RB's original CIN?

Journal: Genes Dev

Publication Year: 2010

Authors: Julien Sage, Aaron F Straight

PubMed link: 20551167

Funding Grants: The retinoblastoma (RB) gene family in cellular reprogramming

Public Summary:
Here we review the role of Rb and its family members in the maintenance of genomic stability, a process which is important in both stem cells and cancer cells.

Scientific Abstract:
The retinoblastoma tumor suppressor RB is the downstream mediator of a cellular pathway that is thought to prevent cancer by controlling the ability of cells to enter or exit the cell cycle in G0/G1. Recently, however, accumulating evidence has suggested that RB, its family members p107 and p130, and their partners, the E2F family of transcription factors, may have important cellular functions beyond the G1/S transition of the cell cycle, including during DNA replication and at the transition into mitosis. In this issue of Genes & Development, three studies demonstrate a critical role for RB in proper chromosome condensation, centromeric function, and chromosome stability in mammalian cells, and link these cellular functions of RB to tumor suppression in mice. Here we discuss how transcriptional and post-transcriptional mechanisms under the control of the RB pathway ensure accurate progression through mitosis, thereby preventing cancer development.