From Tradition to Innovation: Postbiotic Metabolites of Herbal Medicines as Novel Drug Leads

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Abstract:

Traditionally used plant materials can be transformed by human gut microbiota into postbiotic metabolites with markedly different structures and pharmacological properties. This approach sheds new light on the mechanisms underlying the biological activity of medicinal plants and highlights the significant potential for discovering novel pharmacologically active molecules that result from metabolism of plant specialized metabolites by gut microorganisms. These strategies facilitate the discovery of novel lead molecules that can be further developed into active pharmaceutical ingredients.

VGP28 is a postbiotic metabolite produced by human gut microbiota from procyanidins, for which strong inhibitory effect on the inflammatory response of macrophages has been shown. The high anti-inflammatory activity of VGP28 and the limitations associated with its deactivation after oral administration indicate the rationale for obtaining this metabolite in an isolated form through chemical synthesis and utilizing it in the treatment of conditions where it is possible to apply the compound directly to the infamed site. The conducted studies allowed to develop a method for large scale chemical synthesis of VGP28 and confirm anti-inflammatory activity *in vitro* on keratinocytes and fibroblasts, what indicates the potential of utilization of its anti-inflammatory activity in the topical treatment of infammatory skin conditions of various etiologies.

Keywords:

microbiota, natural products, medicinal plants, postbiotics.