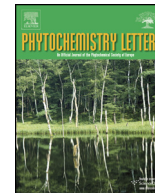




ELSEVIER

Contents lists available at ScienceDirect

## Phytochemistry Letters

journal homepage: [www.elsevier.com/locate/phytol](http://www.elsevier.com/locate/phytol)

Short communication

## Synthesis and cytotoxic effects of (E)-3-(2,3-dimethoxyphenyl)-1-(5-methylfuran-2-yl) prop-2-en-1-one in MDA-MB231 and MCF-7 breast cancer cell lines



Muhammad Nadeem Akhtar<sup>a,\*</sup>, Landa Zeenelabdin Ali Salim<sup>b</sup>, Swee Keong Yeap<sup>c,d</sup>,  
Nadiah Abu<sup>e</sup>, Seema Zareen<sup>a</sup>, Kong Mun Lo<sup>f</sup>, Addila abu Bakar<sup>a</sup>,  
Noorjahan Banu Alitheen<sup>e</sup>

<sup>a</sup> Faculty of Industrial Sciences & Technology, Universiti Malaysia Pahang, Lebuhraya Tun Razak 26300, Kuantan, Pahang, Malaysia

<sup>b</sup> Department of Pharmacy, Faculty of Medicine, University of Malaya, Kuala Lumpur 50603, Malaysia

<sup>c</sup> Institute of Bioscience, Universiti Putra Malaysia, UPM Serdang 43400, Selangor Darul Ehsan, Malaysia

<sup>d</sup> Xiamen University Malaysia Campus, Jalan Sunsuria, Bandar Sunsuria, 43900 Sepang, Selangor, Malaysia

<sup>e</sup> Department of Cell and Molecular Biology, Faculty of Biotechnology and Biomedical Sciences, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

<sup>f</sup> Department of Chemistry, Faculty of Science, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia

View metadata, citation and similar papers at [core.ac.uk](http://core.ac.uk)

brought to you by CORE

provided by UMP Institutional Repository

## ARTICLE INFO

## Article history:

Received 30 September 2016

Received in revised form 5 December 2016

Accepted 16 December 2016

Available online 28 December 2016

## Keywords:

Synthesis of DMMF

Cytotoxicity

MCF-7

Apoptosis

Single x-ray crystallography

## ABSTRACT

A chalcone derivative, (E)-3-(2,3-dimethoxyphenyl)-1-(5-methylfuran-2-yl)-prop-2-en-1-one (DMMF) was synthesized and evaluated against various cancerous cell lines including colon adenocarcinoma (HT-29), myeloplasticleukemia (HL60), breast cancer (MCF-7 and MDA-MB231), normal hepatic cell (WRL-68) and normal breast cell (MCF-10A). The structure of DMMF was determined by EI-MS, <sup>1</sup>H NMR and single X-ray crystallographic techniques. The DMMF possessed the highest cytotoxic effect against MCF-7 breast cancer cell (2.01 ± 1.53 µg/mL) and lowest against normal hepatic WRL-68 and breast cell lines after 24 h of treatment. Induction of apoptosis and regulation of cell cycle progression results indicates the significant increase in early apoptosis and G2/M arrest after 48 h of treatment in MCF-7 cells. Meanwhile, in MDA-MB231 cells, there was an increase in Sub G0/G1 cells population and early/late apoptotic cells upon treatment with DMMF. Additionally, DMMF effectively induced G2/M cell cycle arrest in MCF-7 cells and apoptosis in both MCF-7 and MDA-MB231 cells.

© 2016 Phytochemical Society of Europe. Published by Elsevier Ltd. All rights reserved.