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Multi-facet immune-modifying activities of specific phytochemicals from medicinal herbs

Recent studies showed that a spectrum of innate immune responses, various immune cell types and their cross-talks, and the associated inflammatory activities are involved with many different types of diseases. These findings strongly suggest that, by modulating specific immune cell responses or appropriately suppressing defined inflammatory activities of targeted diseases, we may design new approaches for therapy or treatment of certain inflammatory and chronic diseases, e.g., colitis, dermatitis, IBD and some cancers. Interesting, it's well known and appreciated that Traditional Chinese Medicine (TCM), especially some commonly used medicinal herbs, claimed with functional specificity (e.g., anti-dermatitis promote tissue-wound healing), and routinely used historically for hundreds to thousands of years, have been established for their "strong anti-inflammatory" activities toward specific organ targets.

With the observations and understandings, my laboratory has investigated a group of phytoextracts or the derived pure phytochemicals from specific TCM plants, and evaluated their bioactivities/effects, *in vitro* and *in vivo*, on dendritic cells, MDSCs, Tregs and other immune cell types in mouse models of skin inflammation, colitis and tumor metastasis systems. Experimentally, we employed functional genomics, proteomics, transgenic promoter analysis, cytokine/chemokine profiling, micro RNA array and signaling pathway analysis systems in cross-examination studies. Results and findings, published in eight key papers during the past five years will be discussed and projected for future research directions.

The key lesson we learned from these studies: Highly specific cellular, molecular and signaling pathway effect on mouse and human dendritic cells, tumor stromal cells, skin tissue cells can be obtained by specific phytochemicals from TCM, contributing to potent inflammatory-modulatory activities in test animals of disease models.

Biography

Ning-Sun Yang is a Distinguished Research Fellow and (Distinguished) Professor of Academia Sinica and the associated universities in Taipei, Taiwan. He received his PhD in biochemical genetics at MSU, USA. His major research interests include gene-based cancer vaccines, anti-inflammatory and anti-cancer phytochemicals, and functional genomics studies of dendritic cells. He initiated and helped the development of gene gun technology and pioneered its application to plant genetic engineering, mammalian gene transfer, DNA vaccines and gene therapy approaches. After thirty years of a research career in USA, he went back to Taiwan and established the Agricultural Biotechnology Research Center in Academia Sinica, Taipei, which is now recognized for medicinal and crop plant research. He was elected as a Fellow of the American Association for the Advancement of Science (AAAS, USA). He has published close to 140 research papers, and obtained 14 USA patents.

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