Genetic targets for the prediction, diagnosis, and treatment of IgA nephropathy

Technology #2798

IgA nephropathy is an autoimmune condition that can result in kidney damage and even renal failure in young adults. Physicians rely on a patient's ethnicity and family history to determine risk of IgA nephropathy, and a definitive diagnosis requires an invasive and potentially painful surgical renal biopsy. This technology identifies specific genes and alleles, through genome-wide association studies, that are related to the pathogenesis of IgA nephropathy. Additionally, it incorporates these genetic markers into a quantitative diagnostic tool for non-invasive diagnosis of IgA nephropathy as well as prediction of disease severity and progression. These genes and their products are also identified as potential therapeutic targets for new treatment strategies.

Identification of IgA nephropathy genes leads to less invasive, more effective predictive and diagnostic tools as well as potential treatments

This technology provides a predictive tool to quantitatively risk-stratify patients based on the presence or absence of five specific alleles. Such a non-invasive instrument could identify patients who would benefit from an invasive biopsy while sparing those at low-risk from a painful and potentially dangerous procedure. The technology also identifies specific genetic variations containing protective or at-risk alleles of several specific genes including CFHR-1, CFHR-3, and PSMB8. Therapeutics targeting these genes and their associated products using RNAi, antibodies, or small molecule inhibitors hold promise as effective treatments for IgA nephropathy. Furthermore, naturally occurring deletions of these genes are found in the population suggesting minimal side effects for such treatments.

In vitro research is continuing on this technology. The diagnostic tool was evaluated against three sample patient populations and demonstrated a 5-2-fold increase in risk for developing IgA nephropathy at the highest calculated risk level.
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Applications:
- Genetic diagnostic tool for identifying at-risk patient populations
- Research for studying the genetic mechanism of IgA nephropathy pathology
- Prognostic and treatment guide for patients suspected of having IgA nephropathy
- Diagnostic tool for determining if renal biopsy is necessary in patients suspected of having IgA nephropathy
- Genetic target for therapeutics to treat the underlying cause of IgA nephropathy
- Therapeutic targets for RNAi, proteasome inhibitors, antibodies, and other small molecule inhibitors for the treatment of IgA nephropathy

Advantages:
- Noninvasive tool for diagnosis of IgA nephropathy
- Diagnostic tool enables physicians to avoid unnecessary invasive biopsies in low risk patients
- Identifies novel targets for future therapeutics
- Can provide prognostic information about disease severity and course
- Guides intensity of treatment in patients with diagnosed IgA nephropathy

Patent information:
Patent Pending

Licensing Status:
Available for licensing and sponsored research support
Tech Ventures Reference: IR 2828, 2798, 2799

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