

# TUMOR SELECTIVE MACROPINOCYTOSIS-DEPENDENT RAPIDLY INTERNALIZING ANTIBODIES

Tech ID: 24992 / UC Case 2014-200-0

## INVENTION NOVELTY

This invention establishes a novel method of therapeutic delivery to target tumor cells by macropinocytosis.

## VALUE PROPOSITION

Selective and efficient delivery of therapeutic agents to tumor cells is often challenging. To improve drug efficacy, a method to deliver an effective dose of therapeutic agents to tumor cells with high specificity is needed. Tumor cells have been shown to preferentially engage a process known as macropinocytosis to internalize nutrients from the environment. Therefore, UCSF inventors sought to exploit this pathway by 1) identifying antibodies that are efficiently internalized by macropinocytosis in tumor cells, and 2) developing antibody-toxin conjugates capable of killing these tumor cells.

This novel invention provides the following advantages:

- ▶ An improved method of targeted therapy through a previously unexplored cellular pathway.
- ▶ A high-throughput method to screen for antibodies that are internalized by macropinocytosis, thereby identifying strong candidates for therapeutic development
- ▶ A method to induce uptake of therapeutics that previously had no entryway into the cell
- ▶ Novel antibody compositions that are selectively internalized into tumor cells via a macropinocytosis pathway

## TECHNOLOGY DESCRIPTION

Scientists at the University of California, San Francisco have developed a high-throughput method that leverages both phage antibody display libraries and high-content analysis (HCA) screening to identify antibodies that are rapidly and efficiently internalized by cells through the macropinocytosis pathway. These antibodies can then be conjugated to a variety of molecules including cytotoxins, nanoparticles, radionuclides, and siRNAs/miRNAs to create a novel class of potent targeted therapeutics.

## APPLICATION

### CONTACT

Sunita R. Rajdev  
[sunita.rajdev@ucsf.edu](mailto:sunita.rajdev@ucsf.edu)  
tel: [415-340-2476](tel:415-340-2476).



### OTHER INFORMATION

#### KEYWORDS

Cancer, Tumor Targeting,  
  
Macropinocytosis,  
  
Internalizing Antibody

#### CATEGORIZED AS

- ▶ **Medical**
  - ▶ Disease: Cancer
  - ▶ Research Tools
  - ▶ Therapeutics

#### RELATED CASES

2014-200-0

LOOKING FOR PARTNERS

To develop and commercialize this technology as a novel method of therapeutic delivery to target tumor cells

STAGE OF DEVELOPMENT

Preclinical

PATENT STATUS

| Country                  | Type                  | Number         | Dated      | Case     |
|--------------------------|-----------------------|----------------|------------|----------|
| United States Of America | Issued Patent         | 11,447,563     | 09/20/2022 | 2014-200 |
| Australia                | Issued Patent         | 2015287749     | 06/24/2021 | 2014-200 |
| Switzerland              | Issued Patent         | 3169707        | 12/02/2020 | 2014-200 |
| Germany                  | Issued Patent         | 602015062995.1 | 12/02/2020 | 2014-200 |
| France                   | Issued Patent         | 3169707        | 12/02/2020 | 2014-200 |
| United Kingdom           | Issued Patent         | 3169707        | 12/02/2020 | 2014-200 |
| Ireland                  | Issued Patent         | 3169707        | 12/02/2020 | 2014-200 |
| United States Of America | Issued Patent         | 10,550,195     | 02/04/2020 | 2014-200 |
| Canada                   | Published Application |                |            | 2014-200 |

Additional Patents Pending

RELATED MATERIALS

- Ha, K. D., Bidlingmaier, S. M., Zhang, Y., Su, Y., & Liu, B. (2014). High-content analysis of antibody phage-display library selection outputs identifies tumor selective macropinocytosis-dependent rapidly internalizing antibodies. Molecular & Cellular Proteomics, 13(12), 3320-3331.

ADDRESS

UCSF

Innovation Ventures

600 16th St, Genentech Hall, S-272,  
San Francisco,CA 94158

CONTACT

Tel:  
  
innovation@ucsf.edu  
  
https://innovation.ucsf.edu  
  
Fax:

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