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## **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 ( $t_{1/2} = 69.4d$ ), 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  $ZrO^{186}WO_4 \cdot xH_2O$  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  $ZrO^{186}WO_4 \cdot xH_2O$  gel, which must be minimized to maximize the yield of Re-188.