

# Nuclear Oncology: Frontline Targeted Cancer Care



*#caringforthegoodlife*



# Nuclear Oncology: Frontline Targeted Cancer Care

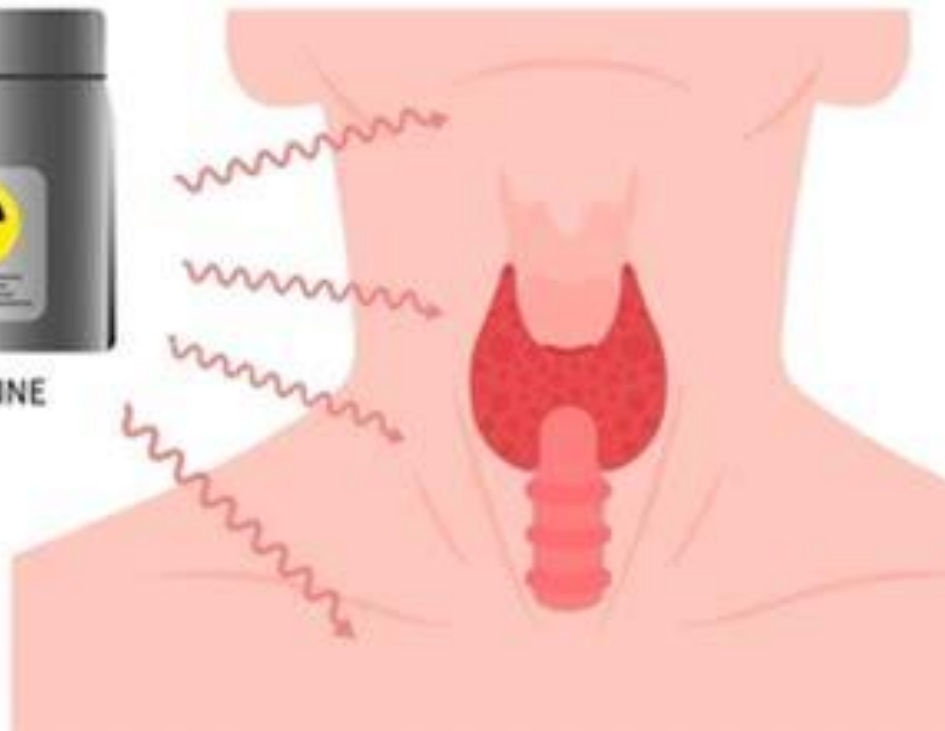
*How imaging and targeted radiopharmaceutical therapy are changing cancer care*

