Oncidium foundation

ACCESS • EDUCATION • HOPE

MARCH 31ST, 2022

Radiotheranostics Today

Voicing the Challenges and Opportunities of Radiotheranostics for Cancer Care

In this Issue:

Today is World Theranostics Day!

81st Anniversary: Making great strides, and yet, so much to discover

This year we celebrate the 81st anniversary of the first radioiodine therapy administered by Dr. Saul Hertz to a patient, thus, marking it the first experience in using the radiotheranostics technique. 8 decades later, his legacy continues, as we are witnessing the rising role of nuclear medicine and radiotheranostics in the cancer setting.

More recently, in March 2022, a great step towards enhancing access to radioligand treatments was achieved when the first PSMA radiotheranostics was approved by the FDA: Lu-177 PSMA-617 (Pluvicto™) for treatment and Ga-68-PSMA kit (Locametz®) for PET imaging. Thus, building hope for men living with prostate cancer.

But why do we celebrate World Theranostics Day? First, to recognize the latest therapy and diagnosis highlights. But also, as there is still a lot to be done to raise awareness about the availability and potential of the technology.

From challenges to opportunities, from awareness to readiness, discover what the voices of Oncidium have to say about bringing forward Radiotheranostics Today.

Ready to talk radiotheranostics with Oncidium foundation?

- Zoom on the radiotheranostics situation in your country
- Evolution, projects and challenges in your region
- Focus on a particular application
- Patient/practitioner interview etc.

Contact us to contribute to the next issue!

SPLASH Trial: Overview and Perspectives for the Field of Radiotheranostics

By Dr. James Nagarajah and Dr. Cristiana Gonçalves Gameiro

James Nagarajah, Assistant Professor at Radboud University Medical Centre (Nijmegen, Netherlands), and Principal Investigator in the Netherlands in the multicenter Phase III, open-label, randomized study known as SPLASH Trial joins Cristiana Gameiro, Scientific Advisor of the Oncidium foundation in a discussion about the aim and directions of the clinical trial. The aim of the talk is to better grasp some technical details about the trial and orient the discussion from a patient perspective and finally discuss hope for people living with cancer and for the field.

Dear Doctor Nagarajah, first, can you tell us more about the importance of the SPLASH Trial and give us a technical overview?

This is, worldwide, the first trial investigating Lu-177 PSMA-I&T in a prospective and well-controlled setting. To this day, there have mostly been retrospective data and small cohorts of prospective data available using PSMA-I&T as a radioligand treatment in prostate cancer patients. I, personally, am looking forward to seeing the results in prostate cancer patients and I believe there is a great future for radioligand treatment in general. But particularly for this class of drugs targeting the PSMA, it's very exciting now.

> *I am looking forward to seeing the results in prostate cancer patients and I believe there is a great future for radioligand treatment in general.*

Briefly, SPLASH is a prospective randomized Phase III international registry study. Therefore, it's a larger setting and the current estimation is about 390 patients. Patients are currently being enrolled from North America (US & Canada) and several countries in Europe including the UK, Sweden, France, Italy & here in the Netherlands will start enrolling between April and June this year. Moreover, there is a crossover design where progressing patients located in the control arm can, should they wish, get access to the treatment as well. The plan for regulatory submission in 2024, with approval first by the FDA (US) in 2025.

Could you please elaborate more as to the reason behind the possible crossover of patients?

I believe that, when it comes to radioligand treatments and especially in the PSMA setting, the crossover design is crucial.
First, it improves the motivation of patients to participate in this trial, since patients allocated to the control arm are given the possibility to cross over to the Lu-177 PSMA I&T arm if they show disease progression and willing to receive Lu-177 PSMA I&T. Second, for us physicians involved in the trial, it reduces patient risk drop-offs and helps us achieve solid statistics.

> *It improves the motivation of patients to participate in the trial, since patients allocated to the control arm are given the possibility to cross over to the Lu-177 PSMA I&T arm if they show progression and are willing to receive Lu-177 PSMA I&T.*

Why is a dosimetry study relevant in the design of this trial and what were the results of this subset study?

Whenever you use radioligand therapies, you need to make sure that this therapy is safe. There have been few dosimetry studies done in the past with PSMA I&T. However, these studies were retrospective studies. Secondly, if you look at the protocols of the dosimetry studies, there is a high variation, and we still don't have a common agreement on how to perform dosimetry, thus every study varies in terms of time point and number of scans but also the way the scan themselves are done (e.g. planar or 3D etc.). Particularly using PSMA I&T, it is important to show the delivered radiation doses to possible organs at risk, e.g. kidneys and bone marrow (salivary glands). The major finding of the dosimetry study is that the bone marrow toxicity is below the threshold of 2 Gy (Gray), it was even less than 1 Gy and the kidney dose extrapolated to the number of four cycles below 20 Gy, which is also safe. Thus, this dosimetry was crucial to show that Lu-177 PSMA I&T is safe applying the planned amount of activity for four cycles. This kind of radiation dose measurement is not possible for non-radioactive drugs used as systemic treatments in an oncological setting, and thus a pillar strengthens the radioligand applications.

