NF1 in Solid Tumors: The Unknown Soldier of Tumor Suppressor Genes

Rayna Patel[1*], Leslie L. Lin[1], Khalil Choucair[1]

[1]Division of Haematology and Oncology, Department of Medicine, The University of Toledo, Toledo, OH 43614

*Corresponding author: Rayna.patel@rockets.utoledo.edu

Published: 05 May 2023

Many of the altered properties of cancer cells are attributed to inactivation of normal cellular regulatory genes that suppress uncontrolled proliferation, evasion of apoptosis, metastasis and tumorigenesis. Loss of tumor suppressor genes (TSG) is crucial for cancer development, along with gain-of-function alterations in proto-oncogenes. NF1 is a TSG well-known in association with Neurofibromatosis type 1 (NF1) syndrome. However, the role of NF1 mutation in cancer has not been extensively studied, unlike other TSGs such as retinoblastoma (Rb), p53, Adenomatous Polyposis Coli (APC), or Phosphatase and Tensin Homolog (PTEN). Here we will discuss the molecular role of NF1 in cancer development and cancer-related cellular signaling. We also review studies that have assessed the prevalence of NF1 mutations and loss-of-function across different solid tumors, and focus on their role in mediating malignant transformation, and modulating response to therapy. This sheds light on the challenges that have hindered a better understanding of NF1's role in cancer development, and discusses the prospect of NF1 as a biomarker for targeted therapies.

https://dx.doi.org/10.46570/utjms.vol11-2023-741