C-3-14

Comprehensive transcriptome and proteome analysis revealed Wolfberry (*Lycium barbarum*) as a novel dietary intervention in optimal IBD management

Wanping Aw [1,2] uepomu0410@gmail.com
Huijuan Jia[2] ginajhj77@yahoo.co.jp
Manaka Hanate[2] manaka.fh@gmail.com
Hiroshi Tanaka[1] tanaka@bioinfo.tmd.ac.jp
Hisanori Kato[2] akatoq@mail.ecc.u-tokyo.ac.jp

[1] Graduate School of Biomedical Science, Tokyo Medical and Dental University, Bunkyo-ku, Yushima 1-5-45, Tokyo 113-8510, Japan
[2] Corporate Sponsored Research Program "Food for Life", Organization for Interdisciplinary Research Projects, The University of Tokyo, Bunkyo-ku, Yayoi 1-1-1, Tokyo 113-8657, Japan

Keywords: Wolfberry, Transcriptomics, Proteomics, DSS induced colitic mice

Background and objectives
Wolfberry (WOL, *Lycium barbarum*), a traditional Chinese medicinal food has been reported to have antiaging, anticancer, health-promoting, and immune-boosting properties. We aimed to elucidate the anti-inflammatory molecular mechanisms of WOL in a dextran sodium sulphate (DSS) induced colitis model.

Methods
Seven-week-old male C57BL/6J mice were fed either 2% WOL or control diet for 1 week after which colitis was induced by administering 1.5% (w/v) DSS for 9 days and Disease Activity Index (DAI) was observed. Colonic mRNA and hepatic protein were extracted and subjected to microarray (Mouse Genome 230 2.0, Affymetrix) and quantitative iTRAQ proteome analysis respectively.

Results
WOL significantly suppressed colon length increase and DAI from Day 7 as compared to DSS group. Transcriptome and proteome analysis showed 131 altered genes and 227 altered proteins, respectively. Microarray and PCR evaluation showed that WOL supplementation significantly downregulated the expression of inflammatory cytokines-interleukin 6 (*IL6*) and matrix metallopeptidase 10 (*MMP10*); and haptoglobin (*HP*), a protein elevated in acute IBD. Expressions of genes downstream of *IL6*-- prostaglandin-endoperoxide synthase 2 (*PTGS2*); and *MMP10*-- intercellular adhesion molecule 1(*ICAM1*) and fibronectin 1(*FN1*) which are commonly elevated during inflammation were attenuated in WOL mice. In addition, proteome analysis revealed that serum amyloid A-1, a critical marker of inflammation which is regulated by *IL6* was decreased by WOL intervention.

Conclusion
These gene and protein expression alterations indicate that WOL modulates colonic inflammatory signaling and propose WOL as a novel dietary intervention in colitis prevention and therapy.