What Is the Role of PRPF39 in Cisplatin Treated Cancer Cells?

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Chemotherapy resistance remains a challenge in treating cancer. There are many factors that can affect resistance, and it is not fully understood. PRPF39 is a pre-mRNA processing factor that plays a role in mRNA processing of many genes. PRPF39 could be a candidate in understanding resistance because it affects many other genes. Previously, it was shown that PRPF39's baseline expression was correlated to cisplatin sensitivity and resistance. My research tested the limits of this observation by looking at the cisplatin induced expression of PRPF39 in cancer cells. I hypothesized that studying PRPF39 expression in cisplatin treated cancer cells would yield new insights. I evaluated cisplatin induced expression in colorectal, breast, and lung cancer cells using qPCR. In colorectal cancer, the expression of PRPF39 decreased 28% ($p=0.004$) and 48% ($p=0.002$) at 24 and 48 hours respectively. In breast cancer, the expression of PRPF39 was 23% downregulated at 24 hours ($p=0.02$), and it showed no change in expression at 48 hours. In lung cancer, the expression of PRPF39 was 52% upregulated at 24 hours ($p=0.002$), but it was 61% downregulated at 48 hours ($p=0.02$). Cisplatin induced gene expression of PRPF39 was shown to be highly dynamic across time and different cancer types. Of the three cancers studied, colorectal cancer is the most promising for PRPF39 modulation to improve cisplatin treatment outcomes due to its consistent downregulation. Gaining more knowledge of PRPF39 in response to drug treatments is important in combating drug resistance.

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