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Breast Cancer Research Awareness DSR-BCRA

(Health, Lifestyle, Wellbeing)

IEEE Access
Multidisciplinary | Rapid Review | Open Access Journal

Particle Swarm Optimization Feature Selection for Breast Cancer Recurrence Prediction

Sakri, SB, Rashid, NBA, Zain, ZM

Abstract:
Women who have recovered from breast cancer (BC) always fear its recurrence. The fact that they have endured the painstaking treatment makes recurrence their greatest fear. However, with current advancements in technology, early recurrence prediction can help patients receive treatment earlier. The availability of extensive data and advanced methods make accurate and fast prediction possible. This research aims to compare the accuracy of a few existing data mining algorithms in predicting BC recurrence. It embeds a particle swarm optimization as feature selection into three renowned classifiers, namely, naive Bayes, K-nearest neighbor, and fast decision tree learner, with the objective of increasing the accuracy level of the prediction model.

Publication Year
2018

PLOS ONE

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Breast cancer mortality in Saudi Arabia: Modelling observed and unobserved factors

Refah Mohammed Alotaibi

Abstract

Breast cancer is one of the most dangerous and frequently occurring cancers among women, and it also affects men. We aimed to determine the prevalence and factors associated with mortality among patients with breast cancer in Saudi Arabia.

Data for this analysis of breast cancer mortality among Saudi Arabians were obtained from the Saudi Arabian Cancer Registry at the King Faisal Hospital and Research Centre. Both descriptive and inferential statistical analyses were conducted using proportions, chi-squared tests, and the Cox regression model. Frequentist and Bayesian inferential statistics were used to estimate the risk ratios. A frailty term was specified to control for suspected heterogeneity across regions. Bayesian and deviance information criteria were used to discriminate between the frequentist and Bayesian frailty models, respectively.

Publication Year
2018

biomolecules

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Potential Role of Curcumin and Its Nano formulations to Treat Various Types of Cancers

Kabir, MT; Rahman, MH; Akter, R; Behl, T; Kaushik, D; Mittal, V; Pandey, P; Akhtar, MF; Saleem, A; Albadrani, GM; Kamel, M; Khalifa, SAM; El-Seedi, HR; Abdel-Daim, MM

Abstract

Cancer is a major burden of disease globally. Each year, tens of millions of people are diagnosed with cancer worldwide, and more than half of the patients eventually die from it. Significant advances have been noticed in cancer treatment, but the mortality and incidence rates of cancers are still high. Thus, there is a growing research interest in developing more effective and less toxic cancer treatment approaches. Curcumin (CUR), the major active component of turmeric (Curcuma longa L.), has gained great research interest as an antioxidant, anticancer, and anti-inflammatory agent. This natural compound shows its anticancer effect through several pathways including interfering with multiple cellular mechanisms and inhibiting/inducing the generation of multiple cytokines, enzymes, or growth factors including IκB kinase β (IκKβ), tumor necrosis factor-alpha (TNF-α), signal transducer, and activator of transcription 3 (STAT3), cyclooxygenase II (COX-2), protein kinase D1 (PKD1), nuclear factor-kappa B (NF-κB), epidermal growth factor, and mitogen-activated protein kinase (MAPK).

Publication Year
2021

ACS Medicinal Chemistry Letters

Benzofuran-Based Carboxylic Acids as Carbonic Anhydrase Inhibitors and Antiproliferative Agents against Breast Cancer

Wagdy M. Eldehna*, Alessio Nocentini*, Zainab M. Elsayed, Tarfah Al-Warhi, Nada Aljaeed, Ohoud J. Alotaibi, Mohammad M. Al-Sanea, Hatem A. Abdel-Aziz**Hatem A. Abdel-Aziz** Department of Applied Organic Chemistry, National Research Center, Dokki, Cairo 12622, Egypt More by Hatem A. Abdel-Aziz, and Claudiu T. Supuran

Abstract:
Pursuing our effort for developing effective inhibitors of the cancer-related hCA IX isoform, here we describethe synthesis of novel benzofuran-based carboxylic acid derivatives,featuring the benzoic (9a–f) or hippuric (11a,b) acid moieties linked to 2-methylbenzofuran or 5-bromobenzofuran tails via an ureido linker. The target carboxylic acids were evaluated for the potential inhibitory action against hCAs I, II, IX, and XII. Superiorly, benzofuran-containing carboxylic acid derivatives 9b, 9e, and 9f acted as submicromolar hCA IX inhibitors with KIs = 0.91, 0.79, and 0.56 μM, respectively, with selective inhibitory profile against the target hCA IX over the off-target isoforms hCA I and II (SIs: 2 to >63 and 4–47, respectively). Compounds 9b, 9e, and 9f were examined for their antiproliferative action against human breast cancer (MCF-7 and MDA-MB-231) cell lines. In particular, 9e displayed promising antiproliferative (IC50 = 2.52 ± 0.39 μM), cell cycle disturbance, and pro-apoptotic actions in MDA-MB-231 cells.

