

## **INVESTOR PRESENTATION**

**NOVEMBER 29th, 2021** 

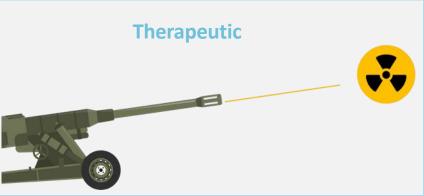


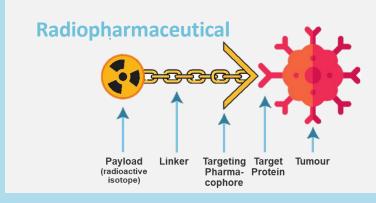
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## WHAT ARE RADIOPHARMACEUTICALS?







# Radiopharmaceuticals deliver radioactive isotopes to the tumour cells

- Diagnostics: low energy radioisotopes which allow physicians to <u>SEE</u> and to measure disease within the body
- Therapeutics: high energy particle emitters to <u>TREAT</u> malignant tumours, cancer, and other diseases

## Process involves attaching a radioactive isotope to a targeting agent such as a small molecule or antibody

- Peptides or mAbs specifically binds tumour cells
- Peptides or mAbs are loaded with Imaging Isotopes to <u>SEE</u> the tumour cells
- Peptides or mAbs are loaded with Therapeutic Isotopes to <u>TREAT</u> tumour cells, being extremely selective to damage cancer cells DNA, while not damaging healthy tissues

## **INVESTMENT HIGHLIGHTS**

Highly prospective portfolio comprising clinical & pre-clinical stage radiopharmaceutical assets for both diagnostic & therapeutic applications

Four distinct and well differentiated clinical platforms spanning peptides, small molecules & antibodies – 133 patients dosed to date

Deep clinical program on-foot with five Phase 2 clinical trials and two Phase 1 clinical trials ongoing

One of the deepest clinical pipelines on the ASX

Commercially attractive license arrangements

Broad & robust IP portfolios



World-class management team comprising C-suite executive team recruited from the most prestigious radiopharmaceuticals companies & universities globally

Manufacturing utilizing many of the widely adopted radioisotopes in the existing supply chain

Raised A\$50m in IPO to list on the ASX 25 November 2021

Rich news flow generated by four platforms over next 24 months

R&D engine secured with lab and facilities access via Sponsored Research Agreements

## FOUR DISTINCT & WELL DIFFERENTIATED PLATFORMS

### BALANCED PORTFOLIO OF SMALL MOLECULES, PEPTIDES AND MONOCLONAL ANTIBODIES, WITH DIAGNOSTIC & THERAPEUTIC POTENTIAL

### **Pivalate** Phase 1 & Phase 2 | N= 49

- Phase 2 kidney diagnostic
- Phase 2 Brain mets diagnostic
- Phase 2 glioma diagnostic
- Phase 2 solid tumour
- Pre-clinical companion therapeutic

### Nano-mAbs Phase 1 | N=74

- Phase 2 HFR-2 breast diagnostic
- Phase 1 HER-2 breast therapeutic
- Pre-clinical PD-L1 NSCLC Therapeutic
- Pre-Clinical Trop 2 & PTK7 diagnostic

### **Avb6 Integrin** Phase 1 | N=10

- Phase 1 diagnostic pancreatic, head & neck
- Pre-clinical therapeutic, pancreatic, head & neck

### PSA-mAb Pre-clinical

Pre-clinical diagnostic and therapeutic in prostate cancer













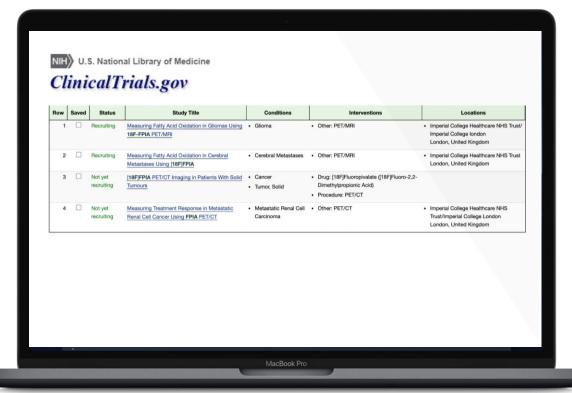




## 18F-Pivalate PHASE 1 & PHASE 2 N=49



RPT 18F-FPIA radiotracer is the invention of Professor Eric Aboagye of Imperial College London



