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Gene Section
Mini Review

RNF139 (translocation in renal carcinoma, chromosome 8 gene)

Anita Bonné, Eric Schoenmakers, Ad Geurts van Kessel

Department of Human Genetics, University Medical Center Nijmegen, Nijmegen, the Netherlands (AB, ES, AGvK)

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Identity

Other names: TRC8 (translocation in renal carcinoma, chromosome 8 gene); RCA1; HRCA1; MGC31961; 8_125443572

HGNC (Hugo): RNF139

Location: 8q24.31

DNA/RNA

Description

The TRC8 gene covers 13.96 kb. The gene contains 2 confirmed introns, 2 of which are alternative. The gene showed similarity to the hereditary basal cell carcinoma/segment polarity gene, 'patched' (PTCH) This similarity involved 2 regions of 'patched,' the putative sterol-sensing domain and the second extracellular loop that participates in the binding of sonic hedgehog (SHH). In the t(3;8) translocation, TRC8 was found to be fused to FHIT and disrupted within the sterol-sensing domain. In contrast, the FHIT coding region was maintained and expressed. In a series of sporadic renal carcinomas, an acquired TRC8 mutation was identified. By analogy to patched, TRC8 might function as a signaling receptor, and other pathway members, to be defined, are mutation candidates in malignant diseases involving the kidney and thyroid.

Protein

Description

664 amino acids.

Localisation

Plasma membrane.

Function

The protein encoded by this gene is a multi-membrane spanning protein containing a RING-H2 finger. This protein is located in the endoplasmic reticulum, and has been shown to possess ubiquitin ligase activity. This gene was found to be interrupted by a t(3:8) translocation in a family with hereditary renal and non-medulary thyroid cancer. Studies of the Drosophila counterpart suggested that this protein may interact with tumor suppressor protein VHL, as well as with COPS5/JAB1, a protein responsible for the degradation of tumor suppressor CDKN1B/P27KIP.

Implicated in

t(3;8)(p14.2;q24.1) and hereditary renal cell cancer.

Disease
Familial renal cell cancer.

Cytogenetics
Disruption of the gene because of the t(3;8) translocation.

Hybrid/Mutated gene
FHIT/TRC8. Although studies demonstrated that the 3p14.2 breakpoint interrupted the fragile histidine triad gene (FHIT) in its 5-prime noncoding region, several reasons made it unlikely that FHIT is causally related to renal or other malignancies.

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