Publication Year
2020

3-Methylthiazolo[3,2-a]benzimidazole-benzenesulfonamide conjugates as novel carbonic anhydrase inhibitors endowed with anticancer activity: Design, synthesis, biological and molecular modeling studies

Alkhaldi, AAM, Al-Sanea, MM, Nocentini, A, Eldehna, WM, Elsayed, ZM, Bonardi, A, Abo-Ashour, MF, El-Damasy, AK, Abdel-Maksoud, MS, Al-Warhi, T, Gratteri, P, Abdel-Aziz, HA, Supuran, CT, El-Haggar, R

Abstract

Herein we describe design and synthesis of different series of novel small molecules featuring 3-methylthiazolo[3,2-a]benzimidazole moiety (as a tail) connected to the zinc anchoring benzenesulfonamide moiety via ureido (7), enaminone (12), hydrazone (14), or hydrazide (15) linkers. The newly prepared conjugates have been screened for their inhibitory activities toward four human (h) carbonic anhydrase (CA, EC 4.2.1.1) isoforms: hCA I, II, IX and XII. Thereafter, the urea and enaminone linkers were elongated by one- or two-atoms spacers to afford the elongated counterparts 9 and 13, respectively. Finally, the zinc anchoring sulfonamide group was replaced by the carboxylic acid group to afford acids 17. Compounds 12d, 13b and 15 displayed single-digit nanomolar CA IX inhibitory activities (KIs = 6.2, 9.7 and 5.5 nM, respectively), along with good selectivity towards hCA IX over hCA I and II. Subsequently, they were screened for their growth inhibitory actions against breast cancer MCF-7 and MDA-MB-231 cell lines, and for their impact on cell cycle progression and induction of apoptosis. Moreover, a molecular docking study was conducted to gain insights for the plausible binding interactions of target sulfonamides within hCA isoforms II, IX and XII binding sites.

Publication Year
2020

AACR American Association for Cancer Research

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Thymoquinone and epicatechin ameliorate the anticancer properties of tafuramycin-A against naive and resistant breast cancer cells

Ohoud Y. Alshehri, Hanan A. Henidi, Fahad A. Alabbasi, Ibrahim M. El-Deeb, Majed A. Halwani and Ahmed M. Al-Abd

Abstract

Tafuramycin-A (TAF) is naturally occurring duocarmycin-SA derivative with known DNA alkylating and/or intercalating potential. On the other hand, TAF possesses excessive and non-specific toxic properties. Epicatechin (EPI) and thymoquinone (TQ) are naturally occurring compounds with a wide range of biological activities, such as anticancer and chemomodulatory potentials. Herein, we temporally assessed the anti-breast cancer properties of TAF alone and in combination with EPI or TQ against naïve (MCF-7, MDA-MB-231 and T47D cells) and resistant breast cancer cells (MCF-7Adr). TAF alone showed very potent cell-killing properties against both naïve and resistant breast cancer cell lines in a time-dependent manner with IC50's ranging from 17 - 190 nM, 2 - 19 nM and 1 - 2 nM after 24 h, 48 h, and 72 h exposures, respectively. To a lesser extent, TQ alone showed moderate cytotoxic properties against all cell lines in a time-dependent manner with IC50's ranging from 4.4 - 18.9 µM, 2.8 - 16.5 µM and 2.1 - 22.7 µM after 24 h, 48 h, and 72 h exposures, respectively.

