TITLE: Automated Process for Discovering Disease Biomarkers in the Antibody Repertoire
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TECHNOLOGY: Diagnostics

UTSD: 3176

SUMMARY:

This technology describes an automated process, algorithm, and software for identifying disease biomarkers in an antibody repertoire.

The features that predict antibody-mediated diseases are ultimately the result of molecular interactions between a subset of antibodies and their associated antigen.

Many diseases are hard to diagnose leaving many patients undiagnosed and untreated, while other diseases are hard to detect early enough delaying treatment that could prevent irreversible damage. Identifying biomarkers for antibody-mediated disease is of great importance to ensure early diagnosis as well as to design appropriate therapeutics.

The present invention describes tools and methods to identify antibody-mediated disease biomarkers in high throughput. Identified targets could significantly influence future treatment of autoimmune, infectious and neoplastic diseases. This automated process requires little to no prior knowledge of the disease state, is extremely sensitive, and is able to provide a positive diagnosis based on the presence of a single diagnostic antibody.

The invention is composed of three parts. A high throughput system to obtain sequence data on antibody paratope (antigen binding site) regions. An algorithm to process sequence data according to almost 500 biochemical properties. And software to analyze these properties to identify biomarkers.

There are two unique aspects for the use of this invention as a diagnostic tool. A detector function that scores each antibody flagging positive diagnosis whenever a high score is present. And the predicted diagnosis is fitted to the correct answer by choosing parameters in the detector function that maximize the likelihood of correct diagnosis.

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Please reference UT Southwestern Case Number: **3176**