Title:

Taking a holistic view of PEST-containing nuclear protein (PCNP) in cancer biology

Abstract:

Polypeptide sequences enriched with proline (P), glutamic acid (E), aspartic acid (D) and serine (S)/ threonine (T) (PEST) have been reported to be the most abundant and frequently distributed at the cellular level. There is growing evidence that PEST sequences act as proteolytic recognition signals for degradation of residual proteins which is critical for activation or deactivation of regulatory proteins involved in cellular signaling pathways of cell growth, differentiation, stress responses and physiological death. A PEST containing nuclear protein (PCNP) was demonstrated as a tumor suppressor in a neuroblastoma cancer model and tumor promoter in lung adenocarcinoma cancer model. Its unique properties like ubiquitination by NIRF, co-localization with NIRF in nucleus and tumor progression attract the attention of researchers. PCNP was reported to be ubiquitinated by ring finger protein NIRF in E3 ligase manner and as modulator of MAPK and PI3K/AKT/mTOR signaling pathways. In this review, we summarize PCNP linked DNA damage response, Post translational modifications, and transportation to address initiation, prognosis, and resistance of tumor cells in terms of cell cycle regulation, transcription and apoptosis. Hence, we demonstrate PCNP as a novel target in cancer diagnosis and treatment.