

## High Affinity Cross Species Single Domain Antibodies Targeting Mesothelin

### Summary

Researchers at the National Cancer Institute (NCI) have isolated two high affinity anti-mesothelin single domain antibodies (also known as nanobodies), A101 and G8. These antibodies have been isolated from NCI's newly developed camel single domain (VHH) libraries by phage display. The antibodies have a high affinity for mesothelin-positive tumor cells from both human and mouse origins. The NCI seeks licensing and/or co-development research collaborations to advance the development and commercialization of these antibodies.

### NIH Reference Number

E-040-2019

### Product Type

- Therapeutics

### Keywords

- Mesothelioma, Mesothelin, Chimeric Antigen Receptor, CAR, Antibody-drug Conjugate, Bispecific Antibody, ADC, Recombinant Immunotoxins, RITs, Ho

### Collaboration Opportunity

This invention is available for licensing and co-development.

### Contact

- Abritee Dhal  
NCI TTC

[abritee.dhal@nih.gov](mailto:abritee.dhal@nih.gov) (link sends e-mail)

### Description of Technology

Mesothelin is a cell surface protein that is an excellent target for immunotherapy because of its limited expression on normal tissues and its high expression on many cancers, including mesothelioma, cholangiocarcinoma, pancreatic, ovarian, lung, stomach, bile duct, and triple-negative breast cancer.

Researchers at the National Cancer Institute's (NCI) [Laboratory of Molecular Biology](#) have isolated two anti-mesothelin single domain antibodies (also known as nanobodies), A101 and G8. These antibodies have been isolated from newly developed camel single domain (VHH) libraries by phage display and have been used to shown to specifically target

mesothelin-expressing cell lines with high affinity. Additionally, these mesothelin antibodies can be used as either independent agents or targeting domains in recombinant immunotoxins (RITs), antibody-drug conjugates (ADCs), bispecific antibodies, and chimeric antigen receptors (CARs). Significantly, CARs using these antibodies have shown specific killing activity against mesothelin positive tumors including mesothelioma cell and mouse models, strongly supporting that these candidates may be further developed as therapeutics.

### **Potential Commercial Applications**

- 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**

- New A101 and G8 antibodies with high mesothelin binding specificity should result in less non-specific cell killing and lower-grade 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
- CARs using the A101 and G8 antibodies are available for immediate testing

### **Inventor(s)**

[Mitchell Ho Ph.D. \(NCI\)](#), [Ira Pastan M.D. \(NCI\)](#), [Jessica Hong B.S. \(NCI\)](#), [Nan Li Ph.D. \(NCI\)](#)

### **Development Stage**

- Pre-clinical (in vivo)

### **Patent Status**

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/789,650 , Filed 08 Jan 2019

### **Therapeutic Area**

- Cancer/Neoplasm

### **Updated**

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