Based on a short chain carbohydrate which utilizes the early steps of fatty acid oxidation and is very stable

In comparison to the clinical standard in PET imaging, 18F-FDG, in prostate and brain cancers, 18F-FPIA showed superior imaging performance, and was equally good for 2 breast cancer models

Phase 1a in 24 healthy patients completed

Phase 1b study complete in glioma

Phase 2 kidney and Brain mets studies currently recruiting

Phase 2 study in resected solid tumours to be opened in Nov/Dec 2021

Phase 2 study for glioma to be opened in Nov/Dec 2021

Sponsored Research Agreement to be entered with Imperial over three years with a focus on therapeutic use

Candidate selection of Pivalate therapeutic to be completed by I half 2022

## NANO-MABS N=74

The technology is based on single-domain camelid antibodies known as nano-mAbs derived from camels

The technology is the invention of Dr Hong Hoi Ting formerly of Oxford University, GE Healthcare, and Shanghai National Technology Centre

A therapeutic product is made by a genetic engineered camelid antibody labelled with a radioisotope of therapeutic radiation.

This therapeutic product is paired with a diagnostic, using the same antibody vector but labelled with a lower radiation radioisotope for imaging

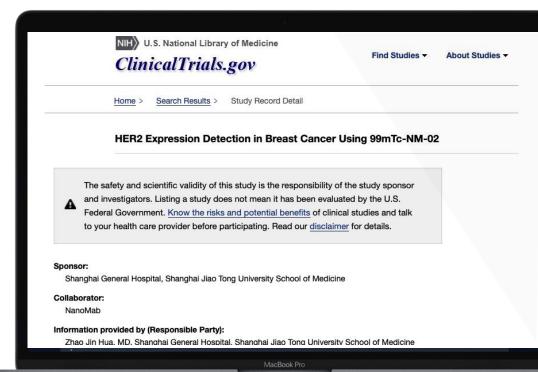
Initial targets are HER-2 for breast cancer, PD-L1 for non small cell lung cancer, TROP-2 for TNBC, PTK7 for multiple solid tumours.

A Phase 1 imaging study for HER-2 breast cancer has been completed on 33 patients in Shanghai & Germany. A Phase 1 therapeutic compassionate use study is expected to dose the first patient before December 2021

A Phase 1 imaging study for PD-L1 in NSCLC has been completed in 40 patients in Shanghai & London







## **AVβ6 INTEGRIN PHASE 1 IMAGING N=10**

AVB6 is the invention of internationally regarded integrin expert Professor Johannes Notni, formerly at the Technical University of Munich and now Professor at Essen University

A Phase I compassionate use diagnostic clinical study is ongoing in Germany in pancreatic and head & neck cancer, with 10 patients to date. Published in European Journal of Nuclear Medicine Sep 2021.

AVB6 is a strong and selective ligand for a cell surface protein called ανβ6-integrin. As such, it can accumulate in tissue areas characterized by high ανβ6-integrin levels

There is compelling evidence that ανβ6-integrin is found in many of the most challenging cancers, such as pancreatic carcinoma, cervical, head-and-neck, and certain lung cancers AVB6 offers an unparalleled performance for radiolabelling with Gallium-68

AVB6 is a highly promising clinical candidate for early detection of the aforementioned conditions by PET imaging

Our plan is to design & synthesise a number of conjugates for a therapeutic approach and enter clinical trials at the earliest opportunity

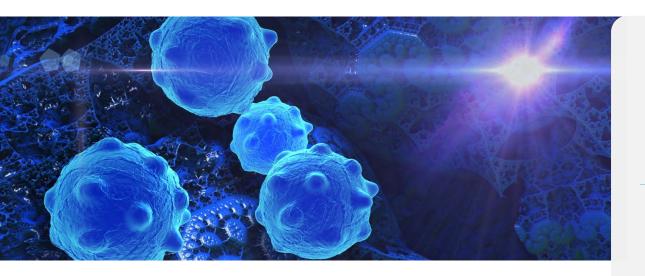
Radiopharm has entered into a three year Sponsored Research Agreement with Professor Notni and his scientific team to develop a therapeutic application at the earliest opportunity







