

Researchers developing probiotic yogurt-based drugs

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Ben-Gurion University of the Negev (BGU) Prof. Raz Jelinek (left) and Ph.D student Orit Malka with their probiotic yogurt in a BGU lab Credit: Credit: Dani Machlis

Researchers at Ben-Gurion University of the Negev (BGU) have for the first time identified new drug candidates based on molecules isolated

from probiotic Kefir yogurt for combating pathogenic bacteria and treating various inflammatory conditions, including inflammatory bowel disease (IBD) and COVID-19 related cytokine storms.

The research, published in *Microbiome*, a leading peer-reviewed publication was led by Orit Malka, a Ph.D. student of Prof. Raz Jelinek, GU vice president and dean for research and development.

"These results are notable, since this is the first demonstration that virulence of human pathogenic bacteria can be mitigated by molecules secreted in [probiotic](#) milk products, such as yogurt or kefir," said Prof. Jelinek. "Our research illuminates the mechanism by which milk fermented probiotics can protect against pathogenic infections and aid the immune system. Following promising results in animal models, we look forward to administering these drug candidates to patients who are experiencing a cytokine storm due to COVID-19 infection, or people suffering from acute inflammatory bowel pathologies, such as Crohn's disease."

Kefir is a fermented probiotic dairy drink made by infusing cow or goat milk with kefir grains containing yeast and lactic acid bacteria. Probiotics are widely perceived as helping immune functions, affecting balanced microbial populations in the digestive system, and potentially protecting the body against bacterial infections.

"The healthy properties of probiotics in yogurt have been widely recognized, but our remarkable BGU researchers have shown how they actually have the potential to be highly effective drugs," says Doug Seserman, [chief executive officer](#), American Associates, Ben-Gurion University of the Negev. "It is another example of groundbreaking research and innovation at BGU."

The BGU researchers demonstrated that the kefir-secreted molecules

were able to significantly reduce virulence of *Vibrio cholerae*—which causes cholera. The anti-bacterial effect was based on disrupting communication among the [bacterial cells](#) which is a promising approach against [antibiotic-resistant bacteria](#).

In a follow-up study, the scientists observed that the isolated molecules had dramatic anti-inflammatory properties in various pathological conditions and disease models. For example, [experimental results](#) revealed that the molecules effectively healed mice inflicted with a lethal 'cytokine storm'—the extreme immune response which is one of the main causes of death in COVID-19 patients. The molecules not only eliminated the cytokine storm, but also restored balance to the [immune system](#), an extraordinary feat pointing to significant therapeutic potential.

The researchers have formed a new company to develop and commercialize the technology through BGN Technologies, the BGU technology transfer company.

"In a world where antibiotic-resistant bacteria are becoming an imminent threat, the novel molecules discovered by BGU scientists pave a completely new path for fighting bacterial infections by disrupting cell-cell communications in [pathogenic bacteria](#)," said Josh Peleg, CEO of BGN Technologies. "Moreover, the dramatic anti-inflammatory activities of the [molecules](#) may open new avenues for therapeutics and scientifically proven probiotic food products." "Years of breakthrough research have now reached a validation point that led to the establishment of a biopharma company for the further development and clinical evaluation of this exciting new technology that can potentially revolutionize the treatment of bacterial infections as well as inflammatory conditions."

More information: Orit Malka et al, Cross-kingdom inhibition of

bacterial virulence and communication by probiotic yeast metabolites, *Microbiome* (2021). [DOI: 10.1186/s40168-021-01027-8](https://doi.org/10.1186/s40168-021-01027-8)

Provided by American Associates, Ben-Gurion University of the Negev

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