



Research Note

Advanced Medical Isotope Corp.

Back on Track



Chief Research Analyst

Marcel Wijma MSc

+1 (917) 460 6185 (US)

+31 (6) 8489 2954 (NL)

+61 (0) 426 4349 240 (AU)

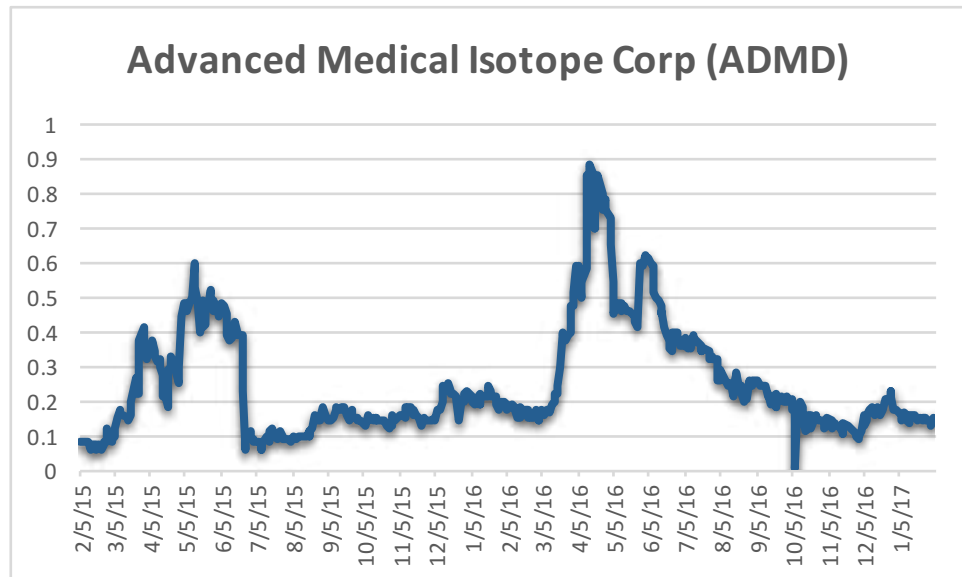
m.wijma@leeuwenhoeck.com

<http://www.leeuwenhoeck.com>



Date: 6 February 2017

Name:	Advanced Medical Isotope Corp
Country:	United States
Price:	USD 0.15
ISIN Code:	US00765X2018
Reuters Code:	ADMD
Market Cap (USD m):	4.8
EV (USD m):	4.8
Cash & cash eq. (USD m):	
Shares outstanding (m):	31.8
Average Daily Volume :	220,265
Free float:	100%
52-week Range:	0.07-1.00





Executive Summary

- Advanced Medical Isotope Corp. (AMIC) is an US based Life Sciences company that provides an innovative technology for safer and more effective radiation therapies for difficult to treat cancers. Its lead product is Yttrium-90 RadioGel, which is a brachytherapy device comprising highly insoluble Y-90 particles delivered by needle injection using a water-polymer composite for high-dose treatment of non-resectable solid tumors that cannot be treated effectively by any other means.
- Yttrium-90 is an ideal medical isotope with a short half-life (2.7 days) and is a pure beta-emitter. It is approved as a therapeutic agent as part of traditional delivery systems, specifically on monoclonal antibodies targeting cancer cells (Zevalin) and as the active ingredient in glass or resin microsphere in use for treating liver tumors (TheraSphere and SIR-Spheres).
- Recently there was a change in management with Dr Mike Korenko taking over the helm. Dr. Korenko formerly served as Vice-President of Westinghouse, where he was tasked with overseeing 300 and 400 areas, including the Fast Flux Testing Facility (FFTF) and all engineering, safety analysis, and projects for the Hanford site. We are confident that such an experienced CEO will be able to bring AMIC back on the right track
- The financial position of the company was improved considerably with the repayment of all outstanding mature convertible debt. Over the last 18 months, AMIC has reduced its overall liabilities on the balance sheet by over 75%. The Company is on track to ramp up product development and testing activities with their commercialization partner IsoTherapeutics Group. Besides, last month it was announced that in the Superior Court of the State of Washington it was awarded a total sum of USD 527,876 against



BancLeasing. This further improves the company's balance sheet.

