Editorial Letter

A light shining through darkness: probiotic against COVID-19

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The colonic microbiota play a key role in human gastrointestinal tract physiology include maintaining homeostasis of the large bowel and modulating the host immune response. Lactic acid bacteria (LAB) especially *Lactobacillus* and *Bifidobacterium* are the main part of gut microbiota, which are considered as health beneficial probiotic bacteria with valuable effects in humans [1, 2].

Probiotic bacteria are currently used in industrial food production and therapeutically procedures [3]. The lactic acid produced by probiotic bacteria in the fermentation process causes decrease pH to inhibit the growth of putrefactive and pathogenic bacteria. Besides, LAB could have improvement effects on the nutritional value of fermented products through increase the production of the main food components such as vitamins, essential minerals, and amino acids [4]. Probiotics have been shown to be effective in preventing and treating different disorders such as atopic dermatitis, urinary tract-

infections, colorectal cancer, and rheumatoid arthritis [5]. Competition with disease-causing microbes, producing antimicrobial peptides (AMPs), modulate the microenvironment and regulate the host immune system makes probiotics a very interesting field for infectious disease research [6].

Since December 2019, coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) affected many people globally, and finding new treatment strategies is crucial [7]. To date, there is not strong practical evidence that showed the use of probiotics has promising effects in patients with COVID-19. However, previous studies suggested that the use of probiotics may reduce or prevent some of the major complications of COVID-19. The most significant cases are reducing antibiotic associated-diarrhea and ventilator-associated pneumonia, and prevention of acute respiratory distress syndrome (ARDS) and upper respiratory tract infections (RTIs) [8, 9]. Regarding the prevention of RTIs, probiotics maybe not directly affect SARS-CoV-2 but can be efficient for reducing the risk of co-infections [9].

Previous indirect evidence gives us hope that probiotics research might eventually deliver therapeutic options for fighting against COVID-19, but until reaching that goal further *in vitro* and *in vivo* researches will be highly needed.

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Conflict of Interests

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