To be continued page 03

From a patient perspective, why is it important to establish a multidisciplinary team within the study?

First, a lot of people underestimate the logistics behind such kinds of prospective studies (preparation and transportation of the doses within short time frames, organization of screening phases, patient preparation and hospitalization in dedicated rooms, radiation safety measures and waste handling etc.). It takes a committed and heterogeneous team to effectively provide such therapies.

Second, a lot of people think this is purely a nuclear medicine-related treatment, but it is not. It's an oncological treatment. Therefore, we need to have our oncological and urological colleagues on board and convinced about the treatment potential. It is crucial from a patient perspective. Indeed, patients are not visiting the nuclear medicine department as often as they are vising their oncologists and urologists to discuss the best treatment for them. The following step consists in, bringing every specialty around the same table to evaluate and select eligible patients. Then, once enrolled, patients must be accompanied by the entire team of specialists in every step of their journey and for any question, they may have. Essentially, rather than saying it is important to have a multidisciplinary approach among doctors, it is all about providing a multidisciplinary approach for patients so they can get the best of all worlds, to help them.

> *It's all about providing a multidisciplinary approach for patients so they can get the best of all worlds, to help them.*

To finish perhaps on a "hopeful" note for patients and for the field: Could you please give us a broad perspective, in your opinion, regarding the future of radiotheranostics for prostate cancer and for other types of cancer?

I believe this is going to be the nuclear medicine decade for theranostics in oncology. I´d even introduce a new term "Theranometrics" where we (from a Nuclear Medicine perspective) not only see the targets we want to treat but also quantify the radiation doses to these targets and organs at risk. It started now with prostate cancer but is also opening new doors for nuclear medicine in oncological and urological settings.

Moreover, if you look at ASCO or ESMO, you can see that more and more people are eager to learn about nuclear medicine techniques and their strengths and weaknesses. Moreover, besides the involvement of global players, there are many new companies and start-ups emerging at a rapid speed focusing on new targets and new therapeutic options. Not every target is guaranteed to work out, but I believe several of them are going to fly high. The critical point here is to properly select the most promising compounds.

> *I believe this is going to be the nuclear medicine decade for theranostics in oncology.*

What are your expectations regarding the Oncidium foundation?

Even though we have been doing radiotheranostics for 80 years in the cancer setting, today, nuclear medicine treatments and imaging techniques are only visible in dedicated centers, often solely in top academic ones. Now, I would like us to be able to spread the word to a broader auditorium by reaching out to nonacademic centers but also to patients so that they can actively approach their physicians asking them questions about radiotheranostics options. Thus, encouraging their physicians to investigate and learn more about the existence, availability and where to get treated. To reach this goal, I believe that the Oncidium foundation is going to support and enhance the visibility of our field and inform about the promising treatments we are developing, globally.

Thank you very much! At the end of the day, it is all about raising awareness about radiotheranostics, reaching out to small centers all over the world, also in developing countries and to a broader audience in general.

Truly, that is my hope.

HCPs & Patients: Learn more about SPLASH.
Patients? Ask if you are eligible for the SPLASH Trial.

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- Assistant Professor at Radboud University Medical Center (UMC)
- Principal Investigator for SPLASH Trial in the Netherlands at Radboud UMC

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Nancyclotep, a Reference Center in Radiotheranostics

By Prof. Gilles Karcher and Marjorie Fougère

In keeping with the worldwide emergence of radiotheranostics, Nancyclotep and Nancy University Hospital are positioning themselves as a referral site for Vectorized Internal Radiation Therapy (VIRT).

A dedicated care unit to accommodate patients was set up next to a complete molecular imaging platform to offer quality nuclear medicine. In this facility, radioactive drugs will be produced to carry out clinical research and healthcare activities. Thus, it is all about being ready to use radiotheranostics technologies: from production of radioactive drugs radiopharmaceuticals for imaging and VIRT to treat patients. This project includes:

• A 14-bed care unit, dedicated to vectorized internal radiation therapy with alpha- and beta-emitting radionuclides within the Nancy University Hospital;

• A technical platform comprised of:

- A mini cyclotron;
- An automated robotic system to produce radiopharmaceuticals using microfluidics;
- A conventional GMP radiopharmaceutical production unit;
- A radiochemistry R & D laboratory;
- A small animal imaging platform.

Nancyclotep has obtained a European funding of €7.2 million and has partnered with PMB, a subsidiary of the ALCEN group, which manufactures small cyclotrons and automated robotic systems for producing radiotracers.

Nancyclotep and Nancy University Hospital aim to position themselves as a key player in clinical trials in the field of molecular imaging and VIRT through:

- A regional hospital setting with substantial oncological activity (Lorraine cancer Institute, Nancy University Hospital);
- Control of the local supply of Fluor 18, Carbon 11, Zirconium 89, Gallium 68, Copper 64;
- A state-of-the-art imaging facility including 3 PET-CT and 6 gamma-cameras.

A dedicated team was formed to take care of patients and has been well trained in radiation protection and radioactive waste management. For this type of treatment, it is necessary to have a highly technical, passionate team made up of radiopharmacists, radiophysicists, medical electro radiology technicians and nuclear medicine practitioners.

