

CANCER THERAPEUTICS WITH ENGINEERED ANTIBODY DOMAINS GIVE INCREASED HALF-LIFE

SUMMARY

The National Cancer Institute seeks partners to co-develop or license cancer therapeutics based on engineered human antibodies with increased FcRn Binding and *in vivo* half-life.

REFERENCE NUMBER

E-136-2014

PRODUCT TYPE

- Diagnostics
- Therapeutics

KEYWORDS

- biologic
- antibody

COLLABORATION OPPORTUNITY

This invention is available for licensing.

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DESCRIPTION OF TECHNOLOGY

Monoclonal antibodies (mAbs) are a fast growing class of new therapeutic molecules. However, their large size remains a significant challenge, that prevents them from targeting sterically restricted epitopes and efficiently penetrating into tissues. Smaller antibody fragments and engineered variants are under development to address this challenge, but to date their therapeutic applications have been limited due to rapid clearance and short half-life that greatly decrease their efficacy *in vivo*.

Researchers at the National Cancer Institute's [Laboratory of Experimental Immunology](#) have developed two antibody constant domains or binders with increased FcRn binding and *in vivo* half-life. In addition, these binders are small in size (16kDa), very stable, and can be efficiently expressed in *E. coli*. As a result, the binders are particularly well suited as scaffolds for the generation of antibody libraries, from which a desired antigen binder could be developed into therapeutic products with much greater potency

compared to existing mAbs. They could also be used as fusion partners to extend the half-life of candidate protein therapeutics.

POTENTIAL COMMERCIAL APPLICATIONS

- Antibody scaffolds for library construction, and the generation of therapeutics against various diseases;
- Fusion partners to extend the half-life of candidate protein therapeutics.

COMPETITIVE ADVANTAGES

- Small (16kD) size for better tissue penetration, and in the case of fusion proteins, reduced steric hindrance for therapeutic activity;
- Superior stability compared to isolated CH2 domains and stability comparable to or higher than that of an isolated Fc fragment;
- Exhibit greatly enhanced FcRn binding abilities, including more potent transcytosis and longer in vivo half-life;
- Can be efficiently expressed in *E. coli*.

INVENTOR(S)

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DEVELOPMENT STAGE

- Pre-clinical (in vivo)

PUBLICATIONS

Ying T, et al. [PMID: 24792384](#).

PATENT STATUS

- **U.S. Filed:** US Provisional Application No. 62/022,810 filed July 10, 2014

THERAPEUTIC AREA

- Cancer/Neoplasm
- Infectious Diseases