Polycytotoxic T Cells

Tech ID: 27475 / UC Case 2016-676-0

SUMMARY

UCLA researchers in the Department of Dermatology have characterized a novel subset of CD8+ T cells, termed polycytotoxic, that mediate killing of intracellular pathogens.

BACKGROUND

CD8+ T cells are known to engage in cytotoxic activity, where they use pore-forming proteins and proteases (granzyme B, granulysin, and perforin) to induce apoptosis in target cells. This cytotoxic role is activated in response to intracellular infections, but it could be suppressed to prevent Graft vs. Host disease, autoimmune disease, and other abnormal immune responses. However, not all CD8+ T cells express those cytotoxic proteins, and the specific population(s) responsible for antimicrobial defense have not previously been identified.

INNOVATION

Researchers at UCLA have identified a subset of CD8+ T cells called polycytotoxic T cells that express all the necessary cytotoxic proteins. By analyzing the surface expression, researchers also identified several biomarkers that can be used to purify this population of cells. Using *in vitro* functional testing, the polycytotoxic T cell subset was found to be more adept at killing intracellular pathogens.

APPLICATIONS

- Antibiotic development
- Vaccine target
- Cancer immunotherapy: biomarker for T cell target
- Organ transplantation: prevention of Graft vs. Host disease
- Autoimmune disease treatment
- Blockade of drug reactions: Stevens-Johnson syndrome, Toxic epiderman necrolysis, Drug-induced hypersensitivity syndrome (DIHS)

ADVANTAGES

Polycytotoxic T cells show increased killing of intracellular pathogens

Identified a subpopulation of T cells that expresses the necessary cytotoxic proteins

- Can activate or repress this population specifically, depending on context

RELATED MATERIALS

- Busch, M. et al. (2016). Lipoarabinomannan-responsive polycytotoxic T cells are associated with protection in human tuberculosis. Am J Respir Crit Care Med.

PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,096,965	08/24/2021	2016-676

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OTHER INFORMATION

KEYWORDS

Polycytotoxic, T cells, CD8+, cytotoxic T cells, adaptive immunity; intracellular infection; antimicrobial; perforin; granzyme B; granulysin; Graft vs Host disease; vaccines; antibiotics; drug-induced hypersensitivity syndrome; Stevens-Johnson syndrome

CATEGORIZED AS

- **Medical**
  - Disease: Autoimmune and Inflammation
  - Disease: Infectious Diseases
  - Research Tools
  - Therapeutics
  - Vaccines

RELATED CASES

2016-676-0

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