## 2ND GEN PSA-mAb ANTIBODY PRE-CLINICAL





\*LUND, Sweden, Jan. 21, 2020 /PRNewswire/ -Diaprost entered into an exclusive Research and Option
Agreement with a Top 10 Pharmaceutical company
strategic partner in October 2017. Diaprost now
announces that its strategic partner has exercised its
option to acquire rights to its h11B6 antibody. An upfront
payment and research funding has already been paid
and an early-stage clinical trial has been initiated. In
payments made prior to option exercise, Diaprost
received \$13M. The option fee and potential future
payments, including commercial milestones, for its
h11B6 antibody for prostate cancer may be up to \$90
million. No royalties are payable.

Proprietary humanized monoclonal antibody (hu PSA), capable of targeting free human prostate kallikrein (PSA) in prostate cancer cells and internalizing payload.

PSA-mAb is the discovery of Prof David Ulmert formerly of Memorial Sloan Kettering and now UCLA. An earlier generation of this antibody h11B6 invented by Prof Ulmert was sold to Janssen in 2020 for approx. USD\$100m \*

The antibody platform enables a radiotheranostic applicable therapy of prostatic cancer through radioimmunotherapy as well as diagnostics of advanced prostate cancer.

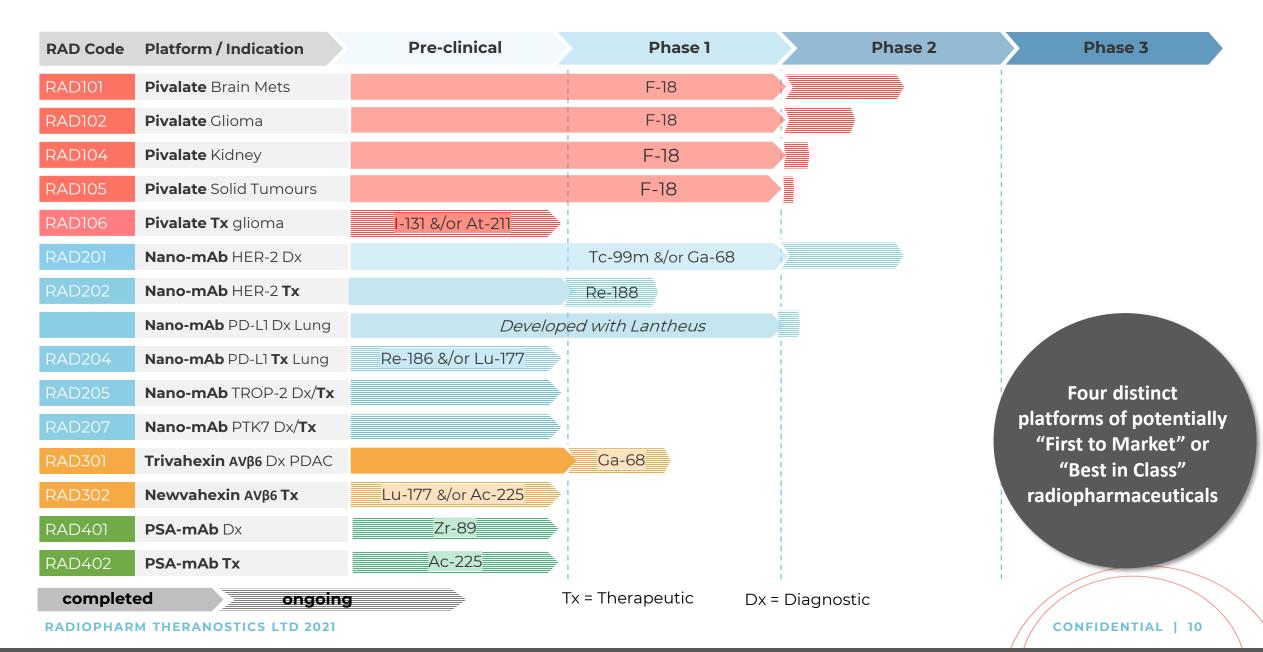
10 000-fold + higher expression of KLK3 (PSA) in prostate tissue, compared to other tissue.

[225Ac]-hu PSA results in curative treatment by sustained tumour regression and a significant increase in median survival time.

Developability data demonstrates a stable humanized antibody, without signs of degradation and aggregation.

