Antibodies for Pseudomonas (P.) aeruginosa

Tech ID: 27615 / UC Case 2017-557-0

ABSTRACT

Researchers at the University of California, Davis have developed recombinant antibodies (VHH or nanobodies) to diagnose and treat Pseudomonas (P.) aeruginosa infection.

FULL DESCRIPTION

Pseudomonas (P.) aeruginosa is a leading cause of death in patients with pulmonary disease, pneumonia and cystic fibrosis. The pathogenic bacteria secretes a variety of virulence factors, altering the immune microenvironment and suppressing host immune defenses. The bacteria also forms a biofilm, making it very resistant to antibiotics. Currently, diagnosis of the infection itself requires invasive samples from painful sterile sites and treatments are limited to antibiotics. Therefore, there is a need for alternative methods to identify and treat P. aeruginosa infection.

Researchers at the University of California, Davis have developed antibodies (polyclonal and nanobodies) that enable the diagnosis and treatment of Pseudomonas (P.) aeruginosa. These antibodies are recombinant single domain antibodies (VHHs) that recognize and inactivate the cystic fibrosis transmembrane conductance regulator inhibitory factor (Cif) secreted by P. aeruginosa. These antibodies can be used as a diagnostic tool for sensitive, high throughput detection of the infection and as a selective Cif-enzyme activity inhibitor. Recombinant VHHs can also be used to perform highly sensitive screening assays for small molecule inhibitors of Cif catalytic activity.

APPLICATIONS

- High throughput detection of P. aeruginosa infection
- Selective inhibitor of Cif-enzyme activity possibly useful in treatment
- Screening assay for small molecule inhibitors of Cif catalytic activity

FEATURES/BENEFITS

- Sensitive
- Specific
- Recombinant single domain antibodies:
  - Allow unlimited supply
  - Cheap production of uniform reagent
  - Easy storage (bacterial stock vs mammalian cells or as a DNA sequence information)
  - Easy genetic manipulations
  - Low antigenicity

PATENT STATUS

Country	Type	Number	Dated	Case

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OTHER INFORMATION

KEYWORDS

Pseudomonas aeruginosa, P. aeruginosa, recombinant single domain antibodies, VHHs, cystic fibrosis transmembrane conductance regulator inhibitory factor, Cif

CATEGORIZED AS

- **Medical**
  - Diagnostics
  - New Chemical Entities, Drug Leads
  - Therapeutics
- **Research Tools**
  - Antibodies

United States Of America	Issued Patent	12,006,355	06/11/2024	2017-557	
United States Of America	Issued Patent	11,225,514	01/18/2022	2017-557	

RELATED CASES

2017-557-0

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Method of Preventing Bone Loss and Periodontal Disease
- Multi-Target Inhibitors for Pain Treatment
- Improved Dioxin Detection and Measurement
- Detection System for Small Molecules
- Small Molecule sEH Inhibitors to Treat Alpha-Synuclein Neurodegenerative Disorders
- Soluble Epoxide Hydrolase-Conditioned Stem Cells for Cardiac Cell-Based Therapy
- Beneficial Effects of Novel Inhibitors of Soluble Epoxide Hydrolase as Adjuvant Treatment for Cardiac Cell-Based Therapy
- Antibodies: Bacillus Delta Endotoxin PAbs
- Antibodies: Bromacil Herbicide PAbs
- Novel Neuropathy Treatment Using Soluble Epoxide Inhibitors
- Novel and Specific Inhibitors of p21
- Antibodies: Urea Herbicide Pabs
- Bioavailable Dual sEH/PDE4 Inhibitor for Inflammatory Pain
- Chemical Synthesis of Lipid Mediator 22-HDoHE and Structural Analogs
- Antibodies: Triazine Herbicide Pabs
- Optimized Non-Addictive Biologics Targeting Sodium Channels Involved In Pain Signaling
- Soluble Epoxide Hydrolase Inhibitors For The Treatment Of Arrhythmogenic Cardiomyopathy And Related Diseases
- A New Pharmaceutical Therapy Target for Depression and Other Central Nervous System Diseases

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