

Availability of Radioisotopes Produced in North America

A list of all radionuclides produced in North America by the major industrial and government sources of radionuclides (in either radiochemical or radiopharmaceutical form) is presented here, along with the address of each supplier. Of these suppliers, 5 are Department of Energy (DOE) laboratories: Brookhaven National Laboratory, Los Alamos National Laboratory, Oak Ridge National Laboratory (ORNL), Pacific Northwest National Laboratory, and Sandia National Laboratory. This list was rechecked by multiple contributors for accuracy and submitted on behalf of the Commission on Radiopharmaceuticals of the Society of Nuclear Medicine to inform potential users of the availability of a wide range of radionuclides in the United States and Canada.

The list was tabulated with the assistance of the manufacturers and government agencies whose addresses appear at the end of this article. Calibration sources and standards

are not the subject of this compilation. This detailed list intentionally excludes stable isotopes, for which ORNL or Isoflex Corporation (Moscow, Russia) should be contacted.

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Element	Radioisotope	Source	Element	Radioisotope	Source
Actinium	²²⁵ Ac	ORNL	Curium	²⁴⁴ Cm	ORNL
	²²⁷ Ac	ORNL		²⁴⁸ Cm	ORNL
Aluminum	²⁶ Al	LANL	Dysprosium	¹⁶⁶ Dy	ORNL, MURR
Americium	²⁴¹ Am	LANL	Fluorine	¹⁸ F	III (local synthesis)
	²⁴³ Am	ORNL	Gadolinium	¹⁴⁸ Gd	LANL
Antimony	¹²² Sb	MURR		¹⁵³ Gd	NEN, III, DUP
Arsenic	⁷² As	LANL*	Gallium	⁶⁸ Ga	WUSTL
	⁷³ As	LANL		⁶⁷ Ga	NOR, MAL, DUP, NYC
Barium	¹³³ Ba	NEN, DUP	Germanium	⁶⁸ Ge	NEN, BNL, LANL, DUP
Berkelium	²⁴⁹ Bk	ORNL	Gold	¹⁹⁸ Au	NEN, MURR
Beryllium	⁷ Be	LANL, BNL		¹⁹⁹ Au	BNL
Bismuth	²⁰⁷ Bi	LANL	Holmium	¹⁶⁶ Ho	MURR, ORNL
	²¹⁸ Bi	ORNL		^{166m} Ho	ORNL
Bromine	⁷⁶ Br	WUSTL	Indium	¹¹¹ In	NEN, NOR, NYC, MAL
	⁷⁷ Br	WUSTL		^{114m} In	NEN
	⁸² Br	NEN	Iodine	¹²³ I	NEN, NOR, III, MAL, NYC, SYN
Cadmium	¹⁰⁹ Cd	DUP, NEN, LANL*		¹²⁴ I	WUSTL
	^{115m} Cd	NEN		¹²⁵ I	NEN, NOR, SAN
Calcium	⁴⁵ Ca	NEN		¹²⁹ I	NEN, DUP
Californium	²⁴⁹ Cf	ORNL		¹³¹ I	NEN, NOR
	²⁵² Cf	ORNL	Iridium	¹⁹² Ir	ORNL, NOR, MURR, III
Carbon	¹⁴ C	NEN, NOR	Iron	⁵² Fe	BNL
Cerium	¹⁴¹ Ce	NEN		⁵⁵ Fe	DUP, NEN, ORNL
Chlorine	³⁶ Cl	NEN, NOR		⁵⁹ Fe	NEN
Chromium	⁵¹ Cr	NEN, NOR, MURR	Krypton	⁸⁵ Kr	DUP
Cobalt	⁵⁷ Co	NEN, NOR, III, DUP	Lanthanum	¹⁴⁰ La	MURR
	⁵⁸ Co	NEN	Lead	²⁰³ Pb	NOR
	⁶⁰ Co	NEN, III, ORNL, NOR	Lutetium	¹⁷⁷ Lu	MURR, ORNL
Copper	⁶⁰ Cu	WUSTL	Magnesium	²⁸ Mg	BNL
	⁶¹ Cu	WUSTL	Manganese	⁵² Mn	BNL
	⁶⁴ Cu	NEN, WUSTL, ORNL		⁵⁴ Mn	NEN
	⁶⁷ Cu	MURR, BNL, LANL*			

