

Anti-Hypertensive Probiotics

Eric Banan-Mwine Daliri¹, Byong H Lee^{1,2*} and Deog H Oh¹

¹Department of Food Science and Biotechnology, Kangwon National University, Chuncheon, South Korea

²Department of Microbiology/Immunology, McGill University, Montreal, QC, Canada

***Corresponding Author:** Byong H Lee, Department of Food Science and Biotechnology, Kangwon National University, Chuncheon, South Korea, Department of Microbiology/Immunology, McGill University, Montreal, QC, Canada.

Received: August 07, 2016; **Published:** August 08, 2016

Hypertension remains an important disease characterized by a sustained high systolic blood pressure of 140 mm Hg and above. If left untreated, hypertension can lead to inadequate blood supply to vital organs, which can cause coronary heart diseases, stroke and eventually death. Current regimen includes a change in lifestyle, reduced salt intake and regular exercise in addition to antihypertensive drugs to reduce blood pressure (BP). Nevertheless, there is increasing evidence that gut dysbiosis is linked to hypertension. For instance, a high Firmicutes-to-Bacteroidetes ratio is associated with increased blood pressure in spontaneous hypertensive, Dahl salt-sensitive rats [1] and in humans [2]. There is also a significant reduction in gut microbial diversity during hypertension [2]. These observations suggest that innovative dietary strategies that affect the gut microbiota could control hypertension. Over the years, several studies have demonstrated the role of probiotics and probiotic fermented products in maintaining or reducing BP. Gomez-Guzman, *et al.* [3] recently observed that administration of *Lactobacillus fermentum* CECT5716 or *L. coryniformis* CECT5711 plus *L. gasseri* CECT5714 for 5 weeks significantly improved endothelial relaxation and reduced systolic blood pressure in SHR rats with no significant changes in heart rate. A meta-analysis of 9 randomized, controlled trials on the effects of probiotics in reducing human blood pressure also showed that probiotic consumption significantly reduced systolic BP by 3.56 mm Hg (95% confidence interval, 6.46 to 0.66) and diastolic BP by 2.38 mm Hg (95% confidence interval, 2.38 to 0.93) relative to the control groups. Administration of multiple probiotic species, however, tend to result in a higher reduction in BP than single species [4]. In foods, probiotics hydrolyze proteins to release bioactive peptides some of which are ACE inhibitors [5] and this is part of the mechanism by which probiotic fermented foods reduce blood pressure. However, controlling the probiotic proteolytic system during fermentation as well as the purification of ACE inhibitory peptides from the hydrolysate is tedious, and thus some researchers have developed the therapeutic recombinant probiotics. Such probiotics synthesize specific anti-ACE peptides in the culture media. Yang, *et al.* [6] recently transformed *L. plantarum* NC8 with anti-ACE inhibitory peptides YFP and TFP. The recombinant probiotics significantly reduced SBP than *L. plantarum* (wild type).

The role of probiotics consumption in lowering blood pressure may be as a result of epigenetic modification probably by microRNA. Short chain fatty acids and other probiotic metabolites can also influence energy expenditure, gut metabolism as well as gastrointestinal and renal ion transport and thus reduce blood pressure.

Bibliography

1. Jose PA and Raj D. "Gut microbiota in hypertension". *Current Opinion in Nephrology and Hypertension* 24.5(2015): 403-409.
2. Yang T, *et al.* "Gut dysbiosis is linked to hypertension". *Hypertension*. 65.6 (2015): 1331-1340.
3. Gomez-Guzman M, *et al.* "Antihypertensive effects of probiotics *Lactobacillus* strains in spontaneously hypertensive rats". *Molecular Nutrition and Food Research* 59.11 (2015): 2326-2336.
4. Khalesi S, *et al.* "Effect of probiotics on blood pressure: a systematic review and meta-analysis of randomized, controlled trials". *Hypertension* 64.4 (2014): 897-903.

5. Aluko RE., "Antihypertensive peptides from food proteins". *Annu Rev Food Sci Technol* 6 (2015): 235-262.
6. Yang G., *et al.* "Effective treatment of hypertension by recombinant *Lactobacillus plantarum* expressing angiotensin converting enzyme inhibitory peptide". *Microbial Cell Factories* 14 (2015): 202.

Volume 4 Issue 5 August 2016

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