Proceeding of The First International Conference of Iraqi Center for Cancer and Medical Genetics Research

29 & 30 October 2024
Baghdad - Iraq

DOI: 10.29409/ijcmg.v17iS-1

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Abstract

Background: Cancer is the second most common cause of morbidity and mortality in children. This study aimed to epidemiologically and demographically assess common cancers in children in Iran. Materials and methods: This cohort study was conducted on children registered in Mahak Hospital and Rehabilitation Complex (which is a non-governmental organizations (NGO)-related hospital for only malignant diseases). A total of 2232 questionnaires were filled out for cancer patients between 2007 and 2016. The factors including age, gender, race, family history, type of treatment, and type of cancer were entered into Cox regression model to examine their effect on mortality of children diagnosed with cancer. Results: The Cox regression model showed that age, race, type of cancer, family history of cancer, and type of treatment had a significant effect on mortality of children diagnosed with cancer ($P < 0.05$). The hazard ratio (HR) of mortality in 1015- years old was higher than that of 15- years old ($P = 0.03$, HR = 1.3). The HR of mortality in patients with brain tumor ($P < 0.01$, HR = 2.24), sarcoma ($P < 0.01$, HR = 2.32), and neuroblastoma ($P < 0.01$, HR = 2.56) was twice the value in patients with leukemia. The HR of mortality in patients who had a family history of cancer was higher than that of patients without it ($P < 0.01$, HR = 1.33). Patients who had undergone chemotherapy along with surgery and radiotherapy ($P = 0.02$, HR = 0.68) and patients who received chemotherapy along with surgery ($P = 0.01$, HR = 0.67) had a lower HR of mortality compared to the chemotherapy group. Conclusion: Young age, multidisciplinary approach, and absence of family history were associated with lower hazard of death in children diagnosed with cancer; brain tumor, leukemia, and sarcoma had higher hazard of mortality compared to leukemia. Children with a family history of cancer should be under regular follow-up. Treatment should be multidisciplinary and comprehensive.

Keywords
Cancer, Cox models, childhood, epidemiology, survival

Receiver-operating characteristic curve analysis of biomarkers in prognosis, diagnosis, and follow-up of Breast Cancer

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Abstract

Breast cancer is among the most frequently diagnosed cancers in women, and there are multiple genetic and environmental causes involved in the progression of this type of cancer. For the Serological Study, an ELISA test was performed to estimate mammaglobin-A concentration in serum samples. The findings showed that its levels were increased in malignant samples with a mean of 3.74 ng/ml. Resistin level was also elevated in malignant samples with a mean equal to 4.195 ng/ml. CA153- level as an important tumor marker was increased in malignant samples with a mean of 36.15 Unit/ml. CEA level was elevated in malignant samples with a mean of 41.983 ng/ml. The findings also showed that Mucin (MUC) concentration was increased in malignant samples with a mean of about 33.45 ng/ml. AKT level was increased in malignant samples with a mean of about 3.174 ng/ml. In conclusion, our study found that these tumor markers in combination may be a useful way for prognosis, detection, and also follow-up of BC. CEA and MUC are the best markers in their sensitivity and specificity.

Keywords
Breast Cancer, mammaglobin, Resistin, CA153-, CEA, Mucin, AKT

Risk Factors Associated with Breast Cancer among Women in Al-Najaf Province

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Abstract

Breast cancer is the most common malignant among females in Al-Najf, Iraq, and around the world. The aim of the study was to identify risk factors associated with BC. A hospital-based case-control study enrolled 100 women with BC and 200 healthy women selected by purposive sampling methods. Data collected by questionnaire form through direct interview, which consisted of four parts. Risk factors were estimated descriptively using percentages and odd ratios with their correlated 95% confidence interval. The predictors of the occurrence of breast cancer were determined using logistic regression to estimate unadjusted association and adjusted association. BC risk was found to be increased in women with age after 40 years and elderly especially ≥60 years (OR: 10.18, 95% CI: 4.1388,25.048), illiterate women (OR: 2.24, 95% CI: 1.06, 4.73), living in low economic status (OR: 2.87, 95% CI: 1.31,6.27), smoking (2.634, 95% CI: 1.021,6.792), women who bottle-feed their children (OR: 2.16, 95% CI: 1.01,4.61), eating backed and processed food (P: <0.001), overweight and obese women (OR: 1.875, 95% CI: 0.208, 16.88) and (OR: 4.062, 95%CI: 0.463, 35.64) , previous abortion (OR: 1.08, 95% CI: 0.64,1.83), women who didn't perform routine self-examination (P: 0.051), women who didn't have information about BC (P: 0.041), women who didn't visit health facilities for breast examination (P: <0.001). The majority of participants had at least one risk factor for BC and had low knowledge; consequently, women's awareness of these factors must be enhanced through proper channels. Prevention programs are necessary to be established to emphasize the benefits of early detection and treatment. Screening programs must be carried out in accordance with risk, and women ought to be invited to healthcare facilities for screenings. Further studies are needed; one of the most effective methods to combat BC is increasing the quantity of high-quality research in this field.

Keywords
Breast Cancer, Risk Factors, Al-Najaf Province

Analysis and Comparison of Highest Cancers in Iraq

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Abstract

Cancer is considered the second cause of death after strokes in Iraq. This paper discusses cancer diseases in Iraq with special reference to the ten most common diseases and mortality, as well as cancer diseases and mortality of children and comparisons for both sexes. Publications of Iraqi Cancer Board, Annual Report, and Iraqi Cancer Registry 2022 on the prevalence and mortality of common cancers in Iraq were used and analyzed for the ten most common types of cancers in Iraq for both genders as well as for children of age (0 – 14). The analysis of data on the prevalence and mortality of higher cancer diseases in Iraq indicated that male cancers were higher than female, leukemia, brain, and breast cancers are considered the highest cancer prevalence and mortality, as well as in children, the general trend of cancers is positive. We concluded that there is an increase in the rates of cancers, with the possibility of reducing the risks of these cancers through attention and developing plans to combat them and reduce their effects and early detection. In Iraq, the cause of the spread of cancer diseases, especially in the southern regions of Iraq, is due to environmental pollution and the entry of toxins into drinking water, in addition to radiation resulting from the successive wars in Iraq.

Keywords
Cancer, Iraqi Childhood cancers, WHO, Iraqi Cancer Registry 2022, Iraqi Cancer Board

Global Leukemia Cancer; Analysis & Indicators

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Abstract

Leukemia is a malignant disease of the blood and bone marrow that leads to cancer, which makes up a percentage of 2.5% of all other cancers with a small mortality rate of 3.1 among the deaths of other cancers. The paper discusses the global data on leukemia cancer, its analysis and comparison by region, and a discussion of children›s cancer cases of this type. Publications for the year 2022 on the prevalence and mortality of leukemia cancer diseases by regions were used, with a comparison and finding their indicators, illustrated with graphs for each country. The analysis of data indicates that this type of cancer has the lowest incidence and mortality of other cancer types, the highest incidence and mortality were in Asia and Europe, and the lowest were in Oceania. With an examination of mortality and prevalence data, along with information on the disease›s frequency in children under ten, this paper provided a thorough explanation of leukemia›s prevalence. In 2022, the number of cases of leukemia increased, particularly among Asian men.

Keywords
Cancer incidence, epidemics, prevalence, mortality, Iraqi Childhood Leukemia, WHO

Exploring the Epidemiological Patterns of Diet in Breast Cancer Patients: A Comprehensive Study for Public Health

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Abstract

Background: Breast cancer is one of the most common cancers diagnosed in women worldwide, with increasing incidence, mainly in industrialized nations. A number of risk factors, including lifestyle, environmental conditions, and genetics, contribute to the development of breast cancer, In addition, diet is recognized as a changeable factor influencing the incidence and survival rate. Patients and Methods: This study was conducted at Hiwa Oncological Hospital in Sulaymaniyah City, Iraq. A total sample size of 301 patients diagnosed with breast cancer was collected between June 2023 and January 2024. The collected data included the patient's demographic data, medical histories, dietary habits, and other relevant parameters that are associated with their daily dietary regimens. The data were then analysed using IBM SPSS Statistics. Results: The majority of patients were aged between 4049-, and the most common breast cancer subtype was invasive ductal carcinoma (IDC) among patients located in Sulaymaniyah City. The study revealed the epidemiological patterns of the dietary habits of the patients and how they play a significant role in the development of breast cancer. The study had also revealed the patterns of the diet according to the subtype of the breast cancer, showing that the majority of the patients had a balanced diet, consumed 12- meals of fruit and vegetables per day, and had no dietary restrictions. Conclusion: These outcomes underline the importance of promoting a healthy lifestyle with dietary habits and screening to lessen the breast cancer burden in the region, and initiating the role of diet and early detection among the population could be critical in lowering breast cancer rates and improving outcomes.

Keywords
Breast cancer; diet; invasive ductal carcinoma; breast cancer epidemiology

Detection of gene expression in sentinel lymph node of primary breast cancer patients

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Abstract

Sentinel lymph node (SLN) micrometstasis detection improves outcome for breast cancer follow up procedure. The aim of the present study was to identify gene profiles that accurately predicted the outcome of breast cancer patients. Fifty tumor sample from breast cancer patients were analyzed for the expression of 3 genes using quantitative-PCR. Also clinical verification for recurrence to distant organs was performed. Three gene signature were confirmed based on tumor›s stage, grade, ER status, using conditional logistic regression. Based on this findings, the negative reported lymph nodes for metastasis, had micro metastasis in significant values. There was a significant difference between normal and cancer samples in 3 gene expression marker and also there was meaningful relationship between three gene expression with tumor›s grade, stage according to progression of tumor. A novel gene expression signature predictive of micro metastatic patients was evaluated. In this assessment, relationship between this gene with tumor›s features that finding clear role for these genes with tumor›s outcome, needs to be established.

Keywords
Breast cancer, Gene signature, Iran., Sentinel lymph node

Chromosome 7 deletions associated with Nephrocalcinosis in an Iraqi Family

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Abstract

A family of six members who suffering nephrocalcinosis requested chromosomal analysis from our laboratories in Iraqi center for cancer and medical genetics. G-banding chromosomal analysis was performed according ICCMGR protocol, imaged karyotype by using CytoVision (Leica microsystems Crop) and chromosomal were designation according to ISCN respectively. The relatives showed breaks at rare fragile site 7p22 some as chromatid breaks others as chromosomal deletion. The adult members abnormalities extending to 7p21 band. For our knowledge the correlation of fragile site7p22 and nephrocalcinosis has not been previously reported as we showed in our present study, Only two studies mentioned to the role of the association between aldosterone and 7p22 and the other study mentioned to association of aldosterone and nephrocalcinosis ,so our current study clarifies a new relationship between 7p22 and nephrocalcinosis especially when we know that the region holds some genes which involved in renal genesis and kidney function so , we concluded that because of region 7p22-ter holds effective genes involve in kidney function , their deletion may led to appearance of nephrocalcinosis and the fragile site 7p22 may has role in nephrocalcinosis.