# The Beginning 1931



# Saul Hertz

## The First Biologic Targeting



# The First Patient

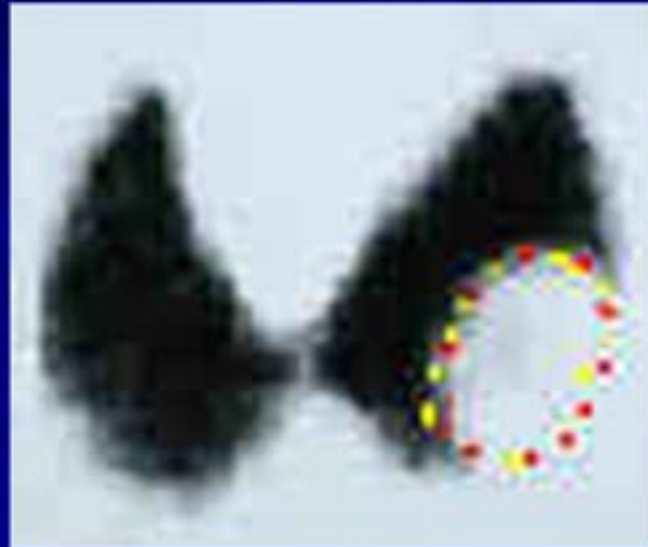


Courtesy of the Dr. Saul Hertz Archives

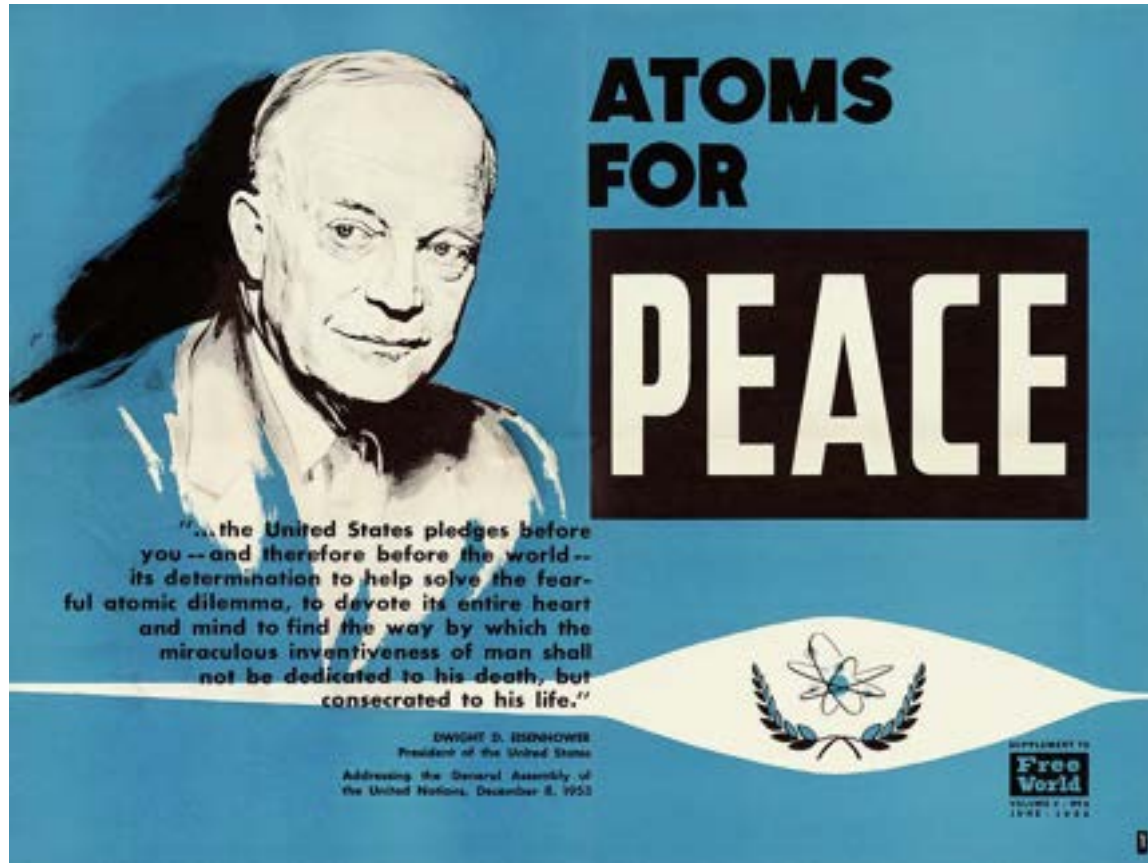


