



The College of Graduate Studies and the College of Science Cordially Invite You to a

Master Thesis Defense

Entitled

*ROLE OF AUTOPHAGY IN ACRIDOCARPUS ORIENTALIS-INDUCED ANTI-BREAST CANCER
ACTIVITY*

by

Suhib Hisham Ahmed Saeed Altabbal

Faculty Advisor

Yusra Al Dhaheri, Department of Biology
College of Science

Date & Venue

10: 00 AM

Thursday, 11 November 2021

https://teams.microsoft.com/l/meetup-join/19%3ameeting_YmViYTI0YjltYTdlMCM0ZDgwLTk5YTQzMjU5OTA2ZGQzM2Zm%40thread.v2/0?context=%7b%22id%22%3a%2297a92b04-4c87-4341-9b08-d8051ef8dce2%22%2c%22oid%22%3a%22333943ab-4632-48af-b3aa-8554fb701d04%22%7d

Abstract

Breast cancer is the most frequently diagnosed cancer in women worldwide. Triple Negative Breast Cancer (TNBC), which lacks the expression of the hormonal Estrogen Receptor (ER) and Progesterone Receptor (PR), and the amplification of Human Epidermal Growth Factor Receptor 2 (HER2), is not responsive to the hormonal therapy making chemotherapy and radiotherapy, which cause severe side effects, the current available choices to treat TNBC. Therefore, there is an urgent need to find new novel targets and therapeutic choices for TNBC. It is estimated that 50% of all drugs in clinical use during the 21st century are natural products and plants derived. *Acridocarpus orientalis* is a rare plant used in folk medicine to treat many health conditions. The aim of this study is to evaluate the anti-cancer activity of *Acridocarpus orientalis* Ethanoic Extract (AOEE) against TNBC cell line MDA-MB-231, and to investigate the molecular mechanisms underlying its activity. The results revealed that AOEE inhibits cell proliferation in a concentration- and time-dependent manner. The anti-proliferative effect of AOEE was found to be accompanied with the induction of cell cycle arrest at the G1/S phase. These changes were accomplished with upregulation of p21^{WAF1} and p27^{Kip1}, downregulation of PCNA, Cyclin D1, phospho-Rb. Moreover, AOEE induces autophagy through upregulation of autophagy related proteins LC3-II, Beclin-1, p62. Cellular senescence was induced in AOEE treated MDA-MB-231 cells confirmed by p16 upregulation and senescence-associated β -galactosidase (SA- β -gal) expression in the treated cells. In conclusion, AOEE inhibits the proliferation of MDA-MB-231 breast cancer cells through induction of autophagy, cellular senescence and DNA double stranded breaks, suggesting that *Acridocarpus orientalis* could be a potential source for novel chemotherapeutic agents against TNBC.

Keywords: *Acridocarpus orientalis*, triple-negative breast cancer, autophagy, cell cycle arrest, cellular senescence, DNA damage