IP-portfolio includes issued patent and applications for substance matter for imaging and therapy with hu PSA

## RAD CLINICAL DEVELOPMENT PIPELINE



### **EXECUTIVE LEADERSHIP TEAM**



### MANAGING DIRECTOR / CEO

Riccardo was most recently Chief Commercial Officer of Novartis company Advanced Accelerator Applications, one of the leading radiopharmaceutical and nuclear medicine companies globally. He was responsible for global commercial strategy and country organisations in ~20 countries across North America, Europe and Asia. He was lead for Lutathera inmarket growth strategy and execution to build a blockbuster asset and lead on the prelaunch plan for Lu-PSMA 617 in metastatic prostate cancer. Prior to this he was Senior VP and Global Head, Breast Cancer Franchise for Novartis Oncology from 2017, overseeing the launch of major breast cancer products including KISQALI and PIQRAY. He has held various management roles with Novartis Pharma and Ethicon/Johnson&Johnson.





#### **CHIEF MEDICAL OFFICER**

David was most recently at Cornell University where he was Prof of Nuclear Medicine, Medical Director of the imaging research centre, and Director of the Multi-Center Clinical Translational Science Center. He was an active member of the ethics board and a past chair of the Cornell ethics board for cancer research. He has participated in over 60 clinical trials at Eli Lily and over 100 trials at Merck in novel radio-pharmaceutical or drug development. He was the principal investigator of 11 first-in-human studies of novel radiopharmaceuticals at the University of Pennsylvania, and the sponsor of nine investigational radiopharmaceuticals at Cornell. Previously he was at Endocyte as Vice President of Imaging. He has coauthored more than 100 peerreviewed publications.



Penn









Thom has spent more than 25 years in the development and commercialization of radiopharmaceuticals and imaging agents. He has served in senior leadership roles at Navidea BioPharmaceuticals Inc. Alseres Pharmaceuticals, Lantheus Medical Imaging (LMI), Bristol Myers Squibb (BMS), and DuPont. He was a Board Member of the Academy of Molecular Imaging and Chairperson of its Institute for Molecular Technologies.





#### **EXECUTIVE CHAIRMAN**

Paul is the Founder of Radiopharm Theranostics.

25 years experience in biotech, healthcare and life sciences focused on start-up and rapid growth companies. Previous and current Boards include Imugene, Chimeric Therapeutics, Viralytics (sold to Merck in 2018 for \$500m), Prescient, Polynoma, Arovella Therapeutics.





Lantheus

















## RECENT IPOS IN RADIOPHARMACEUTICAL SPACE

NOV 2020 \$1.1B gross proceeds **SEP 2019** \$250M gross proceeds

JUN 2020 \$212.5M gross proceeds **JUN 2020** \$144M gross proceeds









AUG 2021
A\$92M gross proceeds

**DEC 2020** \$98.6M gross proceeds

SEP 2020 DKK273M gross proceeds \$96M gross proceeds



NANOBIOTIX EXPANDING LIFE





## **KEY ACQUISITIONS IN RADIOPHARMA SPACE**

**JAN 2018** US\$3.9B

**DEC 2018** US\$2.1B

**JUN 2019** US\$450M + **MAR 2021** US\$300M























## **INVESTMENT SUMMARY**



Radiopharmaceuticals experiencing a high level of investor interest and M&A activity globally including China



Radiopharm's portfolio is a balanced pipeline with risk diversification - many shots on goal



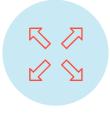
Over 130 patients treated to date across seven clinical trials. Multiple programs already in the clinic



World class management team including CEO, CMO & CTO from some of the most prestigious radiopharmaceuticals companies & universities globally



Regular news flow arising from numerous projects



Broad and robust IP portfolio



Established links into China with two Phase 1 trials completed at Shanghai General Hospital



