

Familial clear cell renal cancer

Identity

Note Renal cell carcinomas (RCC) represent 85% of all primary renal tumors. In general, RCCs are sporadic tumors but cases of familial RCC have also been reported. If detected early and without metastases, the disease can be cured surgically with conservation of renal function. Both familial and sporadic cases have in common the presence of abnormalities involving chromosome 3, suggesting a primary role for this chromosome in RCC causation, particularly the clear cell type. An early gene rearrangement due to translocation may be a primary event. Loss of 3p and somatic mutation(s) in a tumor-suppressor-gene(s) on 3p (e.g. [VHL](#)) may be recurring events related to tumor progression

Inheritance The inherited form of renal cancer is characterized by :

- the tumor is found at an early age compared to sporadic tumors (see below)
- the tumors are found frequently bilateral
- multiple occurrence.

Other (well known) classes of inherited renal cell carcinomas are: the [Von Hippel-Lindau syndrome](#), and the [Lynch syndrome II](#).

Also chromosome abnormalities may be related to inherited renal cancer.

Clinics

Note No phenotypic sign.

Neoplastic risk Multiple and/or bilateral [nonpapillary renal cell carcinomas](#), with median age 45 yrs at diagnosis (range 18-79 yrs, most cases being between 35 and 55 yrs old).

Treatment If the tumor is detected at an early stage the tumor can be surgical removed, without the lost of the renal function.

Prognosis Depends on the stage of the tumor at the time of detection.

Cytogenetics

Note Clear-cell renal cell carcinomas are associated with chromosome 3 translocations and deletions of 3p.

Genes involved and Proteins

Gene Name [FHIT](#)

Location 3p14.2

Note FHIT is a breakpoint spanning gene on chromosome 3 in a constitutional familial case of a t(3;8)(p14;q24) translocation.

DNA/RNA

Description 10 exons

Protein

Description 147 amino acids

Gene Name [TRC8](#)

Location 8q24

Note TRC8 is a breakpoint spanning gene on chromosome 8 in a constitutional familial case of a t(3;8)(p14;q24) translocation.

Gene Name [DIRC2](#)

Location 3q21

Note Dirc2 is a breakpointspanning gene on chromosome 3 in a constitutional familial case of a t(2;3)(q35;q21) translocation.

DNA/RNA

Description The gene spans 73 kb, 9 exons.

Protein

Description 478 amino acids

Expression Expression in pancreas, kidney, skeletal muscle, liver, lung, placenta, brain and heart.

Localisation Proximal tubular cells of the kidney.

Function May be a transporter.

Gene Name [DIRC3](#)

Location 2q35

Note Dirc3 is a breakpointspanning gene on chromosome 2 in a constitutional familial case of a t(2;3)(q35;q21) translocation.

DNA/RNA

Description The gene spans 3071 bp and contains 12 exons.

Gene Name [DIRC1](#)

Location 2q33

Note Dirc1 is a breakpointspanning gene on chromosome 2 in a constitutional familial case of a t(2;3)(q33;q22) translocation.

DNA/RNA

Description DIRC1 gene contains 2 exons and spans approximately 57 kb of genomic DNA

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