Cancer Therapies Using Engineered Monomeric Fc Molecules

Summary (1024-character limit)
The National Cancer Institute, Nanobiology Program seeks parties to co-develop cancer therapeutics base on antibody fragments.

NIH Reference Number
E-019-2012

Product Type
- Therapeutics

Keywords
- neonatal Fc receptor
- FcRn
- mFc
- IgG1
- mAbs

Collaboration Opportunity
This invention is available for licensing.

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Description of Technology

The National Cancer Institute, Nanobiology Program seeks parties interested in collaborative research to co-develop engineered molecules therapies.

Efforts to engineer antibody-based therapeutics, to date, have encountered technical limitations due to the relatively large fragment size and short fragment half-life. Antibody fragments are emerging as promising biopharmaceuticals because of their relatively small size and other unique properties. However, compared with full-size antibodies, these antibody fragments lack the ability to bind to some Fc receptor and have reduced half-lives.

NCI scientists have developed small (□27 kDa) antibody fragments that are potentially useful for

therapeutic development. These are monomeric IgG fragment (mFc) compositions; they have long half-lives, are functional (pH dependent binders of neonatal Fc receptor - FcRn); soluble, and they express in *E. coli* efficiently. The molecules may serve as a platform for development of engineered mFc-based antibodies and fusion proteins with therapeutic applications: the smaller size may allow for superior access to targets and tissues compared to full sized mAbs and larger fragment-based therapeutics, while also retaining important functional characteristics. The IgG Fc is a dimer of two constant domains (CH2-CH3 chains). The Fc has a long half-life, which makes it promising as a candidate for engineering antibody therapeutics.

Potential Commercial Applications

Therapeutics - human and veterinary, engineered antibody and fusion proteins.

Competitive Advantages

- Smaller size results in reduced steric hindrance
- Increased therapeutic efficiency

Inventor(s)

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Development Stage

- Discovery (Lead Identification)

Publications

Ying T, et al. Soluble monomeric IgG1 Fc. [PMID 22518843]

Patent Status

- **U.S. Patent Filed:** U.S. Patent Application Number 61/063,245, Filed 31 Jan 2008
- **U.S. Provisional:** U.S. Provisional Patent Application Number 12/864,758, Filed 07 Jan 2010

Therapeutic Area

- Cancer/Neoplasm