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Unveiling the anticancer effect of traditional Chinese herbal medicine

Scientifically verifying traditional Chinese herbal medicine

Abstract
In this issue of World Journal of Gastroenterology, Huang and colleagues reported that Calculus bovis (CB), a traditional Chinese herbal medicine, impedes the growth of liver cancers in vivo. Through further in vitro studies, they showed that CB suppressed the M2 polarization of tumor-associated macrophages by suppressing the Wnt signaling pathway, which consequently inhibited the growth of liver cancer. Although the effects of traditional Chinese herbal medicine are often not scientifically proven, Huang and colleagues successfully identified the molecular mechanism involved in the anticancer effect of CB, and it is anticipated that the molecular mechanisms involved in the effects of other traditional Chinese herbal medicines will be scientifically elucidated, as demonstrated in this article.

Key Words: Calculus bovis; Chinese herbal medicine; Wnt; Hepatocyte carcinoma; Liver cancer; Tumor-associated macrophages; M2 polarization

Core Tip: The scientific evidence for the effectiveness of traditional Chinese herbal medicine has always been questioned. Huang and colleagues successfully identified the molecular mechanism involved in the anticancer effect of Calculus bovis. They showed that this herbal medicine controls the polarization of tumor-associated macrophages by regulating Wnt signaling. The scientific verification of other traditional medicines is awaited.
TO THE EDITOR

The effectiveness of traditional Chinese herbal medicine has been demonstrated through empirical evidence. However, scientific evidence has always been sought. With respect to this issue of the World Journal of Gastroenterology, Huang and colleagues investigated the effect of a traditional Chinese herbal medicine through *in vivo* and *in vitro* studies[1].

Calculus bovis (CB) is a traditional Chinese herbal medicine that has been used for its antitumor potential in various organs. Huang and colleagues reported that CB impeded the growth of liver cancers *in vivo* and investigated the anticancer effect of CB on liver cancers[1]. They identified 22 chemical constituents of CB *via* mass spectrometry, and further investigation revealed that CB suppressed the M2 polarization of tumor-associated macrophages (TAMs) by downregulating the Wnt signaling pathway, which consequently inhibited the growth of liver cancer.

Ample evidence indicates the involvement of Wnt signaling in cancers of multiple organs[2]. In the liver, Wnt signaling has been shown to play a pivotal role not only in tumorigenesis but also in the maintenance of homeostasis and regeneration[3]. Therefore, it is preferable to control the Wnt signaling pathway by regulating TAM polarization rather than simply blocking it. These findings suggest the strength of CB as a therapeutic agent for liver cancer.

Recent investigations on TAMs have revealed their crucial role in the progression of cancers, and the influence of TAMs on cancer stem cells has attracted increasing attention[4]. Previously, Yang and colleagues reported that hepatocyte carcinoma cells secrete Wnt ligands and induce M2 macrophage polarization[5]. Hence, CB can exert its effect by attenuating the effects of hepatocyte carcinoma-produced Wnt ligands and suppressing M2 polarization. Regulating the polarization of macrophages, as described in this study, can be considered an effective means to control tumor progression[6,7].

Despite their effectiveness according to empirical evidence, the effects of traditional Chinese herbal medicine are often not scientifically proven. However, Huang and
colleagues successfully identified the molecular mechanism involved in the anticancer effect of CB in this study. This long-awaited study provides scientific evidence for the use of Chinese herbal medicine. Moreover, since traditional Chinese herbal medicines have been used for many years, there is little concern about their adverse effects. It is anticipated that the molecular mechanisms involved in the effects of other traditional Chinese herbal medicines will be scientifically elucidated, as demonstrated in this article.
Mariko Yamada, Hideki Hayashi, Moe Yuuki, Nahoko Matsushima, Bo Yuan, Norio Takagi. "Furin inhibitor protects against neuronal cell death induced by activated NMDA receptors", Scientific Reports, 2018