Genomic Predictor of Kidney Cancer Prognosis and IL-2 Treatment Response

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SUMMARY

UCLA investigators have identified a single nucleotide polymorphism (SNP) for use as a biomarker for the prediction of overall survival and likelihood of response to interleukin-2 treatment in patients with kidney cancer.

BACKGROUND

Renal cell carcinoma is the most common type of kidney cancer among adults, with 31,000 new cases and 12,000 deaths reported annually in the US alone. The disease is often asymptomatic until it has advanced far beyond a curative point, and thus the median survival time is low. Traditionally, for patients whose tumors are within range, surgery is the preferred treatment and has a 90% cure rate. Once the RCC has metastasized, alternative therapies such as interleukin-2 (IL-2) intervention become necessary. This therapy, though incredibly effective in a limited number of patients, is associated with high toxicity and low response rates overall. Previous studies have indicated that CAIX, the protein product of the carbonic anhydrase 9 (CA9) gene, is not expressed in benign organs and tissues but highly expressed in clear cell RCC. Expression of CAIX correlates with better prognosis and response to IL-2 therapy, but it would be advantageous to identify a single nucleotide polymorphism (SNP) biomarker in the coding region of CA9 to determine if DNA variants exist among patients that might effectively predict a patients response to IL-2 treatment.

INNOVATION

Researchers at UCLA have identified a SNP in CA9 that acts as a biomarker of survival from renal cell carcinoma (RCC). Additionally, this SNP serves as an independent prognostic factor of positive response to IL-2 based immunotherapy of RCC.

APPLICATIONS

▶ For the determination of a CA9 SNP associated with improved overall survival from RCC and a greater likelihood of response to IL-2 therapy

ADVANTAGES

▶ CA9 SNP pre-screening of patients with RCC prior to IL-2 intervention helps decrease the incidence of unwarranted treatment and the associated adverse side-effects for low-responders
▶ Integration of this SNP into various assays by pharmaceutical companies during clinical trials allows for the identification and validation of drug targets for RCC

STATE OF DEVELOPMENT

Researchers have analyzed the CA9 gene-coding region and CAIX protein expression in kidney cancer patients to correlate SNPs with patient survival and response to IL-2 treatment. A SNP has been identified and patients with this polymorphism showed improved overall survival and a greater likelihood of response to IL-2.

PATENT STATUS

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RELATED MATERIALS