# Iodine Imaging

## THYROID CANCER



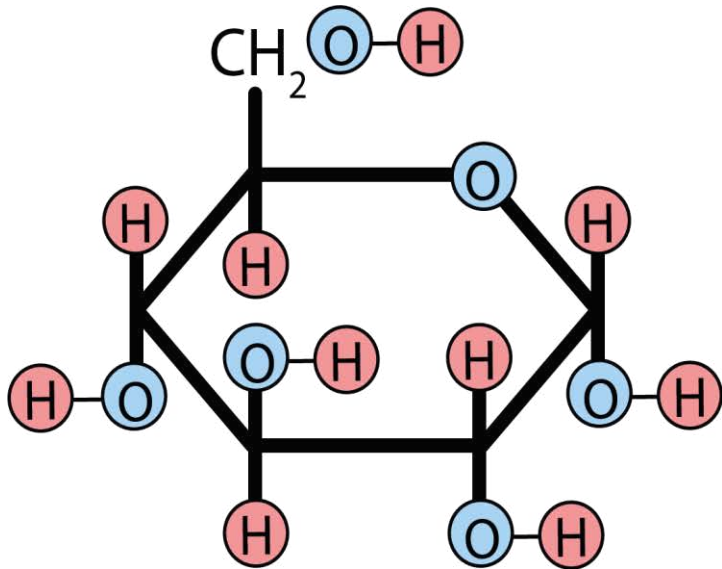
# Post World War II Turning Point



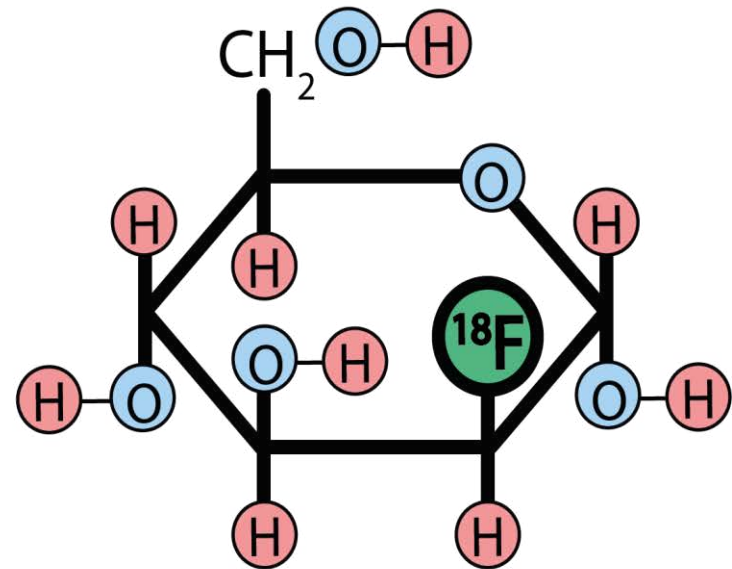
# Positron Emission Tomography PET



# FDG PET



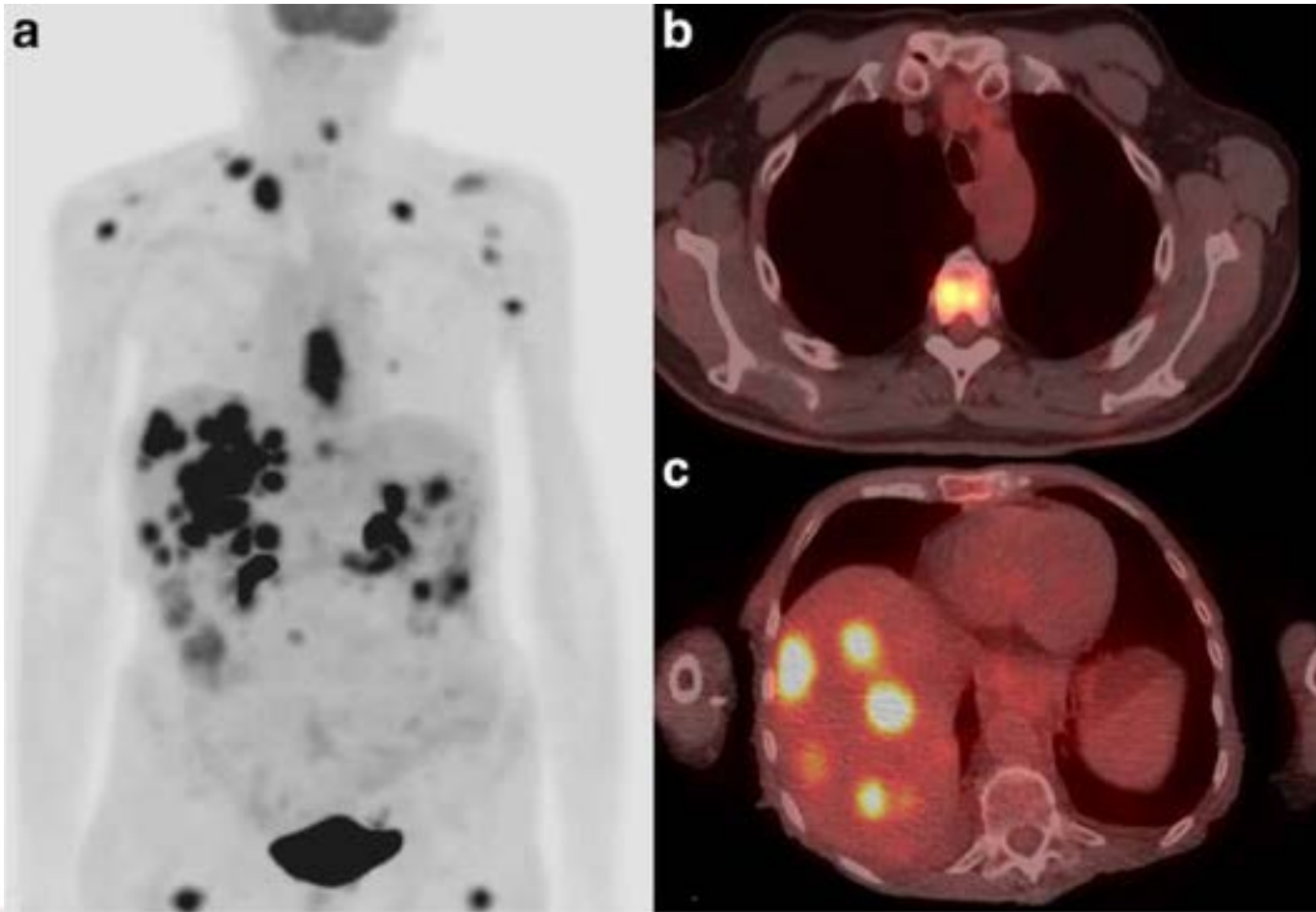
