Drug Design, Development and Therapy

Dovepress

open access to scientific and medical research

Open Access Full Text Article

LETTER

Thinkful of Icariin Induces Triple-Negative Breast Cancer Cell Apoptosis and Suppresses Invasion by Inhibiting the JNK/c-Jun Signaling Pathway [Letter]

Sela Septima Mariya, Ratih Rinendyaputri, Uly Alfi Nikmah

Center for Biomedical Research, Research Organization for Health, National Research and Innovation Agency (BRIN), Cibinong Science Center, Cibinong, West Java, Indonesia

Correspondence: Ratih Rinendyaputri, Center for Biomedical Research, Research Organization for Health, National Research and Innovation Agency (BRIN), Cibinong Science Center, Jl. Raya Bogor No. 490, Cibinong – Bogor Km. 46, Cibinong, West Java, Indonesia, Email ratih.rinendyaputri@brin.go.id

Dear editor

Icariin/ICA is a flavonoid bioactive produced from the roots and leaves of the Epimedii herb, which is used to treat a number of ailments. Extracts of Epimedii herbs contain several bioactivities, including the capacity to prevent cancer cell invasion and migration, improve sexual function and memory, raise phytoestrogen activity, boost immunology, and have anti-inflammatory qualities[1] Gao et al found that the use of ICA to induce apoptosis and reduce invasion of triple-negative breast cancer (TNBC) was successful in silico and in vitro.[2] Nonetheless, findings were studied, evaluated, and merited greater discussion in the study and treatment strategies reported in this paper.

In this investigation, ICA concentrations able to promote apoptosis and reduce cancer cell invasion. The activation of JNK/c-jun and an increase in the number of cell deaths show this (Annexin V).[2]Previous research reported that different concentrations of 5, 10 and 20 μM showed the effect of increasing the ratio of Bax/Bcl2 genes, apoptotic rate and suppressing cell invasion. Previous research has shown that using ICA can promote stem cell proliferation and differentiation. Song et al conducted an in vivo test using a dose of 20 mg/kg and 40 mg/kg and in general, ICA regulates the immunosuppressive microenvironment and mediates apoptosis and anti-metastasis in breast cancer cells via the SIRT6/NF-kB signaling pathway.[3] The use of doses needs to be considered its effect on stem cells and other normal cells. For this reason, in vivo tests and clinical trials need to be carried out to determine the effect on stem cells and normal cells.

This study used in silico and in vitro testing for future studies that will be followed up with in vivo tests to ensure that the proper dose is obtained while not being hazardous to normal or stem cells. Evaluation of the expression of gene role in apoptosis using RT-qPCR to Hs 578T and MDA-MB-468 cells treated with ICA can be performed to confirm the ICA induces development of apoptosis pathway via the extrinsic or intrinsic pathway. The development of apoptosis-targeting anticancer drugs has gained much interest since cell death induced by apoptosis causes minimal inflammation and gene expression is a method usually use to evaluate profile regulation which play role in the diseases such as diabetes, Alzheimer,[4] etc. In addition to doses, repeated administration can also be considered in vivo trials. A prior study has undertaken ICA injection in rats with tumors, the use of non-human primate/NHP animal models can be explored considering the genetic similarities of NHP to humans.[4,5]

Acknowledgments

Gao S et al deserve praise for their productive work in this sector. The authors would also like to thank Dr. Sunarno and all of the researchers at the Center for Biomedical Research BRIN for their continuous assistance.

Received: 24 March 2023
Accepted: 11 April 2023
Published: 24 April 2023

Disclosure

All authors stated that there is no conflict of interest regarding the communication.

References

1. Seyedi Z, Amiri MS, Mohammadzadeh V, et al. Icariin: a promising natural product in biomedicine and tissue engineering. Vol. 14. In: *Journal of Functional Biomaterials*. MDPI; 2023.
2. Gao S, Zhang X, Liu J, et al. Icariin induces triple-negative breast cancer cell apoptosis and suppresses invasion by inhibiting the JNK/c-Jun signaling pathway. *Drug Des Devel Ther*. 2023;17:821–836. doi:10.2147/DDDT.S398887
3. Song L, Chen X, Mi L, et al. Icariin-induced inhibition of SIRT6/NF-κB triggers redox mediated apoptosis and enhances anti-tumor immunity in triple-negative breast cancer. *Cancer Sci*. 2020;111(11):4242–4256. doi:10.1111/cas.14648
4. Darusman HS, Mariya SS, Sari IK, et al. Spontaneous expression of the gene of KI67 and P53 in cynomolgus monkeys infected with papillomavirus. *Vet World*. 2022;15(4):962–967. doi:10.14202/vetworld.2022.962-967
5. Darusman HS, Saepuloh U, Mariya SS, Sajuthi D, Schapiro SJ, Hau J. Increased expression of GAPDH in cynomolgus monkeys with spontaneous cognitive decline and amyloidopathy reminiscent of an Alzheimer's-type disease is reflected in the circulation. *Am J Primatol*. 2021;83(11). doi:10.1002/ajp.23296

https://doi.org/10.2147/DDDT.S414046