

## **Biomarkers for Early detection**

Current diagnosis of Alzheimer's relies largely on documenting mental decline. We now know that Alzheimer's has already caused severe brain damage in individuals who are diagnosed in this way. To detect Alzheimer's before these devastating symptoms begin, it is believed that biomarkers (short for "biological markers") offer one of the most promising paths to investigate. A biomarker is something that can be measured to accurately and reliably indicate the presence of disease.

An example of a biomarker is fasting blood glucose (blood sugar) level, which indicates the presence of diabetes if it is 126 mg/dL or higher. Other examples include beta-amyloid and tau levels in cerebrospinal fluid as well as brain changes detectable by imaging. Recent research suggests that these indicators may change at different stages of the disease process.

Before a biomarker can be used in medical clinics, it must be validated, in which multiple studies in large groups of people establish that it accurately and reliably indicates the presence of disease. Furthermore, the laboratory methods used to measure the biomarker must be shown to be stable and reliable.

Researchers are currently investigating whether presymptomatic Alzheimer's disease causes consistent, measurable changes in urine or blood levels of tau, beta-amyloid or other biomarkers. In addition, scientists are exploring whether early Alzheimer's leads to detectable changes elsewhere in the body, eg. whether beta-amyloid forms characteristic deposits in the lens of the eye. There are currently no validated biomarkers for Alzheimer's disease, but researchers continue to investigate several promising candidates, including brain imaging, proteins in cerebrospinal fluid, proteins in blood and genetic risk profiling.