Publication Year
2020

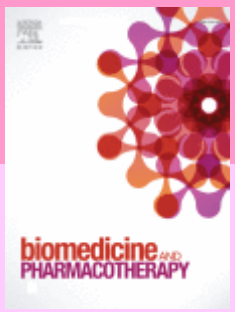
Novel oxindole/benzofuran hybrids as potential dual CDK2/GSK-3 beta inhibitors targeting breast cancer: design, synthesis, biological evaluation, and in silico studies

Wagdy M Eldehna 1, Sara T Al-Rashood 2, Tarfah Al-Warhi 3, Razan O Eskandrani 2, Amal Alharbi 2, Ahmed M El Kerdawy 4

Abstract

The serine/threonine protein kinases CDK2 and GSK-3β are key oncotargets in breast cancer cell lines, therefore, in the present study three series of oxindole-benzofuran hybrids were designed and synthesised as dual CDK2/GSK-3β inhibitors targeting breast cancer (5a-g, 7a-h, and 13a-b). The N1 -unsubstituted oxindole derivatives, series 5, showed moderate to potent activity on both MCF-7 and T-47D breast cancer cell lines. Compounds 5d-f showed the most potent cytotoxic activity with IC50 of 3.41, 3.45 and 2.27 µM, respectively, on MCF-7 and of 3.82, 4.53 and 7.80 µM, respectively, on T-47D cell lines, in comparison to the used reference standard (staurosporine) IC50 of 4.81 and 4.34 µM, respectively.

Publication Year
2021



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Exploration of therapeutic applicability and different signaling mechanism of various phytopharmacological agents for treatment of breast cancer

VandanaSinghaKuldeepKumarbqDeepikaPurohitcRavinderVermaaParijatPandeypSaurabh BhatiadeVinayMalikfVineetMittalaMd. HabiburRahmangGhadeer M.AlbadranihMohammed W.ArafahiFatma M.El-DemerdashjMuhammad FurqanAkhtarkAmmaraSaleemlMohamedKamelmAgnieszkaNajdanMohamed M.Abdel-DaimoDeepakKaushika

Abstract

In this review, we have discussed the number of plants along with their patents of different herbal formulations which are being used for the treatment of BC and other types of cancers. We have also delineated the different signaling mechanisms through which they inhibit the growth of BC cells. In nutshell, we can conclude that large numbers of herbs or their extracts are reported for the treatment of BC. But still, there is further need for research in-depth to translate the use of natural products clinically BC treatment.

Publication Year
2021

Antioxidant and Understanding the Anticancer Properties in Human Prostate and Breast Cancer Cell Lines of Chemically Characterized Methanol Extract from Berberis hispanica Boiss. & Reut

y Loubna El Fakir 1,Kaoutar Bouothmany 2ORCID,Amal Alotaibi 3,*,Mohammed Bourhia 4,*ORCID,Riaz Ullah 5,*ORCID,Saira Zahoor 6,Mohamed El Mzibri 2,Said Gmouh 7,Tajelmolk Alaoui 1,Abdelhamid Zaid 1 andLaila Benbacer

Abstract

The current research was conducted to investigate the chemical profile, antiproliferative, and antioxidant activities of methanol extracts obtained by two different methods including maceration and Soxhlet from Berberis hispanica Boiss. & Reut. Antiproliferative activities were evaluated by the MTT (3-(4, 5-dimethylthiazolyl-2)-2, 5-diphenyltetrazolium bromide) assay in four human cancer cell lines including prostate (LnCap and 22 RV1) and breast cancer (MDA-MB-231 and MCF7). The antioxidant power was evaluated by DPPH ((2,2-diphenyl-1-picryl-hydrazyl-hydrate), ABTS (2,2′-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid), and FRAPS (Ferric reducing antioxidant power) tests. The chemical composition was conducted by gas chromatography-mass spectrometry (GC-MS) after methylation. Total phenolic and flavonoid contents were assessed using the Folin–Ciocalteu method..

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2021

Springer

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Antitumor effect of copper nanoparticles on human breast and colon malignancies

Mohammed Al-zharani, Ashraf Ahmed Qurtam, Walid Mohamed Daoush, Mohamed Hassan Eisa, Nada Hamad Aljarba, Saad Alkahtani & Fahd A. Nasr

Abstract
Breast and colon carcinomas are two types of common cancers which lead to cancer-related deaths. Due to their cytotoxic potential against cancer cells, recently many studies of copper nanoparticles (CuNPs) have been conducted. In the current work, we aim to evaluate the cytotoxic and apoptosis-inducing effects of CuNPs on the human breast (MCF-7) and colon (LoVo) cancer cells. CuNPs were prepared in starch-stabilizing aqueous solution by electroless deposition technique in alkaline tartrate bath using formaldehyde as the reducing agent of copper sulfate. The obtained CuNPs were characterized by SEM, TEM, and XRD to confirm the particle size, morphology, and chemical composition. Standard colorimetric MTT and LDH assays were used to estimate the cytotoxic effect of CuNPs on MCF-7 and LoVo cells.

