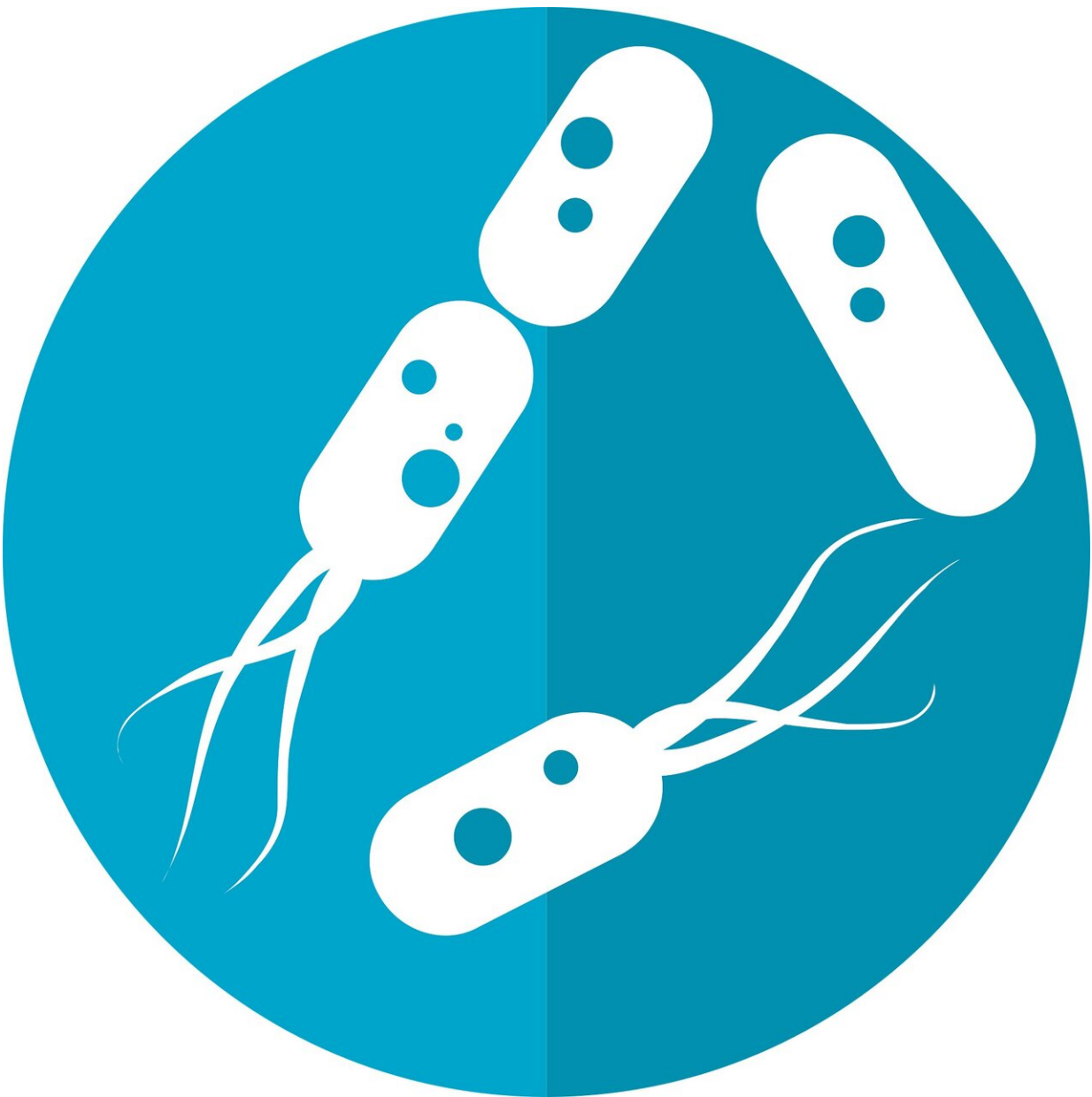


Healthy gut microbiome improves success of cancer treatment

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The largest study to date has confirmed the link between the gut microbiome and the response to cancer immunotherapy therapy for melanoma.

The study is published today in *Nature Medicine* and co-ordinated by King's College London, CIBIO Department of the University of Trento and European Institute of Oncology in Italy, University of Groningen in the Netherlands and funded by the Seerave Foundation.

Dr. Karla Lee, clinical researcher at King's College London and first author of the study, said that "preliminary studies on a limited number of patients have suggested that the gut microbiome, as an immune system regulator, plays a role in the response of each patient to cancer immunotherapy, and particularly in the case of melanoma. This new study could have a major impact on oncology and medicine in general."

The microbiome, the set of microorganisms that live in the intestines, can be altered through dietary changes, next generation probiotics and fecal transplantation. This change is in turn modifying the microbiome's action on the immune system. Understanding the characteristics of the microbiome can enable treating clinicians to alter a patient's microbiome accordingly before starting treatment. Less than 50% of patients respond positively to immunotherapy for melanoma so finding strategies to increase the number of positive responders is crucial.

The study put together the largest cohort of patients with melanoma and samples of their gut microbiome from five clinical centers in the UK, the Netherland and Spain. Researchers carried out a large-scale metagenomic study—sequencing of the gut microbiome—to investigate

whether there is an association between the composition and function of the gut microbiome and response to immunotherapy.

Results confirmed a complex association as it involves different bacterial species in different patient cohorts. The presence of three types of bacteria (*Bifidobacterium pseudocatenulatum*, *Roseburia* spp. and *Akkermansia muciniphila*) seem to be associated with a better immune response. An additional finding was that the microbiome itself is strongly influenced by factors including patient constitution, use of proton pump inhibitors and diet that should be considered in future longitudinal studies.

Co-author Professor Tim Spector from King's College London said that "this study shows the chances of survival based on healthy microbes nearly doubled between subgroups. The ultimate goal is to identify which specific features of the microbiome are directly influencing the clinical benefits of immunotherapy to exploit these features in new personalized approaches to support cancer immunotherapy. But in the meantime, this study highlights the potential impact of good diet and gut health on chances of survival in patients undergoing immunotherapy."

Co-author Professor Nicola Segata from University of Trento said that their "study shows that studying the [microbiome](#) is important to improve and personalize immunotherapy treatments for melanoma. However, it also suggests that because of the person-to-person variability of the [gut microbiome](#), even larger studies must be carried out to understand the specific gut microbial features that are more likely to lead to a positive response to [immunotherapy](#)."

More information: Tim Spector, Cross-cohort gut microbiome associations with immune checkpoint inhibitor response in advanced melanoma, *Nature Medicine* (2022). [DOI: 10.1038/s41591-022-01695-5](https://doi.org/10.1038/s41591-022-01695-5). www.nature.com/articles/s41591-022-01695-5

Provided by King's College London

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