Maintain opportunistic Business Development strategy

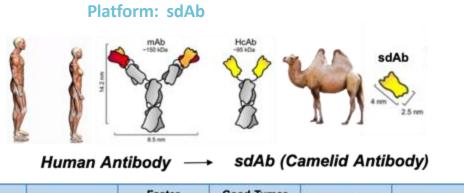


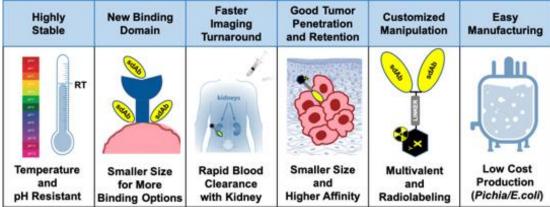


## **APPENDIX**



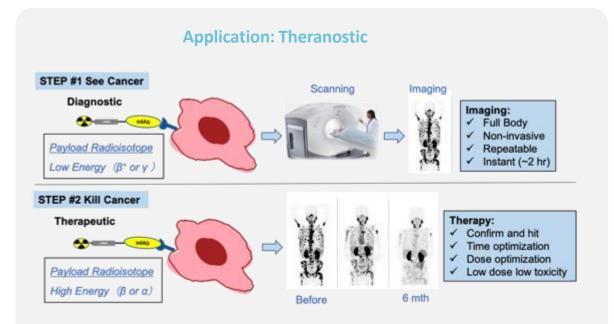
## NANO-MABS PHASE 1 & PHASE 2 N=73





A therapeutic product is made by a genetic engineered camelid antibody labelled with a radioisotope of therapeutic radiation.

This therapeutic product is paired with a diagnostic, using the same antibody vector but labelled with a lower radiation radioisotope for imaging.



Initial targets are HER-2 for breast cancer, PD-L1 for Non -Small Cell Lung Cancer & TROP-2 for Triple Negative Breast Cancer

## **HER-2 PHASE 1 BREAST IMAGING COMPLETE N=33**

Phase 1 imaging has been completed on 33 patients with Tecnetium-99m: 30 in Shanghai; 3 in Germany

Non-invasive and demonstrated safety

Accumulation / high uptake in target within 2 hours post injection

Acceptable biodistribution and dosimetry (Renal protection can be achieved by standard pre-injection of gelufusin/amino acids mixture)

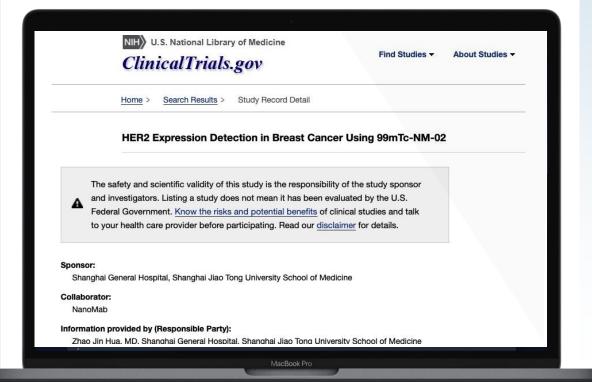
Shows clear intra- and inter-tumoural heterogeneity of HER-2 expression.

Provide more accurate, and informative information on HER-2 cancers in comparison to existing IHC / FISH detections from biopsy samples.

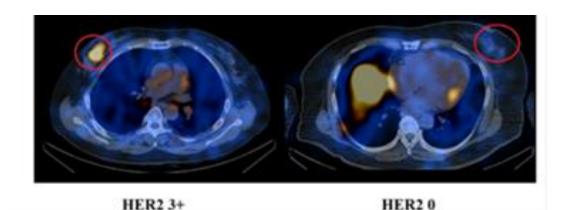
Potential to be used for whole body assessment and treatment of HER-2+ cancers with different medical radioisotopes







### **HER-2 PHASE 1 BREAST THERAPEUTIC COMMENCING**



UNIKLINIK RWTHAACHEN





Phase 1 therapeutic about to launch in late stage HER-2+ breast cancer at Aachen and Curanosticum Centres in Germany with Re-188, and Lu-177

1st patients dosing ~September/October 2021

Can be easily adopted for therapeutic with Re-186, Lu-177 or Ac-225

High Probability of success as a therapeutic agent:

- Patients' safety data
- Same targeting as imaging but just change of war-head (Tc-99m to Re-188, or Ga-68 to Lu-177)
- Re- and Tc- structural and reaction chemistry is the "same"easy conversion.
- Apply to patients with good images and dosimetry – SEE then TREAT

## PD-L1 PHASE 1 NSCLC IMAGING COMPLETE N=40

PD-L1 is a pan-cancer biomarker, and immuno-checkpoint blockers are becoming the most important treatment of multiple cancers

Imaging technology is licensed to *Lantheus* for research collaborations in diagnostic imaging

