

Higher Bacteria Levels Inside Tumors Can Promote Immunotherapy Resistance

Higher amounts of bacteria create an immunosuppressive tumor microenvironment.

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- Researchers found that the amount, and not the type, of bacteria inside tumors can predict response to treatment in lab models of head and neck cancer.
- Higher amounts of bacteria create an immunosuppressive tumor microenvironment.
- This understanding could identify patients more likely to benefit from immunotherapy and guide clinicians to minimize antibiotics in other patients.

Higher amounts of bacteria inside tumors can drive immunosuppression and resistance to immune checkpoint blockade in patients with head and neck squamous cell carcinoma (HNSCC), according to researchers from The University of Texas MD Anderson Cancer Center.

The study, published in [Nature Cancer](#) and co-led by [Renata Ferrarotto, MD](#), professor of [Thoracic/Head and Neck Medical Oncology](#), showed that increasing the amount of bacteria in lab models and in tumor samples of HNSCC led to immunotherapy resistance, regardless of the species of bacteria tested.

“We now have key evidence that the abundance of bacteria is a driver of tumor microenvironment remodeling and immunosuppression,” Ferrarotto said. “While more studies are needed, this could eventually help clinicians identify patients who are most likely to benefit from treatment and, in other patients, control the use of antibiotics to reduce the intratumoral bacteria load.”

Why did the researchers look at gut bacteria?

While a subset of patients with HNSCC respond well to immune checkpoint blockade, many do not. This highlights a need for biomarkers to identify which patients are more likely to benefit. Some studies have suggested that the amount and type of gut bacteria might be indicative, but the results have been unclear.

In this study, the researchers tested different bacterial species at different amounts in lab models of HNSCC and found that the only predictor of treatment resistance was a higher amount of overall bacteria inside the tumors.

How does this affect patients with head and neck squamous cell carcinoma?

Further clinical studies are needed to confirm these findings but knowing that tumor bacteria levels can affect immunotherapy resistance could help clinicians determine which patients are more likely to benefit from immunotherapy treatment. It can also guide physicians to minimize the use of antibiotics in those patients who have higher bacterial loads.

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