VIRT is really one more weapon in the radiotherapeutic arsenal against cancer. It comes in addition to other cancer treatments such as surgery, chemotherapy, etc. With VIRT, there are a lot of new treatment perspectives coming up for cancer. The VIRT will soon be an upcoming and pivotal option for enhancing patients' lives.

The Oncidium foundation team was present at the inauguration of the Nancyclotep VIRT platform held on March 9, 2022, to witness first-hand this new chapter in the effort of bringing forward the innovative and promising role of radiotheranostics technologies for cancer diagnosis and therapy.

The inauguration of this platform allowed to highlight the important factors necessary to an operational and long-lasting implementation, development, and use of radiotheranostics technologies, particularly as cancer is set to remain a major concern when it comes to healthcare considering longer average life expectancy, aging and evolving lifestyles.

To achieve this goal, it is essential to gather around the same table all the interlocutors that come from different backgrounds: politicians, policymakers, nuclear medicine practitioners, nurses, and healthcare staff more broadly, industry, patient advocates and the general public. Moreover, setting priorities was emphasized around healthcare, well-being, research and development, innovation, and sustainability. Thus, enabling a great push in the right direction for an effective implementation of radiotheranostics and finally to build hope for better access to people living with cancer.

Gilles Karcher MD
Chairman and Founder
at Nancyclotep

Marjorie Fougère
Director
at Nancyclotep

Focus on Actinium-225

By Dr. Richard Zimmermann and Tala Allahham

The Actinium-225 used in this photograph, taken by Dr Andrew R. Burgoyne at Oak Ridge National Laboratory as part of the Tri-Lab effort with Brookhaven National Laboratory and Los Alamos National Laboratory, was supplied by the U.S. Department of Energy Isotope Program, managed by the Office of Isotope R&D and Production.

The oncology world is just discovering the benefits of Lutetium-177 (^{177}Lu) that already other promising radionuclides are emerging. Amongst them, Actinium-225 (^{225}Ac), an alpha particle emitter, is presenting new and different advantages that bring renewed hope for patient treatment.

Grasping the potential

The time between the identification of interesting new radionuclides and their availability at the industrial scale has been typically spanning over decades. For instance, the story of ^{177}Lu really started around 1998, with the availability and the preliminary publications of animal therapy and it took until 2017 for EMA and 2018 for FDA approval of the first marketed drug, ^{177}Lu-Oxodotreotide, to reach the market. Actinium has been known and tested in human for more than 20 years, and it is now anticipated that the first ^{225}Ac-labeled drug may reach the market by 2026 at best.

Nowadays, new radiopharmaceuticals develop successfully around a new radionuclide only if an industrial key player believes and decides to invest in it. As long as a radionuclide is not available with a guarantee of easy large-scale production and affordable price, the attempts to develop associated radiopharmaceuticals remain in the realm of academic research. What's more, to be taken seriously, any new radionuclide must show some advantages compared to the existing "standard".

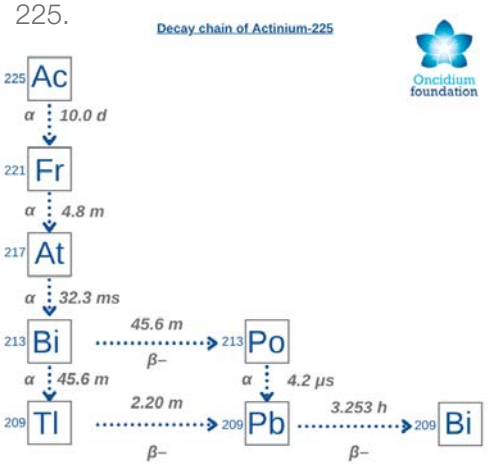
What is so interesting about ^{225}Ac?

^{225}Ac has been known for a while now but was only considered when physicians discovered that Lutetium is not the only solution and that some tumors would need something "stronger" in terms of cancer cell destructive potential. An alpha emitter should do the job, meaning, in other words, that an alpha particle could destroy what an array of beta particles cannot. By replacing ^{177}Lu with ^{225}Ac in a molecule that has already proven a certain efficacy (such as the PSMA peptides or somatostatin analogues for example), superiority might be established in non-responder or relapsing patients. This became the real starting point of all this narrative, even though precursors such as radiolabeled antibodies (^{225}Ac-Lintuzumab, ^{225}Ac-Daratumumab, developed by Actinium Pharma) have been of high interest for some time already. When it became obvious that the substitution of Ac for Lu was feasible in many Lu-labeled molecule, the level of interest in the production of ^{225}Ac in the industry was triggered.

Challenges regarding implementation

Around 2015, the worldwide capacity of ^{225}Ac reached about 1.5 Ci. Even considering that single dose amounts needed per patient with alpha emitters compared to beta-emitters will be far lower (10 µCi for ^{225}Ac vs 100-150 mCi for ^{177}Lu), this total available amount would considerably limit access for a high number of patients. Researchers associated with the industry decided to tackle the problem and among the almost 10 different methods to produce ^{225}Ac, the four most efficient methods were selected and investigated.

