Technology Overview

Although immune checkpoint blockade therapies represent important treatments for cancer, most patients are non-responders or may relapse. The efficacy of these treatments relies on cytotoxic T-cell recognition of antigens presented by MHC Class I on tumor cells and can be reduced by suppression of antigen presentation or blunt tumor-immune interactions. Fred Hutch researchers have discovered that DUX4, a double homeobox transcription factor expressed normally only early in development, is a novel regulator of antigen presentation and immune modulation. They found that DUX4 is re-expressed in solid tumors, is associated with anti-tumor activity, and promotes resistance to immune checkpoint blockade. Therefore, DUX4 is useful not only as a biomarker for identifying patients that may respond to immunotherapies, but also as a target to increase the effectiveness of immunotherapies.

Applications

- Therapeutic target for cancer treatment
- Therapeutic target to upregulate MHC Class I for use in combination with adoptive TCR-based T cell therapies
- Predictive biomarker for immunotherapy response

Potential Advantages

- Reveals a molecular basis for DUX4 amplification in cancer cells

Market Overview: The global cancer therapeutics market was valued at USD 121 billion in 2017 and is estimated to reach USD 172.6 billion by 2022 growing at a CAGR of 7.4%. Main market drivers include increase in cancer prevalence, advances in cancer research and surge in collaboration between pharmaceutical companies.

Investigator Overview

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