New technique detecting 'sugar-coated' proteins could identify diseases earlier

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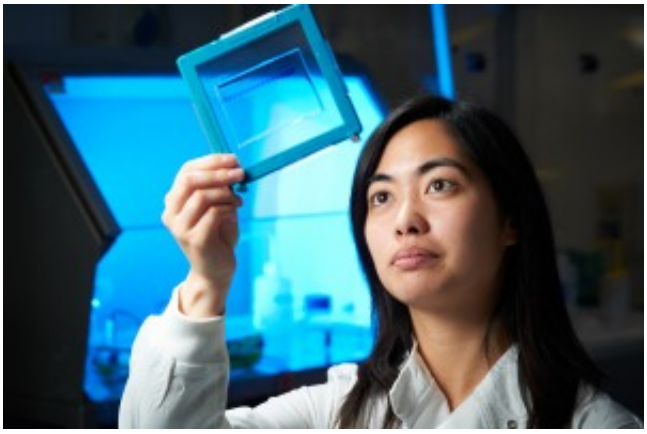

Marta Pereira Morais.

(Phys.org) —Scientists from our Departments of Biology & Biochemistry and Chemistry have developed a new technique that could be used in blood tests to detect a range of age-related conditions such as diabetes, dementia and Alzheimer's.

In the process of ageing, proteins in the body react with sugars in a process called glycation. This damages the protein's function which in some diseases can trigger complications such as inflammation and premature aging.

The team of chemists and biochemists at Bath have developed a technique that detects levels of glycated proteins in blood and tissue

samples, which can be used to assess the damage caused by sugars in age-related diseases.

The technique, published today in the Nature Group journal *Scientific Reports*, is based on gel electrophoresis, where samples are put into a thin gel layer and an electric current is applied. The gel acts like a molecular sieve, sorting proteins from the samples according to their size and shape, allowing scientists to identify whether specific proteins are present in the sample.

The system, patented by the research team, uses boronic acid labelled with a fluorescent tag to distinguish between the glycated and unmodified proteins. The method also, allows them to distinguish glycated proteins from proteins that have been glycosylated; a normal process in healthy cells where sugars are added using enzymes.

Researchers are now looking for industrial partners to collaborate and develop the system to detect levels of glycated proteins in human blood samples, leading to a simple test for a variety of age-related diseases.

Dr Jean Van Den Elsen, from the University's Department of Biology & Biochemistry, explained: "We are currently using our technique to understand how these age-related diseases work, by identifying new biomarkers for diseases such as Alzheimer's disease (AD) and testing how new treatments affect levels of glycated proteins.

Marta Pereira Morais, the post-doctoral researcher on the project added: "So far we've proven this test is able to detect glycated proteins in blood and in a caterpillar model for diabetes. We have also been able to distinguish between brain material from healthy mice and those with AD pathology.

"We hope in the future to develop this technology into a simple blood

test for diseases such as AD, so that patients with the condition can be diagnosed and treated earlier."

More information: dx.doi.org/10.1038/srep01437

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