Development of a portable source for production of Re-188
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Rhenium 188 is a radioisotope that is potentially useful for treatment of certain types of cancer including bone cancer and circulating tumors. Its short half-life of 16.7h however makes it an awkward choice for clinical use as much of the product will decay during shipping. This project focuses on the development of a portable source of producing high specific activity Rhenium188 from a longer lived (t1/2 = 69.4d), low specific activity source; Tungsten 188. Tungsten 188 is obtained by double neutron capture from Na$_2^{186}$WO$_4$. Peroxide complexes of the Sodium Tungstate (Na$_2^{186}$WO$_4$) and Zirconyl Nitrate (ZrO(NO$_3$)$_2$) are formed and then mixed with heating to yield a ZrO$^{186}$WO$_4$·XH$_2$O gel precipitate. This is loaded into a column and washed with saline. As the W-188 decays to Re-188, high specific activity Sodium Perrehnate (Na$^{188}$ReO$_4$) will be eluted from the column. This can then be reduced to form the final drug on location. Future studies may include a similar method of production for a Mo-99/Tc-99m generator, another drug commonly used for imaging. The final poster will also discuss crystalline content of the ZrO$^{186}$WO$_4$·XH$_2$O gel, which must be minimized to maximize the yield of Re-188.