

Study on the Mechanism of Yam Polysaccharide in the Treatment of Sarcopenia

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Abstract

Objective To study the main active components and potential mechanism of Chinese yam (Yam granule) in the treatment of sarcopenia by network pharmacology and in vitro experiments in mice. **Methods** The active components and main targets of traditional Chinese medicine components of yam were collected from the network database such as TCMSP, and the disease genes of sarcopenia were searched from the database such as GeneCards, and the targets and pathways of yam acting on sarcopenia were predicted by intersection. The mice were cultured and induced to differentiate in vitro. The cells were pretreated with yam medicated serum, and then stimulated with TNF- α inflammatory factor, resulting in muscle cell atrophy. Western blot and polymerase chain reaction showed that it could affect the expression of related proteins in NF- κ B pathway and AKT-mTOR pathway in muscle cells. **Results** In the action of yam on muscle, the core targets are MTOR, ESR1, EGFR, SIRT1, CTNBN1, VEGFA, ALB, IL6, TP53, TNF and AKT1, which may interfere with HIF-1, AGE-RAGE, TNF, PI3K-AKT-mTOR and other signal pathways. After the intervention of yam medicated serum, C2C12 muscle cells became thicker and the expression of MuRF1 mRNA decreased. In the western blot experiment, the drug-containing serum of Chinese yam decreased the amount of Atrogin-1 protein stimulated by TNF- α , inhibited the phosphorylation and degradation of I κ B α , and reduced the protein degradation. Yam medicated serum reduced the inhibition of TNF- α on p-AKT and p-4EBP1, and increased protein synthesis. **Conclusion** Chinese yam may have preventive and therapeutic effects on sarcopenia through network pharmacology and in vitro experiments. Yam inhibits NF- κ B pathway and slows down muscle protein degradation. Yam activates AKT-mTOR pathway and promotes protein synthesis in muscle cells.

Keywords

Yam Granule, Yam Polysaccharide, Sarcopenia, Multi- target Regulation, Network Pharmacology