Glucose



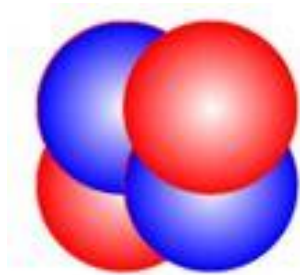
<sup>18</sup>F - Glucose



# Detecting Cancer: FDG PET



# Radioactive Particles Administered Systemically Can Treat Cancers



● 2 protons  
● 2 neutrons

**Alpha particle**  
( $\alpha$ ,  $\alpha^{2+}$ ,  $\text{He}^{2+}$ )

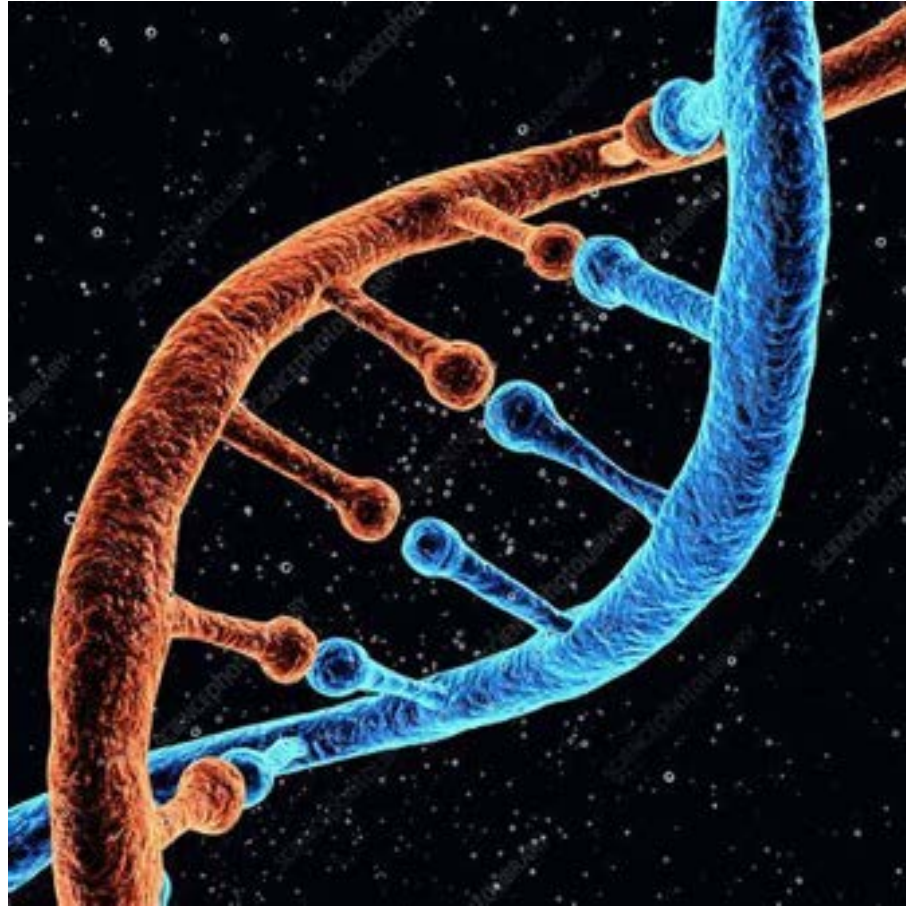
● high speed  
electron or  
positron

**Beta particle**  
( $\beta$ )

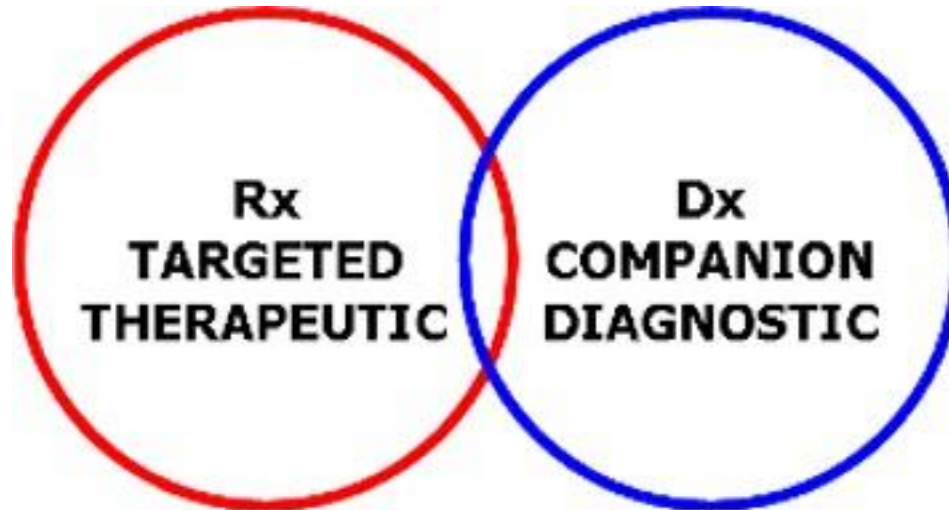
©2019 Let's Talk Science