Worldwide exclusive license to Radiopharm for therapeutic use

Imaging done on 40 lung NSCLC patients: in Shanghai General and at Kings College London

Approved for Phase 2 Imaging Clinical Trial by MHRA

DMF for Imaging filed with FDA in US

Easy adopted for therapeutic

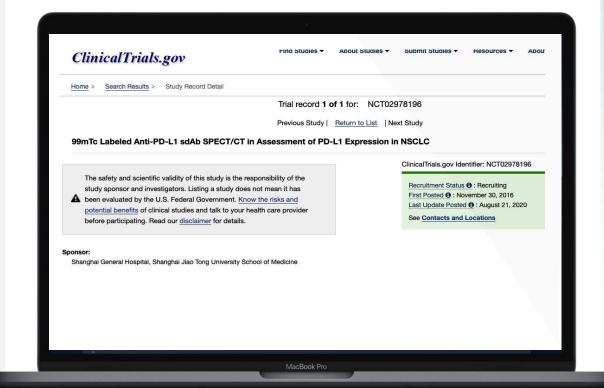
High Probability of success as therapeutic agent: Patients safety data; same cold kit as imaging but just change of war-head

Apply to patients with good images - SEE than TREAT





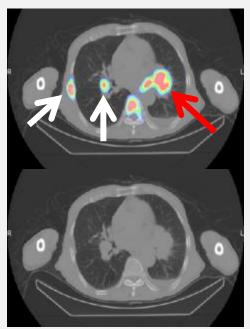


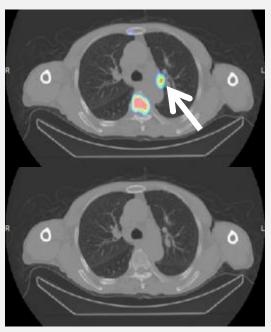


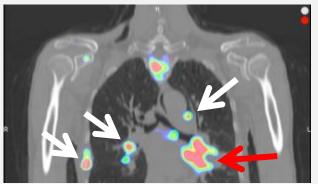
## **PD-L1 CLEAR UPTAKE & ADVANTAGES**

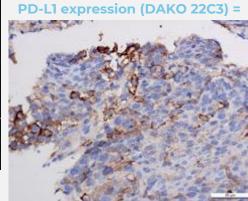
OF IMAGING V. BIOPSY

### TC002-High PD-L1 expression within Primary tumour and Multiple Mets









#### Primary NSCLC T:BP=3.09

Hilar Lymph Nodes (LEFT) T:BP=3.25 Hilar Lymph Nodes (RIGHT) T:BP=3.40 Chest wall/Pleura (Right) T:BP=3.28

SPECT-CT <sup>99m</sup>Tc-NM-01 2hr pi

Patient TC002: Male, 75 YO, chest x-ray showed lung shadow, CT scan confirmed multiple lesions. Biopsy confirmed squamous cell carcinoma, a lower left lobe lung hilar tumour, 44 x 48mm is size with multiple metastases, nodal and distant. 99mTc-NM-01 scan results had uptake in primary tumour (T:BP = 3.09) (2h) and multiple metastatic lesions (2h) all >2.3 cut-off, therefore, a strong positive image. PD-L1 IHC likely understated PD-L1 expression for this patient, PD-L1 treatment prognosis for such a patient is expected to be favourable, though further investigation is required.

## TROP-2 AND PTK7 PRE-CLINICAL CANDIDATES

TROP-2

| Target                        | tumour-associated calcium signal transducer   |
|-------------------------------|---|
| Gene                          | TACSTD2   |
| Cancer<br>Hallmarks<br>(MoA): | Sustaining proliferative signaling; Activating invasion and survival  |
| Indications:                  | TNBC, SCLC, NSCLC, HNSCC<br>Pancreatic/Colorectal/Gastric/Ovarian/Prost<br>ate Cancer (6.4M overall new cases/year) |

### **Current Status of Development:**

High Binding Candidates selected

- Preclinical theranostic required (6 months)
- Clinical samples (+6 months)
- First-in-human imaging within 12 months

### PTK7

| Target                        | Protein Tyrosine Kinase 7   |
|-------------------------------|---|
| Gene                          | PTK7  |
| Cancer<br>Hallmarks<br>(MoA): | Activating invasion and metastasis;<br>Inducing angiogenesis          |
| Indications:                  | TNBC, Ovarian Cancer, NSCLC, Colorectal (2.6M overall new cases/year) |

