

From Functional Food to Nutraceutical

Broccoli Sprouts

Integral role in Cellular Defence including Detoxification

Overview of its Significance

We live in an era where modern medicine is strongly focused on relief of symptoms; the pharmaceutical industry provides many solutions to address this demand. It is becoming increasingly apparent, however, that the diseases which cause most distress at the individual level and are the most expensive at the public health level are not always responsive to such symptomatic therapy.

As a consequence, there is a groundswell of interest in seeking therapies which address the fundamental causes of disease as opposed to relieving the symptoms alone. Research into the biochemistry governing the causes of disease, however fails to capture public imagination in the way that newer avenues such as stem cell research and gene therapy have done.

Nevertheless, there are numerous research groups across the globe exploring the causes of disease at its very origins, within the cell and its organelles. Their goal is to understand the biochemical and cellular perturbations which lead ultimately to disease. Knowing where these biochemical events begin enables the development of targeted biomolecules which can alter the course of disease at the earliest stages of its development and long before symptoms appear.

Sulforaphane is one such biomolecule which is capable of influencing disease-causing processes very early and via many different mechanisms. Its actions are capable of favourably influencing processes like oxidative stress, inflammation, detoxification, DNA protection and immunity. These aberrations in the cell's normal chemistry are the forerunners to disease and are associated with premature ageing.

The ability to favourably influence these core processes can significantly protect against the development of disease in general. The term, chemoprotection refers to the ability of certain substances (usually fruits or vegetables) to prevent the development of disease. The Brassica family, also known as the Cruciferous Vegetable family (includes broccoli sprouts and cabbage) are well-known for their disease protective effects. **Sulforaphane** is naturally derived from certain species of this vegetable family. The association of decreased cancer risk with intake of cruciferous vegetables is stronger than that reported for fruits and vegetables in general[i].

If perturbations in the fundamental biochemistry can be prevented at the cellular level, then tissues, organs, systems and whole organisms may benefit in their overall health status [ii].

[1] Brigelius-Flohe R et al. Part of the series: From Dietary Antioxidants to regulators in cellular signalling and gene regulation. *Sulforaphane and selenium, partners in adaptive response and prevention of cancer*. [Free Radic Res](#) 2006;40(8):775-87

[ii] Houghton CA, Fassett RG, Coombes JS. *Sulforaphane: Translational Research from Lab Bench to Clinic*. [Nutrition Reviews](#). 2013 Nov;71(11):709-26.

