

Editorial

Natural Products for the Attenuation of Allergic Airway Inflammation

Over the past few decades, incidence of allergic disease has tremendously increased, thus representing a serious health problem worldwide. Apparently, many factors seem to contribute to the pathogenesis of allergic disease and, among them, environmental pollutants, chemical allergens, changes of life style and increased longevity should be mentioned. Besides conventional treatments, administration of natural products to prevent allergic disease outcome or alleviate clinical manifestations has recently become a very common practice. In this special issue of Current Pharmaceutical Design, a constructive attempt has been made to provide readers with novel information on the anti-allergic mechanisms of an array of natural products, while describing a series of clinical trials with various plant-derived foods and probiotics in inflammatory allergic disease.

Chirumbolo [1] will illustrate the properties of flavonoids as natural substances endowed with anti-inflammatory and anti-allergic potential. However, some concerns still remain about their *in vivo* efficacy since some important issues such as bioavailability, gut transformation, pharmacokinetics, signaling and cellular interactions are not completely understood.

Gostner and associates [2] will describe the ability of certain antioxidants to play anti-inflammatory activities but, at the same time, shifting the immune balance towards Th2-type response may increase allergic disease and asthma, also contributing to obesity epidemic. Moreover, food preservatives altering the composition of intestinal microbiota may also contribute to the increase of allergic disease.

Henriques and Penido [3] will discuss on the anti-allergic properties of *Carapa guianensis*, whose medicinal properties have been attributed to five tetranortriterpenoids. Experimentally, these last compounds are able to inhibit the activation of mast cells, eosinophils, and T cells, thus preventing inflammatory/allergic reactions.

Kumazawa and associates [4] will point out the experimental effects of the oral administration of fermented grape foods (FGP) by lactic acid bacteria. FGP are enriched in flavonoids and are able to inhibit allergic symptoms in the effector phase.

Marzulli and associates [5] will describe the *in vitro* activity of fermented grape marc (FGM) from Negroamaro and Kosu *Vitis vinifera* on normal human peripheral blood mononuclear cells. Both FGMs modulate the rate of proliferation/apoptosis/necrosis of lymphocytes, while decreasing respiratory burst of granulocytes and monocytes as well as basophil degranulation. All these *in vitro* activities support the anti-inflammatory/allergic activities displayed by grape polyphenols.

Nyanhanda and associates [6] will stress out the beneficial effects of fruit-derived proanthocyanins mostly in terms of lower prevalence of respiratory disease in fruit consumers. In particular, the ability of these natural products to reduce release of cytokine and eotaxin, increase antioxidant function and act on tissue remodeling and tight junctions will be described.

Tanaka [7] will place emphasis on the ability of flavonoids to interfere with allergic reactions, inhibiting release of Th2-type cytokines and CD40 ligand expression by mast cells and basophils.

These *in vitro* data are confirmed by epidemiologic studies which found lower incidence of asthma in a cohort of individuals with high intake of dietary flavonoids.

Li and associates [8] will discuss on the effectiveness of subcutaneous allergen specific immunotherapy in the treatment of IgE-mediated allergies. In particular, a better understanding of the crosstalk between skin and gut or airway will be helpful in the design of new strategies for the therapy of allergic disease.

Akiyama and associates [9] will provide experimental and clinical evidence on the preventive effects exerted by polyphenols (*e.g.*, O-methylated catechin), carotenoids, polysaccharides and non-digestible oligosaccharides on allergic disease.

Martinolli and associates [10] will stress out the problem of food allergies in childhood and new therapeutic strategies. In particular, oral, sublingual, epicutaneous or subcutaneous administration of small amounts of native or modified allergens represents a promising approach for food allergic patients.

Chung and Reed [11] will present recent findings about novel approaches to decrease allergenic proteins in foods. In particular, emphasis will be placed on new methods such as physical and chemical treatments, life style changes and the use of supplements to render hypoallergenic food products.

Cianferoni [12] will discuss on the current management of food allergies consisting of educating the patient to avoid responsible allergens and starting therapy. Also in this review the use of sublingual oral immunotherapy will be highlighted.

Miles and Calder [13] will discuss on the benefits of omega-6 and omega-3 polyunsaturated fatty acid administration to infants and children with allergic disease. In particular, fish oil supplementation in infancy may decrease the risk of developing allergic disease but whether this benefit is long-lasting needs further confirmation.

Ebo and associates [14 and 15] will illustrate the state of art in the diagnosis and therapy of food allergy. In particular, allergen component-based specific IgE assays and flow assisted quantification of activated basophils seem to represent novel diagnostic tools. Specific immunotherapy based on allergen specific treatments has recently been introduced and needs further validation.

Castell and associates [16] will present data on the efficacy of flavonoids in the treatment of allergic asthma or rhinitis. They conclude that certain flavonoids may represent an alternative or complementary therapy in the prevention or treatment of allergies but additional clinical trials are required to confirm the therapeutic role of flavonoids.

Huang and associates [17] will point out that collaborative efforts among clinicians, epidemiologists, immunologists and geneticists are highly required for the validation of dietary preventive interventions in allergic disease. In particular, population subgroups that would benefit from dietary treatments should be identified.

Mavrommati and Theoharides [18] will approach the problem of treating atopic conditions with complementary and alternative medicines. Dietary supplements containing chondroitin sulphate and bioflavonoids or various herbs, such as Forsythia, Ginko and Echinacea are object of investigation.

Scott and associates [19] will discuss on the dietary interventions in asthma, placing emphasis on the administration of omega-3 fatty acids. These compounds exert anti-inflammatory activities acting on different pathways, such inhibition of NF-kB and modification of eicosanoid production.

Magrone and associates [20] will provide evidence for the potential anti-allergic activities of Leucoselect®-Phytosome®, a compound enriched in epigallocatechin gallate. Administration of Leucoselect® Phytosome® to frail elderly patients is able to increase the release of Th1-type cytokines, thus, likely, inhibiting the Th2-mediated allergic reactions.

Peluso and associates [21] will provide evidence for the beneficial effect of mixed fruit-juice drink (FJD) and vitamin C in the prevention of postprandial stress. Decrease of the inflammatory response due to FJD may also prevent the risk of allergic disease.

Prakash and associates [22] will discuss about the use of probiotics for the prevention and treatment of allergic disease. In particular, concerning the mode of delivery, microencapsulation of probiotics seems to be an important device for oral administration of Lactobacilli and Bifidobacteria to allergic patients.

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