

# Molecular targeting techniques using a bio-medicene enabling the theranostics

Theranosticsを可能にするバイオ医薬品を用いた分子標的技術

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**OMIC** Okayama Medical Innovation Center

Molecular Imaging Provides Innovation in Future Life Science and Drug Discovery



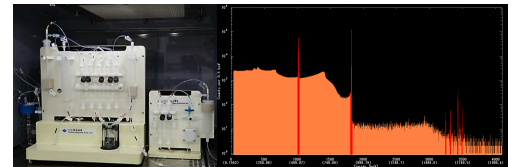
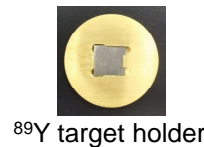
**Theranostics (Therapeutics + Diagnosis) accelerates drug discovery and enables personalized cancer therapy.**

## PET imaging of macromolecules

- Macromolecules have a long biological half-life.
- PET probes are required for their suitable (occasionally longer) half-life.



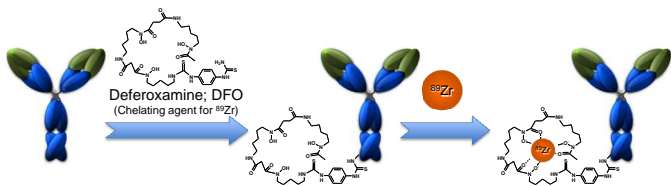
We developed production and purification system for  $^{89}\text{Zr}$  ( $T_{1/2} = 78.4$  hours).



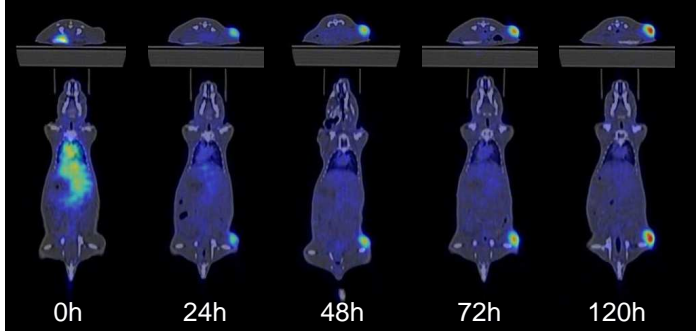
## Immuno-PET

- Use a therapeutic antibody for companion PET diagnosis.
- Non-invasively visualize bio-distribution of antibody.
- Predict therapeutic effect without in vitro diagnosis.

### $^{89}\text{Zr}$ -labeling with antibody



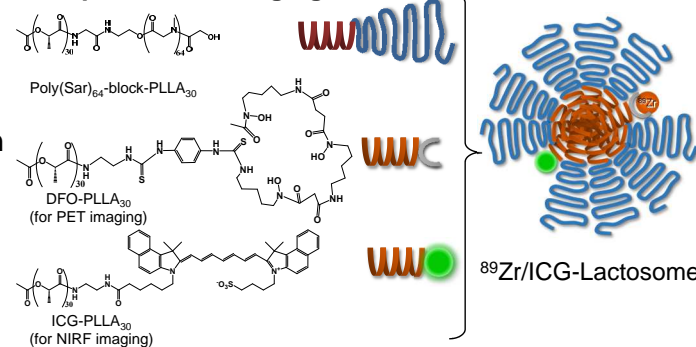
### Example of immuno-PET (anti-HER2 antibody)



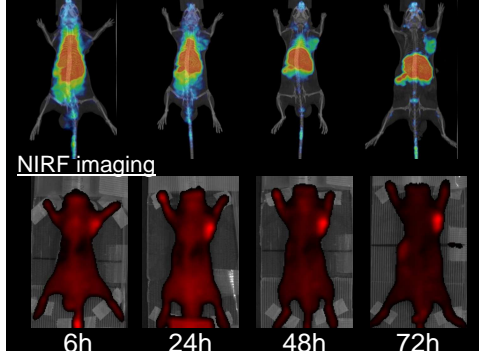
## DDS-imaging

- Use therapeutic nanoparticles for molecular targeting.
- Visualize biodistribution by PET, before or simultaneously with treatment.
- Predict and monitor therapeutic effect.

### Example of DDS-imaging



### PET imaging



## Molecular Imaging Facilities



Cyclotron HM-12S (Sumitomo Heavy Industries, Ltd.)



Clairvivo PET (Shimadzu Corp.)



Eminence STARGATE (Shimadzu Corp.)



Small Animal SPECT/CT (Gamma Medica-Ideas, Inc.)



Imaging Mass Spectrometry System (Shimadzu Corp.)



IVIS Imaging System (Xenogen Corp.)

OMIC promotes the external use of molecular imaging research facilities.