Docket #: S17-450

Common neoantigens in EGFR and RAS mutations generate generalized cytotoxic T lymphocytes for adoptive T-cell therapies

Cancer specific antigenic epitopes called neoantigens are necessary for effective adoptive T cell therapies. Neoantigens generate cytotoxic T lymphocytes (CTLs) and CTLs can be exploited to safely target and eliminate cancerous cells. Two major challenges in adoptive T-cell immunotherapy are the insufficient recognition of cancer antigens due to mutations and the exhaustion of T lymphocytes. Inventors in the Nakauchi Lab identified antigenic epitopes specific to mutations found on RAS and EGFR in lung, colon, and pancreatic cancer. Leveraging their patented T-cell rejuvenation technology, the inventors use these newly identified neoantigens to generate induced pluripotent stem cells (iPSCs). Additionally, the generated T-cells can be redifferentiated via the neoantigen specific T-cells. To date, very few mutations have been identified as neoantigens within RAS and EGFR. As mutations in RAS and EGFR are common across cancers, the same CTLs generated can be used to treat multiple types of cancers. The invention provides a novel platform for develop effective adoptive immunotherapeutics.

Applications

- Adoptive immunotherapy
- Stem cell research and therapeutics
- T cells and iPSCs research

Advantages

- Same CTL can be used to treat multiple cancers
- One of the few neoantigens that have been identified across RAS and EGFR
- Effective, safe, and targeted immunotherapy

Publications

- Nishimura T., Nakauchi H. (2019) Generation of Antigen-Specific T Cells from Human Induced Pluripotent Stem Cells. In: Boyd A. (eds) Immunological Tolerance. Methods in Molecular Biology, vol 1899. Humana Press, New York, NY. doi: 10.1007/978-1-4939-8938-6_3

Innovators

- Hiromitsu Nakauchi
- Toshinobu Nishimura

Licensing Contact

Kimberly Griffin

Technology Licensing and Strategic Alliances Manager

Email