

Innovative alpha therapy targeting PSMA for refractory prostate cancer

Principal Investigator

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Project Outline

Unmet needs in prostate cancer

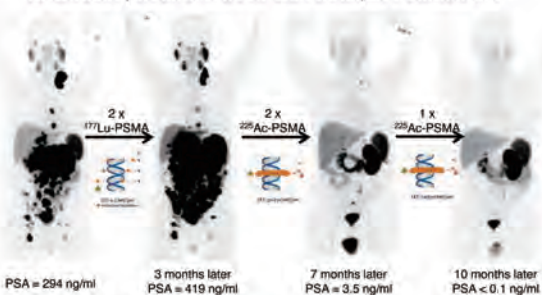
- Patient data (2018, Japan)
 - Number of new patients: 92,021/year (1st in male)
 - Number of deaths: 12,544/year
- Castration-resistant prostate cancer
 - Five-year survival rate: 42% (low risk), 24% (intermediate risk), 5% (high risk)



(National Cancer Center Cancer Information Service <https://better.bayer.jp/>, Armstrong AJ, et al. Eur Urol. 2020.)

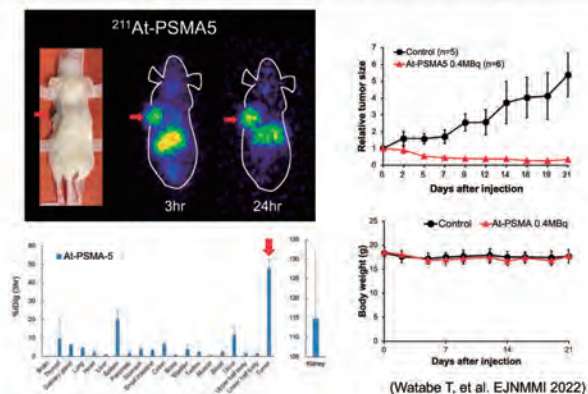
Alpha-ray therapy with actinium(²²⁵Ac)-PSMA

Advanced prostate cancer with multiple metastases



α-therapy (²²⁵Ac) is remarkably effective in refractory cases in β-therapy (¹⁷⁷Lu).
(C.Kratochwil et al. J Nucl Med. 2016)

²¹¹At-PSMA5: new alpha therapy

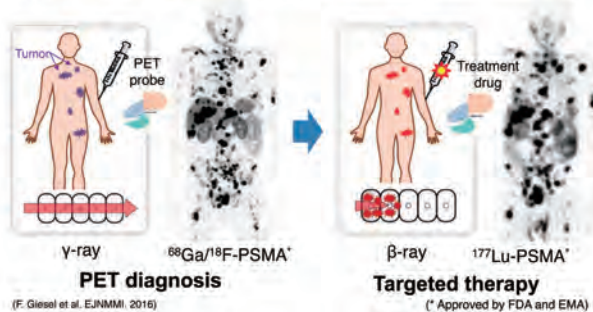


(Watabe T, et al. EJNMMI 2022)

PSMA theranostics

(Prostate specific membrane antigen)

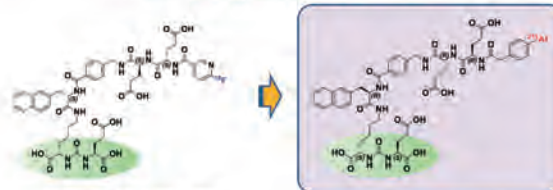
- Membrane protein highly expressed on the membrane surface of prostate cancer cells
- Expressed in most of prostate cancers, including castration-resistant prostate cancer



(F. Giesel et al. EJNMMI. 2016)

²¹¹At-PSMA5: new alpha therapy

Green area: Specific binding site to PSMA (Urethra structure)



[¹⁸F]PSMA-1007 PET

(Clinical research in Osaka University)

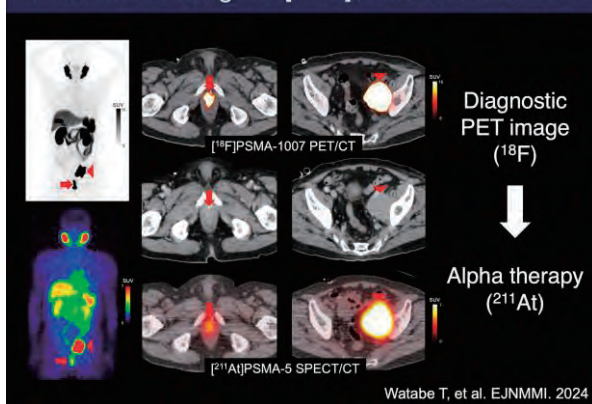
²¹¹At-PSMA5 therapy

(Patent filed)

In Osaka University, we developed a new drug ²¹¹At-PSMA5 by replacing the radionuclide with ²¹¹At. ²¹¹At is an alpha-emitting nuclide that can be produced in an accelerator, which can be used on an outpatient basis and manufactured domestically.

(Watabe T, et al. EJNMMI 2022)

1st in human Image of [²¹¹At]PSMA-5 in mCRPC



Target disease: prostate cancer

Patent information: Application number: JP 2021-125774

Technology features: An anticancer drug that emits alpha rays for advanced cancer with multiple metastases

Current status: Under AMED translational research (seeds F) in 2022-2026, and Phase I investigator-initiated clinical trial is being conducted at the University of Osaka Hospital.