

## Production and Applications of Very High Specific Activity Sn-117m

Nigel R. Stevenson<sup>1,3</sup>, George St. George<sup>2</sup>, Jaime Simon<sup>2</sup>, R. Keith Frank<sup>2</sup> and David W. Mueller<sup>1</sup>

<sup>1</sup>*Clear Vascular, Inc., 21 Waterway Ave., The Woodlands, TX 77380*

<sup>2</sup>*IsoTherapeutics Group LLC, 1004 S. Velasco, Angleton, TX 77515*

<sup>3</sup>Contact: [nigel@clearvascular.com](mailto:nigel@clearvascular.com)

Sn-117m is a 14 day half-life gamma (159 keV) and conversion electron (130 keV) isotope that has historically been produced in reactors at low (up to 20 Ci/g) specific activities and used for bone pain palliation studies. Recently, this isotope has also found application in investigative efforts to image and treat vulnerable plaque. However, this application requires high (carrier-free) specific activity Sn-117m that can only be produced with accelerators. A new production method has, therefore, been developed that uses the Cd-116( $\alpha$ ,3n) reaction with a 47 MeV alpha beam striking an electroplated Cd-116 target. Resulting yields were confirmed to be high (~0.15 mCi/ $\mu$ Ah) with minimal undesirable by-products. An ion exchange column method was used to isolate the Sn-117m resulting in a very pure high specific activity (~20,000 Ci/g) product. This isotope has subsequently been attached to biological targeting molecules and used in pre-clinical and clinical studies to treat vulnerable plaque.