

Nickel Promotes Breast Cancer Cell Proliferation

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Cancer is the second leading cause of death in women in the United States. Incidences of breast cancer have increased from 1 in 20 in the 1960's to 1 in 7 today. Current studies in our lab have shown that the heavy metals such as nickel can stimulate cell growth in estrogen receptor (ER) positive breast cancer cells, MCF-7. These heavy metals, which include nickel, cadmium, mercury, and chromium are found highly contaminated in our soil and water. Exposure to these heavy metals has shown to be associated with many diseases, including cancer. Previous studies have shown that nickel is carcinogenic and evaluations by the International Agency for Research on Cancer (IARC) show that mice developed tumors when injected with nickel compounds at various sites (Report on Carcinogens, Tenth Edition, 2002). Our lab also has preliminary results suggesting that nickel may act as a carcinogen by promoting breast cancer cell growth. Like other metalloestrogens, nickel may function as an endocrine disruptor of ER α , however further analysis are necessary to elucidate nickel's role in the development and progression of breast cancer. Our cell proliferation results demonstrate that nickel does stimulate the growth of MCF-7 cells in hormone deprived (HD) conditions in comparison to the PBS treated, control. Our preliminary Western Blot analysis also suggests that nickel may induce the expression of various cell cycle proteins including cyclin E1 and cdk2. To further understand how nickel promotes breast cancer cell growth, our lab will examine the long and short term effects of sustained nickel exposure on the protein and gene expression of ER positive MCF-7 breast cancer cells.