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News & Comments

P. grandiflorus fosters, the treatment of breast cancer

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Many severe diseases, such as cancer, chemotherapy, and other powerful synthetic medications, inflict more harm than good, impacting an individual's bodily and emotional health, as well as their families' social well-being. People are increasingly resorting to herbal medicine, which involves the use of herbs for therapeutic purposes. Traditional Chinese Medicine (TCM), among other medicinal herbal techniques, has been viewed as a legitimate and current alternative or auxiliary treatment to anti-cancer medications and the side effects of chemotherapy, and can also be used to alleviate or mitigate these side effects. Network pharmacology is a branch of pharmacology that focuses on biological interactions and their genetic equivalents that play a key role in a drug's therapeutic effect.

A network pharmacology technique was used to deduce the mode of action of *P. grandiflorus* against breast cancer in this study. The anticancerous potential of *P. grandiflorus* is currently unknown due to a lack of evidence, and its mode of action is unknown. Furthermore, the predictive study using molecular docking tries to evaluate the active chemicals' potential activity in their interactions with the herb's potential therapeutic targets. This study provides a good foundation for determining the herb's potential capabilities for additional potentially medicinal purposes.

This network pharmacological investigation was conductedin the Computational Lab, Chongqing Engineering Research Center of Antitumor Natural Drugs, Chongqing, China.The TCMSP database was used to search for all constituents in *P. grandiflorus*, and then the KEGG pathway database was used to search for target proteins and genes specific to breast cancer. The STITCH database was used to determine the protective role and pharmacological activity of *P. grandiflorus* and its bioactive components, as well as the associated targets and biological pathways. GO word enrichment study, which was conducted using Cytoscape, demonstrated the therapeutic potential of linked proteins.

In *P. grandiflorus*, ten chemical compounds were discovered. Because their molecular weight and drug likeliness (DL, percent) values are >200 and 0.1, respectively, all of these compounds have medical characteristics. Furthermore, their Oral Bioavailability (OB, percent) values are greater than 10, indicating that all of these drugs are easily absorbed through the oral route. The PPI network that resulted is made up of functional interactions, with nodes and edges representing target proteins and/or their associated genes, as well as connections between various genes.

P. grandiflorus' involvement in Traditional Chinese Medicine (TCM) has been highlighted due to its efficacy in the treatment of a variety of illnesses, including inflammation, obesity, and cancer. Various

studies have indicated its usefulness in cancer treatment; however, the mechanistic action of many herbs is uncertain due to the unknown molecular mechanisms of diverse substances and their interactions with various target proteins. The molecular method of action of *P. grandiflorus* was investigated in this work to determine its therapeutic effect on breast cancer. The retrieval of chemical compounds, the prediction of target compounds, the creation of the PPI network, and the enrichment analysis were all part of this multi-step research. *P. grandiflorus*' involvement in Traditional Chinese Medicine (TCM) has been highlighted due to its efficacy in the treatment of a variety of illnesses, including inflammation, obesity, and cancer. Acacetin has been linked to the suppression of the cell cycle, cell death, caspase activation, and mitochondrial death signalling in cancer cells. Acacetin inhibited cellular proliferation in carcinoma cells and contributed to a decrease in the survival of breast cancer cells. Acacetin promoted the prevention of cellular development in malignant cells by activating the ROS-JNK pathway, as found in a recent study. Luteolin has been widely recognized as having anti-cancer properties. Luteolin caused apoptosis in breast cancer cells and slowed their migration in vitro, suggesting that the substance may also prevent breast cancer cells from crossing the lymphatic barrier.

According to the findings, *Platycodon grandiflorus* compounds like acacetin, spinasterol, cisdihydroquercetin, luteolin, robinin, and platycodin D interact with proteins like JUN, FOS, EGFR, and MAPK8, and their mutual interplay is linked to breast cancer manifestation and treatment with *Platycodon grandiflorus*, indicating the importance of the herbal compounds' synergistic relationship with the target protein.

JOURNAL REFERENCE

Qiang, M., D. Xuesong, X. Shu, L. Guoli and C. Jie *et al*., 2022. Network pharmacology based retrieval of bioactive ingredients of *Platycodon grandiflorus* and its molecular mechanism against breast cancer. Int. J. Pharmacol., 18: 428-436.

KEYWORDS

Platycodon grandiflorus, STITCH, biological effects, cytoscape, breast cancer, mechanism of action, molecular targets