

2nd International Conference on **Epidemiology & Evolutionary Genetics**

August 18-19, 2014 DoubleTree by Hilton Beijing, China

Forskolin and isoforskolin from native plant *Coleus forskohlii* play multiple biological roles

Fukai Bao

Kunming Medical University, China

Forskolin (also called Coleonol) is labdane diterpene that are produced by the plant Indian Coleus (*Coleus forskohlii*). Forskolin is commonly used to raise levels of cyclic AMP (cAMP) in the study and research of cell physiology. Forskolin resensitizes cell receptors by activating the enzyme adenylyl cyclase and increasing the intracellular levels of cAMP. cAMP is an important signal carrier necessary for the proper biological response of cells to hormones and other extracellular signals. It is required for cell communication in the hypothalamus/pituitary gland axis and for the feedback control of hormones. Cyclic AMP acts by activating cAMP-sensitive pathways such as protein kinase A and Epac. Forskolin is a vasodilator, which may help to decrease blood pressure. Applied with rolipram, forskolin provides a route to inhibition of colon cancer cell growth and survival. These two drugs also work together to induce long-term potentiation in neuronal populations. There have been more than two clinical studies examining the effectiveness of forskolin as a weight loss aid. Only one has been subjected to peer-review and published in a medical journal. This clinical study also observed forskolin's role in significantly increasing lean mass, bone mass, and testosterone in the overweight and obese men involved. This research has led to companies marketing forskolin as a bodybuilding supplement. Forskolin may be helpful in controlling the underlying cause of glaucoma. Successful use of forskolin to reduce intraocular pressure may be due to its unique ability to stimulate adenylyl cyclase activity and increase cAMP which regulates and activates critical enzymes required for the cellular energy required to move fluid out of the eye. Isoforskolin (also known as Coleonol B, 6-acetyl-7-deacetyl forskolin), was isolated from *Coleus forskohlii* native to Yunnan in China. It is identified as one analog of diterpene forskolin (FSK) which comes from the Indian plant *Coleus forskohlii*. Phytochemists found that the Yunnan native plant *Coleus forskohlii* contained rich ISOF but not FSK, so our interest has focused on the bioactivity of ISOF. Recently, ISOF was reported to activate adenylyl cyclase (AC) isoforms 1, 2 and 5. Yang's study demonstrated that ISOF increased cyclic adenosine monophosphate (cAMP) level in rat liver homogenate, and relaxed the histamine induced contraction of isolated guinea pig lung and trachea smooth muscle. Isoforskolin pretreatment attenuates acute lung injury induced by lipopolysaccharide (endotoxin). In human mononuclear leukocyte, isoforskolin (50, 100, and 200 μ M) and dexamethasone (10 μ M) pre-incubation lowered lipopolysaccharide (2 μ g/mL) induced secretion of the cytokine TNF- α , and interleukins (IL)-1 β , IL-6, and IL-8. In conclusion, pretreatment with isoforskolin attenuates lipopolysaccharide-induced acute lung injury in several models, and it is involved in down-regulation of inflammatory responses and proinflammatory cytokines TNF- α , IL-1 β , IL-6, and IL-8. Our results showed that ISOF can inhibit proinflammatory cytokine production of murine macrophages activated by LPS and Lyme disease spirochete outer membrane protein BmpA.

baofukai@126.com
baofukai@hotmail.com