- The total market for inoperable cancers is estimated to be several billion dollars in size. The lack of effective treatments that offers significantly improved survival rates provides ample opportunity to be a game changer for the treatment of these cancers. We feel that Y-90 RadioGel therefore has the potential to be a blockbuster (sales > 1 billion) within a few years since the therapy would be useful in a range of soft tissue cancers.
- Based on our NPV valuation, we believe that AMIC is substantially undervalued at the current share price of USD 0.15. Considering Y-90 Radiogel's much higher potential commercial success compared to Sirtex' SIR-Spheres (with total annual sales of more than AUD 176 million) and the high unmet medical need in several types of cancer, induces us to increase our valuation to USD 25-50 million or USD 0.78-1.57 per share. This represents a substantial upside from the current share price.

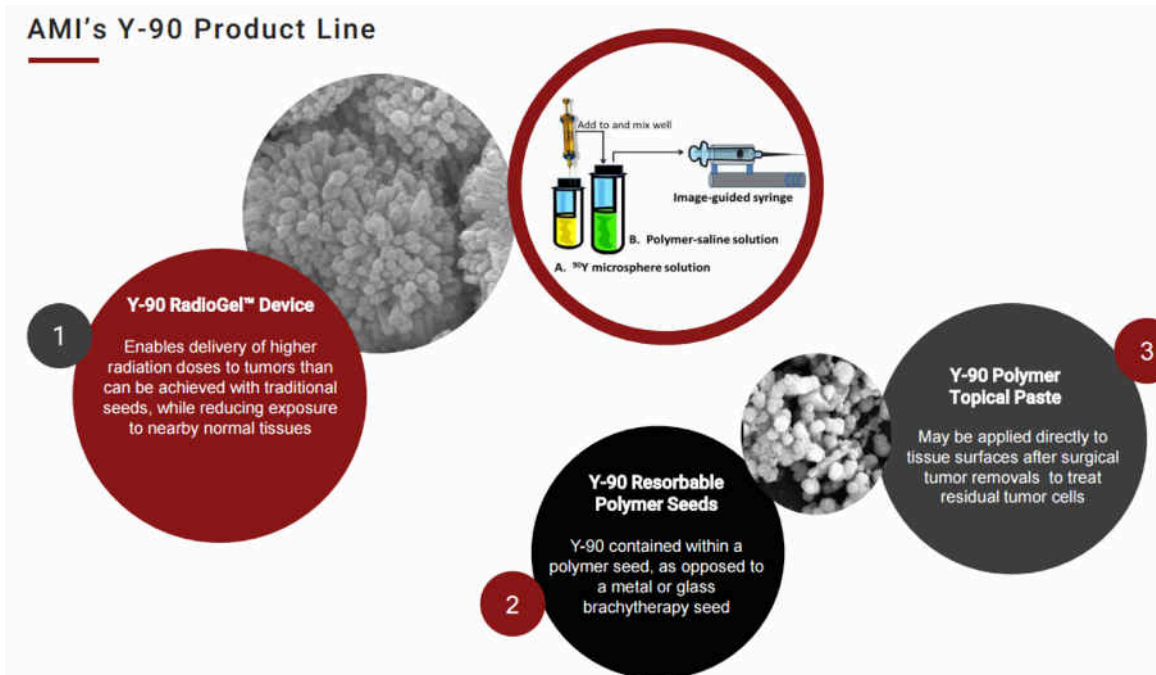


Company Profile & Technology

Advanced Medical Isotope Corporation (AMIC) is engaged in the production and distribution of medical isotopes and medical isotope technologies that are changing the practice of medicine and ushering in a new era of improved patient care. Its vision is to globally empower physicians, medical researchers, and ultimately, patients, by providing them with essential medical isotopes.