The original process and presently the only method leading to ^{225}Ac available for development programs is based on a generator. This historical source is obtained through the natural decay of Thorium-229 (half-life 7,340 years) itself a decay product from Uranium-233. Unfortunately, the precursor is considered as strategic material, and the extraction of thorium is cumbersome. Only a few curies of ^{229}Th are currently available for decay product extraction. Furthermore, there are only three sites (USA, Germany and Russia) presently able to produce today a maximum of 1.7 Ci of pure ^{225}Ac per year. Two of them intend to increase their capacity over the next years but this is likely to be limited to less than 5 Ci. Even though a new company stepped in recently (TerraPower, USA) and is expected to increase the availability (estimated beyond 100 Ci over the next 10 years), it remains insufficient to cover the projected worldwide needs of Ac-225.



A high-capacity approach based on high energy proton irradiation of Thorium-232 is developed at different sites (USA, Canada, Russia), but leads to a radionuclide contaminated with the long half-life ^{227}Ac (21.8 years).

Even if the small fraction of ^{227}Ac has shown absence of adverse effects on patients, industry is not keen on working with a radionuclide that will generate considerable challenges with this long-lived radioactive contaminant in terms of patient dose and waste handling.

Industry has already decided to avoid the use of this quality of Actinium at a large scale, in the same way it has switched from carrier added ^{177}Lu to non-carrier added ^{177}Lu as soon as this later chemical form of Lu-177 was available. There is a way to gain pure ^{225}Ac as by-product from this technology but at the cost of high waste generation, resulting in a high final price for the radionuclide. This quality of Actinium is however a good product to be used in the development of a ^{225}Ac/^{213}Bi generator, but this is a different story.

Future perspectives

The solution will come from cyclotrons and accelerators. This simple process will make use of standard low energy cyclotrons in which targets of Radium-226 are irradiated. There is no generation of ^{227}Ac and the other impurities do have short half-lives, leading to a quite clean ^{225}Ac product. Although this process generates the Ac-225 in low yields, nevertheless it can range in about 100 mCi per week per site.

On the other hand, very large amounts of ^{225}Ac can be produced with accelerators (linacs or rhodotrons) on the basis of a conversion of electrons from photons technology, in which ^{226}Ra is transformed in ^{225}Ac which decays in ^{225}Ac in a very clean way with very high yields (several hundreds of curies per year). At least two of these sites have construction projects (Northstar, USA and SCK-CEN/IBA, Belgium) and there will be probably more to come. In other words, the industrial solution for producing high amounts of clean ^{225}Ac is under construction, which paves the way for the development of an almost unlimited number of new ^{225}Ac-labeled drugs, providing a solution will be found to get access to larger sources of the target material ^{226}Ra, which production had been stopped in the 1950s.

With this increase of medical use of alpha-emitters, industries, together with authorities will also have to become creative in providing appropriate solutions for the handling of patients' radioactive waste.

More than ten ^{225}Ac-labeled drugs have already entered clinical trials and several of them (^{225}Ac-PSMA/Vipivotide, ^{225}Ac-FPI-1434, ^{225}Ac-Lintuzumab, ^{225}Ac-DOTA-SP etc.) are becoming closer to reaching market authorization. While beta-emitter are long range radiation emitter ideal for destroying average size tumors through the cross-firing effect and alpha-emitters better for killing isolated tumor cells or micrometastases, it is highly expected that the sequential treatment of a ^{177}Lu-drug followed by an ^{225}Ac-drug to a patient could be substituted with a co-injection of ^{177}Lu-labeled drug and the same ^{225}Ac-labeled drug, showing much higher efficacy. The demonstration of this simultaneous effect on tumors and micrometastases will proportionally increase the interest for ^{225}Ac. We hope that we only have a few years to wait, just enough time to have access to sufficient amounts of ^{225}Ac of high quality.

The Oncidium foundation's role in striving for education

The foundation focuses its activities around three pillars: Access, Education and Hope, all three complementary, indissociable and equally important to carry out the mission to enhance worldwide access to radiotheranostics technologies for people living with cancer.

Through Education, the foundation strives to bring a better understanding of the functioning and benefits of radiotheranostics for cancer care and nuclear medicine in general but also to provide accurate and up-to-date information about radiopharmaceuticals for therapy. Indeed, an extensive list of marketed, under clinical development, early stage or even discontinued radiotherapeutics is available not only for experts in the nuclear medicine field but also accessible for oncologists, general practitioners (thanks to a search by target) and even patients (through options according to cancer types). Thus, allowing to enhance Access to potentially life-saving information.

In addition to a clear understanding of current availabilities and options, the educational component enables to detect the opportunities that need to be addressed soon, especially those that aim at targeting indications that differ from the already crowded areas of Neuroendocrine Tumors and Prostate Cancer. It is through this endeavor that the foundation can build Hope, by understanding the needs and gaps first and then by supporting research and development and working towards their implementation, at a global scale, to help cancer patients live longer and with better lives.

