

HUMAN SINGLE-DOMAIN ANTIBODIES FOR CANCER THERAPY

SUMMARY

The National Cancer Institute's Center for Cancer Research Nanobiology Program (CCRNP) is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize the dAbs that exhibit potent inhibitory activities against the human IGF signaling pathway.

REFERENCE NUMBER

E-232-2009

PRODUCT TYPE

- Therapeutics

KEYWORDS

- cancer
- therapeutic
- single domain antibody
- Insulin-like growth factor
- IGF

COLLABORATION OPPORTUNITY

This invention is available for licensing and co-development.

CONTACT

John D. Hewes
NCI - National Cancer Institute
240-276-5515

John.Hewes@nih.gov

DESCRIPTION OF TECHNOLOGY

The National Cancer Institute's Center for [Cancer Research Nanobiology Program](#) (CCRNP) is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate, or commercialize the dAbs that exhibit potent inhibitory activities against the human IGF signaling pathway.

Insulin-like growth factor (IGF) mediated signaling has been implicated in the development of several epithelial cancers, such as prostate, breast, and colorectal cancers. This technology consists of human

single domain antibodies (dAbs) that bind to human insulin-like growth factor 1 receptor (IGF-1R) or its ligands, IGF-1 and IGF-2. These dAbs are comprised of only a single variable domain of an antibody with a human framework and three complementarity-determining regions (CDRs). Several of these antibodies inhibit the IGF signaling pathway so they may be therapeutic candidates for the treatment of IGF-related cancers.

POTENTIAL COMMERCIAL APPLICATIONS

- A cancer therapeutic agent that inhibits the IGF-mediated signaling pathway
- A diagnostic employing the detection of insulin-like growth factor 1 receptor (IGF-1R) or its ligands, IGF-1 and IGF-2, in a sample

COMPETITIVE ADVANTAGES

- dAbs are about 10-fold smaller than IgG antibodies and exhibit dramatically increased penetration into solid tumors.
- dAbs can be produced in high yields at low cost, have favorable biophysical properties, and are well suited to engineering.
- dAbs are bioactive as monomers or can be linked into larger molecules to create drugs with prolonged serum half-lives or other pharmacological activities.
- dAbs can be fused to other polypeptides or other drugs to provide fusion proteins or conjugates.
- Human framework reduces potential for host immune reactions.

INVENTOR(S)

[Dimeter Dimitrov \(NCI\)](#) and [Weizao Chen \(NCI\)](#)

DEVELOPMENT STAGE

- Discovery (Lead Identification)

PUBLICATIONS

Chen W, Zhu Z, Feng Y, Dimitrov DS. Mol Immunol. 2010 Jan;47(4):912-921. [[PubMed: 19883941](#)]

PATENT STATUS

- **U.S. Filed:** U.S. Patent 9,056,907 (16 June 2015)
- **Foreign Filed:** Patents Pending in Australia, Canada, and Europe

THERAPEUTIC AREA

- Cancer/Neoplasm