Keywords
Chromosomal aberration, deletion7p22, Nephrocalcinosis ,Iraqi patients

Examination of Chromosome's Aberration and Histological Changes on Bone Tissues in White Mice Caused by Exposures to Bisphenol A as Comparison to Vitamin C Treatment's

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Abstract

This study investigated histological and chromosomal abnormalities in bone marrow samples of mice treated with Bisphenol A compared to antioxidant treatments (vitamin C). Thirty mice (mixed gender) at the age of 68- weeks and weighing 25gm were obtained from the Iraqi Center of Cytogenetic and Tumor Research in Baghdad city, then kept in the animal house of the College of Veterinary Medicine University of Baghdad. Feeding special belts and drinking tap water in special bottles was then adopted for one month, the experiment began in December 2023 and ended in February 2024. Animals divided into 3 groups: 1st group ten mice were orally treated with Bisphenol A at dose 50mg/kg Body Weight 3 days/week (Sunday, Tuesday and Thursday) alone for 4 weeks. Second group ten mice were orally treated with Bisphenol A at dose 50mg/Kg Body Weight 3 days/week (Sunday, Tuesday and Thursday) plus orally treatment of vitamin C at dose of 0.056mg/g Body Weight for 4 weeks. Third group: ten mice were treated with normal physiological saline as control group, after 4 weeks the experiments was ending. Results showed that Bisphenol A caused harmful effects on cell›s genetic material (chromosomes) represented by ring chromosomal, Breaks, Deletions of one or two arms of chromosomes, as well as caused changes in normal histological structures of bone tissue characterized by loss of normal cellular matrix component›s mainly osteocytes which appear as empty vacuoles with no nuclei associated with abnormal mineralization and calcification as comparison to control group and vitamin C treated group. Conclusion: Antioxidants like Vitamin C have protective effects against Bisphenol A toxicity characterized by lowering or absent chromosomal defect with restorer›s normal histological components of bone.

Keywords
Bisphenol A, Vitamin C, Chromosomal Abnormalities, Histological Changes, Bone, Mice

The Potential Role of HDAC1 and HDAC3 Immunoexpression in p53 Downregulation and Tumor Aggressiveness of Colon and Rectum Carcinomas Patients

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Abstract

Objective: Colorectal cancer, ranking second in global cancer mortality following lung cancer, arises from diverse causes. While the genetic aspects of colorectal cancer (CRC) have been extensively explored, there is growing recognition of the substantial involvement of epigenetic modifications of histones at the DNA level in various malignant diseases, including CRC. This research sought to evaluate the immunoexpression of HDAC-1 and 3 in a cohort of colorectal cancer patients. Additionally, we investigated potential associations between the expression of HDAC-1,3 and p53. Methods: The retrospective analysis encompassed 95 paraffin-embedded tissue samples from CRC cases, involving participants aged 22 to 79 years, including 60 males and 35 females. Results: Notably, the expression of the p53 protein exhibited a remarkable correlation with the protein expression of both HDAC1 ($p < 0.001$, rho = 0.522) and HDAC3 ($p < 0.001$, rho = 0.411), as well as the advanced TNM staging of the patients ($p = 0.002$, rho = 0.313). Downregulated p53 was correlated with underexpressed HDAC1& HDAC3. Nevertheless, the observed expression of p53 exhibited a negative but significant correlation with the ages of the patients. Conclusion: The outcomes of this research highlight the diagnostic and prognostic importance of protein 53 in CRC. Our data in respect with the expression of HDACs-P53 correlation could pave the way to hypothesize a possible mechanism of action between the expression of HDACs and 53, highlighting the need for broader studies on Whole Transcriptome Sequencing level to thoroughly illustrate the pattern of interplay between p53 and HDACs.

Keywords
Colorectal cancer, TNM, Immunoexpression, HDACs, P53

Evaluation of salivary carcinogenic microR-21 and miR-125a expression associated with alcohol consumption and smoking

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Abstract

Objectives: The concept of "lifestyle" includes different factors such as nutrition, behavior, stress, physical activity, working habits, smoking and alcohol consumption. Increasing evidence shows that environmental and lifestyle factors may influence epigenetic mechanisms, such as DNA methylation, histone acetylation and microRNA expression. Since microRNAs (miRNAs) represent an emerging field of cancer research, there is an increasing interest regarding the miRNA responses to lifestyle choices. MiR-21 has been established as an oncogenic miRNA while miR-125a was reported as suppresser genic miRNA in different cancer diseases. The aim of this study was to analyze whether cigarette smoking and alcohol consumption, are associated with the dysregulated level of these salivary miRNAs in healthy individuals. Material and methods: Fifty supernatant saliva samples from fifty healthy individual (smoker 10% and alcohol drinker 34%) were analyzed with non-smokers and non-alcohol drinkers by real-time polymerase chain reaction. The expression level of miR-21 and miR-125a was compared in those samples of healthy individuals with different demographical characteristics, social status, drinking and smoking habits. Results: Our data demonstrate overexpression of salivary miR-21 in individuals with regular alcohol consumption and smokers while miR-125a expression level was showed a non-significant influenced in both groups. Conclusion: Differential expression of salivary miR-21 of healthy individuals from a small geographic region's population shows correlation with the existence of common risk factors.

Keywords
microR-21, miR-125a, smoking

Investigation the Role of Toll-like Receptor-9 gene and miR-155 Expression levels in Acute Myeloid Leukemia via Quantitative Real-time PCR

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Abstract

According to the importance of TLR-9 in the course of Acute Myeloid Leukemia (AML), this study aimed to assess it as a signal for the onset of the disease. Over the past ten years, research has revealed that miRNAs are involved in almost every aspect of the development of AML disease, including cellular proliferation, survival, and differentiation. These findings prompted research into miRNAs as disease biomarkers including miR-155, and efforts to therapeutically modify miRNAs to better manage AML disease are still ongoing. The study included (40) samples of Iraqi patients diagnosed with AML during chemotherapy and relapsed course and (40) healthy control as a case-control study. The methods included the measurement of some hematological parameters using a CBC device, RNA was extracted, its concentration and purity were measured, converted into cDNA, and then the gene expression of the TLR-9 and miR-155 genes was measured. Although there were no significant variations in the levels of WBC and lymphocytes between the patients and the healthy subjects in this investigation, there were significant differences in the levels of hemoglobin, erythrocytes, hematocrit, and platelets between the patients and the control group. The fold expression of the TLR-9 gene was comparable among the study groups, as indicated by the results, which were (1.000) and (1.491) for patients and healthy subjects, correspondingly. The miR-155 results were (0.608) and (1.000) for patients and healthy control, respectively, the findings demonstrated that there was downregulation in the fold expression of the miR-155 gene in patients compared to healthy control. It is plausible that cancer cells down-regulate TLR-9 and miR-155 gene expression to evade the immune system which might increase the prospect of AML severity and progression. The dysregulation of the TLR-9 gene during oncogenesis and the down-regulation of miR-155 may act as a prognostic factor in AML patients.

Keywords
Acute Myeloid Leukemia, Pattern Recognition Receptors, Toll-Like Receptor-9 gene, miR-155, Gene expression

Unraveling the Impact of miRNA-199a-5p Delivery on MCF-7 Cell Viability: A Lipofectamine Perspective

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Abstract

Lipofectamine is a commonly used transfection reagent in molecular biology. It›s a lipid-based molecule that helps introduce foreign genetic material (like DNA or RNA) into cells. This study explored the potential of Lipofectamine to kill breast cancer cells (MCF-7 line) using the MTT assay. The miRNA mimics, inhibitors, and negative control (NC) were synthesized and labeled with Stealth/siRNA Transfection Protocol Lipofectamine 2000 ThermoFisher. The study employed both miRNA-199a-5p mimic and inhibitor groups. While the mimic augmented miRNA-199a-5p function, the inhibitor suppressed it. Statistical significance was determined by p-values below 0.05. Both the mimic (p=0.0084) and inhibitor (p=0.0113) groups produced statistically significant results. In conclusion, Lipofectamine demonstrated efficacy in transferring miRNA into MCF-7 cells while causing minimal cellular damage. Peak miRNA expression was observed 72 hours after transfection. Modulation of miRNA-199a-5p levels substantially affected the survival of breast cancer cells.

Keywords
MCF-7, miRNA-199a-5p, Lipofectamine, MTT assay, miRNA

Basal Cell Carcinoma of Maxillofacial Region

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Abstract

Basal cell carcinoma is one of the most common types of skin cancer, experiencing a significant increase in global cases over recent years. This slow-growing cancer is known for its localized nature and very rare ability to spread. It mainly affects the skin that is exposed to the sun, with a particular preference for the face, especially the area around the mouth and nose. Our study aimed to explore the characteristics of BCC in the face, focusing on the maxillofacial region. We compared several advanced diagnostic techniques, including scraping, scratching, and imprinting, as well as the use of diode lasers at wavelengths of 940nm & 980nm. The study covered BCC lesions on the face ranging from 0.5 cm to 2.5 cm in diameter that were treated with diode laser ablation between July 2016 and June 2024 at Ramadi Teaching Hospital at Anbar Health Directorate and a private clinic in Ramadi City, Anbar Province, Iraq. Among the 48 patients with BCC, the majority (62%) were 50 years old or older, with more males (59%) than females, the most common area affected was the middle third of the face (36% of cases). This study showed that cytological examination is a simple and effective method that does not require local anesthesia, saves time and money compared to traditional biopsies, and provides quick diagnoses. The use of diode laser ablation was also found to be highly successful, achieving outstanding results in terms of both function and appearance over a 6-month period. Complications from the treatment were rare.

Keywords
Basal Cell Carcinoma, Maxillofacial Region

10-Year Clinical Outcome of Definitive Radiotherapy in T1-T2 Laryngeal Squamous Cell Carcinoma in Terms of Survival and voice preservation in a Developing Country and region of conflict: A Single Institution Retrospective Report

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Abstract

Early-stage laryngeal cancer represents a great proportion of cancer patients treated with definitive radiotherapy (RT). This study aimed to evaluate the outcomes of radical RT for T1-T2 cN0 laryngeal cancer at an institution, which is in a developing country without adequate infrastructure and also to address overall survival and voice preservation. Based on research studies, radical RT should be performed as soon as possible after diagnosis of early-stage larynx cancer if RT is selected as the main treatment. We evaluated the efficacy of this sort of treatment despite the delay in its initiation. We reviewed the medical records of patients who had cT1-cT2 /cN0 squamous cell carcinoma of the larynx treated with definitive RT from June 2009 to June 2020 and who have not undergone previous surgical treatment or chemotherapy. The median age of the study population was 63 years with a male predominance in the majority of the patients (94%). Histologically, all laryngeal cancers were confirmed to be squamous cell carcinoma and 86% were glottic squamous cell carcinoma. The mean time from diagnosis until initiation of RT was about 4 months. The median follow-up period was six years. From the 53 patients enrolled, the 2, 3, and 5-year survival proportions were 83%, 71%, and 66% in the follow-up duration, respectively. The majority of patients (66%) had good voice preservation. In conclusion, despite all the challenges, the results are promising. Definitive radiotherapy achieved an acceptable cure rate and voice preservation in patients with cT12- laryngeal carcinomas.

