

# The most complete review of the peptide behind Alzheimer's

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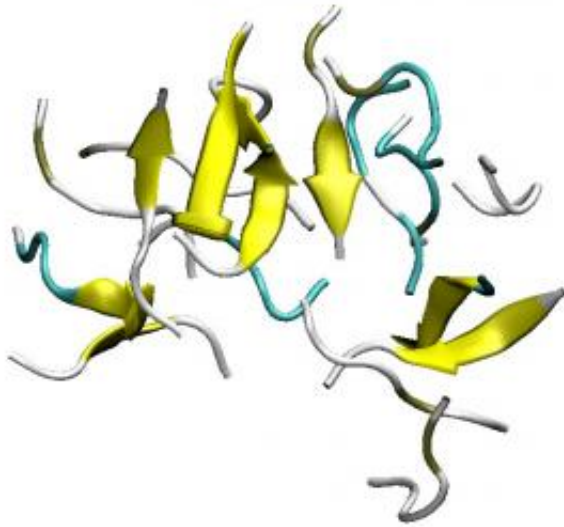
3-D simulation of an amyloid-beta protein. Credit: SISSA

The hope is to be able, one day, to fight the pathogenic action of the amyloid-beta protein, whose build-up is associated with Alzheimer's disease. In the meantime, scientists—including a group from the International School for Advanced Studies, SISSA, in Trieste—have synthesized the knowledge acquired about this protein over the last few

decades in a review paper that is destined to become a milestone for future research.

"It will still take many years to understand the mechanisms leading to the formation of the characteristic plaques seen in brains affected by Alzheimer's disease", explains Alessandro Laio, SISSA professor. "We know they are mostly a build-up of amyloid-beta peptide, the [protein](#) that research is currently focusing on". And, as of today, all those involved in biomolecular research on Alzheimer's will have access to a new and important instrument: an extensive and complete review of all scientific knowledge about this "killer protein" has in fact just been published in the journal *Chemical Reviews*. The work, coordinated by Philippe Derremaux of the French CNRS, engaged the world's leading research centres in the field, bringing together experimentalists and theoreticians. Among them, the group headed by Laio At SISSA, which includes Baftizadeh Fahimeh and Daniele Granata.

"The work done for this review is unique" comments Laio. "Normally, this kind of study is carried out by a small number of scientists who are necessarily experts in a specific sector. This review, by contrast, involved all those working on this topic and who represent the essence of research in this field". When science becomes so advanced, as is the case here, it is unlikely that one person (or even few people) can understand and report on all of its aspects. "Research into amyloid-beta, as well as being extremely specialised, is also multidisciplinary. So, to understand what's been done so far, it's necessary to bring together different competences that are sometimes very distant from one another", continues Laio.



3-D simulation of an amyloid-beta protein. Credit: SISSA

"This review is destined to become a reference for everyone in this sector as it provides the most comprehensive state of the art in this field. Its utility is also practical: for many researchers it will mean considerably cutting down the time needed to explore the subject in depth before designing their experiments".

The study combines experimental and theoretical aspects (the latter, in particular, the focus of research at SISSA). "Everyone hopes that one day they'll be able to understand and fight this disease which, with the world's growing life expectancy, is becoming increasingly widespread. The efforts to be made are still enormous. We hope we have given a significant contribution through our work".

## More in detail



3-D simulation of an amyloid-beta protein. Credit: SISSA

The amyloid-beta peptide (or A-beta) is a protein that is normally present in our body and that in the vast majority of cases has a benign, physiological function.

However, the same protein is also the main constituent of senile plaques, extracellular deposits that build up in the brains of individuals affected by Alzheimer's disease, a form of age-related senile dementia that leads to severe impairment of cognitive function and eventually to death.

In [senile plaques](#), the central core is composed of [amyloid protein](#) and

the outer portion of neuronal waste ("debris" from no longer functioning nerve cells). These formations are found all over the brain, but especially in the hippocampus (an area known to be associated with memory, and hence the severe deterioration of this function in patients) and in other areas (frontal and parietal lobes).

Provided by International School of Advanced Studies

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