

A double-labeled marker for molecular imaging (P-1124)

Facts

- Compound binding specifically to PSMA-expressing prostate cancer cells and combining a PET chelator domain and a fluorescent dye domain for intraoperative detection of neoplastic tissue

Abstract

In recent years, molecular imaging has become increasingly important in the diagnosis of cancer. When using positron emission tomography/computed tomography (PET/CT) as a molecular imaging entity, the surgeon has to assess the size, localization and shape of the tumor obtained by PET/CT by mentally projecting the PET/CT image onto the patient's body. This procedure has the major drawback that the surgeon can never be entirely sure to have removed the entire neoplastic tissue or the correct malignant lymph node. Therefore, fairly substantial parts of the tissue are often removed, including large amounts of healthy tissue, since remnants of neoplastic tissue might otherwise still remain in the patient.

The Technology

The presented technology provides a pharmaceutical compound consisting of three subdomains (A)-(B)-(C): (A) for specific cell surface binding to neoplastic cells, (B) for binding radiometals via a chelator domain for e.g. PET, and (C) harboring a fluorescent dye moiety for optical detection (Figure 1).

The combination of PET tracer and optical moiety enables the surgeon to localize the tumor preoperatively (via PET/CT) and intraoperatively (through optical detection), thus ensuring complete, but sparing, removal of the neoplastic tissue.

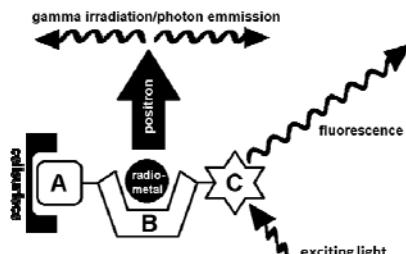


Figure 1 depicts the basic principle of the compound: (A) binding motive, (B) chelator domain, (C) dye moiety

Development Stage

The inventors were able to synthesize an optical dye conjugate of the highly acknowledged PET tracer ^{68}Ga -Glu-urea-Lys-HBED-CC^[1]. The resulting ^{68}Ga -Glu-urea-Lys-HBED-CC-FITC was tested successfully in mice (Figure 2).

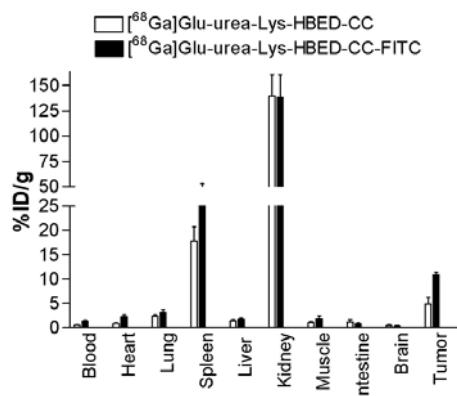


Figure 2 depicts the organ distribution at one hour post injection of 0.06 nmol of either ^{68}Ga -Glu-urea-Lys-HBED-CC or ^{68}Ga -Glu-urea-Lys-HBED-CC-FITC.

Data are expressed as mean % ID/g tissue \pm SD (n=3).

Applications and Commercial Opportunity

The current technology can be used for pre- and intraoperative detection of prostate cancer.

Inventors

The inventors are: Dr. Matthias Eder, Prof. Klaus Kopka, Martin Schäfer, Ulrike Bauder-Wuest, and Prof. Uwe Haberkorn.

Intellectual Property

The US provisional application "A double-labeled probe for molecular imaging and use thereof" was filed October 18, 2013 at the USPTO.

DKFZ Contact:

For further information, please contact:

Dr. Frieder Kern

Deutsches Krebsforschungszentrum

Office of Technology Transfer T010

Email: f.kern@dkfz.de

Tel.: +49-(0)6221-42-2952

Fax: +49-(0)6221-42-2956

[1] Afshar-Oromieh A, Malcher A, Eder M, Eisenhut M,

Linhart HG, Hadaschik BA, Holland-Letz T, Giesel FL,

Kratochwil C, Haufe S, Haberkorn U, and Zechmann CM

[2013] *Eur J Nucl Med Mol Imaging*; **40**: 486-95