



## 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

### CONTACT

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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 Research20, no. 9 (2014): 2457-2465.

► Tumeḥ, 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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