

A device for immunotherapy against Alzheimer's disease : the challenge of measuring amyloid β plaques at TOMCAT beamline

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Alzheimer's disease (AD) is a devastating neurodegenerative disorder causing the most prevalent form of dementia. AD is characterized by a prominent accumulation of protein aggregates in affected regions of the brain called amyloid β plaques ($A\beta$) that are used as markers for defining and monitoring the pathology. An active role of $A\beta$ on the AD progress was proposed in the past suggesting the clearing of the $A\beta$ as a possible cure for AD. Recently, controversial results have indicated that the $A\beta$ role is predominant in the early stage of the disease. Therefore further studies are necessary toward a definitive AD cure.

In the framework of the Commission for Technology and Innovation (CTI), a team composed by researchers from EPFL, Roche and PSI is developing an encapsulated cell device for the passive immunization against $A\beta$ focused on the early clearing of the $A\beta$. Measuring small changes of $A\beta$ accumulation is a further challenge within the project. At the moment, x-ray differential phase contrast is the only way to measure $A\beta$ at high resolution (5-20 μm) in 3D with high sensitivity. Using the grating interferometer setup developed and available at the TOMCAT beamline it is possible to investigate and disclose the proposed therapy efficacy.

In this contribution the capability of the TOMCAT beamline together with the project status and the first results will be presented.

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