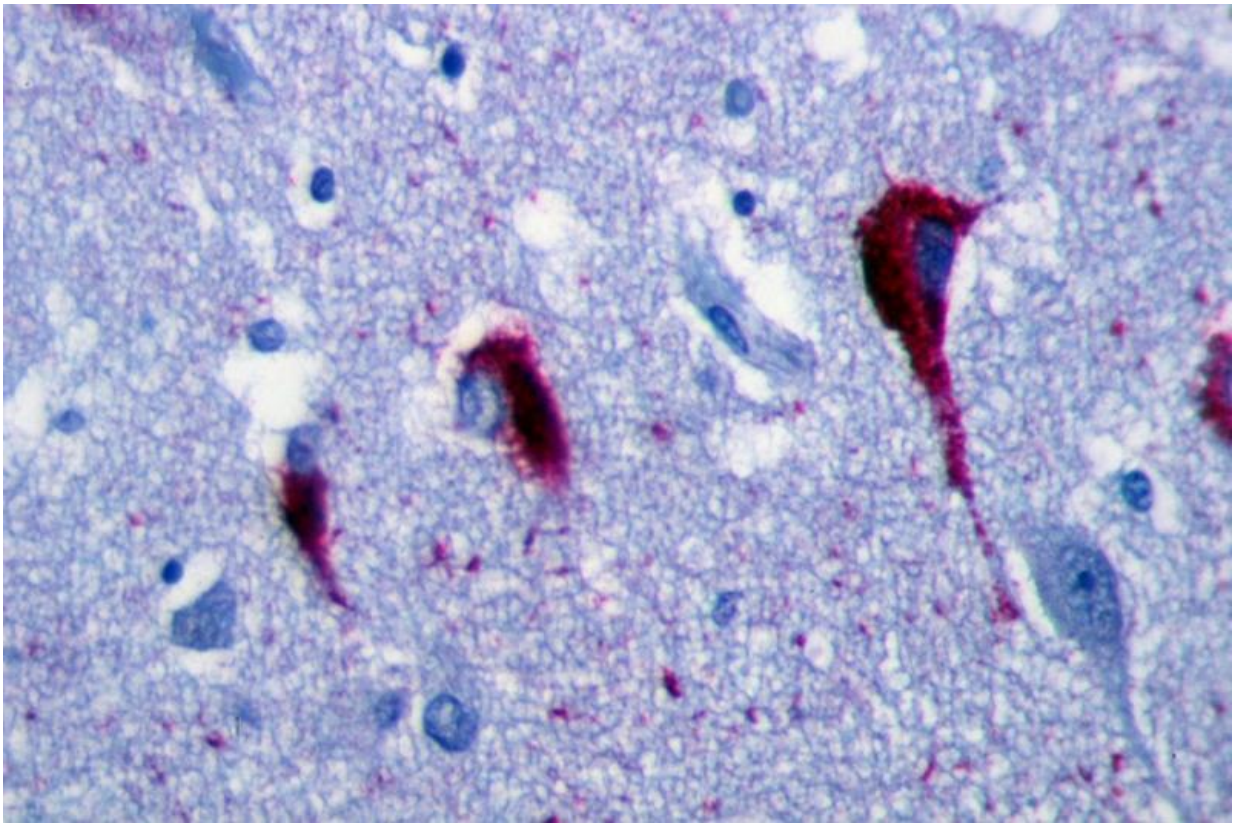
New method to catch notorious Alzheimer protein

March 16 2016



Credit: Leiden Institute of Physics

Medical doctors see lumps of the protein A β-peptide in Alzheimer patients' brains. They are not sure however if this causes the disease, or if it's a consequence of the damage these proteins do on brain

membranes. Resolving this matter is necessary for medication development. Now, Leiden physicists have created a method to get an answer to this important question. Publication on March 16th in *Journal of Biological Physics*.

Martina Huber and her research team managed to detect how Aβ-peptides behave around a mimicked brain membrane. She put a soapy substance in an Aβ-peptide solution, causing the peptides to assume the presence of a closeby membrane. With a so-called EPR tracing technique Huber kept track of the proteins' location, giving her information on whether they immediately started clumping together, or if they first cut off a piece from the imitation membrane.

It depends on the ratio peptide/soap what will happen. With a high concentration of peptide and little soap, there is more binding between both substances, which we associate with membrane damage. On the contrary, a low ratio leads to more lumps. Huber performed her first test on unrealistic concentrations, meaning she can't give an answer for the human body. But she does offer scientists for the first time a method to answer the pressing question for realistic ratios.

'Now we can start studying which ratio leads to which scenario, and which of those ratios actually occur in our body,' says Huber. 'We already see that the protein lumps are less hydrophobic than we expected. We used to suspect that these Aβ lumps refuse to mix with water. Now they appear to be able to access the membrane at more spots than we thought.'

The importance of Aβ-peptide research is demonstrated by the fact that it has no use in normal, healthy processes. Huber: 'Our body only produces it by mistake. It has no legitimate excuse to be present in our brains. So it is clear that this protein has something to do with Alzheimer's. And now we have the means to find out what it does

exactly.'

More information: Interaction of the amyloid β peptide with sodium dodecyl sulfate as a membrane-mimicking detergent, *Journal of Biological Physics*, link.springer.com/article/10.1 … 07/s10867-016-9408-5

Provided by Leiden Institute of Physics