Publication Year
2021

SAGE journals

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Evaluating the Quality of Life and Sleep Quality in Saudi Women with Breast Cancer-Related Lymphedema: A Cross-Sectional Correlational Study

Nissren Tamam1, K. S. Al-Mugren1, H. I. Alrebdi1, Abdelmoneim Sulieman2, and Walid Kamal Abdelbasset

Abstract

Of the total number of participants 27 women had been diagnosed with stage I lymphedema, 84 women had been diagnosed with stage II lymphedema, and 52 women had been diagnosed with stage III lymphedema. All participants have shown low scores on both EORTC QLQ-C30 and PSQI. While analyzing the differences between the 3 stages of lymphedema with the Kruskal–Wallis test, noteworthy statistical differences between the 3 stages of lymphedema ($P < .05$) have been found. The Stage III lymphedema patients have been shown the lowest quality of life values in all scales when compared with the stage I and stage II lymphedema patients. For PSQI scores, the stage III lymphedema patients worse values than the stage I and stage II lymphedema patients ($P < .05$).

Publication Year
2021

Hindawi

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Poly Lactic-Co- Glycolic Acid- (PLGA-) Loaded Nanoformulation of Cisplatin as a Therapeutic Approach for Breast Cancers

Saad Alkahtani , 1 Saud Alarifi,1 Gadah Albasher,1 Mohammed Al-Zharani,2 Nada H. Aljarba,3 Mohammed H. Almarzoug,1 Norah M. Alhoshani,1 Norah S. AL-Johani,1 Hani Alothaid , 4 and Abdullah A. Alkahtane1 1 D

Abstract

Despite recent advancements in cisplatin (cis-diamminedichloroplatinum II) and other platinum-based chemotherapeutic drugs for treating solid tumors, their uses are limited by either in terms of toxicity and/or acquired drug resistance. These side effects have a dangerous problem with higher dose for severe patients. To overcome the low therapeutic ratio of the free drug, a polymeric nanoparticle drug delivery system has been explored promoting delivery of cisplatin to tumors. Recently, the applications of nanoparticles (NPs) have been underlined for encouraging the effects of chemotherapeutic drugs in cancerous cells. The intention of this project is to assess the potential of poly lactic-co-glycolic acid (PLGA) nanoparticles (NPs) for enhancing the effects of anticancer drug cisplatin. For the purpose, we have synthesized PLGA-cisplatin nanoparticles for increasing its bioavailability and studied the comparative cytotoxicity of free cisplatin and PLGA-cisplatin against MCF-7 cancer cell lines and HEK-293 normal cell lines. We have also analyzed the hallmarks of PLGA-cisplatin-induced apoptosis. The outcomes of this study may provide the possibility of delivery of anticancer drug to their specific site, which could minimize toxicity and optimize the drug efficacy

Publication Year
2021

Journal of King Saud University – Science

Cytotoxic activity and toxicity study of HF8, a poly-herbal formulation

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Abstract

ntroduction:Breast cancer ranked the 2nd amongst all cancer in terms of mortality worldwide.Objective:We evaluated the anticancer, apoptotic activity and toxicity of the polyherbal formulation,HF8, prescribed by the herbalist in Saudi Arabia.Methods:HF8 was prepared by mixing different proportion of plants namelyRosmarinus officinalis.L,Vitisviniferaseeds,Cichorium intybusseeds,Trigonella foenum-graecumL seeds,Lavandula multifidaL.,Pistacialentiscusresin,commiphora myrrharesin, andViola odoratafl ower. The HF8 was evaluated for its cytotox-icity using human breast adenocarcinoma (MCF-7, and MDA-MB-231 cells) cell lines.Results:The result revealed promising cytotoxicity on the MCF-7 (IC50: 107mg/mL) and MDA-MB-231(IC50: 89.5mg/mL) cell lines. Further, HF8 was assessed for its apoptotic potential using acridine orange(AO)/ethidium bromide (EB) dual staining and Caspase-3/7. After incubation with MDA-MB-231, theHF8 inducted apoptosis through the activation of caspase-3/7. The toxicity of the HF8 was assessed usingzebrafish and Swiss Albino mice. The zebrafish embryos did not show any noticeable toxicities or terato-genicity when treated with HF8 with a concentration from 0.001 to 300mg/ml. In acute toxicity, no mor-tality detected after a single dose (5000 mg/kg) administration to Swiss Albino mice of both genders.Conclusions:HF8 extract has the potential for development into a potent anticancer agent against breastcancer, albeit further studies are needed to evaluate the mechanism of action as well as validation ofother drug development processes

