

Gene-based Diagnostic Predicts Patient Response to Cancer Immunotherapy

Summary

Somatic mutations can alter the sensitivity of tumors to T-cell mediated immunotherapy. Identifying genes that positively regulate the sensitivity of cancer cells to T-cell mediated clearance is key for effective treatment in cancer patients. Researchers at the National Cancer Institute (NCI) have identified a panel of genes which are useful in predicting a patient's response to immunotherapy. NCI seeks partners to co-develop or license the technology toward commercialization.

NIH Reference Number

E-022-2017

Product Type

- Diagnostics

Keywords

- Gene
- Immunotherapy
- T-cell
- Tumor
- CRISPR
- Diagnostic

Collaboration Opportunity

This invention is available for licensing.

Contact

- Andy Burke
NCI TTC

andy.burke@nih.gov (link sends e-mail)

Description of Technology

Immunotherapy is a promising method of treating cancer that leverages the immune system to promote tumor rejection. However, certain somatic mutations in cancer cells confer resistance to T cell-mediated cytolysis. To improve the effectiveness of immunotherapies for cancer, there exists a need to prospectively identify patients who are most likely to respond to such therapies.

Researchers at the National Cancer Institute (NCI) have developed a method of selecting a therapy for a cancer patient by screening for known mutations which confer immune resistance. By performing a whole genome wide CRISPR-Cas9 screen, the researchers discovered a novel set of genes required for T-cell mediated tumor clearance. The results of this screen were combined with The Cancer Genome Atlas (TCGA) datasets and then cross-validated to determine immune sensitivity in multiple human cancers. Through their studies, the researchers have identified genes that are essential for eliciting an effective T-cell response.

The National Cancer Institute, Surgery Branch, is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this method of using a set of novel genes to determine an appropriate therapy for a cancer patient.

Potential Commercial Applications

- Development of a companion diagnostic for cancer immunotherapies, particularly adoptive cell therapies

Competitive Advantages

- Resistant properties imparted by these genes has been validated by functionally knocking them out in cancer cells
- These genes correlate with T cell cytolytic activity across most cancer types

Inventor(s)

Shashankkumar J. Patel (NCI), Nicholas P. Restifo (NCI)

Development Stage

- Pre-clinical (in vivo)

Publications

Patel, S. et al. Identification of essential genes for cancer immunotherapy. Nature, (2017). doi:10.1038/nature23477

Patent Status

- **U.S. Provisional:** U.S. Provisional Patent Application Number 62/418,461, Filed 11 Nov 2016
- **PCT:** PCT Application Number PCT/US2017/60304, Filed 07 Nov 2017

Related Technologies

- [E-059-2013 - Improved Personalized Cancer Immunotherapy](#)
- E-085-2013
- [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

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