SLC45A3-ELK4 as a Non-invasive Diagnostic Marker for Prostate Cancer

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Technology description

Researchers in the lab of Mark A. Rubin at Weill Cornell Medical College have identified a novel mechanism for overexpression of ELK4, in prostate cancer samples, leading to a new diagnostic marker for such cancers. ELK4 is an erythroblast transformation specific (ETS) gene involved in promoting cell growth, in prostate cancer samples. This group found a novel fusion transcript, linking segments of the androgen responsive, SLC45A3 gene (solute carrier family 45, member 3, also referred to as prostein) and the ELK4 gene, to be highly expressed in a subset of prostate cancers, resulting in ELK4 overexpression.

Chromosome rearrangements of ETS family members in prostate cancer, similar to other translocation tumors, have been shown to represent a distinct subclass of prostate cancer. Typically the promoter elements of an androgen-regulated gene comprise the 5' partner fused to an ETS gene in prostate cancer.

Characterization of the fusion mRNA showed a major variant in which SLC45A3 exon 1 is fused to ELK4 exon 2 in addition to other fusion products. Unlike other ETS fusion events in prostate cancer, these findings show that SLC45A3-ELK4 mRNA expression is heterogeneous, highly induced in a subset of prostate cancers, androgen-regulated, and most commonly occurs through a mechanism other than chromosomal rearrangement (e.g., trans-splicing) in prostate cancer.

When present, the SLC45A3-ELK4 transcript can be detected at high levels in urine samples signaling men at risk for prostate cancer. These SLC45A3-ELK4 transcripts can, therefore, serve as non-invasive diagnostic markers for this subtype of prostate cancer. It is anticipated that other cancer types also produce this fusion transcript, potentially broadening the diagnostic utility of detecting this fusion product to other malignancies as well. This transcript may provide a therapeutic target for such cancers.

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