Diagnostic, Potentially Curative Targeted Radio-Immunotherapy for Human Solid Tumors

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Technology description

Summary of Invention

Separating the components of radio-immunotherapy (RIT)—the immune-targeting localization phase and radioactivity delivery phase (pre-targeted RIT, or PRIT)—shows promise, but tumor selectivity of established methods has presented problems.
MSK investigators have taken HuA33, a humanized antibody specific for the colon cancer antigen GPA33, and turned it into a bispecific antibody that can also bind radioactively labeled metal complexes like Bn-DOTA (huGPA33-C825). This allows them to first saturate the tumors with non-radioactive, tumor-specific antibody, then clear unbound antibody from the patient’s system, and follow with a radioactively labeled compound that will specifically bind to the other ‘arm’ of the antibody.
This new technology overcomes previous limitations of radiation therapy relating to kidney radiation damage, and bone marrow suppression. Studies in mouse xenograft models with HuA33 have shown that this multi-step therapeutic system can deliver curative radiation without toxicities.
When tagged with Bn-DOTA, the delivery of any payload becomes possible, including alpha-emitting radioisotopes, nanoparticles, drugs, and toxins. Quantitative imaging of the therapeutic drug using positron emission tomography (PET) will effectively guide treatment planning.
MSK investigators are developing theranostics, agents with a dual role in diagnostic imagine/dosimetry and therapeutic applications.

Market Need

Large potential market: over 100,000 patients die annually in the U.S. alone from GPA33(+) tumors, including colon, pancreas, and gastric

Advantages

Platform technology targets an antigen that is abundantly expressed and well understood
High therapeutic index
Initial research indicates that curative radiation can be delivered without toxicities in xenograft models

Institution

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