Gene Positioning in Chemosensitive and Chemoresistant Ovarian Cancer Cell Lines

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Ovarian cancer is aggressive, silent (hidden for the majority of its development) and often resistant to cisplatin chemotherapy. Often, each cancer type has unique aneuploidy and gene repositioning, but patterns prevail; therefore, the focus of this study is to find the differences in patterns between sensitive and resistant ovarian cancer cells. If cells are resistant to cisplatin chemotherapy, then they will have specific gene repositioning and an increase in ploidy. Fluorescent *In Situ* Hybridization (FISH) will be utilized to track repositioning and count ploidy on three different ovarian cell lines, two sensitive to cisplatin and one resistant. Twenty-two different commercially manufactured fluorescent probes will attach to corresponding genes in the DNA of the ovarian cell in pairs. Microscopes and software with the help of the probes allow visualization of the desired genes *in vitro*. Ovarian cancer took 14,000 lives last year while the surviving 8,000 had a 75% reoccurrence rate which is often accompanied by chemotherapy resistance. Patterns within individual cancers exist and have been used for diagnosis and better understanding of the most effective chemotherapy in other cancers. Ovarian cancer is often undiagnosed until it has progressed to an advanced stage. When ovarian cancer reaches an advanced stage, 70-80% become resistant to platinum-based chemotherapy, like cisplatin. Using FISH to understand if gene repositioning or cell ploidy enables a cell to become resistant will make future diagnoses more efficient. If doctors can determine that the cancer will be resistant to cisplatin chemotherapy based on the gene count or position, then the patient can be redirected to other medication, saving time and increasing chances of survival. Ovarian cancer is commonly treated with cisplatin chemotherapy and as ovarian cancer is typically caught very late in the progression, any time saved is important.