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Anticancer effect of garcinol in hepatocellular carcinoma via inhibiting α7nAChRJAK2 axis

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Abstract

Background: Garcinol, a polyisoprenyl benzophenone isolated from fruiting bodies of Garcinia indica, and possessing antiinflammatory, antioxidant, acetyltransferase inhibitory and anticancer activities. our previously work has demonstrated α7nAChR drives the progression and recurrence of HCC through JAK2/STAT3 signalling, which has been linked with proliferation, survival, invasion and angiogenesis, and might be a novel target for anti-HCC therapy. Thus, novel agents that can suppress α7nAChR activation have potential for both prevention and treatment of HCC. Here we report, garcinol, could suppress α7-nAChR and downregulated JAK2/STAT3 axis in vitro and in vivo model of HCC.

Methods: Two HCC cell lines have been treated with garcinol and the inhibition of expression of α7-nAChR have been checked by immunoblotting, immuno-fluorescence, and RT-PCR. Xenografted tumour model has been generated in nude mice using HCC cell line and effect of garcinol in the inhibition of tumour growth has been investigated.

Results: Garcinol inhibit α7-nAChR and downstream JAK2/STAT-3 expression in Mahlavu and Hep-J5 cancer cell lines and was also found to inhibit cell proliferation, invasion, migration and lower the tumour's sphere-formation ability. Western blot and real-time PCR further evaluated the expression of α7-nAChR. These results is consist with our previously work on inhibition of α7-nAChR via siRNA. We further verified in vivo using human HCC xenograft tumours in nude mice, where administration of garcinol significantly inhibited tumour growth, improved overall survival, and western blot analysis of remnant tumour lysates showed reduced α7-nAChR expression and activation.

Conclusion: Together, these studies suggested garcinol exerts its anti-proliferative and pro-apoptotic effects through suppression of α7-nAChR and downregulated JAK2/STAT3 signalling in HCC both in vitro and in vivo.

Biography

Ching Li Li is a PhD student of Graduate Institute of Clinical Medicine, College of medicine, Taipei Medical University. She is also a general surgeon of Sijhih Cathay General Hospital, New Taipei City, Taiwan. Expert in laparoscopic oncology surgery. She is ever a international medical surgeon of Marshall Island Majuro hospital. She has her expertise in evaluation and passion in improving the health and wellbeing. Her practice focus on the liver cancer, hepatocellular carcinoma, and works in conjunction with researchers at the medical centre to pioneer clinical research which focuses on anticancer therapies.

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