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Publication(s)

External Link(s)

- [From the lab of Dr. Smita Nair](#)
- [From the lab of Dr. Michael Brown](#)
- [From the lab of Dr. David Ashley](#)

A novel immune competence blood test to predict responsiveness of tumors to cancer immunotherapy

Unmet Need

Cancer immunotherapy provides great advantages over traditional cytotoxic chemotherapy and radiation with more durable clinical outcomes and an improved quality of life. The number of US patients eligible for immunotherapy was estimated to be 43.6% in 2018. However, as response rates vary by both patient and specific type of cancer, only 12.5% of eligible people were estimated to respond. With cancer immunotherapies increasing in use, biomarkers that can predict patient response rates and identify patients likely to respond to immunotherapies are in great need. While some predictive biomarkers currently exist on the market – such as PD-L1, microsatellite instability (MSI), and defective mismatch repair (dMMR), they are specific to a limited number of cancer types. There is a need for additional biomarkers that can predict patient response to cancer immunotherapy while being non-invasive, low-cost, and easily implementable.

Technology

Duke inventors have developed a blood test to measure function of peripheral immune cells to predict responsiveness of tumors to cancer immunotherapy. This is intended to be used as a diagnostic test by physicians to determine if immunotherapy would be appropriate for a given patient. Specifically, this technology uses peripheral blood samples obtained from patients to determine tumor response to innate immune adjuvants. The inventors show that patient monocytes that displayed a positive response to the immune adjuvant in blood were also found to demonstrate a robust response to the adjuvant in the tumor. Thus, peripheral blood immune function can be an indicator of tumor responsiveness to immunotherapy. This has been demonstrated *in vivo* using blood and tumor samples from patients with pancreatic cancer, melanoma, or intraductal papillary mucinous neoplasms.

Other Applications

This technology could also help identify if standard of care treatment currently being used in patients compromises their innate and adaptive immune system which can make the tumor less responsive to cancer immunotherapy and accelerate its progression.

Advantages

- A novel, non-invasive, low-cost, and easily implementable blood test for predicting patient response to cancer immunotherapies
- Can be tailored to the needs of a patient's immune function reducing healthcare costs associated with blanket therapies
- Enables long-term monitoring of tumor progression and immune status