Keywords
Radiotherapy, Laryngeal Carcinoma, Survival, Voice Preservation

Enhancing Personalized Chemotherapy for Ovarian Cancer: Integrating Gene Expression Data with Machine Learning

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Abstract

Objective: Ovarian cancer›s complexity and heterogeneity pose significant challenges in treatment, often leading to suboptimal chemotherapy outcomes. The study aims to use machine learning algorithms, gene selection and gene expression data to enhance the results of chemotherapy. Methods: In order to identify the most informative genes for treatment response prediction, the mutual_info_classif approach is employed in the research. Ten machine learning techniques are used to assess and maximize these genes› prediction potential. Result: Through the examination of the reciprocal relationships between gene expressions and chemotherapy results, the research pinpoints a subset of 20 critical genes that are essential to the effectiveness of treatment. Based on the chosen gene set, the Random Forest classifier is the most accurate among them in predicting treatment responses by achieving 97% as accuracy, 98% as precision, 97% as recall, 97.5 % f1-score. Findings: With a statistical significance of $p = 0.019$, the carboplatin predictor successfully discriminated between patients who were platinum-sensitive and those who were platinum-resistant. Furthermore, a statistically significant variation in survival between anticipated responders and non-responders was discovered by the combined predictor for the platinum-taxane regimen, with median survival times of 12.9 months and 8.1 months, correspondingly ($p< 0.045$). Conclusion: The exceptional performance of this model demonstrates how well it integrates complicated gene expression data to create individualized chemotherapy regimens.

Keywords
Gene Expression, Machine Learning, Ovarian Cancer

Assessing the physical, emotional status and fear of patients with breast cancer

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Abstract

Breast cancer is a significant health issue that affects patients› physical, mental, and financial well-being as well as the health of their families. The study aimed to assess the physical, emotional, and fear of female breast cancer patients. Descriptive research was carried out from 15th January until 30th July 2024. Ninety patients made up a purposive sample that was taken from the Nuclear Medicine Oncology Hospital in Mosul City. The study instrument includes questions about demographic and clinical data, physical and mental health, and fear. Three response alternatives for each item (always, sometimes, never). Both descriptive and inferential statistics were used to examine the data, and the questionnaire›s reliability estimate was 0.89. The results demonstrated an increased risk of breast cancer in women between the ages of 40 and 49. The affected women›s physical and emotional states were moderately impacted (46.7%) and (51.5%), respectively. The responses from the participants indicated that their level of fear was between moderate and high. Additionally, there are worries about the disease›s potential to manifest and spread throughout the body. In conclusion, cancer patients benefit from good physical and emotional support to enhance their health and lessen their worry, and fear by using coping strategies.

Keywords
Physical and emotional status, Fears, Breast Cancer, Therapy

Study the Effects of Serum Tumor Markers CEA , CA125 And CA19.9 in the breast cancer of Iraqi female patients

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Abstract

Breast cancer is the second most common type of cancer among women in the World wide. Early detection and treatment represented the most effective techniques, which would improve BC outcomes and survival rates dramatically. Proteomic tumor markers are released from cancer cell or other cells that response to tumor. They consider as a valuable tool for BC screening by identification can help with early diagnosis, illness staging, and therapy response tracking.

This study involved 50 women, includes (25) women with BC during course of chemotherapy, along with (25) healthy women to serve as a control group, BC patients were grouped according to their current (BC stages - Age - Grade - BMI- Type – Metastasis - Lymph Node (LN) status).

The Age result show the highly females with BC as (44 %) more than 5060- years. The BMI was high significantly increased compared to the control group. The stage III as (36%) was highly percentage than other levels. The B.C patients were (84%) that treated with Chemotherapy than non-treated With Chemotherapy. The Lymph Node (LN) status with (64%) patients highly than negative L.N patients.

The mean ± SD of the serum (CEA) concentration was high significantly increased *** ($P \leq 0.05$) as compared to control groups. The mean ± SD of the (CA125) concentration was significantly** ($P \leq 0.05$) as compared to control groups. Finally the mean ± SD of (CA19.9) concentration was significantly increased ** ($P \leq 0.05$) as compared to control groups.

Then (ROC curve) was plotted for the investigate all markers characteristics, show CEA , CA125 and CA19.9 have higher discrimination power, make them serve as a tumor biomarker for cancer patients.

Finally the (ROC curve) was plotted for the investigate of all markers characteristics, show CEA , CA125 and CA19.9 have high percentage of sensitivities but low specificities percentage to breast cancer group, make it serve as a low screening tool especially for breast cancer Iraqi female patients.

Keywords
CEA, CA125, CA19.9, breast cancer

Prognostic and clinical significance of the DNA polymerase beta in breast ductal carcinoma in situ

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Abstract

Breast carcinoma is considered the second most common cause of death in the UK. DCIS is considered a pre-invasive breast carcinoma and is accompanied by heterogeneous lesions characterized by diverse clinical behavior, which represents 20–25% of all diagnosed cases. Clinical behavior prediction and the progression of DCIS to invasive disease remains a challenge. This study aims to assess the role of the base excision repair (BER) of DNA Polymerase Beta in DCIS. Expression of POLβ protein was evaluated in a large (n = 1015) well-characterized cohort of DCIS, comprising pure (n = 776) and mixed (DCIS coexists with invasive breast cancer (IBC); n = 239) using immunohistochemistry and correlated with clinicopathological parameters and patient outcome. Preclinically, the impact of POLβ depletion was investigated on stem cell markers in representative DCIS cell line models. Aggressive features of DCIS were associated with reduced expression of DCIS including high nuclear grade, large tumor size, comedo necrosis, high Ki67 index, hormonal receptors negativity, and HER2 overexpression. Low nuclear/low cytoplasmic combined of POLβ protein expression represents the strongest association of aggressive behaviors with the characteristics features. Gradual reduction of POLβ protein expression from the tissue of normal breast to DCIS, the invasive BC tissue showed the lowest POLβ protein expression. Lower expression of POLβ protein showed an independent predictor for the recurrence in the patients of DCIS which was treated with breast-conserving surgery. POLβ gene knockdown showed a significant association with a significant increase in cell stemness markers including SOX2, NANOG, and OCT4 levels in MCF10-DCIS cell lines. In conclusion, lower level and/or loss of POLβ protein in DCIS was associated with aggressiveness behavior, moreover, it can predict recurrence. The expression of POLβ protein in DCIS provides an additional feature for patients› risk stratification for personalized therapy.

Keywords
Breast Cancer (BC), Ductal Carcinoma in situ (DCIS), DNA polymerase beta, Prognosis, progression, DNA damage response, outcome

Clinical Investigation Of IL-31, TOS And GSH In The Sera Of Gastric Cancer Females Patients In Iraq

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Abstract

The majority of stomach malignancies are gastric carcinomas, this mismatch causes damage to critical chemicals and cells, potentially damaging the whole body. The study aims to determine oxidative stress and immunological parameters to find their effect on gastric cancer. The study sought to determine the concentrations of anthropometric factors (age and BMI), immunological parameters (IL-31), and parameters related to oxidative stress (TOS and GSH) in the sera of female gastric cancer female's patients. The study included 80 people divided into two groups: the healthy volunteers group and the gastric cancer patients group. There were non-significant ($p>0.05$) differences in age and BMI between control and patients. The study found a substantial increase ($P<0.001$) in IL-31 and TOS levels in GC females compared to the control group. However, there was no significant difference ($p>0.05$) in GSH levels between the healthy control group and GC patients group. In conclusion, our results showed an association between the inflammatory immunological parameter IL-31 and GC infection and that the body›s immunity system plays a significant role in fighting this disease, while also demonstrating that oxidative stress plays an important role in the regulation of the disease.

Keywords
Gastric cancer, IL-31, TOS, GSH, oxidative stress

Inhibition of DGAT1 and its role in breast cancer

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Abstract

Cancer formation requires fundamental changes in the metabolic balance of the transformed cell. Both utilization and synthesis of lipids are affected due to increased demand for new membrane construction, suppressed reliance on oxidative energy production and altered signaling events involving lipid messengers. In this study we assumed that the Inhibition of the diacylglycerol acyltransferase 1 (DGAT1) the enzyme that is responsible of triglyceride synthesis, is a good strategy to reduce proliferation and progression in the selected breast cancer cell lines. Aim of the study is to determine whether the modulation of neutral lipid synthesis will reduce the proliferation of breast cancer cell lines and to determine inhibition of DGAT1 on tumorigenic transformation of breast cancer cells. Methods: High content imaging was used to measure changes in cell proliferation and neutral lipid content in response to drug treatment. mRNA levels were measured by quantitative RT-PCR for FASN enzyme in breast cancer cells. Result and discussion: Treatment with the DGAT1 inhibitor PF-04620110 (PF) suppressed the accumulation of neutral lipids which is mainly consist of triglyceride that is synthesized by DGAT1 enzyme in addition there was a significant decrease in proliferative rate in breast cancer cells upon the DGAT1 inhibition this indicate a correlation between lipid accumulation and suppression of proliferation. In addition, our data suggest that DGAT1 inhibition reduce A 3-dimensional cell growth a tumoregencity indicator. Fatty acid synthase a multi-functional enzyme that catalysis the synthesis›s of fatty acid our data showed no changes in FASN mRNA level.