Publication Year
2021

Morphine Deteriorates Cisplatin-Induced Cardiotoxicity in Rats and Induces Dose-Dependent Cisplatin Chemoresistance in MCF-7 Human Breast Cancer Cells

Azza A K El-Sheikh 1 2, Zenat Khired 3

Abstract

orphine (MOR) is a strong analgesic that is often used in treatment of severe pains during cancer treatment, and thus might be concomitantly used with anticancer drugs as cisplatin (CP). The aim of the current study was to investigate the mechanisms by which MOR can affect CP-induced cardiotoxicity and to explore effects of MOR on the cytotoxic efficacy of CP. MOR (10 mg/kg/day i.p.) was administered to rats for 10 days, with or without 7.5 mg/kg CP single i.p. dose at day 5 of the experiment. In addition, MOR and/or CP were administered to MCF-7 cells to test their cytotoxicity. Compared to control, CP caused cardiotoxic effects manifested by significant increase in serum enzymatic markers; creatine kinase-MB and lactate dehydrogenase, with histopathological cardiac damage. In addition, CP caused cardiac oxidative stress, manifested by significant increased tissue lipid peroxidation product; malondialdehyde and nitric oxide, with significant decrease in tissue antioxidants as reduced glutathione, superoxide dismutase and catalase compared to control. Furthermore, CP significantly increased tissue proinflammatory cytokines; TNF-α and IL-6, as well as upregulated the apoptotic marker; caspase 3 compared to control. MOR/CP combination significantly deteriorated all tested parameters compared to CP alone. In MCF-7 breast cancer cells, administration of MOR in concentrations of 0.1, 1, 10 or 30 µM concomitantly with 1 or 10 µM CP caused dose-dependent reduction in CP-induced cytotoxicity in vitro. In conclusion, MOR administration might deteriorate CP-induced cardiotoxicity during cancer chemotherapy through oxidant, pro-inflammatory and apoptotic mechanisms, and might reduce CP chemotherapeutic efficacy

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BMC

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Low-temperature extracts of Purple blossoms of basil (Ocimum basilicum L.) intervened mitochondrial translocation contributes prompted apoptosis in human breast cancer cells

Mariam Abdulaziz Alkhateeb, Wedad Refaiea Al-Otaibi, Qwait AlGabbani, Amena Ali Alsakran, Alaa Ahmed Alnafjan, Amani Mohammed Alotaibi & Wedad Saeed Al-Qahtani

Abstract

The preventive and therapeutic medical utilization of this plant is an age-long practice across the globe. This study aimed to validate the impact of dark purple blossoms of basil (Ocimum basilicum L.) aqueous extract at low temperature (0 °C) mediated mitochondrial fission contributed to induced apoptosis in human breast cancer cells.

Fresh blossoms were extracted at low temperature (0 °C) using a watery solvent. Human MCF7 breast cancer cells were then treated with 3 separate fluctuated concentrations of 0, 50, 150 and 250 µg/mL for 24 and 48 h.

The outcomes demonstrated the presence of anthocyanins, anthraquinones, tannins, reducing sugars, glycosides, proteins, amino acids, flavonoids and volatile oils and nonappearance of Terpinoids and alkaloids. Contrastingly, frail presence of steroids in basil blossoms aqueous concentrate was noted. In addition, the results from a phytochemical subjective examination of basil (Ocimum basilicum L.) blossoms aqueous extract demonstrated that most of the credited natural impacts containing more remarkable contents of antioxidants and anticancer compounds in basil blossoms aqueous extract. Moreover, the restraint of glucose take-up was alleviated mediated by a dose-dependent manner in MCF7 cells with basil (Ocimum basilicum L.) blossoms aqueous extract inducted for 24 h, resulting in mitochondrial fission.

Publication Year
2021