Advances in Pharmacology and Therapeutics Journal
Shahid Sadoughi University of Medical Sciences, Yazd, Iran
SHAHID SADOUGHI UNIVERSITY OF MEDICAL SCIENCES

Letter to the Editor

Main Molecular Factors and Pathways in the Anti-cancer Act of Crocin

Running Title: Anticancer Act of Crocin

Marzieh Lotfi[1,3], Seyed Hossein Shahcheraghi[2,3*]
[1]Abortion Research Center, Reproductive Sciences Institute, Shahid Sadoughi University of Medical Sciences, Yazd, Iran
[2]Infectious Diseases Research Center, Shahid Sadoughi Hospital, Shahid Sadoughi University of medical sciences, Yazd, Iran
[3]Department of Medical Genetics, School of Medicine, Shahid Sadoughi University of medical sciences, Yazd, Iran

ARTICLE INFO

Received: 04/09/2022
Accepted: 05/31/2023

*Corresponding author
Department of Medical Genetics, School of Medicine, Shahid Sadoughi University of medical sciences, Yazd, Iran
Tel: +98- 9132531389
E-mail
shahcheraghih@gmail.com

Abstract

One of the herbal materials with several anti-inflammatory and antioxidant characteristics is crocin, an effective component derived from saffron, which can be applied to cure a range of diseases. It has been demonstrated that crocin has an important impact on controlling pathological situations such as inflammation, oxidative stress, neurodegenerative diseases, metabolic disorders, and cancer. Notch, PI3K/AKT/mTOR, and cyclic-AMP response element-connecting factor pathways may all be involved in crocin's neuroprotective properties. With its inhibitory effect on toll-like receptors, crocin also preserves the cardiovascular system. Treatment of metabolic problems may be performed by crocin's regulatory influence on the PI3K pathway, mitogen-activated protein kinases, and peroxisome proliferator-stimulated receptor pathways. This letter has investigated effective molecular factors in the anticancer act of crocin.

Keywords: Crocin, Anticancer, Molecular factors

Citation: Lotfi M, Shahcheraghi H. Main Molecular Factors and Pathways in the Anti-cancer Act of Crocin. Adv Pharmacol Ther J. 2023;3(2): 84-86.

Dear Editor,

One of the herbal materials with several anti-inflammatory and antioxidant characteristics is crocin, an effective component derived from saffron, which can be applied to cure a range of diseases (1).

It has been demonstrated that crocin has an important impact on controlling pathological situations such as inflammation, oxidative stress, neurodegenerative diseases, metabolic disorders, and cancer. Notch, PI3K/AKT/mTOR, and cyclic-AMP response element-connecting factor pathways may all be involved in crocin's neuroprotective properties. With its inhibitory effect on toll-like receptors, crocin also preserves the cardiovascular system. Treatment of metabolic problems may be performed by crocin's regulatory influence on the PI3K pathway, mitogen-activated protein kinases, and peroxisome proliferator-stimulated receptor pathways.

Via MAPK, PI3K/AKT/mTOR, VEGF, Janus kinases, and Wnt/β-catenin crocin have an anti-cancer effect. Moreover, the stimulation of the p53 and nuclear factor-erythroid factor 2-related factor 2 may contribute to the anticancer properties of crocin (2).

Human skin cancer cells can be considerably prevented from growth by Crocin, which can also stimulate cell cycle arrest in the G0/G1 phase. Also, it can encourage cells to undergo apoptosis. The JAK/STAT pathway's downregulation may be associated with the apoptosis mechanism (3).

Crocin treatment also can reduce the viability of BT-474 cells and also stimulates the early and late phases of apoptosis in these cells, according to research on the anti-cancer characteristics of this known HER2+ breast cancer cell line. The stimulation of the expression of caspase-9 was the process by which crocin exerted its effects on these cells (4).

This letter showed that signaling pathways specially MAPK, PI3K/AKT/mTOR, VEGF, Janus kinases, and Wnt/β-catenin are very important for the anti-cancer effect of crocin. Thus, more investigations are essential about these signaling pathways and crocin's impact on them in various cancers.

Thus, the following cases are critical points that should be investigated in future studies:

1. Animal experiments are essential for crocin to act on signaling pathways in the cancer cell lines.
2. Crocin is a herbal drug and it can be used as a drug with many effects on cancers. It has fewer dangers.
3. Other pathways such as TGF-β are also important in the cancers. These signaling pathways should be also investigated in future research.

Conflict of interest: Authors state that they have no conflict of interest.

Funding: No

Acknowledgment: Authors like to thank the infectious diseases research center for their aid.

Authors' contribution: ML designed the title and SHSH Wrote the manuscript. All of the authors revised and approved the final version.

References

1. Bastani S, Vahedian V, Rashidi M, Mir A, Mirzaei S, Alipourfard I, et al. An evaluation on potential anti-oxidant and anti-inflammatory effects of Crocin. Biomed Pharmacother. 2022;153:113297.
2. Boozari M, Hosseinzadeh H. Crocin molecular signaling pathways at a glance: A comprehensive review. Phytother Res. 2022;36(10):3859-84.

DOI: https://doi.org/10.18502/aptj.v3i2.13460

3. Wang G, Zhang B, Wang Y, Han S, Wang C. Crocin promotes apoptosis of human skin cancer cells by inhibiting the JAK/STAT pathway. Exp Ther Med. 2018;16(6):5079-84.
4. Faridi N, Heidarzadeh H, Mohagheghi MA, Bathaie SZ. BT-474 breast cancer cell apoptosis induced by crocin, a saffron carotenoid. Basic & Clinical Cancer Research. 2019;11(1):5-15.