### **Current Status of Development:**

High Binding Candidates selected

- Preclinical theranostic required (8 months)
- Clinical samples (+6 months)
- First-in-human imaging within 14 months

## AVβ6 - EUROPEAN JOURNAL OF NUCLEAR MEDICINE

AND MOLECULAR IMAGING - IMAGE OF THE MONTH

### PET/CT imaging of pancreatic carcinoma

AVβ6-specific peptide

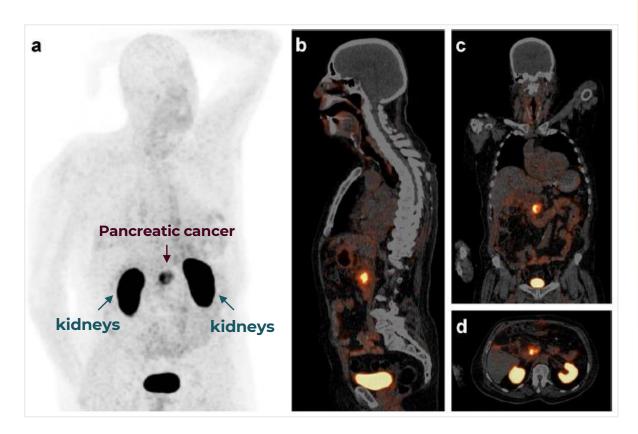
PET/CT image of solitary tumour in pancreatic head

Pancreatic ductal carcinoma confirmed histologically

Prominent signals are observed only in kidneys and urinary bladder due to rapid renal excretion

No relevant uptake is seen in head & neck, lungs, stomach, liver, and intestines

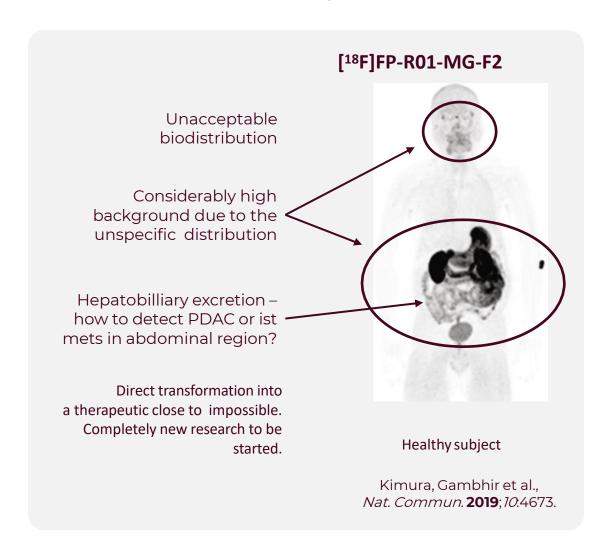
Potential applications for PDAC and other carcinomas (head-and-neck squamous cell, lung adenocarcinoma, colon, cervical, mammary).

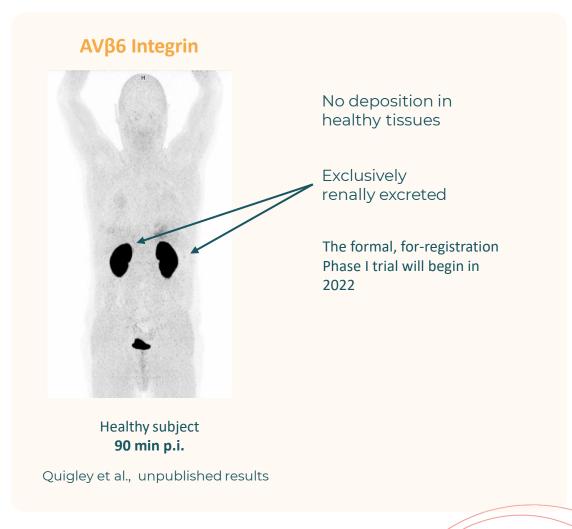


Quigley, N.G., Czech, N., Sendt, W. et al. PET/CT imaging of pancreatic carcinoma targeting the "cancer integrin" α v66. Eur J Nucl Med Mol Imaging (2021). https://doi.org/10.1007/s00259-021-05443-8

