Journal for ImmunoTherapy of Cancer

POSTER PRESENTATION Open Access

Bioengineering cytotoxic T cells to target opportunistic fungal infection

Pappanaicken Kumaresan[1*], Pallavi R Manuri[1], Nathaniel Albert[2], Brian Rabinovich[1], Simon Olivares[1], Sourindra N Maiti[1], Helen Huls[1], Dean A Lee[1], Dimitrios Kontoyiannis[2], Laurence J Cooper[1]

From Society for Immunotherapy of Cancer 28th Annual Meeting
National Harbor, MD, USA. 8-10 November 2013

Clinical-grade T cells are genetically modified ex vivo to express chimeric antigen receptors (CARs) to redirect their specificity to target tumor-associated antigens in vivo. We have developed gene therapy approach to render T cells specific for invasive fungal infections (IFI) due to Aspergillus. We adapted the pattern-recognition receptor Dectin-1 to activate T cells via chimeric CD28 and CD3-zeta (designated D-CAR) upon binding with carbohydrate cell wall in Aspergillus germlings. T cells genetically modified with Sleeping Beauty system to stably express D-CAR were selectively propagated on artificial antigen presenting cells using an approach that is approved by FDA to develop CAR T cells for clinical trials. The D-CAR+ T cells exhibited specificity for beta-1,3-gucan and damaged and thus inhibited hyphal growth of Aspergillus. Treatment of D-CAR+ T cells with steroids did not compromise anti-fungal activity. Thus, we report a clinically-appealing strategy to transfer innate immunity for mycology to cytotoxic T cells.

Authors' details
[1]Department of Pediatrics, MDACC, Houston, TX, USA. [2]Department of Infectious Disease, MDACC, Houston, TX, USA.

Published: 7 November 2013

doi:10.1186/2051-1426-1-S1-P4
Cite this article as: Kumaresan *et al.*: Bioengineering cytotoxic T cells to target opportunistic fungal infection. *Journal for ImmunoTherapy of Cancer* 2013 **1**(Suppl 1):P4.

[1]Department of Pediatrics, MDACC, Houston, TX, USA
Full list of author information is available at the end of the article