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Autoantibody Biomarkers for Crohn's Disease

Crohn's disease (CD), is an inflammatory bowel disease that affects about 3 out of 1,000 people in the U.S. It is currently not known what causes CD, but hereditary, environmental factors and a dysregulated immune system are thought to play a role. Diagnosis of CD is difficult and often involves expensive imaging and invasive biopsies. Current non-invasive diagnostic biomarkers for CD are limited in their utility due to frequent false positives. Progress in identifying individual autoantigens and autoantibodies in CD has been challenging due to limitations of available immunoassays.

Researchers at the Biodesign Institute of Arizona State University and collaborators at the Mayo Clinic have, utilizing nucleic acid programmable protein arrays (NAPPA), identified a set of autoantibodies as potential biomarkers associated with CD that may be useful in diagnosis and management. These biomarkers were identified by looking at the antibody profile of 96 patients with established CD and 96 healthy controls, evenly split into discovery and validation sets randomly. Autoantibodies of both IgG and IgA were profiled against ~1900 human proteins, in the discovery set, on NAPPA. These autoantibodies were further validated in an independent validation set by ELISA. Most of these autoantibodies are newly identified and have sensitivities above 15% at 95% specificity.

These autoantibody biomarkers have potential clinical impact in understanding CD pathogenesis and could be used to improve current CD diagnostic tests and treatment options.

Potential Applications

- Diagnostic tests to detect Crohn's disease
- Improving treatment options for CD
- Understanding CD pathogenesis

Benefits and Advantages

- High Specificity
- The best logistic regression model of some of the biomarkers had

sensitivities of 60.4% at 95% specificity and AUC 0.844

- These antigens have not previously been associated with CD
- Blood test – low cost, minimizes the need for invasive diagnostic procedures
- NAPPA allows for faster identification of AAbs and enables proteome-level study of antibody responses without the need to purify individual proteins

For more information about this opportunity, please see

Wang et al - J Crohns Colitis - 2017

For more information about the inventor(s) and their research, please see

Dr. LaBaer's departmental webpage