For more information, visit our *Education page.*

Richard Zimmermann Ph.D.
President & Founder at Oncidium foundation

Tala Allahham
Communication Outreach Coordinator at Oncidium foundation

The ICPO Foundation - How the Paradigm Shift in Cancer Care Leads to Collaborative Growth in Theranostics

By Prof. Richard P. Baum, Josh Mailman and Odile Jaume

Today, the paradigm shift in cancer care to Precision Oncology is well recognized. In this shift, the Theranostics Community needs to live up to its potential by demonstrating its ability to improve the current standard of care: from late to early diagnosis, from bystander to being actively involved in patient care, from severe side-effects to minimal side-effects, from exploding costs to sustainable health economics, from months to years of prolonged survival, and from low quality of life to preserved and improved quality of life.

There is still room to grow on the path toward expanding international patient access to the Theranostics toolbox, including improving standardization of clinical practices and certified professional training. It is encouraging to see that rising radiopharmaceuticals forecasts presented by the SNMMI and EANM are indicating an increase in the number of radiopharmaceutical therapies performed. The question is thus, how to support this growth, how to collaborate and ensure the expected patient outcomes prove their value?

In 2019, the International Centers for Precision Oncology Foundation (ICPO) was established with the aim to answer this question. Our goal is to unleash the potential of Theranostics for international patients, regardless of their backgrounds and conditions, via improved access to certified education curriculum and standardized infrastructure models for those providing Theranostics. The ICPO Founders, namely Prof. Dr. Richard P. Baum, Udo J. Vetter, Michael Lee-Chin, and Oliver Buck, strongly believe that a collaborative approach is the only way forward to growing Theranostics. Therefore, the ICPO mission is to help scale patient access together through education, know-how transfer, and standardization in clinical practice via creating the ICPO Community, Academy, and Center « Social Franchise » network at a global level.

Over the last year, the ICPO Academy – structured around e-learning and hands-on courses/practical training – has been developed thanks to a public-private partnership (PPP) supported by the German International Cooperation Society (Gesellschaft für Internationale Zusammenarbei, GIZ). The first pilot phase will involve five Chinese hospitals. ICPO's primary aim is to allow more physicians, radiochemists, physicists, and nurses/technologists to receive certified Theranostics training worldwide. Secondly, ICPO will introduce the concept of ICPO Centers, which will strategically spearhead standardizing, certifying, and scaling patient access for Radiomolecular Precision Oncology (RPO) worldwide, essentially building a «social franchise model» for dedicated and optimized Precision Oncology Centers. Lastly, ICPO supports scientific research from all Theranostics perspectives, ranging from radiopharmaceutical development to artificial intelligence, image-guided medicine, or virtual reality models, thanks to the 15 international members of the Scientific Advisory Board.

As a call for action to the broad Theranostics Community, the ICPO Foundation held, with great success, its 2nd ICPO Forum in Garching Munich last October 2021. On this occasion, more than 200 medical professionals from around the globe joined in and fostered a shared and future-oriented vision for a self-amplifying growth of Theranostics. In addition to numerous top-class scientific lectures, were among the forum´s highlights talks by patients and nurses, urging for more transparency and multidisciplinary approaches so patients can be more involved and informed about their therapy while reassured about safety, efficacy, quality of life, and discrepancies across geographies and clinical centers. Moreover, the need for standardization of care, hand-in-hand with education and centers certifications, including audits, was also emphasized in the ICPO talks and relayed by the International Atomic Energy Agency representative during the panel discussion. During the meeting, the Oncidium Foundation also presented the latest and impressive results of the Noble registry, demonstrating the starting and final points of patient centricity in Theranostics. In the future, ICPO and Oncidium Foundations will work to bring Theranostics practices and processes to international quality standard levels in order to expand and harmonize global patient access.

Embracing a community responsibility, the ICPO Foundation today encourages all leaders within the Nuclear Medicine Community as well as related pharmaceutical, industrial, medical, financial, and philanthropic sectors, who recognize the current paradigm shift in cancer care, to champion the ICPO cause by joining us as members of our community. Together we can initiate projects with a higher sense of purpose for oncology patients worldwide. Together we can initiate projects with a higher purpose for cancer patients around the globe and achieve improvements with sustainability. We hope that Radiomolecular Precision Oncology lives up to its promise, curative and abundant to all patients in need irrespectively of race, country or social status. *Contact* - *Website.*

Odile Jaume
CEO at ICPO Foundation,

Richard P. Baum, MD
- Trustee at ICPO Foundation
- President at ICPO Academy
- Consultant at Curanosticum

Josh Mailman
President at NorCal CarciNET Community

Synergies between ICPO Foundation and the Oncidium foundation

It is common knowledge that ICPO foundation and the Oncidium foundation are working towards the same goal: enable a growing number of people living with cancer worldwide to get access to radiotheranostics for cancer care, regardless of their origin and financial situation.

In this regard, they share opinion of the importance of enhancing awareness and bridging gaps, all made possible by building a collaborative approach. However, rather than duplicating and to better grasp challenges and opportunities, both organizations joined forces to explore synergies, create complementarity and ultimately carry out their common goal in an optimal and sustainable way.

Join us during our next collaborative webinar on PSMA PET/CT Beyond the Images

Objectives:

- Describe the several PSMA-targeting tracers and PET/CT technology (SUVmax, SUV mean, etc.)
- Describe the accuracy of PSMA-PET/CT for staging and re-staging prostate cancer based on best prospective studies
- Understand the basis of PSMA radioligand therapyand the trials in metastatic prostate cancers.

