MiR-133a-3p overexpression-induced elevation of cisplatin-mediated chemosensitivity to non-small cell lung cancer by targeting replication factor C3

Abstract - Investigated the role of miR-133a-3p expression in NSCLC resistance to cisplatin (DDP) treatment and elucidate the possible mechanisms. MiR-133a-3p expression levels in DDP-resistant cells (SPC-1/DPP and A549/DDP) were measured using quantitative reverse-transcription polymerase chain reaction. Cell proliferation, cell apoptosis, cell cycle distribution, and DDP sensitivity were detected through flow cytometry, Cell Counting Kit-8 (CCK-8) and western blot analysis. In addition, databases were used to predict the miR-133a-3p targets, confirmed by dual-luciferase reporter assay. The miR-133a-3p expression levels obviously decreased in the A549/DDP and SPC-1/DPP cells [**P < 0.01; (n = 3)]. Upregulation of the miR-133a-3p expression notably suppressed cell growth, enhanced cell apoptosis, and resulted in cell cycle arrest in the SPC-1/DPP and A549/DDP cells. CCK-8 assay for the detection of proliferation of the miR-133a-3p mimic-transfected A549/DDP and SPC-A1/DDP cells treated with different DDP doses revealed IC50 values of NC mimic group: 6.85 μg/mL; miR-133a-3p mimic: 3.9 μg/mL and NC mimic group: 6.9 μg/mL; miR-133a-3p mimic: 3.99 μg/mL, respectively]. By contrast, it elevated DDP sensitivity in the A549/DDP cells and DDP resistance in the SPC-1/DPP cells. Mechanically, miR-133a-3p negatively regulated replication factor C3 and promoted DDP sensitivity in the SPC-1/DPP and A549/DDP cells, 94 potential targets that might bind to miR-133a-3p were identified.

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