Keywords
diacylglycerol acyltransferase, proliferation, neutral lipid, FASN

Angiotensin II Receptor Antagonist, Valsartan, Has Beneficial Effect in Lung Metastasis of Colorectal Cancer Treated with Fluorouracil

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Abstract

Purpose: Lung metastasis is the main cause of death in patients with colorectal carcinoma (CRC). Angiotensin II has been confirmed to facilitate cancer cell progression and metastasis. In this study, the possible anti-metastatic effects of an angiotensin II receptor type 1 (AT1R) antagonist, valsartan, have been investigated in an experimental CRC lung metastasis model. Methods: An animal CRC lung metastasis model was used, involving intravenous injection of CRC cells. The experimental groups included (1) control group; (2) 5-FU (5-fluorouracil) group (5 mg/kg/every other day; ip); (3) valsartan group (40 mg/kg/day; po); and (4) valsartan + 5-FU group (combination group; valsartan 40 mg/kg/day, oral gavage, and 5-FU 5 mg/kg/every other day; ip). After 11 days, macroscopic and histological evaluations of lung tissues have been done for evaluation of lung metastatic nodules. In addition, inflammatory and angiogenic markers and oxidative stress index were measured in lung tissue. Results: Our results showed that administration of valsartan especially in combination with 5-FU significantly reduced lung metastatic nodule and metastatic area ($p < 0.05$) in macroscopic and histological evaluations stained by hematoxylin-eosin. Measurement of inflammatory, angiogenic, and oxidative/antioxidative markers in lung tissue indicated that the level of IL-6, angiogenic markers (VEGF and VEGFR-1), and antioxidative markers significantly reduced in combination group ($p < 0.05$) while the MDA as a marker of oxidative stress increased ($p < 0.05$). Conclusion: These results suggest that valsartan in combination with standard chemotherapeutic agents can have a synergistic effect in treatment of lung metastasis of CRC.

Keywords
AT1R antagonist, Colorectal cancer, Fluorouracil, Lung metastasis, Valsartan

Bcl-2 expression in breast cancer cell lines and death program

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Abstract

Breast cancer is a hormone-dependence and heterogenic disease. Drug resistance is the main reason for the failure of breast cancer treatment. Combinatory medications are methods for treatment but they are not sufficient in action. However, new approaches like molecular therapy reveal a new insight into cancer treatment. Studies show that Bcl-2 gene family inhibitors and ER blockers cause the improvement of recovery. Interfering molecules such as antisense ones can inhibit the expression of Bcl-2 and push the cancer cells to apoptosis. Our team designed a new Antisense Oligonucleotide (ASO) based on Antisense oligo G3139. MCF-7 and MDA-MB-231 cell lines were used to evaluate cellular proliferation. Liposomes and cationic nano-complex (Niosome) are used to increase the cellular delivery of ASO and Tamoxifen. We also investigated the cytotoxicity and apoptotic effects of Tamoxifen, naked ASO and Nano-packed ASO. The results indicated significant down-regulation of the Bcl-2 gene and inhibition of MCF-7 and MDA-MB-231 cellular proliferation. Flow-cytometry showed early apoptosis in all cell groups. The newly designed ASO reduced the expression of the Bcl-2 gene. It also had a synergistic effect with the Tamoxifen. The cationic nano-complex (Niosome) was more efficient than the liposome in delivering designed oligo antisense Bcl-2 in the cancer cells.

Keywords
Bcl-2, breast cancer, death program

Detection of ATP production inhibition in AMJ13, HC, SKG and REF cell lines under the combined treatment of 2-deoxy glucose and metformin

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Abstract

Cancer cells use glycolysis to produce energy in a very addictive manner. Although this type of glucose oxidation can only make a limited number of ATP molecules, cancer cells seldom complete the energy recapitulating from glucose molecules via mitochondrial oxidative phosphorylation. It depends majorly on glycolysis to obtain the required amount of energy for its tremendous proliferative bioactivity. Based on this principle, preventing cancer cells from the exhilarating use of glycolysis would constitute a tempting strategy to control its growth. In this research, three of the already known compounds for their capability to interfere with glycolysis were invested (ethanol, 2-Deoxy glucose, and metformin) to study their ability to inhibit the proliferation rate of three cancer cell lines, human breast cancer cell line (AMJ13), mice hepatocellular carcinoma (HC), human esophagus cell carcinoma (SKG), and normal rat embryo fibroblast cells (REF). While metformin can reduce glucose production in the liver, it may increase glycolysis in other contexts, particularly when cells must compensate for the reduced mitochondrial function. Here comes the role of 2-deoxy-glucose. This compound represents a glucose analog molecule. It will compete with glucose to enter glycolysis and limit the downward of the cycle, thereby reducing ATP levels production in the cells. Three different concentrations of ethanol, metformin and 2-deoxy-glucose were used (0.1, 0.01, and 0.001 mole) solo and in combination to detect the growth inhibition rate and apoptosis induction. Levels of ATP production were assessed after similar treatment. Results indicated a various growth inhibition capabilities of the three compounds (Eth, Met, and 2DeO) by themselves and in combination with each other for three different exposure time 24, 48, and 72 h. Metformin was the most potent inhibitor followed by 2-Deoxy glucose and ethanol with less potent toxicity. When the three compound were combined with each other, the toxicity was elevated, while the ATP production and apoptosis induction were clearly evident. In conclusion, the three compound invested in this study were approved to interfere with glycolysis and lowered the total of ATP production and may this interfering was the cause behind induction of growth inhibition and apoptosis induction in the cancer cell lines studded.

Keywords
AMJ13, HC, SKG, REF, 2-deoxy glucose

Investigating the Anticancer Properties of Bacterial Toxoid in Combination Vaccines

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Abstract

Utilizing the bacterial vaccines as a Bacterial-Based Cancer Therapy may be considered an elegant novel strategy that makes vaccines multifunctional tools that can play dual different significant roles in medicine. Most studies in this regard tested bacterial-based cancer immunotherapy, current work aims to try in vitro immuno-independent experiments to explore the anticancer activity of vaccine-derived bacterial toxoids in different cancer cell lines. Six concentrations of the DTP vaccine (5 x 1025 ,$^{4-}$ x 10125 ,$^{5-}$ x 10625 ,$^{6-}$ x 10312 ,$^{7-}$ x 10^{7-}, and 15 x 10^{6-} µg /ml) were tested against two different cancer cell lines (SKG, HC) and Rat Embryonic Fibroblast (REF) cell line as normal cells. Using the Crystal Violate cytotoxicity assay we assessed killing percentages for each of the six concentrations of toxoid, thus toxoid IC50 was calculated. Cytopathological effects such as apoptotic cells were evaluated under an inverted microscope. With significant statistical differences at a probability level lower than 0.001, our study found a toxic effect of microbial toxoid on all cancer cell lines SKG and HC, while for the normal REF cell line, this toxic effect was correlated only with the highest concentrations of toxoid. Cytological changes were observed in cancer cells treated with bacterial toxoid with insignificant effect on normal cells.

Keywords
Bacterial toxoid, SKG, REF, HC cell line, Bacterial vaccines

NF-κB inhibition influence oncolytic virotherapy activity in esophageal carcinoma

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Abstract

Background: The current study investigated the potential synergistic anticancer effect of curcumin and COX2 in combination with Newcastle disease virus (NDV) for the treatment of esophageal carcinoma. Methods, we evaluated the combined effects of curcumin, COX2, and NDV on the SKGT4 esophageal carcinoma cell line. Cell cytotoxicity and clonogenic viability assays were used to assess cell death after treatment with various combinations. Measurements of cytochrome C release and apoptotic figures were used to estimate the induction capacity of apoptosis. Results, Contrary to our initial hypothesis, curcumin and COX2 co-treatment with NDV did not enhance the virus›s antitumor effect. Instead, these agents reduced NDV-induced cell death in esophageal carcinoma cells suggesting that both curcumin and COX2 may possess antiviral properties, suggesting a potential explanation for the observed inhibition of NDV›s oncolytic activity. Conclusions, our findings suggest that curcumin and COX2 may not be suitable combination partners with NDV for the therapy of esophageal cancer. Their antiviral properties appear to counteract the oncolytic effect of the virus. More research is needed to explore alternative therapeutic strategies that can leverage the oncolytic potential of NDV for the treatment of esophageal cancer.

Keywords
NF-κB, carcinoma,

Exosomes derived from EGFR-mutated adenocarcinoma induce epithelial-mesenchymal transition in lung cancer cells

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Abstract

Exosomes are small, membrane-bound vesicles that play a significant role in intercellular communication within the tumor microenvironment and contribute to cancer progression, metastasis, and drug resistance. In this study, we aimed to investigate the effects of exosomes to induce epithelial-mesenchymal transition in lung cancer cells.

We isolated EVs from PC9 cells, which harbor an EGFR exon 19 deletion mutation, and were subsequently used to treat A549 cells, an EGFR wild-type lung adenocarcinoma cell line.

Nanoparticle tracking analysis (NTA) and electron microscope confirmed the presence of exosomes, as well as their size and concentration. However, Western blotting used to identify the exosomal markers, such as CD9 and CD63, and oncogenic proteins, such as mutant EGFR, within the PC9-derived exosomes. Upon treatment with these exosomes, A549 cells exhibited hallmark features of EMT, including increased cell migration, loss of epithelial markers (E-cadherin), and upregulation of mesenchymal markers (N-cadherin and vimentin), as shown by immunofluorescence and qPCR analysis.

These findings suggest that exosomes derived from EGFR-mutated adenocarcinoma cells can induce EMT in lung cancer cells, potentially contributing to enhanced tumor invasiveness and resistance to therapy.

Keywords
Lung cancer, exosomes, EGFR, CD9

Using TRAIL-Containing Exosomes to induce Apoptosis in 4T1 Cells

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Abstract

TRAIL (Tumor necrosis factor-related apoptosis-inducing ligand) is a critical component in tumor therapy, recognized for its ability to selectively trigger apoptosis in cancer cells while sparing normal cells, making it a highly promising anticancer agent. Despite this potential, the clinical application of recombinant TRAIL is hindered by its instability and short half-life, which limit its therapeutic efficacy. This study evaluated the use of TRAIL-containing exosomes as a novel approach to improve the stability and delivery of TRAIL in cancer therapy.

the effects of functional anti-TRAIL antibodies and TRAIL-containing exosomes on the proliferation and apoptosis of 4T1 cells, a murine breast cancer cell line was evaluated. Cell proliferation was assessed using the MTT assay following treatment with varying concentrations of functional recombinant TRAIL protein and TRAIL-containing exosomes. The results showed that recombinant TRAIL protein did not significantly inhibit 4T1 cell proliferation. In contrast, flow cytometry analysis with Annexin V/PI staining demonstrated a marked increase in apoptosis in cells treated with TRAIL-containing exosomes at concentrations of 50 and 100 µg/mL. This apoptotic effect was further corroborated by acridine orange and ethidium bromide staining, confirming increased cell death in response to TRAIL-expressing exosomes.

These findings underscore the limitations of using recombinant TRAIL alone and highlight the potential of exosome-based therapies to enhance the stability, delivery, and overall efficacy of TRAIL in cancer treatment. TRAIL-containing exosomes represent a promising strategy for overcoming the challenges of recombinant TRAIL and improving therapeutic outcomes in cancer therapy.