This webinar is supported by **the Oncidium Foundation and hosted by the Canadian Urology Association.**

Advancing Theranostics: Building a New Centre at UCLA

By Prof. Johannes Czernin and Dr. Jérémie Calais

Theranostics with Radiopharmaceutical therapies are now emerging as part of the standard of care of prostate cancer and neuroendocrine tumors. Recent projections predict a theranostics market volume of >$7 Bill. in 2025 (Herrmann et al (Lancet oncology 2020). High demand for PSMA-targeted molecular radiotherapy (MRT) is expected in the next coming years for patients with advanced stage of prostate cancer, that will further increase as indications will expand to earlier disease stages.

To meet the rapidly increasing patient' need for this novel therapy the UCLA Ahmanson Translational Theranostics Division with its nuclear medicine clinic is building a 4000 sf outpatient clinic to serve up to 16 patients/day (FIGURE 1). The projected delivery date is Q4 2022-Q1 2023. The clinic will be equipped with 8 infusion chairs, placed in lead shielded private compartments providing optimized radiation protection for patients and staff. After careful screening procedures that include patient consultations, blood draws to assess the risk of toxicity, and PET-targeted imaging to determine whether the therapeutic target is present, patients will be scheduled for a 2–3-hour outpatient visit during which the therapeutic radioactive drug is administered. Following discharge only minimal radiation safety procedures are required. The outpatient treatment is repeated 4-6 times in 4–8-week intervals depending on the disease specific protocol.

Advantages of the treatment include cancer selectivity which reduces treatment side effects; the ease of outpatient administration due to the very low radiation exposure of the environment following the treatment; and the effectiveness of therapy that has been documented in large clinical trials of patients with prostate cancers (Vision, Peter Mac, UCLA) and neuroendocrine tumors (NETTER).

Challenges include the small number of adequately trained experts to administer molecular radiotherapy. Professional societies need to develop appropriate curricula and training guidelines to create a competent legion of "theranosticians". The current small number of theranostic centers that can deliver this treatment to significant numbers of patients is another major challenge. We estimate that as many as 150 treatment centers will be needed in the USA in the near future (Czernin and Calais, Journal of Nuclear Medicine, in press). Thus, a focused and rapid facility ramp up is needed. Finally, the supply chain of radioisotopes is suboptimal due to limited production sites. Industry will need to step up its efforts to ascertain adequate drug supply.

Theranostics have now arrived as an important component of precision oncology. Theranostics based precision oncology requires substantial investments supply chain, training (physicians, nurses, technologists, dosimetrists, radiation safety experts), site design and operational workflows.

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- David Geffen School of Medicine at UCLA
- Advisory Board Oncidium foundation

Patients and Advocates Working for Greater Access to Theranostics Around the Globe

By Simone Leyden

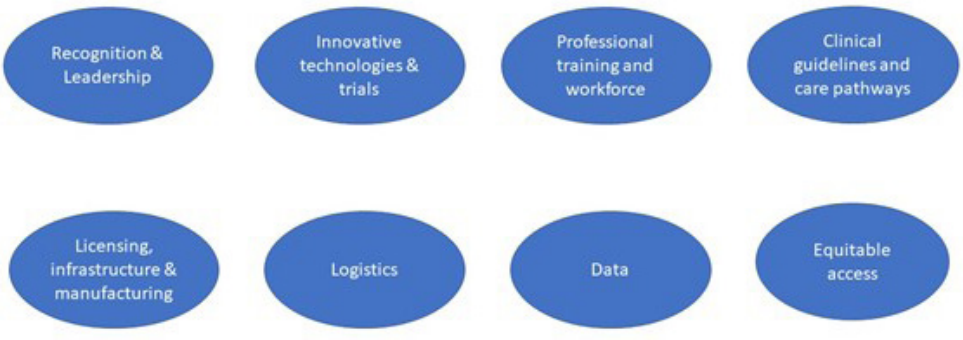
The development of Theranostics over the past 25+ years in treating Neuroendocrine Tumor (NET) patients, is recognized globally as the optimal treatment in improving patient outcomes and care. Whilst the scientific evidence is not disputed, universal access is still lacking.

A recent survey of over 3000 NET patients and HCPs, conducted by the International Neuroendocrine Cancer Alliance (INCA) called SCAN (Survey of Challenges in Access to Diagnostics and Treatment for Neuroendocrine Tumor (NET) Patients), found that whilst access to 68Ga-DOTA PET/CT has improved, a higher proportion of HCPs reported PRRT was unavailable compared to studies conducted in 2017. Despite some improvements, SCAN highlighted that global availability and affordability of specialized tools remains poor and a critical area to advance, especially in Emerging and Developing Economies.

To assist in raising awareness about Theranostics with policy makers and to future proof access for further cancer types, patient advocates have been active alongside healthcare professionals in key activities around the globe. In October 2021, NeuroEndocrine Cancer Australia hosted the first Australian Theranostics Roundtable, bringing together key researchers, clinicians, policy makers, HTA Chairs, industry and patients with a goal to discuss the challenges, and provide solutions to the best path forward in the future of precision oncology in nuclear medicine.