AMIC has exclusively licensed Yttrium-90 (Y-90) polymer composite technology from Battelle Memorial Institute, developed at Pacific Northwest National Laboratory, a leading research institute for government and commercial customers. Its products include: Y-90 RadioGel™ device - combines Y-90 particles with a polymer carrier that injected directly into the tumor, Y-90 Fast-Resorbable Polymer Particles - Y-90 contained within a polymer particle, as opposed to metal or glass. It is used in place of treating cancers with marketed titanium or glass particles, Y-90 Polymer Topical Paste - designed to be applied directly to tissue surfaces after surgical tumor removals to treat residual tumor cells, etc. Advanced Medical has partnerships with IsoTherapeutics Group, LLC, GSG International GmbH, The Life Sciences Discovery Fund and the Colorado State University.

The AMIC therapy is an example of brachytherapy. Brachytherapy is a form of radiotherapy for the treatment of cancer. Most radiotherapy is done externally whereby the patient is placed under a radiation device. However, in some cancers like pancreas and liver cancer, internal radiotherapy is much more effective and targets only the tumor without damaging the healthy surrounding tissue.



Source: AMIC

The RadioGel™ device places Y-90 particles in tumor tissue and Yttrium-90 containment within the tumor following injection. According to the company there are several benefits of the RadioGel device:

- **Maximizing Therapeutic Index:** The short-range beta particles emitted by Y-90 deliver radiation energy within a tight range. This enables radiation to be selectively delivered to target tissues while minimizing radiation dose to nearby normal tissues. High therapeutic indices imply that more radiation energy may be imparted to target tissues, with less radiation reaching adjacent normal tissues.
- **Half Life: Y-90 has a half-life of just 2.7 days.** Many traditional brachytherapy products use isotopes with longer half-lives such as 9.7 days for cesium-131, and sixty days for I-125.



- **Optimized Delivery Method:** Current brachytherapy devices place permanent metal particles in the prostate by using up to 30 large needles. By contrast, AMIC's Y-90 RadioGel™ device is designed to be administered in a minimally invasive procedure with small-gauge needles.
- **No Permanent Particles Remaining:** Current brachytherapy devices place permanent metal particles in the tumor. AMIC's Y-90 RadioGel™ device utilizes a biodegradable, non-toxic polymer that is ultimately absorbed by the body. This eliminates the possibility of a long-term particle migration or other problems that may sometimes arise when particles remain in the body.
- **Good Safety Profile:** Many traditional brachytherapy devices utilize isotopes that emit x-rays (akin to gamma radiation). X-rays or gamma radiation travels within and outside of the body and have long half-lives. AMIC's brachytherapy products use the Yttrium-90 isotope, which is a beta-emitter. The Yttrium-90 beta-emissions travel only a short distance and has a short half life of 2.7 days.
- **Potential Lower Cost:** Yttrium-90 supplies are readily accessible and are relatively inexpensive. The elimination of the metal or glass enclosures used in traditional brachytherapy particles greatly reduces manufacturing costs.

The initial target for Y-90 RadioGel should be inoperable cancer, as first line treatment in conjunction with standard chemotherapy. Treatment currently is multiple weekly courses of intravenous chemotherapy for inoperable disease, which only creates on average a few months survival advantage compared to having no treatment administered. Therefore, there is a major unmet need for additional therapies that can reduce the tumour burden and increase quality of life in late stage cancer patients.



Overview Treatment Options in Radio Therapy

As there are only two chemotherapy drugs on the market that have shown to extend survival marginally, radiation therapy is used in combination of chemotherapy. Radiation therapy is a cancer treatment that uses high-energy radiation, in the form of waves (such as x-rays) or particles (such as protons), to kill cancer cells or prevent them from growing and dividing. Radiation therapy can prevent pancreatic tumors from growing and sometimes shrinks them. There are two main types of radiation therapy, external beam radiation therapy and internal radiation therapy (or brachytherapy).

External beam radiation therapy

This radiation therapy delivers radiation by using a machine outside the body, which directs a beam or multiple beams of radiation through the skin to the tumor or tumor bed. External beam radiation therapy is commonly used in treating pancreatic cancer patients.

