

Nek1 Knockdown Delays DNA Repair and Impairs G2 Checkpoint in HEK293t Cells

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Introduction: NIMA related kinases (Nek) are evolutionarily conserved proteins structurally related to the *Aspergillus nidulans* mitotic regulator NIMA. Nek1, one of the eleven isoforms of the Neks identified in mammals, seems to be involved in the etiology of the polycystic kidney disease (PKD) in humans. Moreover, evidences suggest the participation of Nek1 in response to DNA damage after ionizing radiation and besides, the interaction of this kinase with proteins involved in DNA repair pathways and the cell cycle regulation. However, the accurate function of this protein not yet has been determined. **Objective:** analyze the importance of Nek1 in DNA repair and cell cycle regulation. **Methods and Results:** we showed a reduction in DNA migration by comet assay in cells with silenced Nek1 compared to wild type line when treated with cisplatin indicating that crosslinks are not effectively repaired in these cells. Co-treatment but not post-treatment with methyl methanesulfonate (MMS), which induces strand breaks, did prevent crosslinks induces by cisplatin. Wild type HEKs presented G2 arrest after treatment with MMS, cisplatin and hydrogen peroxide, while Nek1 KD cells this arrest was not observed, suggesting a role of Nek1 in the detection or signaling of DNA damage to the cell cycle machinery. **Conclusions:** Nek1 has a role in the cellular response to genotoxic stress both in relation to DNA repair as well as cell cycle regulation.

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