, and other degenerative diseases are more closely related at the molecular level than many scientists realized, an international team of researchers, including ESRF scientists, reported in April in *Nature*.

The brains of patients with these diseases contain harmful rope-like structures known as amyloid fibrils, which are protein molecules linked by water-tight "molecular zippers". "We have shown that the fibrils have a common atomic-level structure," said David Eisenberg, a UCLA-DOE professor and a member of the team. "All of these diseases have a dry steric zipper. With each disease, a different protein transforms into amyloid fibrils, but the proteins are very similar at the atomic level." The UCLA team, together with scientists from the University of Copenhagen and the ESRF, carried out part of their research at ID13. "It has been a great international collaboration," Eisenberg said.

*Sawaya et al., Nature, 29 April 2007.*

## SHAPING THE FUTURE OF THE ESRF



## ESRF UPGRADE MEETING

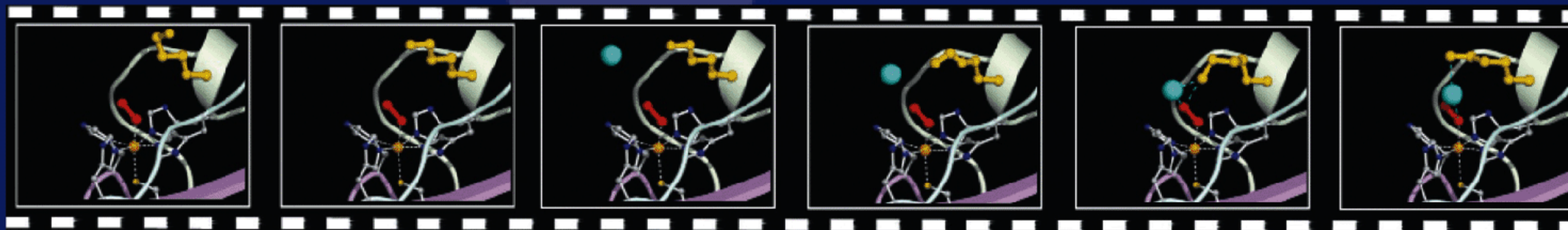
Presentation of the Upgrade Programme  
to scientific community

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**24 OCTOBER 2007**

<http://www.esrf.eu/events/conferences/UpgradeMeeting>

## SCIENTISTS FILM PROTEINS AT WORK BY FREEZING THEM IN DIFFERENT STATES



The film shows how the lysine amino acid (yellow part of the protein) grabs a water molecule (in blue) and imports it into the enzyme to perform the catalytic reaction on the superoxide (in red). Credits: G. Katona.

Scientists from the ESRF and the Institut de Biologie Structurale have managed to produce a movie of a protein whose role is to eliminate toxic molecules. They pictured this protein in action by freezing it at several states.

Most of the research done on proteins is based on their study in a resting state and their study in movement is extremely limited due to technological limitations. A French team has made a movie of an enzyme found in bacteria. "The achievement of this research is two-fold: on one hand there is the technological success of filming an enzyme in action and on the other hand there are the results that contribute to the knowledge of how this enzyme works", explains scientist Dominique Bourgeois.

*Katona et al., Science, 20 April 2007.*

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