Panel discussions included the Australian experience – imaging and therapy past, present and future; clinical trials and innovative technologies; models of care for rare and less common cancers versus common cancers; importance of investment now for the future "Think global - act local"; sovereign capability, future workforce and infrastructure; trade opportunities, industry performers and supply chains; HTA frameworks for the future, and most importantly registrants heard first hand patient experiences. The event was recognized as a success by all participants and a subsequent report is in development with key actions to be used for future advocacy work.

In Europe, current INCA President Cathy Bouvier represented the patient voice as part of SPARC (Stakeholder Political Alliance for Radioligand Cancer therapies), in the launch of their European position paper, as well as the release of the Health System Readiness for radioligand therapy in the UK report. The key areas of focus from these reports and the Theranostics Roundtable are the need for a "whole of system" approach to areas such as:



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The success of Theranostics relies on the collaboration of all stakeholders, and the past experience in the NET community of the strong alliance between patients and HCPs proves what can be achieved. As we look to the future directions of Theranostics and the focus on strategies to further enhance the efficacy of PRRT including combination treatments with other systemic therapies, such as radiosensitising chemotherapy, DNA repair-modifying agents and immunotherapy, this alliance will be more important than ever.

Simone Leyden
• CEO and Co-Founder
Neuroendocrine Cancer Australia
• Past President
International Neuroendocrine
Cancer Alliance

Oncidium foundation note

The Oncidium foundation recognizes and supports the pivotal work of NeuroEndocrine Cancer Australia and joins forces with all the key interlocutors in the field. Indeed, it is only by working hand in hand that awareness and access can be achieved. When it comes to rare cancers such as neuroendocrine tumors (NETs), the foundation always keeps in mind the global reality that Rare is Many. To bridge this gap, the foundation's commitments include:

- Raising awareness through education on radiotheranostics options and NETs with a dedicated page providing information about the disease, approved and in-developments radiotherapeutics. ***Learn more***
- Identifying and registering therapy centres worldwide providing radiotherapeutics for NETs. ***Register*** your therapy centre or ***locate*** the nearest one
- Reaching out to and giving voices to patients through exchanges with advocacy groups or ***patient testimonials.*** ***Get involved***
- Evaluating and collaborating on projects working towards more equitable access to treatments to people living with NETs, regardless of origin and financial situation.

Did you know?

Do you know that there are 300 million people worldwide who are diagnosed with a rare disease, a number equivalent to the population of the world's third largest country? Since 2008, a global patient-led campaign has been held each year on February 28th to raise awareness about people living with rare diseases and to spread the message on Rare Disease Day: Rare is Many.
It is estimated that there are 200 rare cancers, among which Neuroendocrine Tumors. The Oncidium foundation therefore wishes to increase awareness about this rare disease and show its support to the NETs community.

What's up Oncidium foundation?

Throwback Thursday

The Oncidium foundation, 10 Years and Counting Serving Radiotheranostics Developments

According to estimates from the World Health Organization (WHO) in February 2022 (source: World Health Organization - *Fact Sheets Cancer*), cancer is a leading cause of death worldwide, accounting for nearly 10 million deaths in 2020, or nearly one in six deaths. Between 30 and 50% of cancers can currently be prevented by avoiding risk factors and implementing existing evidence-based prevention strategies. The cancer burden can also be reduced through early detection and appropriate treatment and care of patients who develop cancer. Many cancers have a chance of cure if diagnosed early and treated appropriately.

A pivotal and visionary idea

Whether referred to as Radiotheranostics, Theranostics, Theragnostics, Radioligand Therapy,... the technology represents an innovative and rising player in the oncology field, as it aims to deliver precise and targeted diagnostic and therapy drugs to cancer cells, regardless of their location in the body, thus limiting damage to healthy tissue. "Seeing what you treat and treating what you see", this technology can predict if one is more likely to respond to the specific therapy or not and anticipate results.

Back in 2011, the availability of radiotheranostics was quite limited. However, the pipeline of radiolabeled drugs under clinical development began to gain momentum, based on two major technical progresses: the market availability of Lutetium-177 (NET therapy) and the concept of radiotheranostics that was gaining more and more interest among scientists and physicians. The next challenge was to bring visibility about this new therapeutic approach among oncologists, patients, and the general public.

It is towards this goal that the Oncidium foundation was created, a non-profit, public benefit organization, founded in 2011 by Dr. Richard Zimmermann, that would bring to light and illustrate the benefits of this technology. Based in Belgium but acting globally, the mission of the foundation is to support and accelerate the development of radiotheranostics for cancer care. It was a visionary idea that could not get off the ground due to the lack of financing. Nevertheless, back then, Dr. Zimmermann was already working on the foundation's development by attending congresses, giving presentation, building a network and thus, by already planting the seeds leading to the Oncidium foundation project: spreading the word about the potential and benefits of radiotheranostics.

