

Poster #24

Uranyl Nitrate Mimics Estrogen Activity *In vivo* and *In vitro*

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To proliferate nuclear weapons extensive uranium (U) mining took place in the Four Corners region of the United States from 1940 to 1990s. Few of the mines located on the Navajo Reservation were abandoned properly consequently drinking water sources have been contaminated with U. A Navajo Health Authority study described increases in neoplasms among Navajo children living near U mining activity and Navajo teenage girls have 17 times greater incidence of reproductive cancers than the national average. Recent studies demonstrate many heavy metals possess estrogenic properties *in vivo* and *in vitro*; however, uranium has not been among metals tested. Our hypothesis is that uranium mimics estrogen eliciting estrogen sensitive responses *in vivo* and *in vitro*. *In vivo*, ovariectomized female mice were treated with uranyl nitrate (UN) and diethylstilbestrol (DES), for 30 days in their drinking water. There was a statistically significant ($p < 0.05$) 4-fold increase in uterine weight and uterine epithelial cell density at UN (60ug/L) and DES (50ug/L) in treated mice compared to mice drinking tap water. *In vitro*, MCF-7 cells, a breast cancer cell line sensitive to estrogens, were treated with UN or 17 β -estradiol (E₂). Cell proliferation in UN or E₂ treated cultures was more than doubled compared to control cells ($p < 0.0001$). Our *in vivo* and *in vitro* results were observed at UN concentrations equal to or less than U concentration in drinking water sources on the Navajo Reservation. Our results suggest that uranium possesses estrogenic activity and may cause reproductive effects in the Navajo people.

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