Keywords
tumor therapy, breast cancer, 4T1 cell

Fabrication of magnetic nanocomposite as responsive drug delivery vehicle for cervical cancer therapy

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Abstract

The development of carriers for drug delivery faces significant challenges from a therapeutic perspective. The present study presents an innovative nanocarrier based on combination of functionalized magnetic nanocomposite nano-chitosan and cisplatin. Hydrophobic drugs such as cisplatin could be delivered using magnetic nanoparticles modified with biocompatible copolymers. This study aimed to determine the antitumor effects of free cisplatin enhancement in cervical cancer cells using cisplatin-encapsulated Fe3O4@SiO2@N-Chit-FA. An additional layer of nanochitosan was coated on top of the magnetic nanocomposite to increase its stability in aqueous solutions. Biocompatibility and cytotoxicity of Fe3O4@SiO2@N-Chit-FA-cis complex were evaluated against the cervical cancer animal model in C57BL6 mice. An external magnetic field was used to test the in-vivo uptake and distribution of Fe3O4@SiO2 @N-Chit-FA-cis in tumor cells. The results showed that the released drug would induce its effects on a specific target area when an external magnetic field was applied, and Fe3O4@SiO2@N-Chit-FA-cis can suppress tumor growth more than cisplatin alone via induction of tumor necrosis. Overall, Fe3O4@SiO2@N-Chit-FA nanocomposites hold great potential for use in targeted nanomedicine to deliver bio-functional molecules.

Keywords
cancer therapy, nanocomposite

Investigating the anticancer activity of Cerium nanoparticle decorated on GO produced by green methods against cancerous cell lines

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Abstract

Introduction: Green synthesis of nanoparticle is considered as a promising method to synthesize a functionalized nanoparticle (NP) with no byproducts formed during the synthesis process when compared to chemical methods preparation. Compared to other traditional cancer treatment strategies, such as surgery, chemotherapy and radiotherapy, nanoparticle produced by green methods is considered as a powerful replacement to the above-mentioned treatment methods with no side effects. Aim: To determine the potential impact of GO/CeO2 nanoparticles NPs as an anti-tumor agent in biomedical field, an in vitro study. Methods: In the current study, CeO2 was synthesized using co-precipitation method. The method of preparation used is considered green due the usage of Allium Sativum extract in the synthesis of CeO2 nanoparticles. Graphene -Oxide (GO) was prepared by pulsed laser ablation in water (PLAL) which is also considered as a green method. The decoration of CeO2 on GO was achieved by mixing the GO with CeO2 nanocolloid. The as-prepared GO-CeO2 NPs was characterized using XRD, UV-visible spectrophotometer, FESEM, EDS and FTIR. For the in vitro study, nine CeO2 concentrations were used (starting from 0.98 – 250 µg/ml) as duplicate dilutions, to investigate the potential effect of CeO2 nanoparticles. The as-prepared GO/CeO2 were investigated against panel of cancer cell lines (human breast cancer cell line AMJ13, brain cancer cell line AMGM5, human oesophagus cancer cell line SK-GT-4) and compared with normal cell line REF both with/without using CeO2 in culturing. Results: The FESEM results show that the CeO2 NPs are homogeneous and nearly spherical in its shape with an average dimension of 55 nm. The FTIR analysis has proved that the as-prepared CeO2 NPs are functionalized by the Allium Sativum extract. The in vitro results showed that the GO/CeO2 had significant potential impact in the high concentration 250 µg/ml at p> 0.05 against breast cancer cell line AMJ13 (with growth inhibition 51.04%) compared with other cell lines that showed less significant effect at p> 0.05 on brain cancer cell line AMGM5 (with growth inhibition 37.12%) and increased the proliferation rate on oesophagus cancer cell line SK-GT-4 and with no effects on control cell line REF during 48h of time exposure. Conclusions: According to the above results, we concluded that the as prepared CeO2 is a promising anticancer agent against breast cancer cell line that was proved to be safe on normal cell line REF.

Keywords
AMJ13, AMGM5, CeO2, In vitro, SKG

Synthesis, characterization and cytotoxic effect of 2-(5-chloro-3,3-dimethylindolin-2-ylidene)-3oxopropyl-idene)amino) benzoic acid on MCF7 cancer cell line

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Abstract

New compound of 2 - ((E) - ((E) - 2 - (5 - chloro - 3,3 - dimethylindolin - 2 - ylidene) -3-oxopropylidene) amino) benzoic acid has been synthesized by the condensation reaction of malonaldehyde with 4-aminobenzoic acid in methanol under acidic condition. The chemical structure of the synthesized compound was characterized by TLC, FT-IR, 1H NMR and 13C NMR and the absorption bands are approved the chemical structure of this new compound.

The cytotoxic activity of the new synthetic Schiff base compound was studied by using Brest cancer cell line (MCF7) and normal cell line (REF). The results displayed low inhibition rate for low concentration on normal cells with 11% and 12% for 48 hrs. and with (40, 60)µg/ml concentration showed 16% and 22% for the same time. but the cytotoxic activity of this compound toward MCF7 showed a higher inhibition rate with 64% for the concentration (60 µg/ml), 63% for (40 µg/ml), 60% for (20 µg/ml) and 56% for (100 µg/ml). after 48 hrs. so this new compound have a high potential to inhibit cancer cell lines .

Keywords
benzoic acid, MCF7

Study The Anticancer Activity for Annana plant seeds

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Abstract

The whole world is still searching for natural sources in various fields, especially natural alternatives in treating diseases and various health disorders, most notably in the treatment of tumors and cancers. The present study included an in-vitro anticancer investigation for Annana seeds on two cell types of breast cancer(MCF-7&MDA) and one normal cells line represented by REF. Active constetuents in the seeds were extracted by maceration with70% ethanol.The phytochemical general tests had been conducted to investigate the extracted seeds active contents. Phenolic compouds and flavonoids in extracted residue were estimated by HPLC technique besides the non-polar substance in the seeds residue. Three cell types were subjected to several seeds extract one normal represented by REF cells and two breast cancerous cell lines(MF-7&MDA) were subjecter for anticancer assay. Results showed that the ethanolic extract residue was 8.4 g from 90 g powderd plant seeds represented as 9.34% W/W and the seed residue posessed many active constituents. The HPLC assay indicated that the seeds extract was rich with Gallic acid, Caffeic acid, pyrogaloll, Cinnamic acid, p-coumaric acid and less extent Chlorogenic acid as simple phenolic compounds. Luteolin, Kaemperol, and Apegnine and fewer amounts of Quercetin, Rutin and Catechin as flavonoids had been also indicated in the seeds extracted residue. For the non polar seeds conted the following components were detected at a descending level: β – myrcene, p-cymene, α-pinene, Eugenol, and β- pinene. The anti-cancer activity of the seed extract at several concentrations showed a different effect on the three types of cell lines under current study.

Keywords
Annoma seeds, MCF-7 Cell line, MDA Cell line, REF cells, Anticancer activity

Crataegus azarolus Fruits and Leaves Effects on Gastric cancer Cell Line (AGS) Growth, Migration, Colony formation, Apoptosis, and Expression, Levels of Some Selected Genes

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Abstract

Gastric cancer (GC) remains one of the leading causes of cancer morbidity and death worldwide. Despite enormous scientific progress, there is still a low success rate and a high expense and adverse effect profile for these treatments. These reasons have led researchers to look for alternative treatments, such as the use of natural plant materials. Crataegus azarolus, contains compounds with health potential and minimal side effects. The purpose of this study was to investigate possible antiproliferative, migratory, and apoptotic effects of C. azarolus fruits and leaves methanol and acetone extracts on human gastric adenocarcinoma cell lines (AGS) and human fibroblast cell lines. AGS cells were treated with different concentrations of methanol and acetone fruits extracts (10, 50, 100, 250 and 500µg/ml). Our results demonstrated that methanol fruit (MF) extract showed significant higher anti-proliferative at 500µg/ml concentrations, when estimated by MTT assay at $p<0.001$ with an IC50 values 300µg/ml. MF extract showed a significant ($p<0.01$) cellular migration inhibitory effect. Clonogenicity of AGS was considerably ($p<0.001$) inhibited, resulting in a decrease in holoclone production in acetone fruits (AF) and AL extracts. Apoptosis was induced, with the highest 31.4% MF. EGR1 expression increased dramatically ($p<0.001$) in AF extract, while EZH2 expression increased significantly ($p<0.001$) when treated with MF and AL. PTEN and NDRG1 both were highly upregulated in MF and AF extracts, respectively. In conclusion, C. azarolus demonstrated anti-cancer effects on AGS cell line. As a result, C. azarolus might be suggested as a therapeutic option for cancer therapy.

Keywords
Crataegus azarolus, Gastric cancer Cell Line (AGS), Genes

Evaluate the utility of Iraqi Ephedra Transitoria methyl extract on the proliferation of cervical cancer cell line

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Abstract

Objective: This study aimed to assess the inhibitory effect of a methanolic extract of Ephedra transitoria on the proliferation of cervical cancer cells. Material and methods: In order to assess Ephedra transitoria anticancer properties, the Hela cell line (derived from cervical cancer) was utilized. The concentration of the agent being evaluated was varied between 0.1 and 1000 µg/ml, and the cells were incubated for both 24 and 72 hours. The IC50 value was taken into account to identify the potency of the examined substance. Results: The study outcomes demonstrated that the extraction ratio of Ephedra transitoria was 8 %. Additionally, the cytotoxicity study revealed that the plant extract has the potential to inhibit the proliferation of human cervical cancer cells in a concentration and time-dependent manner. The extract at a concentration of 1000 µg/ml showed a growth inhibition of 88% after 72 hours. The comparison between the cytotoxicity of a plant extract and traditional anticancer chemotherapy (vincristine) revealed that the plant extract exhibited higher cytotoxicity than cisplatin on the Hela cancer cell line after two incubation periods. Additionally, the IC50 value of the extract was lower than that of vincristine. Conclusion: Ephedra transitoria has been shown to have the ability to inhibit the proliferation of cervical cancer cells by cytotoxicity, which can occur via a cell cycle-specific or cell cycle-nonspecific manner, thus demonstrating its anticancer properties. The study also showed that the plant extract exhibited superior efficacy and potency in the treatment of cancer when compared to cisplatin.

Keywords
cervical cancer, Ephedra Transitoria methyl

Anticancer Efficacy of Citrullus *Colocynthis* Oil as a Promising Agent in Suppressing Human Lung Adenocarcinoma A549 Cells

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Abstract

Lung adenocarcinoma is the most common respiratory system tumor seen globally. Most tumors face challenges like multidrug resistance and low selectivity, thus alternative therapeutic strategies and approaches are needed. Increasing evidence from preclinical and clinical studies suggests that phytochemicals can inhibit cancer development and progression. We used Citrullus Colocynthis oil extraction, as phytochemical therapy, to inhibit cell proliferation, invasion, and enhanced cell death. The study included analyzing the extracted oil by GC-mass and assessing cell viability utilizing MTT, apoptotic, and wound healing assay. The human lung adenocarcinoma A549 cancer cell line and human breast epithelial HBL-100 normal cell line were treated with oil. The results demonstrated a significant cytotoxic effect of oil against cancer cells, the effect is accompanied by apoptotic migration arrest, with adverse no effect on normal cells. Our findings suggest that phytotherapy suppresses cancer cells and provides new insight into developing therapeutic strategies for cancer in the near future.