Starting operational activities

It is in March 2019 that the foundation could operationally start thanks to the generous contribution of two philanthropists, already convinced about the promising future of this technology, **Christian Behrenbruch and Andreas Kluge**. It is then that Rebecca Lo bue was appointed General Manager and formed her team of Community Outreach Coordinators with Floriane Laurent and Tala Allahham, to implement and carry out the mission and goals of the foundation. ***"The strength of the Oncidium foundation is its commitment to work beyond borders as we are surrounded by devoted people all around the world, who bring their expertise and passion to serve a common goal: a better access to patient."*** stated Rebecca Lo bue. With already 22 recognized experts on board representing 15 countries, a worldwide network is emerging with Oncidium Ambassadors that endeavor to raise awareness through education campaigns, local collaborations, liaison with national cancer organizations, patient's associations, and shared knowledge.

The Oncidium foundation also counts on a scientific board regrouping key opinion leaders in the field to guarantee an accurate and precise communication, to identify developments and recommend projects advancing the technology.

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The first Philanthropists behind the launch of the Oncidium foundation

The Oncidium foundation would not be able to continue the work it does or accomplish the achievements it has made without the generosity of its supporters. We would like to show our deep appreciation to our initial benefactors, that believed in the foundation, and thus, enabling the shift from being "just a cutting-edge idea" to a concrete and functional

Christian Behrenbruch

Internationally recognized for his achievements regarding the commercialization of healthcare IT, medical devices, and biotechnology products, Dr. Christian Behrenbruch has over twenty years of healthcare entrepreneurship and executive leadership experience in the chosen field of nuclear medicine and personalized medicine, with a particular interest for radiotheranostics. *Lean more.*

Christian plays an active role in fostering the development of this technology and has been involved from the start, having been the Oncidium foundation's enthusiastic initial and long-term supporter.

"As the field of nuclear medicine grows in importance, there is a need for patient advocacy groups that are able to build awareness of the field and connect patients to treatment options. I have always admired the vision of the Oncidium foundation and as an early participant in the creation of the foundation with Richard Zimmermann, I wanted to help deliver on the mission."

Andreas Kluge

With other 20 years of clinical research and development experience Dr. Andreas Kluge has extensive experience in the practice of Nuclear Medicine and radiochemistry, molecular imaging and the clinical development of novel radionuclide-based products and devices. *Lean more.*

Like Christian, Andreas is actively involved in raising awareness and supporting the development of new radiopharmaceuticals for cancer care. Believing in the purpose of the foundation, his generous contribution is of great significance to the realization and development of the Oncidium project.

"Having been in the field of nuclear medicine for over two decades, I witnessed first-hand radionuclide therapy gaining momentum worldwide, and felt the need to contribute to this worthy cause, by giving a voice to the Oncidium foundation. Given that the public still doesn't have a clear understanding of its advantages, I believe that what the Oncidium foundation has been doing with endeavor can fill the current breach and takes us one step further to reach our common goal."

Future directions

Now that the foundation is implemented and up and running, the next step is to explore new projects focusing on: Enhancing Patients Access, Accelerating Clinical Developments, Improving Production Capacities, Supporting Early-Stage Developments, and Increasing Partnerships. In brief, the next challenge will be to enable a more global development, use and access, so that every person living with cancer can be offered the right diagnosis and therapy, wherever and whenever they need it. *Stay tuned!*

What's up Oncidium foundation?

Latest Updates

Oncidium foundation New Ambassadors, Meet the Newcomers

From all around the world, the voices of theranostics exchange ideas, share their projects, visions and aspirations for the work of the foundation locally and internationally, to further support and promote the development of Radiotheranostics for cancer care.

Patricia Edem

Leila Safavi

Dalveer Singh

Who will become the next Ambassador?
Find out why and how

Coming up next!

The Oncidium foundation team continues to put the efforts into increasing awareness and access to radiotheranostics options for cancer care. Bridging gaps and building hope can only be achieved through continuous exchanges and collaborations on projects that can help enhance visibility and spread the word, to as many people as possible, globally. So, what's next in line?

Radiotheranostics on the move with the Oncidium foundation!

Join our global race that aims to encourage participants to move together and get actively involved to raise awareness about the benefits of radiotheranostics in cancer care. After downloading the application atlasGo and paying for the registration ticket, participants can start the challenge, do sports and make a difference ! You can choose from a variety of sport activities on the platform and atlasGo will be able to track and record your activities, which will eventually help us reach our common goal of 5000 kilometers.

Thank you to all the ambassadors for your involvement and inspiring ideas. Without your support, Tackle Cancer Challenge would not have been able to become a worldwide event. *Contact us*, to participate.

Supporters of the Oncidium foundation

Support the foundation and join the fight against cancer

Supporting the foundation will allow to finance research and development of new radiotheranostics, but also to reach directly patients thanks to contributions that will help finance treatments using radiotherapeutics technology.

We know that this path is not easy. We know the importance of finding the right and nearest doctor, understanding the diagnosis and evaluating treatment options. Thus, it is our mission to educate, raise awareness, and support people living with cancer and their loved ones in this daily battle.

Your contribution will help support key areas related to the organization's work: education, R&D, enhanced access to treatments and clinical trials, advocacy, outreach etc.

For more information about our Support Levels: **contact us.**

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