Internal radiation therapy (brachytherapy)

Brachytherapy delivers radiation through radioactive material implanted in or near the cancer. This type of radiation therapy is still rarely used in pancreatic cancer patients. In addition to standard external beam radiation therapy, the following two methods of planning and delivering external beam radiation are currently used in pancreatic cancer treatment. These specialized methods are able to minimize the amount of radiation delivered to normal tissues and are used when a higher dose of radiation is recommended:

- *Intensity-modulated radiation therapy (IMRT)*

IMRT is a type of external beam radiation therapy that delivers focused radiation to the tumor by modulating (varying) the intensity of the radiation beam under precise computer control. By using



three-dimensional computer imaging to determine the size, shape and location of the tumor, and by varying the intensity of the radiation dose, IMRT allows a higher dose of radiation to be administered to the tumor while minimizing the amount of radiation delivered to healthy tissue near the pancreas, such as the duodenum (the first portion of the small intestine). This may lead to fewer side effects and allow higher doses of radiation to be delivered safely, compared to standard radiation therapy.

- *Stereotactic body radiation therapy (SBRT)*

SBRT is a type of external beam radiation therapy designed to deliver high doses of radiation precisely to small tumors, usually in five or fewer treatments. SBRT uses multiple narrow radiation beams to target small, well-defined areas. In order for SBRT to be delivered safely in pancreatic cancer patients, the tumor must remain motionless or the machine delivering the radiation must be able to adjust for any movement of the tumor, such as during breathing. Patients may be fitted with a customized device to keep the body perfectly still or the treatment machine may have the ability to limit, monitor and adjust for any movement during the treatment. Also, small metallic particles may be implanted near the tumor before treatment begins to better track the location of the tumor during treatment. CyberKnife® is one type of SBRT. Some studies have suggested that the delivery of high doses of radiation in a few treatments is difficult to accomplish without damaging the intestinal tract.

There is currently no evidence that this type of radiation therapy is better than standard radiation therapy for pancreatic cancer. In fact, one study has shown that stereotactic radiation for pancreatic cancer caused ulcers to develop in the duodenum. There are ongoing studies to determine the appropriate radiation dose and frequency of radiation doses given using SBRT to avoid damaging the duodenum. Therefore, SBRT is still being studied in clinical trials for pancreatic cancer and its usage is only recommended as part of a clinical trial.



Proton beam radiation therapy

This is a type of external beam radiation therapy that uses proton beams rather than x-rays. Protons are charged particles that deposit most of their energy at a very narrow area within the body. Because of this characteristic, proton beam therapy allows a higher, more conformed dose of radiation to be delivered to the tumor, while sparing surrounding healthy tissue. Therefore, it generally causes fewer side effects. Proton therapy is only available at very few centers throughout the US and is being studied in clinical trials for pancreatic cancer.

Comparison Brachytherapy

	CS-131	I-125	Pd-103	Y-90	Y-90 advantage
Primary Emissions	Auger x-rays	Auger x-rays	Auger x-rays	Beta rays	High energy, finite path
Average Path length	Infinite	Infinite	Infinite	4mm	Safer for Healthy tissue and medical staff
Half Life	9.7 days	60 days	17 days	2.7 days	Short Half Life Shorter treatment
Delivery Form	Metal particles	Metal particles	Metal particles	Biodegradable polymer	No casing remains
Costs	Utilize expensive isotopes	Utilize expensive isotopes	Utilize expensive isotopes	Readily accessible less expensive	Cost Savings



Competitive Landscape

During examination of comparable companies, we looked at medical device companies that have radiology therapy products in cancer. Companies like Sirtex, Oncosil Medical, Oncura, Isoray, Elekta and BTG.