Keywords
Cytotoxicity, Anticancer therapy, Human lung adenocarcinoma, Apoptosis, Citrullus Colocynthis

Anxiety level among patients treated with chemotherapy at Oncology Teaching Hospital in Baghdad city

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Abstract

Patients with cancer experience feelings of anxiety that increase or decrease at different times. Patients may become more anxious as their cancer spreads or as their treatment becomes more intense. The level of anxiety you experience treated with chemotherapy may be different for one person with cancer than for another. Objective: the study aims to assess the level of anxiety among patients treated with chemotherapy and to find out the relationships between anxiety levels and some variables such as (age and gender, level of education, and marital status). Method: A cross-sectional study was conducted from December 2022 to May 2023 at the Oncology Teaching Hospital in Baghdad City, including 65 patients on the morning shift and a questionnaire to measure anxiety levels (anxiety self-rating scale). (20) The collected data were analyzed with SPSS V.23 including descriptive statistical tests frequencies, percentages, mean, and chi-square tests were used for inferential analysis. Result: The research results indicated that the majority of participants were women. (58.5%), aged between 39 and 48 years (30.8%) and diagnosed with breast cancer (41.5%). and the highest percentage of levels of anxiety (55.4%,32.3, % and 12.3%) were as moderate, mild, and extreme anxiety levels respectively. Furthermore, the chi-square test showed no statistically significant differences between the anxiety level and participants› Demographic variables. Conclusion: The study concluded that the participating patients had a moderate level of anxiety. and There is no significant relationship between the level of anxiety of the patient treated with chemotherapy and demographic characteristics.

Keywords
Patients, Anxiety Level, Chemotherapy, Cancer

Chronic Inflammation induced by Escherichia coli Blood Infections as a Risk Factor for Pancreatic Cancer Progression and the Diagnostic Role of CA19-9, Amylase, and Inflammatory Markers

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Abstract

Background and Aim: Pancreatic cancer exhibits a high level of aggressiveness and is associated with a high mortality rate. The study comprised 50 pancreatic cancer patients and 50 healthy family and friends. The main goal is to explore the biomarkers CA199-, Amylase, PCT, and IL-6 in addition to the presence of Escherichia coli (E. coli) infections in pancreatic cancer patients› bloodstreams and the impact of chronic inflammation on the progress of pancreatic cancer.

Methods: Both the control and patient groups went through the measurement of their CA199-, IL-6, and PCT levels with a Roche-Cobas C411 and amylase with a C311. In addition, a VITEK2 Compact system was utilized to detect E.coli blood infection. Furthermore, the antibiotic susceptibilities were evaluated to identify patterns of susceptibility in cancer patients.

Results: Patients with pancreatic cancer exhibited higher PCT, and IL-6 levels (P≤0.01), indicating chronic inflammation promoting tumor growth, invasion, and metastasis, and high levels of CA199- (P≤0.01), indicating pancreatic cancer. Tumor damage and ductal blockage lowered amylase levels in pancreatic cancer patients, in addition, Bloodstream infections in pancreatic cancer patients were mostly caused by E. coli (3468% ,50/). The current study found that 29 isolates (85.2%) were multidrug-resistant (MDR)

Conclusion: The tumor marker CA199- is increased in pancreatic cancer patients, indicating biochemical abnormalities. An increase in the levels of PCT and IL-6 is linked to more positive blood cultures, especially for E. coli infections. The decrease in amylase levels suggests tumor-induced pancreatic duct damage and blockage. These findings emphasize the need to monitor biomarkers and infections to understand and treat pancreatic cancer.

Keywords
Pancreatic cancer, E. coli, PCT, CA19 - 9, Amylase, Antibiotic

Molecular and Serological Detection of Human Parvovirus B19 in a Sample of Iraqi Patients with Acute Lymphoid Leukemia in Relation to Hematological Parameters

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Abstract

Acute Lymphoblastic Leukemia (ALL) is a common childhood blood cancer. Human Parvovirus B19 (PV-B19) mainly replicates in bone marrow erythroblasts and can persist long after initial infection. ALL patients frequently exhibit PV-B19 viremia, arising from either viral reactivation or coincidental infection amid acute leukemia. This study aimed to determine the prevalence of PV-B19 infection in ALL patients, investigate its association with hematological parameters at presentation, and monitor these parameters with the disease progression of patients with PV-B19 infection. This case-control study included 30 newly diagnosed acute lymphoblastic leukemia patients and 30 healthy blood donors as control. Patients› data were collected through interviews or records. Plasma levels of anti-PV-B19 IgG and IgM antibodies were assessed by enzyme-linked immunosorbent assay (ELISA), and viral DNA quantification was performed using quantitative polymerase chain reaction (qPCR). The IgG and IgM prevalence in patients was 36.67% and 3.33%, respectively, compared to 33.33% and 0% in controls. The molecular assay revealed that 63.33% of patients were PV-B19 DNA positive, significantly higher than the 6.67% in controls. Patients had a significantly higher mean log10 viral load (5.171.39± copies/ml) than controls (2.64± 0.28 copies/ml) (P= 0.019). PV-B19 had no significant association with hematological parameters before chemotherapy; however, after chemotherapy, viral infection was significantly associated with reduced chemotherapy response and increased blood transfusion rate. In conclusion, PV-B19 infection seems to have more pronounced role in ALL after treatment initiation, where it is associated with an increased rate of blood transfusion and reduced response to chemotherapy. Therefore, PV-B19 should be considered in acute leukemia patients.

Keywords
Parvovirus, Acute lymphoid leukemia, quantitative PCR

Evaluation of Interleukins-6, Interleukins-8, Interleukins-18, Interleukins-23, Interleukins-27 and Toll-Like Receptors 3 and Toll-Like Receptor 4 in Women with Breast Cancer

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Abstract

Breast cancer is a disease that is prevalent among women worldwide and is distinguished by an abnormal growth of cells in the breast tissue. Although substantial progress has been achieved with the early diagnosis and treatment of the disease, the underlying mechanisms that drive it are still complex and not understood. Cancer growth and development have been associated with cytokines and Toll-like receptors (TLRs), which are essential components of the immune system. To understand the possible role they play in disease mechanisms, this study attempts to evaluate the concentrations of IL-6, IL-8, IL-18, IL-23, IL-27, TLR3, and TLR4 in breast cancer patients. Blood samples were obtained from 65 women diagnosed with breast cancer who were between the ages of 18 and 45. We used the ELISA (enzyme-linked immunosorbent assay) technique to quantify the levels of immune markers, including IL-6, IL-8, IL-18, IL-23, IL-27, TLR3, and TLR4, and to evaluate their potential involvement in the disease. The study›s findings revealed a significant increase in the levels of IL-6, IL-8, IL-18, TLR3, and TLR4 in breast cancer patients, indicating their active involvement in the disease›s pathogenesis. However, IL-23 levels did not show any statistical significance. These results show the significance of these immune markers in breast cancer and can either serve as possible biomarkers for disease progression or contribute to the development of targeted therapies.

Keywords
Breast Cancer, Interleukins, TLR3, TLR4, ELISA

Detection of CD34+CD38−LSCs and their expression on CD123+ and CD 96+ with their clinical impact in AML patients before and after chemotherapy

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Abstract

Acute myeloid leukemia (AML) is characterized by the overproduction and accumulation of immature blast cells, specifically myeloid precursors with the stander strategy of therapy patients achieve remission but the majority of them relapse of some of them are resistant to therapy. The cases of relapse and resistance it believed to back to the present of small subpopulations called leukemic stem cells (LSCs) the current study aimed to identify LSCs in patients with AML and their correlation with treatment protocols outcomes status, patient›s characterization, and subtype of AML and to evaluate the expression CD123 and CD96 on CD34+CD38- blast cells by flow-cytometry for the patients that diagnosed with AML before and after chemotherapy, The expressions of CD34+/CD38- cells in blood samples of newly diagnosed constitutes about 61.1 ± 7.8% from all hematopoietic cells, which is significantly (P= 0.013) higher than those in treated patients that constitutes about 40.5 ± 3.7% from all hematopoietic cells in their blood samples. Out of all CD34+/CD38- cells, the result showed that 53.7 ± 8.8% of them also expressed CD123+ in blood samples of newly diagnosed AML patients, which is significantly (P< 0.0001) higher than those in blood samples of treated patients (19.9 ± 3.1%) and the expression of CD96+ in blood samples of newly diagnosed AML patients, which is significantly (P< 0.002) higher than those in blood samples of treated patients (16.8 ± 2.2%) the data results propose that these LSCs can be the reason for disease recurrence and also can be good therapeutic targets.

Keywords
AML, CD34, CD123, CD96, Acute myeloid leukemia

The Impact of Obesity and Hormonal Interventions on Women's Breast Cancer Risk

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Abstract

Breast cancer is a malignant tumor that arises in breast tissue as a result of abnormal cell growth and has the ability to spread to other parts of the body and surrounding tissues. It is the second most widespread form of cancer, and there has been a significant increase in the incidence rate among women. This increase has led to an increased focus on research of potential factors that may contribute to the development of the disease. The use of oral contraceptives and hormone replacement therapy, which are considered potential contributors to an increased risk of breast cancer, are among the factors examined in this study. Additionally, obesity is acknowledged as a critical factor that is believed to be linked to the disease›s development and dissemination. This research endeavors to understand the potential impact of obesity, hormone replacement therapy, and the use of oral contraceptives on the development of breast cancer in women.

