

High Affinity Nanobodies Targeting B7-H3 (CD276) for Treating Solid Tumors

Summary

Researchers at the National Cancer Institute (NCI) have isolated a panel of anti-CD276 (also called B7-H3) single domain antibodies (also known as nanobodies). These antibodies have a high affinity for CD276-positive tumor cells and have great potential for diagnostic and therapeutic technologies against solid tumors. The NCI seeks licensing and/or co-development research collaborations for CD276-targeting camel nanobodies.

NIH Reference Number

E-185-2019

Product Type

- Therapeutics

Keywords

- Nanobodies, CD276, B7-H3, Solid Tumors, Glioma, Neuroblastoma, Pancreatic Cancer, Breast Cancer, Colon Cancer, Lung Cancer, Ovarian Cancer, Chimeric Antigen Receptor, CAR, Antibody-Drug Conjugate, ADC, Ho

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

CD276 (also called B7-H3) is a pan-cancer antigen expressed in multiple solid tumors and an emerging cancer target. CD276 protein is overexpressed in pancreatic cancer, prostate cancer, breast cancer, colon cancer, lung cancer, and brain tumors (such as neuroblastoma) – making it an ideal target for cancer therapy.

Investigators at the National Cancer Institute (NCI) have isolated a panel of anti-CD276 single domain antibodies (also known as nanobodies) from novel camel and rabbit single domain (VHH) libraries by phage display.

Nanobodies are the smallest known antigen-binding fragments of antibodies. Due to their

small size, high solubility, thermal stability, refolding capacity, and relatively easy tissue penetration, they have great potential as medical applications and research tools. These antibodies can be used as either independent agents or targeting domains in recombinant immunotoxins (RITs), antibody-drug conjugates (ADCs), and chimeric antigen receptors (CARs). The CARs using the RWB12, RWC4 and RWG8 antibodies have shown potent killing in various CD276-expressing tumor cell models, strongly supporting that these candidates may be further developed as therapeutics.

The NCI seeks licensing and/or co-development research collaborations for CD276-targeting camel nanobodies.

Potential Commercial Applications

- Numerous solid tumors – including, but not limited to: pancreatic cancer, prostate cancer, breast cancer, colon cancer, lung cancer, and brain tumors (such as neuroblastoma)
- Therapeutic applications include the unconjugated antibodies and their use as a targeting moiety for CARs, RITs, ADCs, and bispecific antibodies
- Diagnostic agent for detection and monitoring levels of mesothelin expressing cancers

Competitive Advantages

- Antibodies with high CD276 binding specificity should result in less non-specific cell killing (off-target toxicity) and lower potential side-effects
- Similarity of camel and human VH sequences suggests humanization of these antibodies is not necessary, and that the product is ready for immediate clinical testing
- Relative ease of Tissue Penetration for targeting Solid Tumors
- CARs using the A101 and G8 antibodies available for immediate testing
- B7-H3 antagonist

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/924,498 , Filed 22 Oct 2019

Therapeutic Area

- Cancer/Neoplasm

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