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Vitamin D/VDR, probiotics, and gastrointestinal diseases

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Abstract

Vitamin D is an important factor in regulating inflammation, immune responses, and carcinoma inhibition via action of its receptor, vitamin D receptor (VDR). Recent studies have demonstrated the role of vitamin D/VDR in regulating host-bacterial interactions. Probiotics are beneficial bacteria with the power of supporting or favoring life on the host. In the current review, we will discuss the recent progress on the roles of vitamin D/VDR in gut microbiome and inflammation. We will summarize evidence of probiotics in modulating vitamin D/VDR and balancing gut microbiota in health and gastrointestinal diseases. Moreover, we will review the clinical application of probiotics in prevention and therapy of IBD or colon cancer. Despite of the gains, there remain several barriers to advocate broad use of probiotics in clinical therapy. We will also discuss the limits and future direction in scientific understanding of probiotics, vitamin D/VDR, and host responses.

Keywords

Autophagy; bacteria; colon cancer; colitis; Lactic Acid Bacteria; IBD; Inflammation; probiotics; NF- κ B; vitamin D; VDR

1. Introduction

Probiotics are ingestible nonpathogenic living microorganisms, and when consumed in adequate amounts as food components, confer some beneficial effects to the host by inhibiting or treating diseases, according to the World Health Organization [1]. Recent laboratory studies and clinical trials have shown the potential health benefits of probiotics in treating various human diseases [2–4]. In this review, we focus on the recent progress on the mechanisms of probiotics actions that modulate vitamin D and VDR in inflammatory response and development of human diseases, such as inflammatory bowel diseases (IBD), colon cancer, gastritis, and liver diseases. We summarize etiologic and clinical evidence of probiotic in modulating vitamin D/VDR and balancing gut microbiota. The limits and future direction in studying probiotics and vitamin D/VDR are also discussed.

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