## AVβ6 BEST-IN-CLASS: PHASE 1A COMMENCED

BIODISTRIBUTION GENERALLY (HEALTHY SUBJECT COMPARISON)

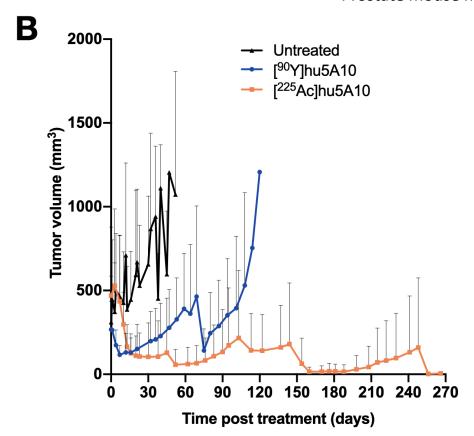


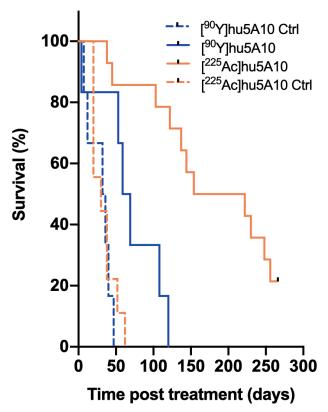


## THERAPY SUSTAINED TUMOUR REGRESSION

#### AND A SIGNIFICANT INCREASE IN MEDIAN SURVIVAL TIME

#### Prostate mouse model





While beta-emitting [90Y]hu PSA had a more immediate effect on tumour volume, treatment with [225Ac]hu PSA resulted in sustained tumour suppression and provided a significant increase in median survival time.

The faster response time seen in Yttrium-90 treatment could be attributed to the difference between the chosen radionuclides in half-life and path length.

## PEER REVIEWED PUBLICATIONS

2021



Eur J Nucl Med Mol Imaging. 2021 May;48(5):1371-1389

HER2-directed antibodies, affibodies and nanobodies as drug-delivery vehicles in breast cancer with a specific focus on radioimmunotherapy and radioimmunoimaging

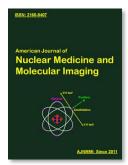
2019



J Nucl Med. 2019 Sep;60(9):1213-1220

Early Phase I Study of a 99mTc-Labeled Anti-Programmed Death Ligand-1 (PD-L1) Single-Domain Antibody in SPECT/CT Assessment of PD-L1 Expression in Non-Small Cell Lung Cancer

2021



Am J Nucl Med Mol Imaging 2021;11(3):XXX-XXX

Preclinical development and characterisation of 99mTc-NM-01 for SPECT/CT imaging of human PD-L1

2016



Expert Opin Biol Then 2016 Aug;16(8):1035-47

Targeted alpha therapy using short-lived alphaparticles and the promise of nanobodies as targeting vehicle

2021



Clin Cancer Res. 2021 Apr 1;27(7):2050-2060

PSA-targeted Alpha-, Beta-, and Positron emitting immunotheranostics in murine prostate cancer models and non human primates

2016



Sci Transl Med. 2016 Nov 30;8(367)

Internalization of secreted antigentargeted antibodies by the neonatal Fc receptor for precision imaging of the androgen receptor axis

2021



Nat Rev Urol. 2021 Mar;18(3):131

Radiotheranostic targeting of fPSA

2014



Expert Opin Drug Deliv. 2014 Dec;11(12):1939-54

Radiolabeled nanobodies as theranostic tools in targeted radionuclide therapy of cancer

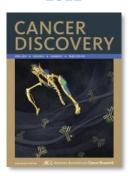
2020



2020 Dec;25(12):2074-2075

Why next generation radiopharmaceuticals will play a key role in the quest for precision medicine

2012



Cancer Discov 2012 Apr;2(4):320-7

Imaging androgen receptor signaling with a radiotracer targeting free prostatespecific antigen

2020



EJNMMI Res. 2020 Dec 1;10(1):145

Inter- and intraobserver agreement of the quantitative assessment of [99mTc]-labelled anti-programmed death-ligand 1 (PD-L1) SPECT/CT in non-small cell lung cancer

2008



Current

2008;1(1):37-41 99mTc-Labeled Nanobodies: A New Type of Targeted Probes for Imaging Antigen Expression