

Fully Human Antibodies and Antibody Drug Conjugates Targeting CD276 (B7-H3) for the Treatment of Cancer

Summary

Researchers at the National Cancer Institute (NCI) seek research collaborations or licensees for a monoclonal antibody targeting CD276, also known as B7-H3, and related conjugates. The antibody and antibody drug conjugates (ADC) containing the antibody of the current invention were tested in vivo and have potential for use in cancer immunotherapy.

NIH Reference Number

E-250-2014

Product Type

- Therapeutics

Keywords

- CD276, Antibody Drug Conjugate (ADC), B7-H3, Cancer, Monoclonal Antibody, Immunotherapy, Immuno-oncology, Dimitrov

Collaboration Opportunity

This invention is available for licensing and co-development.

Contact

- Rose Freel
NCI TTC

rose.freel@nih.gov (link sends e-mail)

Description of Technology

Angiogenesis is the formation of new blood vessels from pre-existing blood vessels. Angiogenesis occurs during normal growth and development, where it is known as physiological angiogenesis, and during the growth of solid tumors, where it is known as pathological angiogenesis. CD276, also known as B7-H3, is a cell surface tumor endothelial marker that is highly expressed in the tumor vessels of human lung, breast, colon, endometrial, renal, and ovarian cancer, but not in the angiogenic vessels of healthy tissue. This differential expression makes CD276 an attractive target for cancer treatment due to the ability to selectively target pathological angiogenesis without impacting physiological angiogenesis. In fact, CD276-directed therapeutic antibodies may have a

higher degree of specificity for tumor vessels than current antiangiogenic agents that cannot distinguish physiological and pathological angiogenesis. Moreover, CD276 protein is also frequently overexpressed on tumor cells. The ability to target the vasculature as well as tumor cells directly makes CD276 a potentially ideal dual-compartment therapeutic target.

Researchers at the National Cancer Institute (NCI) have developed fully human monoclonal antibodies and antibody-drug conjugates (ADCs) that target CD276. The antibodies and ADCs have been tested both in vitro and in vivo and have shown promising data. Pyrrolobenzodiazepine (PBD)-conjugated CD276 ADCs killed both cancer cells and tumor vasculature, eradicating large established tumors and metastases, and improving long-term overall survival in mouse models. In addition, the ADCs have been evaluated in preliminary toxicology studies where they showed limited, if any, off-target toxicity.

Potential Commercial Applications

- Antibody-drug conjugates (ADCs) for the treatment of cancer
- CAR-T cell therapy
- Diagnostic agent for detecting and monitoring CD276-expressing malignancies

Competitive Advantages

- Simultaneously targets both tumor cells and tumor vasculature
- Potentially superior adverse events profile than existing anti-angiogenic agents due to the differential expression of CD276 on tumor and normal vasculature
- Fully human antibodies are less likely to be recognized and cleared by the immune system upon repeated administration.
- Relevance to a wide range of cancers – representing several major market opportunities.
- High cellular internalization.
- Cross-reactive with mouse, rat, and monkey CD276 making preclinical studies easier and more informative.

Inventor(s)

Dimitar Dimitrov, [Brad St. Croix \(NCI\)](#), Zhohgyu Zhu (NCI), Steven Seaman (NCI), Michelle Zhang, Saurabh Saha, Gary Decrescenzo, Dean Welsch

Development Stage

- Pre-clinical (in vivo)

Publications

Seaman S, et al. Eradication of Tumors through Simultaneous Ablation of CD276/B7-H3-Positive Tumor Cells and Tumor Vasculature. [[PMID: 28399408](#)]

Patent Status

- **U.S. Patent Filed:** U.S. Patent Application Number 15/512,000, Filed 16 Mar 2017

- **Foreign Filed:** EP - Patent Application 15772128.300000001, Filed 18 Apr 2017
- **Foreign Filed:** CA - Patent Application 2961609, Filed 16 Sep 2015
- **Foreign Filed:** JP - Patent Application 2017-514697, Filed 15 Mar 2017
- **Foreign Filed:** JP - Patent Application 2017-103551, Filed 25 May 2017
- **U.S. Patent Issued:** U.S. Patent Number 10,604,582 , Issued 03 Mar 2020
- **Foreign Issued:** - Patent Number 6613304, Issued 08 Nov 2019
- **Foreign Issued:** - Patent Number 3193933, Issued 28 Apr 2021
- **Foreign Issued:** - Patent Number 6734227, Issued 13 Jul 2020

Therapeutic Area

- Cancer/Neoplasm

Updated

Tuesday, September 13, 2022

Source URL:<https://techtransfer.cancer.gov/availabletechnologies/e-250-2014>