Keywords
Breast Cancer, Obesity, Hormonal Therapy, oral contraceptives

Antioxidant and anticancer activities of Bio-synthesized selenium nanoparticles by *Escherichia coli*

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Abstract

Selenium nanoparticles possess diverse biological characteristics, and significant biological activity, such as anticancer and antioxidant activities. The Biosynthesis method for producing SeNPs has unique characteristics as simple, dependable, economical, safe, and non-toxic, which make them beneficial in the fields of medicine and pharmacology. In this study, we used sodium selenite (25, 50, and 100 mM) as the precursor for 48 hrs. at a pH of 8 and 160 rpm, selenium nanoparticles were biosynthesized from Escherichia coli isolates (65 isolates). The biofabricated nanoparticles were characterized by several techniques, then evaluated the antioxidant activity and the anti-proliferation effects of SeNPs against cancer cells. The techniques used to characterize the biosynthesized nanoparticles included UV-visible spectroscopy (at 266 nm), Fourier transform infrared spectroscopy, and X-ray diffraction (at 2θ of 23.772, 46.00773, 66.828 and 75.744), which corresponded to the crystal planes of (101), (110), (200), and (210). Scanning electron microscopy exhibited a size between 39.5–50.71 nm, while the average size of the SeNPs by Atomic force microscopy was 21.96 nm. Results showed SeNPs› capacity to combat free radicals as antioxidants, at concentrations of (100, 50, and 25) µg/ml. It was 80.21%, 72.57%, and 69.07%, respectively. Also, the results showed that SeNPs exhibited cytotoxicity against cancer cells lines (SW480 and HepG2) after treatment with various concentrations of SeNPs (25, 12.5, 6.25, 3.125, 0.78, and 0.39) µg/ml for 24 hrs., which showed significant anticancer activity (***$p < 0.05$), with IC50 values of (3.9, 4.5) µg/ml respectively. In addition, the result of the viability of normal cells was noted that SeNPs did not affect normal cells (HEK293). In conclusion, biosynthesized SeNPs can be an effective novel antioxidant and anticancer agent.

Keywords
Selenium Nanoparticles, Escherichia coli, Biosynthesis, Antioxidant, Anticancer

Autophagy Modulators Enhance Antiproliferative Effect of Ibuprofen on Lung Cancer Cells

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Abstract

The formulation of the optimal therapeutic protocol is the unfulfilled clinical requirement for cancer. The synergistic or additive targeting of key pathways by combining anti-cancer medications enhances their effectiveness compared to the mono-therapy environment. Nonsteroidal anti-inflammatory drugs (NSAIDs) and autophagy modulators recently demonstrated anti-cancer efficacy in different experimental approaches. This study aimed to determine the anti-cancer properties of ibuprofen and autophagy modulators (chloroquine and resveratrol), each alone or in combination, in inhibiting the proliferation of lung cancer cells. Lung cancer cells A549 were exposed to different concentrations of ibuprofen, either alone or combined with chloroquine and resveratrol. The impact of these compounds on the expression of autophagic and apoptosis genes (Beclin-1, Atg5, LC3A, LC3B, GABARAP, and caspase3) was investigated by qPCR. The cytotoxic effect of each treatment exhibited different inhibitory styles. The results showed slight inhibition of cancer cells when treated with ibuprofen compared to untreated cells. The chloroquine treatment in combination with ibuprofen exhibited significant inhibition of cancer cells compared with resveratrol and ibuprofen combination. Moreover, the expression of Beclin-1, Atg5, LC3A, LC3B, and GABARAP genes elevated when cancer cells were treated with ibuprofen and chloroquine. On the other hand, the expression of Beclin-1, Atg5, and LC3A genes elevated while LC3B and GABARAP genes decreased when cancer cells were treated with ibuprofen and resveratrol. Caspase3 is highly expressed in cancer cells treated with a combination of ibuprofen and chloroquine. This study suggests that autophagy modulators, especially autophagy inhibitors, play a fundamental role in enhancing the anti-cancer efficiency of ibuprofen.

Keywords
Lung Cancer Cells, Ibuprofen, Autophagy, Chloroquine, Resveratrol, Apoptosis

Association of Intron 4 VNTR (4a/b) Polymorphism of the Endothelial Nitric Oxide Synthase Gene with the incidence of Breast Cancer in Iraqi women

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Abstract

The variable number tandem repeats (VNTR) 4 a/b(rs61722009) polymorphism, in intron 4 of the eNOS gene is critical for different biological processes. Variants in the eNOS gene including VNTR 4 a/b polymorphism are linked to cancer. Several lines of evidence suggest that the 4 a/b polymorphism influences the expression of the endothelial nitric oxide synthase gene and promotes tumor growth in the mammary gland. In this study, we compared the VNTR a/b genotypes of 50 healthy Iraqi women with the genotypes of 50 Iraqi women with breast cancer. We examined the role of this VNTR 4 a/b (rs61722009) polymorphism by using PCR technique genotyping and utilizing DNA genomic extracted from the participants. The results showed that the homozygous wild–type b/b genotype could retain a beneficial impact on the protection against breast cancer potential. On the other hand, the outcomes indicated that both the heterozygous a/b and homozygous mutant a/a genotypes appear to be relevant to increased susceptibility to breast carcinogenesis development in the patients we investigated.

Keywords
Breast Cancer, Polymorphism, VNTR 4 a/b, Genotype

Study The Effects of Some Demographic and Clinical Characteristics of The Breast Cancer Iraqi Female Patients

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Abstract

Background: Breast cancer (B.C) has become increasingly one of the main causes of morbidity and mortality of cancer in recent decades in Iraq, with an impact on many of systems function along the human body directly by its physiological changes or by the harsh treatments used for its cure. Material: Among 130 females included in the study, 65 patients were diagnosed with breast cancer and 65 healthy women with no history or characteristics of breast cancer, some characteristics were gathered (Age, Wight, length, Chemotherapy type, liver function tests, and renal function tests along with breast cancer disease Stage and Lymph node involvement features. Result: Breast cancer females have higher body mass index significantly compared to the healthy control group. Most of the patients were in stage (II, III) respectively. The vast majority of patients were treated with Chemotherapy. Most of the patients showed Lymph node involvement. The results showed higher Urea, Creatinine, ALT and AST levels significantly in patients than in the control. while (ALP) was non-significant. Conclusion: The kidney and liver functions profiles were highly significantly in breast cancer patients than in the controls group in correlation with patients with advanced status and lymph node involvement receiving chemotherapeutic agents.

Keywords
Breast cancer, Demographic & Clinical characteristic, liver function, renal function

Association of thyroid stimulation receptor with Vascular adhesion protein-1 in thyroid cancer patients

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Abstract

Background: Thyroid cancer is one of the most common head and neck cancers with increasing incidences all over the world. The thyroid-stimulating hormone receptor (TSHR) is a surface glycoprotein receptor, part of the leucine-rich repeat subfamily of G-protein-coupled receptors (LGR). Vascular adhesion protein-1 (VAP-1) is a glycoprotein that mediates tissue-selective lymphocyte adhesion. Objectives: The current study was designed to detect this regulatory role of VAP-1, TSHR and thyroid hormone as a signaling to thyroid cancer. Moreover, possibility of dependence VAP-1 as a biomarker in Iraqi patients with thyroid cancer. Patients and Methods:In the present study, 65 cases of thyroid cancer as well as hyperthyroidism patients and 25 cases of healthy controls with age range from 4054- years, were collected between March 2023to June 2024 from Al-Amal National Hospital for Cancer Management in Baghdad, Iraq. T3, T4, TSH, Tg by using architect i1000SR Immunoassay analyzer. Results: in samples were done by ELISA method the mean TSH R level of patients in hypothyroidism vs malignant patients (1.0166 ±0.012) is higher than patients in benin patients (0.977 ±0.004 pg/ml) vs 3.46 ±0.17nmol/L) beside the group of control group (1.336 ±0.023pg/ml). Measuring VAP-1 levels that showed increased in the level of VAP-1 (670.22 ±5.60 pg/ml) controls was appeared comparing (635.85 ±2.71 vs 635.85 ±2.71 pg/ml) in hypothyroidism vs benin patients, also lower level in malignant patients was (347.99 ±4.28 pg/ml) and there was significant difference $p< 0.01$. Conclusion: Finally, no the significant effect of TSH receptor while pretreatment serum VAP-1 levels were lower in thyroid carcinoma patients. Serum VAP-1 could be a useful tool in the detection of thyroid cancer.

Keywords
Thyroid Cancer, Vascular Adhesion Protein-1, ELISA, thyroid stimulation receptor

Investigation of CA 15-3 and IgE for Iraqi lung cancer patients, biochemical and immunological

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Abstract

Lung Cancer (LC) is one of the leading causes of cancer deaths in the world. A number of single nucleotide polymorphisms (SNPs) are associated with the risk of LC which deserved to be studied. Aim: This study aimed to investigates the biochemical and immunological as biomarker for the Iraqi lung cancer patients. Methods: Fifty LC Iraqi patients and 50 apparently healthy people who were considered control group were involved in this study. Blood samples were collected from both groups. For biochemical and immunological study, Results: In a biochemical test the result showed that LDH was highly significant (P≤0.01) comparing with control groups (Mean ± SE) were (292.36 ± 5.88 vs 210.66 ± 5.16;respectively). In contrast ADA, HbA1C and Hb were significantly (P≤0.01) decreased in compare with control group (Mean ± SE) were (32.08 ± 0.85 vs 77.60 ± 5.00; 3.78 ± 0.11 vs 4.68 ± 0.08; 11.86 ± 0.35 vs 13.75 ± 0.17, respectively). Besides immunological study the result showed that the level of biomarker CA 153- was highly increased in (4284% ;50/). Conclusions: From this result we concluded that CA 153- and IgE were satisfactory biomarkers for screening and early diagnosis for lung cancer in Iraq.

Keywords
CA153-, IgE, biochemical, immunological, lung cancer, ADA, HbA1c, Hgb

Design and Synthesis New Heterocyclic – Chitosan Loaded Gold Nanoparticles That Induce Cancer Cell Death

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Abstract

The new novel polymers nanocomposites based chitosan schiff bases and coated gold nanoparticles (AuNPs) was synthesized from many sequence reactions. The synthesized compounds were identified by using FTIR, 1H-NMR, mass spectroscopy and field emission scanning electron microscope (FESEM). In addition, the antibacterial activity of the synthesized compounds Chitosan-Schiff bases [IV]a,b and Chitosan-Schiff base/AuNPs [V]a,b against two resistant pathogenic bacteria E.coli (G-) and Staphylococcus aureus (G+) was examined in vitro comparable with Amoxicillin as standard antibiotic. The cytotoxic effect of novel polymers nanocomposites [V]a against Iraqi patient derived breast cancer cell line (AMJ13) using crystal violet viability Assay was employed to estimate antitumor activity. For a period of 72 hours, the cells were exposed to various concentrations and the results were compared with the effect against normal Rat Embryonic Fibroblasts (REF) cell line. through the use of an inverted phase-contrast microscope, the morphology of the treated cells was investigated to detect the cytopathological changes. The (chitosan Schiff base/AuNps) [V]a exhibited very excellent cancer cell inhibition rate. The Acute Toxicity Test of these nanocomposities was examined showed no-toxicity of these nanocomposities in normal cells. Measurements of cytochrome C release and apoptotic figures were used to estimate the induction capacity of apoptosis which showed the ability of the new nanocomposities to induce apoptosis in cancer cells with less effect on normal cells. In conclusion, the newly synthesized nanocomposities having promising antitumor activities that encourage for more preclinical investigations to move for clinical application in future.

