

How Beneficial Gut Bacteria Could Augment Cancer Immunotherapy

Immunotherapy, a treatment in which a patient's immune system is altered to fight specific cancers, is a game-changing form of cancer therapy. One form of immunotherapy uses drugs called immune checkpoint inhibitors, or ICIs.

ICIs are clinically approved drugs that block proteins called “checkpoints,” which are imitated by cancer cells in an attempt to escape recognition and destruction by immune cells. In the presence of ICIs, however, T cells (our body's defence cells) can effectively recognize and eliminate cancer cells. However, there is one little hiccup—an individual's response to ICI therapy can be variable and is controlled by multiple factors. One of these, emerging evidence suggests, is the health of the individual's gut microbiome.

Our intestines are colonized by a number of microorganisms, which are mostly beneficial and help normal function. The composition of the microbiome varies from person-to-person. A review conducted by collaborators from the U.S. and Lebanon now underscores the key role played by this microbiome in influencing the efficacy of ICIs.

Although the exact mechanism remains elusive, the presence of beneficial gut microorganisms—like *Akkermansia*, *Ruminococcaceae*, *Fecalibacterium*, *Bifidobacterium*, and *Bacteroides*— as well as consumption of probiotics (beneficial microorganisms, or foods containing these microorganisms) has been shown to boost the effect of ICIs.

Another interesting way of controlling the gut microbiome to augment ICI therapy is via a fecal microbiota transplant (FMT), which involves the transfer of healthy human-stool-derived bacterial flora into the recipient's gut through colonoscopy, enema, or other procedures. This process is currently under investigation.

The review also reports that the antibiotic-induced imbalances among gut bacteria affect one's response to ICI therapy, which is why clinicians treating patients on ICI therapy should be careful in prescribing antibiotics to them. When use of antibiotics is necessary, they should consider re-establishing a favorable microbiome using probiotics or FMT.

Researchers are now trying to understand the exact mechanism by which the gut microbiome exerts its influence on immunotherapy, while also trying to assess the overall safety and efficacy of FMT-based procedures for microbial inoculation.

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