Comprehensive transcriptome and proteome analysis revealed

**Wolfberry (Lycium barbarum) as a novel dietary intervention in optimal IBD management**

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**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(FNI) 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.