



RADIOIMMUNOTHERAPY

Pretargeted Radioimmunotherapy for the Treatment of Acute Myeloid Leukemia

Brief Description of Technology

An anti-CD45 bispecific antibody delivering targeted radioimmunotherapy to treat acute myeloid leukemia [AML], while avoiding systemic toxicity.

BUSINESS OPPORTUNITY

Exclusive license
Sponsored research

TECHNOLOGY TYPE

Therapeutic
Hybridoma/Antibody
Protein/Peptide
Immuno-oncology

STAGE OF DEVELOPMENT

Preclinical *in vivo*

PATENT INFORMATION

Patent pending

INVESTIGATOR

Johnnie Orozco, MD, PhD
Clinical Research Division

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Tech ID: 18-097
partnering@fredhutch.org
206-667-4304

Technology Overview

Pretargeted radioimmunotherapy [PRIT] is a two-step approach that delivers radioactivity separate from the initial targeting step. CD45 is a great target for PRIT as it is expressed on nearly all hematopoietic cells and negligibly expressed on non-hematopoietic tissues. Therapeutic efficacy was shown in AML previously when targeting CD45 using a streptavidin-biotin PRIT system, however, some expressed concerns, like endogenous biotin. Therefore, Dr. Orozco and colleagues developed a bispecific antibody targeting CD45 and ⁹⁰Y-DOTA-biotin that showed survival benefits in two leukemia models. Initial proof-of-concept studies in the syngeneic murine leukemia model showed that mice treated with the murine ⁹⁰Y-DOTA-biotin construct had a median survival of 43 days compared to 30 days for the control mice. Then in mice bearing human AML cells (HEL), 60% of the mice treated with the human CD45-⁹⁰Y-DOTA-biotin construct survived 170 days post injection. Untreated controls and non-targeted negative control HEL-bearing mice required euthanasia due to tumor size at day 26 and 32, respectively.

Applications

- Therapy for AML and other leukemias, myeloma, lymphoma, and other cancers expressing CD45

Advantages

- Targeted delivery of radiation to tumor minimizing off-target toxicity
- Addresses concerns of immunogenicity and endogenous biotin

Market Overview

In the US, there will be over 19,500 estimated new cases of AML in 2018 and that number is expected to grow by 2.8% annually over the next decade. The standard of care for AML has been consistent for decades and continues to produce poor outcomes. AML has a five year survival rate of 27%, which decreases with age. Thus, there is a high unmet need for therapies that prolong overall survival for elderly and relapsed/refractory patients.