

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
 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	12,492,490	12/09/2025	2014-200
Australia	Issued Patent	2021203755	02/20/2025	2014-200
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 Patent 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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