

Can probiotics modulate immunity to prevent oral cancer?

The review published by Vasanthi *et al.*^[1] in the previous issue of the journal emphasized the role of probiotics in deterring oral carcinogenesis. The article discussed the underexplored areas of research that are important for oral health and cancer prevention. The effects of probiotics as potential immunomodulatory and antitumorigenic agents are interesting, and hold promise for future therapeutic approaches.

In the abstract, the authors stated that their review was focused on *in vitro* and animal studies; however, the methods section in the text did not seem to reflect the abstract, but rather stated that clinical studies were included and not animal studies. Besides, the use of “probiotics” as the only search term may have affected the search results, as articles that could have been retrieved using the term “probiotic” may have been missed. Similarly, the term “oral cancer” may have missed articles that may have been retrieved with the use of the term “mouth cancer.”

It is also important to highlight the distinction between *in vitro* and animal studies as opposed to clinical trials when discussing the impact of probiotics on cancer. While the review^[1] highlighted several *in vitro* and animal studies that suggested a positive effect of probiotics on oral carcinogenesis, it is crucial to underscore that transitioning from laboratory and animal research to human clinical trials is complex and challenging. Even though the review reported a study describing the synergistic antitumor efficacy of interleukin-2 (IL-2) with the

probiotic, *Akkermansia muciniphila* against colorectal cancer, this may not reflect its overall potential to prevent oral cancer due to the distinct characteristics of both cancers.

In addition, it is important to note that *in vitro* studies and animal models alone may not be able to accurately represent the human system. This is due to the complexity of human physiology, including the immune response toward infections and cancer.^[2,3] Therefore, it is vital to proceed with caution and consider the limitations of preclinical studies when making claims about the potential benefits of probiotics in humans. Clinical trials with well-designed protocols and robust methodologies are needed to validate the effects of probiotics on oral cancer in humans.

Furthermore, the safety and potential side effects of probiotics should be discussed, especially in the context of patients with cancer. Since cancer treatments can compromise the immune system and digestive health, there might be concerns about introducing live microorganisms.^[4] Addressing these safety considerations would provide a more balanced perspective on using probiotics in oncology.

Additionally, the review also discussed the potential for probiotics to restore oral dysbiosis by reducing procarcinogenic bacteria in the oral microbiome, such as *Fusobacterium nucleatum* and *Porphyromonas gingivalis*.^[1] This is a critical point, as maintaining oral health is crucial to

overall well-being and can impact cancer risk.^[5] Expanding on the mechanisms by which probiotics influence the oral microbiome and prevent carcinogenic shifts in microbial populations would add depth to the review.

In conclusion, the review provides essential knowledge on the potential use of probiotics in oral cancer prevention. However, further investigation, including clinical research, should be considered. It is also essential to emphasize the role of preclinical studies and human trials, as it may lead to safety concerns and the potential impact of probiotics on the healthy oral microbiome.

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Conflicts of interest

There are no conflicts of interest.

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