

A Rapid Method of Isolating Neoantigen-specific T Cell Receptor Sequences

Summary (1024-character limit)

Recent research has demonstrated that neoantigen-specific T-cell receptors (TCRs) can be isolated from a cancer patient's lymphocytes. These TCRs may be used to engineer populations of tumor-reactive T cells for cancer immunotherapies. Obtaining sequences of these functional TCRs is a critical initial step in preparing this type of personalized cancer treatment; however, current methods are time-consuming and labor-intensive. Scientists at the National Cancer Institute (NCI) have developed a rapid and robust method of isolating the sequences of mutation-specific TCRs to alleviate these issues; they seek licensing and/or co-development research collaborations for the development of a method for isolating the sequences of tumor-reactive TCRs. For collaboration opportunities, please contact Steven A. Rosenberg, M.D., Ph.D. at sar@nih.gov.

NIH Reference Number

E-067-2017

Product Type

- Research Tools
- Therapeutics

Keywords

- T-cell Receptors, TCR, Immunotherapy, Cancer, Single Cell, Tumor

Collaboration Opportunity

This invention is available for licensing and co-development.

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Description of Technology

Tumors can develop unique genetic mutations which are specific to an individual patient. Some of these mutations are immunogenic; giving rise to autologous T cells which are tumor-reactive. Once isolated and sequenced, these neoantigen-specific TCRs can form the basis of effective adoptive cell therapy cancer treatment regimens; however, current methods of isolation are inefficient. Moreover, the process is technically challenging due to TCR sequence diversity and the need to correctly pair the a and b chain

of each receptor. Thus, there is an urgent need for more robust methods of identifying paired sequences of mutation-specific TCRs for cancer immunotherapy.

Researchers at the NCI have developed an efficient method for isolating the paired sequences of TCRs. Using single-cell methodology, next generation sequencing and custom bioinformatics software, the researchers can isolate full-length TCR α and β chain sequences from mutation-reactive T cells. These isolated sequences can facilitate adoptive cell therapy for cancer patients.

Potential Commercial Applications

- Personalized immunotherapy to treat cancer patients
- Research tool to identify mutation-specific T-cell receptors

Competitive Advantages

- Broadly applicable to different types of malignant tumors
- Limited off-target effects
- Patient-specificity to improve efficacy of adoptive cell therapy
- Rapid and scalable method of isolating neoantigen-specific TCRs

Inventor(s)

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Development Stage

- Pre-clinical (in vivo)

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/479,398, Filed 31 Mar 2017

Related Technologies

- [E-229-2014 - T-Cell Therapy Against Patient-Specific Cancer Mutations](#)
- [E-233-2014 - T-Cell Therapy Against Patient-Specific Cancer Mutations](#)

Therapeutic Area

- Cancer/Neoplasm