Pacific Northwest NATIONAL LABORATORY

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Battelle Number(s):

15408

Patent(s) Issued

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U.S. DEPARTMENT OF ENERGY

Available Technologies

Medical Radioisotope Y-90 Generator

SUMMARY

High-purity radiochemical processing is one of many resident expertises at Pacific Northwest National Laboratory. This signature capability is critical for preparing radioisotopes for special applications in medicine, research, and national security. Researchers at PNNL have developed a small, inexpensive generator prototype for the production of the medical isotope yttrium-90 (Y-90), a short-lived beta-emitting radionuclide that can be milked and purified from its parent radioisotope, strontium-90 (Sr-90).

At present Y-90, a radioactive isotope used in drugs for the treatment of various cancers, including lymphoma, leukemia, ovarian, colorectal, pancreatic, and bone cancers, is produced at limited locations in the United States. The preparation of a highly pure yttrium-90 product for use as a therapeutic drug product component is a significant challenge. The medical isotope has been approved for at least one life-saving cancer drug. However Y-90's distribution is somewhat limited (based on half life of Y-90) to time and production constraints. PNNL scientists have developed a proven and patent-pending prototype for a Y-90 generator that milks Y-90 from its strontium source, purifies it, and strips the Y-90 into a usable form--ready to attach to a cancer therapy drug.

The generator itself is small in size and inexpensive to produce and operate, making it more convenient and affordable for regional and local radiopharmacies--and even hospitals for "near bed" production--to purify and use Y-90 more proximate to the drug delivery location. Furthermore, the highly versatile and simple fluidic design allows the instrumentation to be adapted for the production of other medical isotopes.

ADVANTAGES

* Small footprint allowing smaller, on-site production of yttrium-90 doses at local and regional radiopharmacies or hospitals
* Reduces labor-intense radiochemical separations work normally required to produce yttrium-90 while still producing a high-purity product
* Produces Y-90 doses on demand, which results in less loss due to 1/2 life deterioration and less need for advance isotope shipment scheduling
* Adaptable for the production of other medical isotopes

RELATED LINKS

» **PNNL Radioisotopes Program**

Information about Pacific Northwest National Laboratory's Radioisotope Program

http://radioisotopes.pnl.gov/

» **Perkin Elmer Life Sciences**

U.S.-based producer of Y-90 for research and development purposes

http://las.perkinelmer.com/

» **MDS Nordion**

The foreign supplier of Y-90 approved for Zevalin
http://www.nordion.com/documents/news-releases/2005/MDSN_Berlex_ZEVALIN_20_09_05.pdf

Patents & Intellectual Property

» Patent #: 7,554,098

Technology Portfolio(s)

» Radiochemical Processing

Potential Industry Applications

» Healthcare, Pharma, Biotech & Medical

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