Keywords
Nanoparticles, AMJ13, Rat Embryonic Fibroblasts, Heterocyclic – Chitosan Loaded Gold

A Typical Review of Lung Cancer: Epidemiology, Diagnosis, Treatment, and Risk Factors

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Abstract

Lung cancer is a disease caused by uncontrollable cell division in the lungs. The cells split and give more copies of themselves as part of their normal function. However, sometimes they undergo changes that cause them to continue reproducing uncontrollably. This uncontrolled division results in masses or tumours that can interfere with the proper functioning of organs. Lung cancer specifically refers to cancers that start in the lungs, typically in the airways (bronchi or bronchioles) or small air sacs (alveoli). Primarily, lung cancer includes two groups: small-cell lung cancer and the most common non-small-cell lung cancer. It is found that the leading causes and risk factors for lung cancer include smoking primarily, in addition to exposure to carcinogens such as asbestos, heavy metals, and radioactive gas radon exposure. Lung cancer is the leading cause of cancer death for both men and women worldwide accounting for one-fifth of all cancer deaths. Common symptoms of lung cancer include a persistent or worsening cough, chest pain, shortness of breath, weight loss, hoarseness, and coughing up blood. Lung cancer is treated in a variety of methods, depending on the type of cancer and its spread. Non-small cell lung cancer patients are treated with surgery, chemotherapy, radiation therapy, targeted therapy, or a combination of these options. People with small cell lung cancer are frequently treated with chemotherapy and radiation therapy.

Keywords
Cancer, lung cancer, smoking, small-cell lung cancer, and non-small-cell lung cancer

Genotype and allele frequency of miR146a rs57095329 A/G gene and associated with CLL risk in Babylon province

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Abstract

Background: Chronic lymphocytic leukemia (CLL) is one of the most frequent types of leukemia. It typically occurs in elderly patients and has a highly variable clinical course. Objective: The study aimed to detection association between the miR146a rs57095329 A/G polymorphism and CLL risk in patient and control. Material and Methods: The current study involved 83 patients (forty five males and thirty eight females) and 25 sample from control , ranging in age from 15 to 72 for period between November 2023 to March 2024 in the medical center in Merjan city. After receiving a diagnosis from serological and molecular tests, they were chosen for further evaluation. All patients and controls had their blood and serum samples taken in accordance with a set of ethical guidelines that included some exclusions and included others. Results: the result that show Genotype Distribution for AA genotype was no significantly in leukemia patients in comparison to healthy (55.42% vs. 64%, OR=0.6993, 95% CI: 0.2775 to 1.7623, p= P = 0.4482). While the GG genotype was no significantly less frequent in leukemia patients in comparison to healthy (21.69 % vs 36% oR = 0.4923 95% CL 0.1868 to 1.2977 P = 0.1519) and also the genotype Distribution for AG genotype was no significantly in patient in compared with control (22.89 % vs 0 oR= 15.4186, 95% CL 0.8969 to 265.0558 P = 0.0594) . Conclusion: The genotype distribution of the miR146a rs57095329 A/G polymorphism did not exhibit any significant differences between healthy controls and leukemia patients for any of the three genotypes (AA, GG, and AG).

Keywords
leukemia, miR146a rs57095329 A/G gene, CLL, PCR

The Role of Chromatin Remodeling Complexes in Gene Expression and Genome Stability

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Abstract

Chromatin remodeling complexes are involved in the process of the redox state of chromatin and cell differentiation as well as in cellular processes, such as DNA repair, replication and transcription. This work attempts to establish the roles of chromatin remodeling complexes more particularly, gene regulation and genome stability. By employing RNA-Seq, comet assays, γH2AX foci formation assays, and GFP-based HR and NHEJ efficiency assays we assessed the effects of chromatin remodeler deficiencies. Therefore, using RNA-Seq, the authors found that there were alterations at the transcriptional level as well as increased DNA damage evaluated with comet and γH2AX assays. Furthermore, it was observed that efficiency of both HR and NHEJ are decreased in chromatin remodeler knocked-down cells. Therefore, the results of our study give the detailed picture of the involvement of chromatin remodeling complexes in various processes and emphasizes their importance for the understanding of the pathogenesis of the diseases which are accompanied by the alterations in the activity of chromatin remodeling complexes and their further treatment.

Keywords
Chromatin remodeler, RNA sequencing, DNA injury, Homologous recombination, Non-homologous end joining, genomic stability

Targeting Lactobacillus plantarum metabolites to brain cancer cell line pathway

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Abstract

Brain cancer is associated with high mortality and morbidity rates, finding new therapies is a necessary for treatment., In current study , CFS and crude bacteriocin derived from Lactobacillus Plantarum that isolated from vegetable (cucumber) was assessed on in vitro brain cancer., model as potential adjunctive to therapy, the results appeared that the cytotoxicity impacts was at the highest concentration of crude bacteriocin, towards brain cell line, the crude bacteriocin proved efficient in killing cancer cells at half the inhibitory concentration after being incubated for 72 hr. at 37°C, the IC50, value was represented the ability of substance to inhibit a specific biological or biochemical function. So , in this study we can concluded that crude bacteriocin can be used as anticancer, the selective toxicity of crude bacteriocin towards cancer cell make it promising candidate for further investigation and clinical trails.

Keywords
brain cancer, Lactobacillus Plantarum

Application of Current and Advance Diagnostic and Gene Therapy Strategy in Cancers and Medical Genetics

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Abstract

There are multiple applications of molecular and cytogenetics tests in clinical Genetics and oncology. Mutation and chromosomal analysis is now routinely utilized for the diagnosis of hereditary and non- hereditary monogenic and cancer syndromes. The potential of molecular and cytogenetics tools is recognizing by cytogeneticist oncohematologists, given that specific chromosomal translocations may significantly aid the diagnosis of various leukemias, lymphomas and hereditary and non- hereditary syndromes. The emergence of practical applications of molecular oncology and genetics is largely attributed to the development of user-friendly methods of molecular analysis. The invention of PCR (polymerase chain reaction) and Next-generation sequencing (NGS) is a technology for determining the sequence of DNA or RNA to study genetic variation associated with diseases or other biological phenomena. led to an enormous breakthrough in clinical DNA testing: PCR-based techniques. Also Gene transfer and cell. therapy are an alternative treatment method that introduces therapeutic genes and cells into a cancer cell or tissue to cause cell death or slow down the growth of the cancer. This treatment has various strategies such as therapeutic gene activation or silencing of unwanted or defective genes; therefore a wide variety of genes and viral or nonviral vectors are being used so far. Gene therapy strategies in cancer can be classified as inhibition of oncogene activation, activation of tumor suppressor gene, immunotherapy, suicide gene therapy and antiangiogenic gene therapy. A new treatment modality that introduces new genes into a cancerous cell or the surrounding tissue to cause cell death or slow the growth of the cancer.

Keywords
Gene Therapy, Medical Genetics, Cancer

Studying the relationship between the level of vitamin D, estrogen, parathyroid hormone, ALP and their effect on tumor development in women with breast cancer

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Abstract

More and more women are being diagnosed with breast cancer each year, making it the most frequent cancer in this population. Vitamin D, parathyroid hormone, estrogen, alkaline phosphatase, correlation levels between the parameters measured, and the receiver operating characteristic curve were all examined in this study, which aimed to shed light on the impact of these hormones on the development and progression of breast cancer in both healthy individuals and women diagnosed with the disease. We divide the subjects into three groups for this part: Group 1 consists of individuals who did not receive any treatment for breast cancer; Group 2 consists of those who were in Group 1 but did not receive chemotherapy; and Group 3 consists of individuals who either had surgery or chemotherapy. Patients who were diagnosed early on and did not undergo chemotherapy were categorized as G1. Patients who underwent surgery or chemotherapy were categorized as G3. Patients who were diagnosed early on and did not undergo chemotherapy were categorized as G1. Patients who underwent surgery or chemotherapy were categorized as G3. These patients were categorized into two groups: G1, who were diagnosed early and did not receive chemotherapy, and G3, who were either operated on or given chemotherapy. Results showed that compared to the control group, the breast cancer groups had decreased vitamin D levels. There was a statistically significant difference across all research groups. Two groups, G1(14.74) and G2, were deemed significant since their p-values were less than 0.0001. It was also determined that G2 and G3 (-3.090) were important. The parathyroid hormone readings showed significant differences between G1 and G2 (-98.18, P-value <0.0001), G1 and G3 (-72.59, P-value ~0.001), and G2 and G3 (25.60, P-value <0.0001). A p-value of 0.541 was found for the G3 group at Level G2. There was no statistically significant difference between the two groups when comparing the levels of the ALP enzyme G1 with G2 (-6.367, P-value = 0.0003), G1 with G3 (-4.653, P-value = 0.0113), and G1 with G3 (-4.653, P-value = 0.0113). However, ALP levels were not significantly different between G2 and G3 (p=0.5306). The fact that groups of people with breast cancer had significantly low vitamin D levels and high levels of parathyroid hormone supports the idea that vitamin D can fight cancer. Although levels were within normal ranges in disease-affected groups, this does not absolve estrogen of its role as a risk factor for breast cancer. In populations affected by breast cancer, alkaline phosphatase enzyme levels were within normal ranges, making them a potential diagnostic tool for women with metastasized cancer.

Keywords
Vitamin D, parathyroid hormone, estrogen, alkaline phosphatase

Angiogenesis pathway of the AMN3 Mouse Mammary Adenocarcinoma cell line

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Abstract

Angiogenesis, the formation of new blood vessels, is a critical process that supports tumor growth, invasion, and metastasis. In breast cancer, tumor cells upregulate angiogenic factors to stimulate vascularization and ensure a continuous supply of oxygen and nutrients. The current AMN3 cell line that is an important cancer cell model that is well established and used in cancer drug discovery, we amid to investigate the role of specific angiogenic pathway in its progression. For that we conducted microarray protein expression analysis of the AMN3 mouse mammary adenocarcinoma cell line at 6 and 18 hours post-treatment. Our results revealed a significant upregulation of several key angiogenic factors, including Fibroblast Growth Factor (FGF), Epidermal Growth Factor (EGF), Platelet-Derived Growth Factor (PDGF), and Vascular Endothelial Growth Factor-A (VEGF-A).

These findings suggest that these factors contribute to the creation of a tumor microenvironment conducive to angiogenesis, thereby promoting tumor growth and dissemination. Targeting these factors may represent a promising therapeutic strategy for inhibiting tumor angiogenesis and controlling breast cancer progression.

Keywords
Platelet-Derived Growth Factor, Vascular Endothelial Growth Factor, Epidermal Growth Factor