Development and Applications of Multi-modality Engineered Antibody Fragments as New

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Technology description

INTRO SENTENCE:
UCLA researchers in the Department of Molecular and Medical Pharmacology have developed a method that allows the dual labeling of antibodies with an optical dye and an 18F radionuclide for multi-modality imaging.
BACKGROUND:
Multi-modality antibody-based imaging represents an important advance in the medical field, since it can combine the advantages of positron emission tomography (PET) and optical imaging. This powerful tool provides physicians with not only whole-body and local-tissue information, but also valuable intraoperative data. However, most current dual labeling methods involve attaching the dye and radionuclide directly and non-site-specifically to the antibody, which can affect the antibody's biodistribution and/or clearance properties.
INNOVATION:
UCLA researchers have developed a strategy to site-specifically install multiple diagnostic/therapeutic probes on antibodies via a multi-functional chemical linker. In particular, this tetra-functionalized linker is first conjugated to the C-terminal thiol on cys-diabodies (cDb), and provides orthogonal reactive groups that allow the further functionalization by a fluorophore, radionuclide, and/or therapeutic or diagnostic metal. An example of dual imaging (PET and optical imaging modes) with an anti-prostate stem cell antigen cys-diabody (A2cDb) labeled using this method is demonstrated in mice.

Application area

• Multi-modality imaging

• Intraoperative staging

• Theranostics for cancer

Advantages

• Site-specific labeling of antibody

• Controlled ratio of labels to antibody

• Small effect on antibody’ s properties

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