

Non-invasive detector as early warning for diabetes

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DIABETES



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Researchers from the Hefei Institutes of Physical Science (HFIPS) of the Chinese Academy of Sciences reported that they have developed a pain-free, non-invasive and fast way detector of early diabetes warning signs.

It is a non-invasive scanning device that checks the advanced glycation end products (AGEs) level concentrated in a person's skin [tissue](#).

According to the researchers, they have developed the entire technology for manufacturing from scanning to data processing, of which spatially resolved fluorescence spectroscopy of skin tissue was considered the key technology by the team.

AGEs are a class of stable end products occurring as a result of condensation, rearrangement, cleavage and oxidation modification of free amino groups of large-molecule substances including proteins, [amino acids](#), lipids or nucleic acids with aldehyde groups of reducing sugars under non-enzymatic conditions.

Generally speaking, AGEs increase slowly at low levels in skin of people who have normal glycometabolism; however, accelerated accumulation of AGEs could be brought about by bad living habits, including smoking.

AGE in vivo, especially with an accelerated increase, can induce [insulin resistance](#) and impair islet β cells, which damages glucose regulation and then leads to diabetes. That is why AGEs have been thought to be an early risk factor for diabetes.

The fluorescent property of AGEs allow it to be detected in skin tissue. "If we can detect the AGE and its concentration in skin tissue, it will help people know the risk of developing diabetes at early stage and then they can do something. And the fluorescent property makes it feasible to be detected, and we thought the photoelectric technology can solve this," said Wang Yikun, who led the research team.

The team developed a strategy to detect AGEs in skin tissue by emitting low intensity (but highly safe) light on the [skin](#). Then the AGEs will reflect a fluorescence signal that is collected by a high-precision and

high-sensitivity array detector. After a data process and analysis, a risk assessment report is printed out.

"Our equipment opens the door to early warning of [diabetes](#) then the people with high risk could do something on it, like changing life habits. And it is pain-free and non-invasive which we think will make the detect method easier to be applied," said Wang.

The team is deploying their equipment in many hospitals, healthcare centers and community services.

Provided by Chinese Academy of Sciences

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