

Tracing anti-inflammatory effects of ginger and zingerone from organ to cell by NF- κ B *in vivo* imaging

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Ginger is the rhizome of perennial herb *Zingiber officinale*, which contains ingredients including Zingerone, Gingerol, Shogaol, et al. The mainly active ingredient of ginger is Zingeron. Both in traditional Chinese medicine and recent medical research revealed ginger has antiemetic, anti-inflammatory, anti-oxidative, and anti-cancer effects. Inflammation is the protective precaution to human body against pathogens, and NF- κ B is the important parameter of inflammatory regulation and immunologic reaction. Up to date, most anti-inflammatory researches are limited on cellular experiments; therefore, we try to use *in vivo* imaging assay with IVIS analysis to tracing organ specific effect of ginger extracts and its compound, zingerone, in LPS-induced mouse model. According to the organ-specific results, we then use immunohistochemical staining analysis to define the specific cells involved majorly and probably associated pharmacological mechanism. As our results with IVIS organ-specific analysis system, ginger and zingerone could effectively inhibit inflammatory reaction on brain, liver, and duodenal area, and *in vivo* organ-specific image data showed best effects on jejunum. Our experiment results revealed the anti-inflammatory reaction through immunohistochemical method would inhibit NF- κ B (p65) 、IL-1 β and intestinal leukocytes (CD11b), which regulate leukocyte adhesion and inflammatory response. Our research supplied the *in vivo* imaging evidence of ginger and zingerone to manage its biomedical and pharmacological mechanism, and which research design may perfectly explain the role of ginger major belonging to the intestine meridian system in traditional Chinese medicine. That is, our research marvelous merge important basic experiment design in traditional Chinese medicine, and furthermore, upgrade modern applications of ginger and zingerone in biomedicine.

Key word: Ginger, Zingerone, NF- κ B, *in vivo* imaging, Meridian