

Nucleic Acid Tetramers For High Efficiency Multiplexed Cell Sorting

Tech ID: 27466 / UC Case 2008-685-0

SUMMARY

UCLA researchers in the Departments of Medicine and Pharmacology have a highly specific method of sorting cells by using multiplexed tetramers with unique DNA-oligomer signatures.

BACKGROUND

The standard methods of isolating cells of interest include FACS (fluorescence-activated cell sorting) and 'panning.' Both methods use antibodies as a means of selecting for specific cell populations. A limitation of FACS is that the surface bound antibodies on the cell are often improperly oriented. This often leads to a decreased affinity and therefore decreased affinity for isolating cells. This makes FACS and panning unreliable techniques for isolating extremely rare cell populations.

INNOVATION

Researchers at UCLA have developed a highly specific method of sorting cells by using multiplexed tetramers with unique DNA-oligomer signatures. This will allow users to very specifically isolate rare cells within the sample. This technique is currently being applied to isolate T cells from cancer patients for use in personalized immunotherapy.

APPLICATIONS

- ▶ Cell Sorting
- ▶ In research settings
- ▶ Detection of very rare cell types
- ▶ In clinical settings
- ▶ T-cell isolation from patients for cancer therapy

ADVANTAGES

- ▶ Higher affinity than antibodies for certain targets (high specificity)
- ▶ Modular design / Flexibility
- ▶ Control over number of copies of specific affinity agent used on protein scaffold for detection
- ▶ Oligomer sequence can be modified for very specific targeting of antigen
- ▶ Allows for the sorting of extremely rare cell types

STATE OF DEVELOPMENT

The invention is currently in the testing phase using mouse and human samples. Development is ongoing. U.S. and international patents have been filed.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	8,394,590	03/12/2013	2008-685

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INVENTORS

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OTHER INFORMATION

KEYWORDS

FACS, cell sorting, multiplex cell sorting, T cell, immunotherapy, cancer, nucleic acid, DNA oligomer, panning, tetramer, protein scaffold, affinity, ssDNA, SaC, streptavidin, antigen, MHC

CATEGORIZED AS

- ▶ **Biotechnology**
 - ▶ Other
- ▶ **Medical**
 - ▶ Disease: Cancer
 - ▶ Other
 - ▶ Research Tools
- ▶ **Research Tools**
 - ▶ Other
 - ▶ Screening Assays

RELATED CASES

2008-685-0

RELATED MATERIALS

- ▶ Kwong, Gabriel A., Caius G. Radu, Kiwook Hwang, Chengyi J. Shu, Chao Ma, Richard C. Koya, Begonya Comin-Anduix et al. "Modular nucleic acid assembled p/MHC microarrays for multiplexed sorting of antigen-specific T cells." *Journal of the American Chemical Society* 131, no. 28 (2009): 9695-9703.
- ▶ Koya, Richard C., Stephen Mok, Begoña Comin-Anduix, Thinle Chodon, Caius G. Radu, Michael I. Nishimura, Owen N. Witte, and Antoni Ribas. "Kinetic phases of distribution and tumor targeting by T cell receptor engineered lymphocytes inducing robust antitumor responses." *Proceedings of the National Academy of Sciences* 107, no. 32 (2010): 14286-14291.
- ▶ Chodon, Thinle, Begoña Comin-Anduix, Bartosz Chmielowski, Richard C. Koya, Zhongqi Wu, Martin Auerbach, Charles Ng et al. "Adoptive transfer of MART-1 T-cell receptor transgenic lymphocytes and dendritic cell vaccination in patients with metastatic melanoma." *Clinical Cancer Research* 20, no. 9 (2014): 2457-2465.
- ▶ Tumei, Paul C., Caius G. Radu, and Antoni Ribas. "PET imaging of cancer immunotherapy." *Journal of Nuclear Medicine* 49, no. 6 (2008): 865-868.

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- ▶ [Mouse Model Deficient for the Proton Sensing GPCR T-cell Death-associated Gene 8 \(tdag\)](#)
- ▶ [Anti-Human Deoxycytidine Kinase \(dCK\) Monoclonal Antibody](#)
- ▶ [Novel Non-Immunogenic Positron Emission Tomography Gene Reporter](#)
- ▶ [Targeted Mass Spectrometry Approaches To Detect Kinase Pathways For Personalized Medicine](#)
- ▶ [G2A GPCR Deficient Mouse Model and G2A Monoclonal Antibody](#)
- ▶ [Proton-sensing G Protein-coupled Receptor 4 Knockout](#)
- ▶ [Derivation Of A Human Neuroendocrine Prostate Cancer Cell Line With Defined Oncogenic Drivers](#)
- ▶ [Novel Polyclonal Antibody to Detect a Bruton's Tyrosine Kinase Phosphorylation Site](#)
- ▶ [Non-Immunogenic Positron Emission Tomography Gene Reporter Systems](#)

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