Abstract

Pancreatic ductal adenocarcinoma (PDAC) is a highly aggressive cancer with a five-year survival rate below 10%. A key feature of PDAC is genomic instability, which drives tumorigenesis and progression. A preliminary study has identified RMI2, a key player in maintaining genome stability, as an oncogene that reduces overall survival and drives PDAC cell proliferation. This study explored the mechanistic role of RMI2 in PDAC cell proliferation using the knockdown AsPC-1 model. Western blot analysis revealed that RMI2 knockdown leads to elevated activation of pATR/pCHK1, indicating increased replication stress. Additionally, the mRNA levels of key cell cycle regulators – cyclins, CDK1, and cMYC – were significantly downregulated, suggesting impaired progression through the cell cycle, hypothetically through an impaired homologous recombination repair pathway during DNA replication. In summary, these results suggest that knockdown of RMI2 reduces PDAC cell proliferation by dysregulating its genomic stability. These findings provide new insight into the role of RMI2 in promoting PDAC progression and suggest its potential as a target molecule in a therapeutic or diagnostic context.

Keywords: Pancreatic ductal adenocarcinoma, genomic instability, RMI2