

Tracking proteins behaving badly provides insights for treatments of brain diseases

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(Medical Xpress) -- A research team led by the University of Melbourne has developed a novel technique that tracks diseased proteins behaving badly by forming clusters in brain diseases such as Huntington's and Alzheimer's.

The technique published in [Nature Methods](#) today is the first of its kind to rapidly identify and track the location of diseased proteins inside cells and could provide insights into improved treatments for [brain diseases](#) and others such as cancer.

Developed by Dr Danny Hatters and his team of the Department of Biochemistry and Molecular Biology at the Bio21 Institute, University of Melbourne, the technique uses a flow cytometer to track the [protein](#) clusters in cells at a rate of 1000s per minute. In addition, cells with clustered proteins can be recovered for further study - neither of which had been possible before.

“Being able to identify locations of diseased proteins in cells enables drugs to be developed to target different stages of disease development,” he said.

He said the technique has application to many neurological diseases, which are characterised by formations of proteins clustering such as in Alzheimer's, Parkinson's and Huntington's diseases.

“A challenge for researchers has been trying to understand how proteins

cluster and cause damage in diseases like Huntington's and Alzheimer's. This is the first approach which could enable us to answer those questions.”

“Now we can see how the proteins form clusters inside a cell and can examine which cell functions are being damaged at different steps of the clustering process.”

“No drugs at this stage can stop the clustering process in Huntington's disease for example. This sets up platforms to develop drugs that block the formation of clusters,” Dr Hatters said.

The technique can also be used to examine how signaling processes occur such as when genes are switched on and off.

“It has application to track events of abnormal gene signaling such as in cancer ” Dr Hatters said.

“This technique offers hope in improving treatments for a range of neurological and other conditions,” he said.

This work builds on Dr Hatters previous research where he and his team identified the behaviour of diseased Huntington proteins forming into clusters.

The work was done in collaboration with Monash University.

Provided by University of Melbourne

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