Sirtex

Sirtex Medical Limited is an Australia-based healthcare and medical device company, which manufactures and distributes liver cancer treatments utilizing small particle technology. The Company's segments are based on the regional markets it operates, which include Asia Pacific, The Americas, and Europe, the Middle East and Africa (EMEA). The Company's lead product is a focused radiation therapy known as SIR-Spheres Y-90 resin microspheres, which is a radioactive treatment for liver cancer. The treatment is called Selective Internal Radiation Therapy (SIRT) and consists of a minimally invasive surgical procedure performed by an interventional radiologist. The SIR-Spheres microspheres lodge in the small blood vessels of the tumor where they destroy it from the inside over a short period while sparing the surrounding healthy tissue. It is available in more than 40 countries and over 900 hospitals. The Company has manufacturing and operations in the United States, Germany and Singapore.

Oncosil Medical

Oncosil Medical (ASX:OSL) is an Australia based Life Sciences company that is developing a novel therapy device that implanted locally emits cancer killing radiation into a tumor, called OncoSil™. The therapy showed favorable results in four Phase II clinical trials in pancreatic and primary liver cancer and the company has recently filed for CE Mark approval that is expected to be announced in early 2017. The CE Mark is required to market and sell OncoSil™ in the EU. The OncoSil™ therapy is an example of brachytherapy. The device consists of a mixture of very small



particles of silicon and phosphorus. When the particles are placed in a nuclear reactor for ten days, the phosphorus becomes radioactive. That radioactivity is emitted as beta particles, which only travel about one centimeter through tissues

Isoray

Isoray develops, manufactures and sells isotope-based medical products and devices for the treatment of cancer and other malignant diseases. The Company is engaged in treatment for all solid tumors using Cesium-131. Cesium-131 is a radioactive isotope that can be produced by the neutron bombardment of Barium-130 (Ba-130). The brachytherapy seed form of Cesium-131 may be used in surface, interstitial and intracavity applications for tumors with known radio sensitivity. The Company's product candidate is Proxcelan Cesium-131. The Company markets the Proxcelan Cesium-131 brachytherapy seed for the treatment of prostate cancer; brain cancer; lung cancer; head and neck cancers; gynecological cancer: pelvic/abdominal cancer; colorectal cancer, and ocular melanoma. To produce the Proxcelan seed, the purified Cesium-131 isotope is adsorbed onto a ceramic core containing a gold X-ray marker. The Company also markets the GliaSite RTS for the treatment of brain cancer, such as primary and recurrent gliomas and metastatic brain tumors. GliaSite RTS is a cleared balloon catheter device. The main components included in the GliaSite RTS are the GliaSite Catheter Tray, GliaSite Access Tray, Iotrex Solidifier and either Iotrex or Cesitrex as the radiotherapy solution. The catheter tray includes a GliaSite RTS catheter, two non-coring needles, and two right anchoring clips. Cesitrex is the liquid form of Cesium-131 and can be used in place of Iotrex, the liquid form of Iodine-125, in the Company's GliaSite RTS.

Accuray

Accuray is a radiation oncology company. The Company develops, manufactures, sells and supports treatment solutions. Its suite of products includes the CyberKnife Systems and the TomoTherapy Systems. Its technologies, the CyberKnife and TomoTherapy Systems, are designed to deliver treatments, including radiosurgery, stereotactic body radiation therapy, intensity



modulated radiation therapy (IMRT), image guided radiation therapy (IGRT) and adaptive radiation therapy. Its principal radiosurgery products, the CyberKnife Systems are robotic full-body radiosurgery system designed to treat tumors anywhere in the body non-invasively, which include the CyberKnife M6 Series with configuration options of fixed collimators plus iris variable aperture collimator (FI), fixed collimators plus the InCise MLC (FM) and fixed collimators plus iris variable aperture collimator and the InCise MLC (FIM). The TomoTherapy Systems include the TomoTherapy H Series with configuration options of TomoH, TomoHD and TomoHDA. The Company has operations in Americas, Europe, Middle East, India, Africa and Japan. The CyberKnife Systems are robotic systems that deliver stereotactic radiosurgery (SRS) and stereotactic body radiation therapy (SBRT) and are used to treat multiple types of cancer and tumors throughout the body. The CyberKnife Systems track, detect and correct tumor and patient movement in real-time during the procedure. Treatment with the CyberKnife Systems requires no anesthesia, and can be performed in one to five staged treatment sessions on an outpatient basis. The CyberKnife Systems deliver treatments for intra- and extra-cranial disease sites throughout the body, including prostate, lung, brain, spine, liver, pancreas and kidney. The CyberKnife M6 Series System is available with the InCise multi-leaf collimator (InCise MLC), which is available on a robotic platform. Its configurations of CyberKnife Systems include the CyberKnife M6 Series with configurations of FI, FM and FIM and CyberKnife VSI System. The CyberKnife M6 Series system includes disease-specific tracking and treatment delivery solutions for brain, spine, lung and prostate tumors, treatment speed improvements and options to configure the treatment room. The CyberKnife VSI System comes with fixed collimators or an optional Iris collimator.