# Direct Attack: DNA



# Theranostics

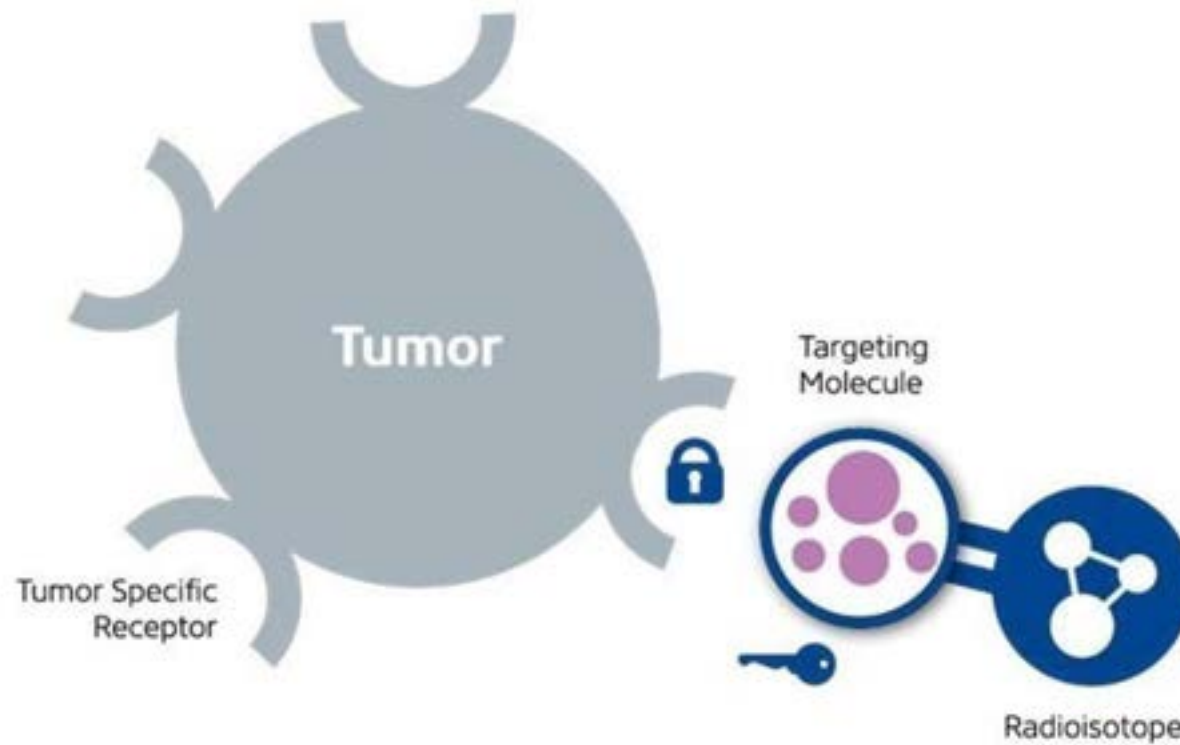


## **THERANOSTICS**

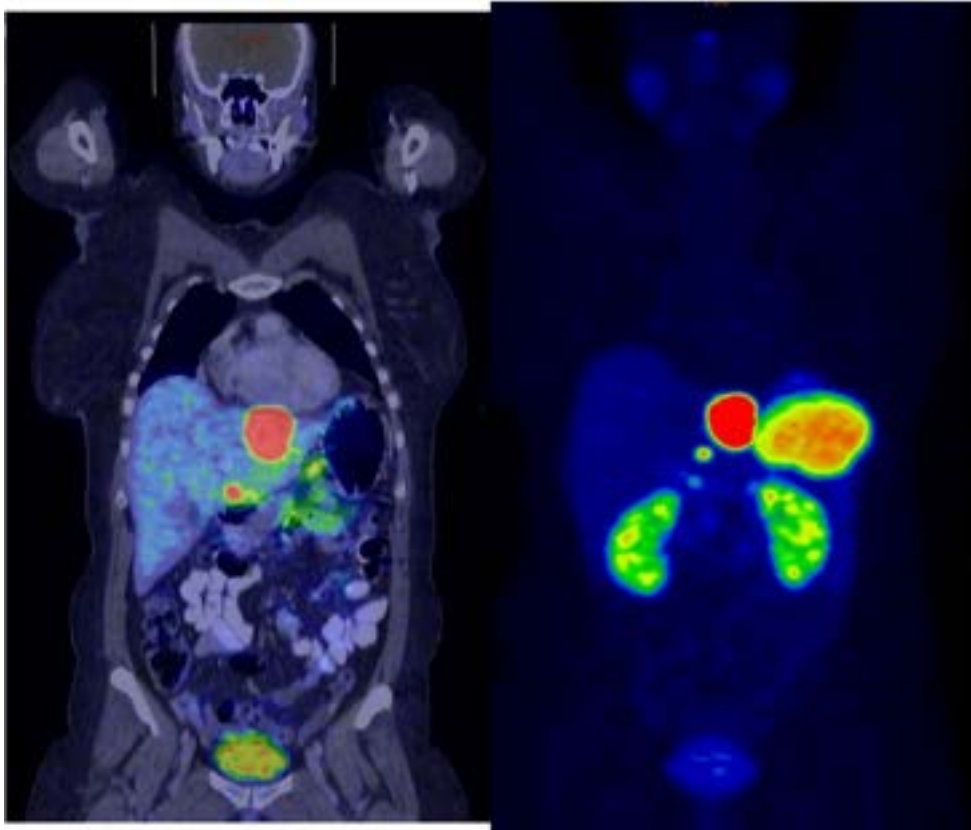
The merging of drug therapy and diagnostics to advance personalised medicine



