

Effect of quercetin on tight junctional proteins and BDNF signaling molecules in hippocampus of PCB exposed adult male rats

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Polychlorinated biphenyls induced ROS alters blood brain barrier integrity which is paralleled by tight junctional proteins. Brain derived neurotrophic factor plays an important role in the maintenance, survival of neurons and synaptic plasticity. It is predominant in the hippocampal areas vital to learning, memory and higher thinking.

Quercetin had drawn attention to the neurodefensive property. We aimed to study the role of quercetin on serum PCB, estradiol, testosterone levels and mRNA expressions of estradiol alpha and beta, expressions of tight junctional proteins, BDNF signaling molecules on hippocampus of PCB exposed adult male rats. Rats were divided into four groups:

Group I: Vehicle treated (i.p); II. quercetin 50 mg/kg bw (gavage); III. PCB (Aroclor 1254-2 mg/kg/bw/ip) treated and IV. quercetin 50 mg/kg/bw (gavage) simultaneous PCB same dose (ip). All treatments were for 30days/daily/ number of animals 6 each (adult albino male).

24h treatment animals were sacrificed, hippocampus was separated. Blood collected and sera were separated and analyzed for serum PCB (GC MS), testosterone and estradiol (RIA) and hippocampal mRNA expressions of tight junctional proteins, BDNF signaling molecules were studied by RTPCR. All the parameters were decreased, quercetin treatment brought back to normal. The data will be discussed with the available literature.

Nutraceuticals

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Nutraceuticals (often referred to as phytochemicals or functional foods) are natural bioactive and the constituents are either of known therapeutic activity or are chemically defined substance generally accepted to contribute substantially to the therapeutic activity of the drug. The term "Nutraceutical" was coined from "Nutrition" and "Pharmaceutical" in 1989 by Dr Stephen DeFelice.

Nutraceuticals provide all the essential substances that should be present in a healthy diet for the human. It provides energy and nutrient supplements to body, which are required for maintaining optimal health, act against various disease conditions and thus promote the quality of life. Nutrients, herbals and dietary supplements are major constituents of nutraceuticals. Nutraceuticals are non-specific biological therapies used to promote wellness, prevent malignant processes and control symptoms. Nutraceuticals, such as glucosamine and chondroitin sulfate, offer possible chondro-protective effects against joint injury. Many nutraceuticals, functional foods and naturally occurring compounds that have been investigated and reported in various studies revealed that these products have profound effect on cell metabolism and often have little adverse effect.

Nutraceuticals have been highlighted as the health industry of the future. It is going to be a growth industry supported by solid fundamental market drivers. Many new companies are coming up to meet the consumer demand of the nutraceutical products. Leading pharmaceutical companies are now in the process of starting new divisions in this business to capitalize upon the forthcoming new opportunities in this market. As per the study the global nutraceutical market was estimated to be \$ 149.5 billion in 2011 with US, Europe and Japan being the largest regional markets, accounting for nearly 93 per cent of the global nutraceutical demand. The Indian nutraceutical market valued at \$ 1,480 million is estimated to grow to US\$2,731 million in 2016 at a CAGR of 13%.

Biography

Shubham Rai has completed her UG from UPT University and M.Pharm at ITS College, Ghaziabad at the age of 24 years. For PG studies she received stipend from AICTE, New Delhi. She has published research papers in international journals of repute. She has delivered presentation at different national & international conferences which includes the presentation at CSIR-National Physical Laboratory New Delhi, Controlled Release Society-Indian Chapter, Mumbai.