Tumor Suppressor Protein

A **tumor suppressor protein** is a type of protein that regulates cell growth by preventing uncontrolled cell proliferation. These proteins are essential for maintaining normal cell cycle checkpoints, promoting DNA repair, and inducing apoptosis when necessary.

When tumor suppressor genes (such as **TP53**, **RB1**, or **NF2**) are mutated or inactivated, their encoded proteins may lose function, contributing to the development and progression of cancer.

- **Functions:**
  - Cell cycle arrest
  - DNA damage repair
  - Apoptosis induction
  - Inhibition of metastasis
- **Examples:**
  - **p53** – regulates DNA repair and apoptosis.
  - **RB** – controls progression from G1 to S phase.
  - **Merlin (NF2)** – involved in contact inhibition and cytoskeletal dynamics.

Loss of tumor suppressor protein function is a hallmark of many human cancers.