BTG plc

BTG plc is a specialist healthcare company. The Company operates in three business segments: Interventional Medicine (IM) (oncology, vascular and pulmonology products), Specialty Pharmaceuticals (antidote products) and Licensing (royalties from licensed assets). The Company's



Interventional Medicine segment offers a portfolio of interventional medicine products that are designed to advance the treatment of liver tumors, advanced emphysema, severe blood clots and varicose veins. The Company's Specialty Pharmaceuticals segment offers a portfolio of antidote products that alleviate toxicity and treat rare conditions. The Company's Licensing segment receives royalties relating to the sales of products that are subject to intellectual property and license agreements between the Company and various partners. The Company's subsidiaries include BTG International (Holdings) Ltd, Provensis Ltd, BTG International Ltd and BTG Employee Share Schemes Ltd, among others.



Analyst: Marcel Wijma MSc

Marcel Wijma, Chief Research Officer and managing partner, has a longstanding history in financial biotech research. After selling Van Leeuwenhoek Research (VLR) to SNS Securities in 2006, he established an award winning analyst team in biotech/life sciences at SNS Securities. In 2009, Marcel was awarded by Financial Times/Starmine as being one of the Top-3 biotech analysts in Europe. Later that year, Marcel purchased VLR from SNS Securities after which the company was reconstituted. At VLR, he leads the professional VLR research organisation, which is augmented by selected external financial researchers with a specialisation in Life Sciences. Mr. Wijma has a Masters degree in Financial Economics from Erasmus University in Rotterdam.

Disclaimer

The facts stated and the opinion and prognoses given in this publication are based on data and information considered to be reliable and have been carefully worked into our analyses and prognoses. However, no guarantee can be given as to their fairness, accuracy or completeness. Van Leeuwenhoek Institute. does not accept responsibility or liability in any way in respect to the information stated herein. Van Leeuwenhoek Institute does not hold or have positions in securities as referred to in this publication. The views expressed in this publication accurately reflect the analyst's personal views on the subject securities or issuer. Neither the analyst's compensation nor the compensation received by Van Leeuwenhoek Institute is in any way related to the specific recommendations or views contained in this publication.

Any investments referred to herein may involve significant risk, are not necessarily available in all jurisdictions, may be illiquid and may not be suitable for all investors. The value of, or income from, any investments referred to herein may fluctuate and/or be affected by changes in exchange rates. Past performances are not indicative for future results. Investors should make their own investment decisions without relying on this publication. Only investors with sufficient knowledge and experience in financial matters to evaluate the merits and risks should consider an investment in any issuer or market discussed herein and other persons should not take any action on the basis of this publication.

Information, opinions or recommendations contained in this publication are submitted solely for advisory and information purposes. The information used and statements of fact made, have been obtained from sources considered reliable, but we neither guarantee nor represent the completeness or accuracy. Such information and the opinions expressed are subject to change without notice. This publication is not intended as an offering or a solicitation of an offer to buy or sell the securities mentioned or discussed.

Van Leeuwenhoek Institute does not accept any equity compensation. Reports are performed on behalf of the public, and are not a service to any company. The analysts are responsible only to the public, and are paid in advance to eliminate pecuniary interests and insure independence.

Periodic Research reports and research notes on this Company are available at our web site: www.leeuwenhoek.com © Copyright 2017 by Van Leeuwenhoek Institute Inc.