

ANNUAL CONGRESS ON
BIOMEDICAL AND BIO INSTRUMENTATION

May 27, 2022 | Webinar

Accepted Date: 06-01-2022 | Accepted Date: 07-01- 2022 | Published date: 30-06-2022

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The isolation of isoflavonoids and related analogues: A bright path to tackle hormonal related disorders

Phytoestrogens are plant constituents with a di-phenolic structure similar to estrogen. They are found in a wide variety of edible plants. They bind to estrogen receptors but preferentially to ER. They may act as weak estrogens in some circumstances. Phytoestrogens bind to both ER α and ER β but preferentially to ER β (8-40x more). They also inhibit tumor growth factors such as Protein Tyrosine Kinases (PTK) and DNA Topoisomerases involved in tumorigenesis. Phytoestrogens may inhibit Vascular Endothelial Growth Factor (VEGF) and possess antioxidant qualities. The importance of these secondary metabolites encouraged us to develop a cross-kingdom assay that carries a chemically inducible gene expression system, which was introduced to describe a novel strategy in which transgenic plants are used to measure the bioactivity of mammalian proteins. It is a new, low-cost, easy, and efficient estrogenic screening platform. In 2005, our group published the first report on a cross-kingdom bioassay utilizing transgenic pER8: GFP Arabidopsis for the detection of compounds possessing estrogen agonist or antagonist activities. The shoots of transgenic plants were used as a material for the screening of the estrogenic activity. In 2013, we developed for the first time a transgenic pER8:GUS Arabidopsis callus in a cross-kingdom assay to evaluate the estrogenic activity of 17 β -estradiol (E2) and natural products. The transgenic plants were utilized to produce many calli, which stably expressed transfer genes by asexual reproduction. The optimum formula for calli induction and production were selected from sixteen solid media and six liquid media, respectively. This assay was used to evaluate the phytoestrogenic activity of many plants used in Asian folk medicine. The assay proved sensitive and selective for compounds with phytoestrogenic activity.

Recent Publications

1. Mohamed El-Shazly, The Antileukemic and Anti-Prostatic Effect of Aeropylsinin-1 Is Mediated through ROS-Induced Apoptosis via NOX Activation and Inhibition of HIF-1 α Activity. *Life* 2022 May; 12(5):687
2. Mohamed El-Shazly, The effectiveness of Fuzi in combination with routine heart failure treatment on chronic heart failure patients. *Journal of Ethnopharmacology*. 2022 Feb; 289(25):115040
3. Mohamed El-Shazly, The Impact of Polyphenolic In The Management of Breast Cancer: Mechanistic Aspects and Recent Patents. *Discovery*. 2021 Dec; 177(12): 454-460

Biography

Mohamed El-Shazly is the head of pharmaceutical biology department, faculty of pharmacy and biotechnology, the German university in Cairo, Cairo, Egypt. He was graduated from the faculty of pharmacy, ain-shams university, Cairo, Egypt in 2000. In 2006, he received his master's degree from jacobs university bremen, bremen, Germany in nanomolecular science, and he pursued his Ph.D. focusing on the synthesis of pharmaceutical intermediates and natural products. In 2009, he received his Ph.D. and went back to Egypt to join his home institute. In 2011, he worked at the graduate institute of natural products, kaohsiung medical university, kaohsiung, Taiwan.

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