

## Gene Section

### Review

# DAXX (death-associated protein 6)

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### Identity

**Other names:** BING2; DAP6; EAP1; MGC126245; MGC126246

**HGNC (Hugo):** DAXX

**Location:** 6p21.32

### DNA/RNA

#### Description

Daxx gene has 8 exons on chromosome 6. The sizes of the exons are 66, 256, 832, 212, 214, 475, 223 and 191 bps.

#### Transcription

2,477 bp mRNA.

Two alternative transcripts:

1. Isoform 1 has been chosen as the canonical sequence.
2. Isoform 2 differs from the canonical sequence as follows:

696-740:SSLCIPSPARLSQTPHSQPPRPGTCKTS  
VATQCDPEEIIIVLSDSDPAKNLGRRRSKQDQG

### Protein

#### Description

740 amino acids, 82.2 kDa; contains in 3 coiled coils (residues 180-217, 358-399 and 430-489), and 2 nuclear localisation signals (residues 391-395 and 628-634).

#### Expression

Ubiquitous.

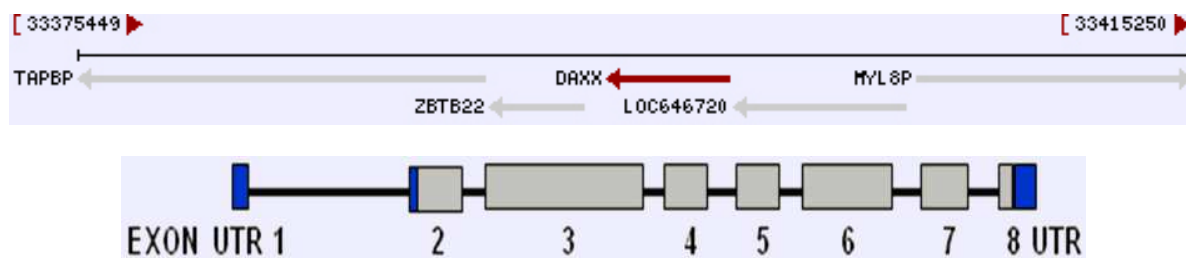
#### Localisation

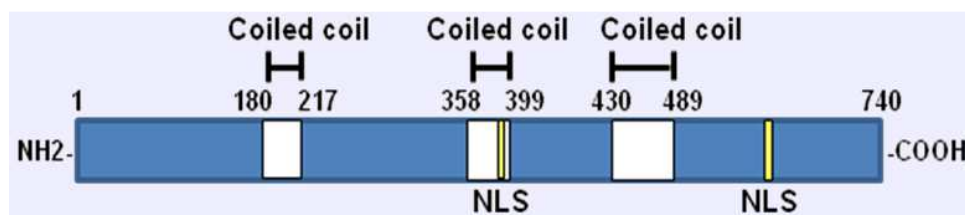
Nucleus and cytoplasm.

Note: Dispersed throughout the nucleoplasm, in PML/POD/ND10 nuclear bodies, and in nucleoli. Colocalizes with a subset of interphase centromeres, but is absent from mitotic centromeres. Detected in the cytoplasmic punctate structures. Translocated from the nucleus to the cytoplasm upon glucose deprivation or ischemic stress.

#### Function

Interaction with Fas death domain and induces Fas-mediated cell death.





Establishes Fas-Daxx-ASK1-JNK axis.

Implicated in ischemic cell death. Daxx translocates from the nucleus to the cytoplasm upon ischemic stress. Cytoplasmic Daxx interacts with NHE1 and stimulates the NHE1 transporter activity and suppresses the NHE1-ezrin-AKT1 pathway.

Associated with the PML body in the nucleus.

Interacts with SUMO1 and UBC9 and is sumoylated at K630 and 631. However, the sumoylation status does not determine its localization onto the PML body.

Mediates SUMO-dependent transcriptional control and subnuclear compartmentalization.

Suppresses cell death in the early embryo.

Daxx silencing sensitizes cells to Fas- and stress-induced cell death through caspase activation, cytochrome C release and JNK activation.

### Homology

Homology with Pan troglodytes (99%); Canis lupus familiaris (89%); Bos taurus (83%); Mus musculus (70%), Rattus norvegicus (73%).

## Mutations

### Note

Substitutions (see the external links).

## Implicated in

### Promyelocytic leukemia

#### Disease

Daxx is a component of the promyelocytic leukemia protein (PML) nuclear bodies (NBs).

### Alpha-thalassemia

#### Disease

Daxx complex is a novel ATP-dependent chromatin-remodeling complex, with alpha-thalassaemia syndrome protein (ATRX) being the core ATPase subunit and Daxx being the targeting subunit.

### Leukemia

#### Disease

Daxx protein was expressed in 38.0% of 50 children with acute leukemia, which was significantly higher than that of the control group (5.0%) ( $P < 0.05$ ). Daxx expression is abnormal in children with acute leukemia and associated with some clinical features of acute leukemia, suggesting that it may play an important role in the genesis and development of acute leukemia.

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