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Element	Radioisotope	Source	Element	Radioisotope	Source
Molybdenum	⁹⁹ Mo	NOR	Strontium	⁸² Sr	BNL, LANL*, NOR
Nickel	⁶³ Ni	NEN, NOR, DUP, ORNL		⁸⁵ Sr	NEN
Niobium	⁹⁵ Nb	NEN		⁸⁹ Sr	NEN, ORNL
Osmium	¹⁹¹ Os	MURR		⁹⁰ Sr	NEN, PNNL
Palladium	¹⁰³ Pd	NEN, BNL, ORNL, NOR, LANL*	Sulfur	³⁵ S	NEN, MURR
	¹⁰⁹ Pd	MURR, ORNL	Technetium	^{95m} Tc	BNL, LANL*
Phosphorus	³² P	NEN, NOR, MURR		⁹⁶ Tc	BNL
	³³ P	NEN, MURR		⁹⁹ Tc	NEN, ORNL
Platinum	¹⁹¹ Pt	MURR		^{99m} Tc	NOR, DUP
	^{195m} Pt	MURR, ORNL	Tellurium	^{123m} Te	ORNL, MURR
Plutonium	²³⁸ Pu	ORNL		^{125m} Te	MURR
	²³⁹ Pu	ORNL		^{129m} Te	MURR
	²⁴⁰ Pu	ORNL	Terbium	¹⁶⁰ Tb	MURR
	²⁴¹ Pu	ORNL	Thallium	²⁰¹ Tl	NOR, III, DUP, MAL, NYC
	²⁴² Pu	ORNL	Thorium	²²⁶ Th	ORNL
Polonium	²⁰⁹ Po	ORNL		²²⁸ Th	ORNL
Potassium	⁴⁰ K	ORNL		²³⁰ Th	ORNL
	⁴² K	NEN	Tin	¹¹³ Sn	NEN
Promethium	¹⁴⁷ Pm	NEN		^{117m} Sn	NEN, ORNL
	¹⁴⁹ Pm	MURR	Titanium	⁴⁴ Ti	LANL
Radium	²²⁵ Ra	ORNL	Tungsten	¹⁸⁸ W	NEN, ORNL, MURR
Rhenium	¹⁸⁶ Re	MURR, ORNL		¹⁸⁸ W/ ¹⁸⁸ Re	ORNL
	¹⁸⁸ Re	MURR, ORNL	Uranium	²³³ U	ORNL
Rhodium	¹⁰⁵ Rh	MURR		²³⁴ U	ORNL
Rubidium	⁸³ Rb	BNL		²³⁵ U	ORNL
	⁸⁶ Rb	NEN		²³⁶ U	ORNL
Ruthenium	⁹⁷ Ru	BNL		²³⁸ U	ORNL
	¹⁰³ Ru	NEN	Vanadium	⁴⁸ V	LANL
Samarium	¹⁴⁵ Sm	ORNL		⁴⁹ V	LANL
	¹⁵³ Sm	NEN, BNL, ORNL, MURR	Xenon	¹²⁷ Xe	BNL
Scandium	⁴⁶ Sc	NEN, MURR		¹³³ Xe	NOR, DUP, GEC
	⁴⁷ Sc	ORNL	Ytterbium	¹⁶⁹ Yb	MURR
Selenium	⁷² Se	LANL	Yttrium	⁸⁶ Y	WUSTL
	⁷⁵ Se	NEN, MURR, LANL		⁸⁸ Y	LANL
Silicon	³² Si	LANL		⁹⁰ Y	NEN, NOR
Sodium	²² Na	NEN, LANL, DUP, BNL	Zinc	⁶⁵ Zn	NEN, BNL, LANL*
	²⁴ Na	NEN	Zirconium	⁸⁸ Zr	LANL*
				⁹⁵ Zr	NEN

*available from LANL in 2001.

BNL = Brookhaven National Laboratory
Medical Department
Radionuclide and Radiopharmaceutical Research Group
Building 801
PO Box 5000
Upton, NY 11973-5000

DUP = DuPont Corp.
Medical Imaging Division
331 Treble Cove Road
N. Billerica, MA 01862-2897

GEC = General Electric Corporation
6705 Vallecitos Road
Sunol, CA 94586

III = International Isotopes, Inc.
3100 Jim Christal Road
Denton, TX 76207

LANL = Los Alamos National Laboratory
Chemical Science and Technology Division
Medical Radioisotopes Program
PO Box 1663, Mail Stop J514
Los Alamos, NM 87545

MAL = Mallinckrodt Inc.
Imaging Group
675 McDonnell Blvd.
St. Louis, MO 63134

MURR = Missouri University Research Reactor
Reactor Research Center
Research Park
Columbia, MO 65211

NEN = NENTM Life Science Products
549 Albany Street
Boston, MA 02188-2512

NOR = MDS Nordion
447 March Road
Kanata, Ontario
CANADA, K2K 1X8

NYC = Nycomed-Amersham Corp.
101 Carnegie Center
Princeton, NJ 08540

ORNL = Oak Ridge National Laboratory
Isotope Distribution Office
PO Box 2009
Oak Ridge, TN 37831-6385

PNNL = Pacific Northwest National Laboratory
902 Battelle Boulevard
Richland, WA 99352

SAN = Sandia National Laboratories
PO Box 5800
Albuquerque, NM 87185-1145

SYN = Syncor Pharmaceuticals Inc.
1313 Washington Avenue
Golden, CO 80401

WUSTL = Washington University
Mallinckrodt Institute of Radiology
510 South Kingshighway
MIR Box 10
St. Louis, MO 63110