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Type 1 Diabetes Biomarkers

Type 1 Diabetes (T1D) is one of the most common juvenile autoimmune diseases and is characterized by progressive destruction of pancreatic ß-cells. By the time of T1D diagnosis, around 70-90% of pancreatic ß-cells are already dead. T1D patients face many potential health complications and co-morbidities which lead to both personal and societal burdens. Prevention of T1D is only possible if individuals can be identified with a high risk for progression to T1D. Finding early diagnostic and prognostic biomarker candidates of T1D, prior to symptomatic disease onset will be of great value for disease prevention and early intervention.

Researchers at the Biodesign Institute of Arizona State University in conjunction with collaborators at University of Florida have discovered 17 autoantibodies (AAbs) that can be used as potential biomarkers for early detection and risk prediction of T1D. These AAbs have not been previously associated with T1D and have sensitivities ranging from 10-27% at 95% specificity. These AAbs were identified using a proteome-scale, two-stage serological AAb screening followed by an independent validation study. These biomarkers could be utilized in a kit for assessing the presence of antigens for T1D.

These biomarkers may help with early diagnosis and prediction of T1D before disease onset and before significant destruction of pancreatic ß-cells. This would have a significant impact on treatments and options for T1D patients and those who may be at high risk of getting T1D.

Potential Applications

- T1D diagnosis
- Identifying patients at risk for developing T1D
  - Early intervention
  - Disease prevention
- Personalized therapeutics

Benefits and Advantages

- Better predictor of patients who might develop T1D
- The discovery of additional biomarkers aids in the differential diagnosis of T1D
- Sensitivities ranging from 10-27% at 95% specificity
- The two-screen method limits the potential for overfitting the data
- The identification of these biomarkers and correlation of their seropositivity with clinical features may be of benefit to disease stratification
- Advances the understanding of disease etiology and heterogeneity

For more information about the inventor(s) and their research, please see Dr. LaBaer's laboratory webpageDr. Anderson's laboratory webpage