# Theranostics: Mechanism



# Theranostics Pair



# Lutathera – FDA Approved

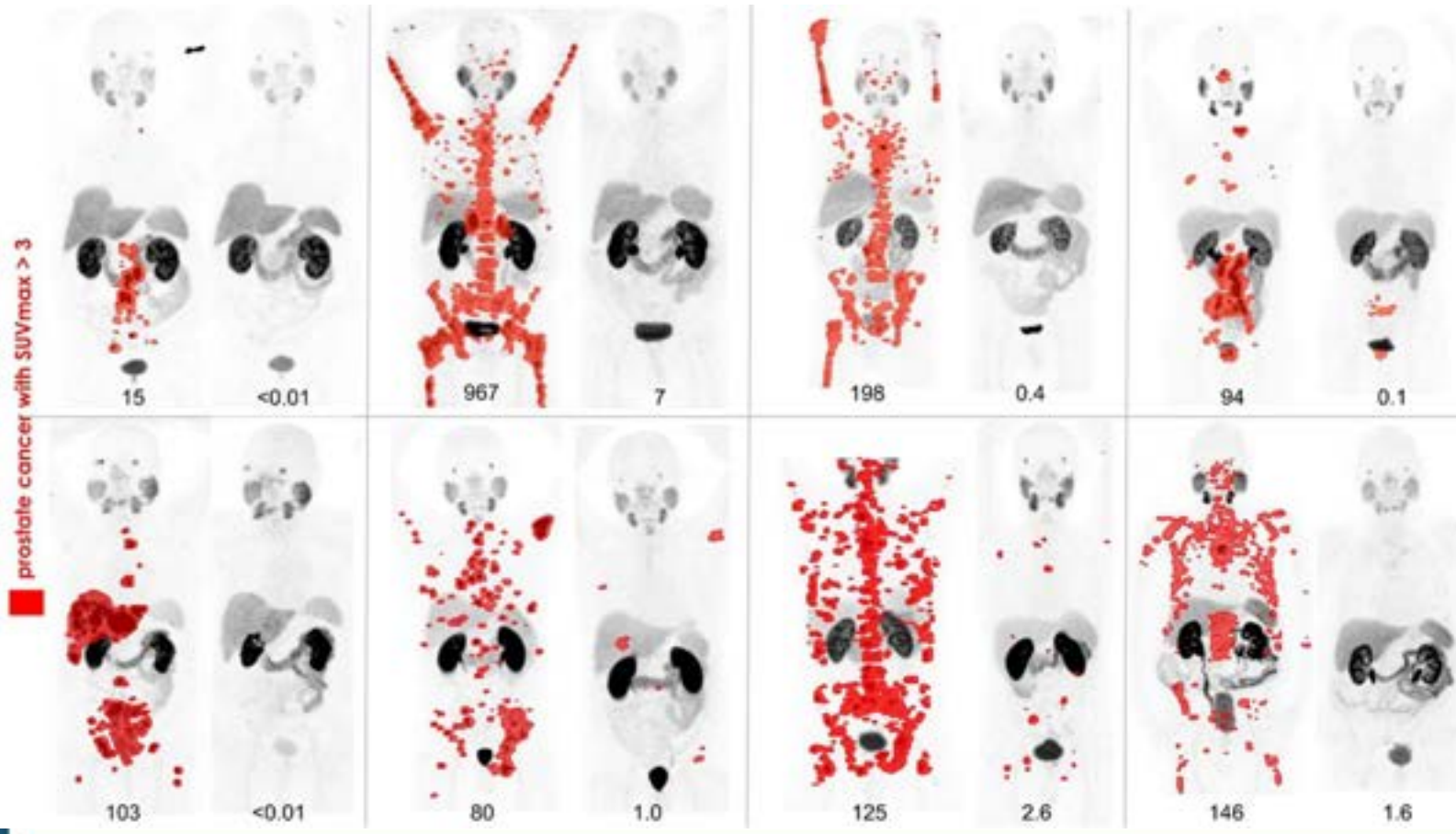
**LUTATHERA<sup>®</sup>**  
(lutetium Lu 177 dotatate)  
injection, for intravenous use



# Pluvicto – FDA Approved



# Response to Treatment



# Nebraska Cancer Specialists Theranostics Clinical Trials

- Prostate Cancer
- Breast Cancer
- Gastric Cancer
- Kidney Cancer
- Melanoma
- Colorectal Cancer
- Ovarian Cancer
- Pancreatic Cancer
- Lung Cancer NSC
- Lung Cancer SC
- Neuroendocrine (agnostic)
- Head and Neck
- Multiple Myeloma
- Glioma (in process)
- Sarcoma (in process)



Questions or Comments?

