Platinum Induced Gene Expression Yields Insights to Chemotherapy Resistance

Weston, May (School: Marian High School)

Chemotherapy resistance is a pressing issue in treating cancer, and despite decades of research, it is still incompletely understood. Cancer cells can be inherently resistant or develop resistance. Therefore, it is crucial to understand resistance and the mechanisms that contribute to it. In the 2017 study, “Identification of Novel…” by Stark et al., the cisplatin induced expression of over 250 proteins was measured over time in inherently sensitive and resistant LCL cells. The research conducted in this project analyzes the role of four genes (ADPGK,ZNF326, LSR, ENC1) and their role in chemotherapy resistance in cancer cells. The genes’ expression was measured in cancer cells through qPCR. I hypothesized that all of the genes would play a role in resistance with their induced expression mirroring the resistant LCLs. I found that largely these genes’ induced expression suggested a role in resistance, though I did find two examples of sensitivity. Understanding the role of these genes in chemotherapy resistance will push further research of these genes to be identified as biomarkers for chemotherapy resistance. In addition to that, LSR and ZNF326 exhibit the potential to be manipulated to support sensitivity instead of resistance because they have shown that they can play a role in sensitivity in HCT116 (cisplatin). Overall, understanding the relationship between gene expression and chemotherapy resistance will help to improve treatment outcomes.

Awards Won: