Atlas of Genetics and Cytogenetics in Oncology and Haematology

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Cancer Prone Disease Section

Short Communication

WAGR (Wilms' tumor/aniridia/genitourinary anomalies/mental retardation syndrome)

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Identity

Inheritance: Generally sporadic, a few inherited cases sometimes with milder phenotype were reported; occurrence: rare

Clinics

Phenotype and clinics

- High Wilms' tumor (WT) risk (can also manifest bilaterally),
- Aniridia (AN),
- Genitourinary anomalies (GU) (hypospadias and kryptorchism in males),
- Mental retardation,
- (Growth retardation).

Various combinations of these features can be present, partly depending on deletion extent.

Neoplastic risk

High.

Cytogenetics

Inborn conditions

del(11)(p13), contiguous gene syndrome with WT/GU and AN loci separated by about 700 kb; deletions may be cytogenetically invisible.

Cytogenetics of cancer

Deletions of the second chromosome 11 copy are rare; Wilms' tumors of WAGR patients frequently show subtle mutations of the remaining WT1 allele.

Genes involved and proteins

Note

Contiguous gene syndrome:
- Wilms' tumor: WT1 Wilms' tumor suppressor gene,
- Genitourinary anomalies: WT1 haplo-insufficiency,
- Mental retardation: unknown,
- Aniridia: PAX6.

WT1 (Wilms' tumor suppressor gene)

Location

11p13

DNA/RNA

Description: 10 exons
Transcription: 3 kb mRNA; four alternative splice forms.

Protein

Description: 429 to 449 amino acids, according to alternative splicings; zinc finger transcription factor.
Localisation: Nuclear.

Mutations

Germinal: Various types of mutations, mostly affecting zinc fingers.
Somatic: Biallelic inactivation in Wilms' tumors (<15%).

PAX6 (paired-homeodomain protein)

Location

11p13

DNA/RNA

Description:
http://www.hgu.mrc.ac.uk/Softdata/PAX6/About/pax6cdna.htm

Protein

Description: Paired-homeobox transcription factor; see http://www.hgu.mrc.ac.uk/Softdata/PAX6/About/about.htm.
Expression: Mainly eye, CNS and nasal development.
Localisation:Nuclear.
Function: Transcriptional regulator.
Homology: Pax gene family.

Mutations

Germinal: Mostly nonsense mutations; see (The Human PAX6 Mutation Database).
Somatic: Not known.

References

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