Author's response re: "Anti-inflammatory property of propolis"

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Dear Editor-in-Chief

We appreciate the interesting and helpful comments made by Dr. Salvatore Chirumbolo⁽¹⁾ on our article entitled "Brazilian green propolis improves immune function in aged mice".⁽²⁾ Our study investigated the effects of Brazilian green propolis on immunological parameters, such as cytokines, peritoneal macrophages function and antibodies in aged mice. The results demonstrated that administration of Brazilian green propolis had a positive effect on immune function in aged mice.

IL-1 β , IFN- γ and IL-4 are cytokines secreted by macrophage, Th1 and Th2 cells, respectively and vital in maintaining normal immune function. For example, IL-1 β is involved in a variety of cellular activities, including cell proliferation, differentiation and apoptosis. IL-4 is known to be active in the stimulation of B and T cell proliferation and the differentiation of B cells into plasma cells. IFN- γ is critical in the protection against viral, some bacterial and protozoal infections.⁽³⁻⁵⁾ It has been demonstrated that aging is often accompanied with decreased production of IL-1 β , IL-4 or IFN- γ and compromised immune function.⁽⁶⁻⁸⁾ Therefore, it should be beneficial when the production of these cytokines is recovered to some extent in the aged. In our study, serum IL-1 β , IL-4 and

IFN- γ showed an increasing trend after Brazilian green propolis treatment in aged mice and meanwhile, some immunological parameters were also improved. A number of studies conducted in several different laboratories also indicated that propolis, as well as some of its components, was active in increasing the secretion of several cytokines and the mechanisms involved are not clear yet.⁽⁹⁻¹⁴⁾ It should be pointed out that overproduction of some cytokines is not beneficial and frequently associated with inflammatory response or autoimmunity, as raised kindly by Dr. Salvatore Chirumbolo.⁽¹⁾ However, no statistic significance was found for serum contents of IL-1 β , IL-4 and IFN- γ among different groups in our study, suggesting that IL-1 β , IL-4 and IFN- γ were not overproduced at the doses we administrated. It is not certain whether the production of IL-1 β , IL-4 and IFN- γ will be enhanced further if more propolis is administrated.

We consider that Brazilian green propolis is potential to be a regulator of immune/inflammatory response or an immuno-enhancer and may have a health promoting action in the aged, though further studies in elderly subjects are needed. It is also necessary to further investigate the roles played by individual compounds present in Brazilian green propolis, such as artemillin C, cinnamic acid or other components.

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