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24th International Conference on

Cancer Research and Pharmacology

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International Congress on

Structural Biochemistry, Stem Cells and Molecular Biology

August 5-6, 2019 | Singapore

Scientific Tracks & Abstracts

30 YEARS OF EXCELLENCE IN MEDICAL PUBLISHING

Real-time potentiometric monitoring hydrolysis of a bio-degradable drug (Atracurium besylate)

Ahmed Ma'mun
Cairo University, Egypt

Over the last decade, the field of Point-of-care (POC) diagnostics and *In- vitro* diagnostic (IVD) tests have been extensively used and acquired increasing prominence. The outstanding opportunities offered have greatly expanded the application fields and have placed these technologies at the forefront of the tests used in providing life-saving decisions to maintain health, manage disease, monitor therapy or pre- surgical operation examinations. Being portable and the unique ability of selective, and direct detection of ionic analytes in biological specimens without extraction, are very attractive features of potentiometric Ion Selective Electrodes (ISEs). The ability to furnish a continuous real time signals allows performing *in vitro* monitoring of the chemical species in chemical or biological reactions in the real time. Our drug, Atracurium besylate (ATR) is a skeletal muscle relaxant used for anesthesia in surgical operations undergoes chemo-degradation *in vivo* yielding a toxic metabolite Laudanosine (LDS). A closer insight to the *in vivo* metabolic processes of ATR, it was reported to be susceptible to degradation by Hofmann elimination as a primary route and ester hydrolysis as a secondary route of chemo-degradation.

Biography

Ahmed Ma'mun he completed his master degree in analytical chemistry at Cairo university. Also, he is an Editorial board member in journal of electrochemical society and many reputable scientific journals. Invited speaker in many international conferences worldwide. Expert in all topics related to analytical chemistry and bioanalysis Since graduation from Faculty of pharmacy-Cairo university May 2006. This lecture is a part of my recent publication " Real-time potentiometric sensor; an innovative tool for monitoring hydrolysis of chemo/bio-degradable drugs in pharmaceutical sciences" published in journal of biomedical and pharmaceutical analysis-The American Chemical Society- February 2018.

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Intestinal microorganisms and colorectal cancer: Causative or opportunistic agents?

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Globally, colorectal cancer (CRC) is reported as the third most common cancer which accounts for 862000 deaths in 2018. Lifestyle and genetic factors are the main risk factors of CRC. However, in recent years, scientists believe that infectious microorganisms including bacteria, parasites and viruses could also be a contributing factor of CRC. Infection leads to CRC mainly via two mechanisms: inflammation and immunosuppression. Having said that, microorganisms can be either directly or indirectly be associated with CRC, with later being related to other gut related diseases such as Irritable bowel diseases (Chrohn's and ulcerative colitis) and Irritable bowel syndrome that are known as CRC-inducing diseases. In addition, some organisms secrete metabolites that could enhance the growth of a tumor causing the tumour to spread faster. With this, past studies have linked some intestinal microorganisms namely *Bacteroides fragilis, Cryptosporidium parvum*, and human papillomavirus in the pathophysiology of CRC. On the other hand, numerous reports have also evidenced the presence of these microorganisms as opportunistic agents in immunocompromised individuals especially cancer patients. Such reports have not only focused on prevalence but also on how the host impaired immunity does is utilized by infectious agents to colonize the gut which eventually leads to severe diarrhea, causing difficulties to undergo treatment or recovery stage. The knowledge on opportunistic infections will mainly alert the medical practitioners about treatment protocols for the management of CRC patients. However, the current topic will focus more on the causative (directly or indirectly) effect of selected bacteria, parasite and viruses that are being associated with CRC. The mechanisms used by these miroorganisms in inducing CRC will also be discussed. Such knowledge will create awareness on the importance of screening individuals with gut related symptoms for intestinal pathogens before advancing to advance cancerous stage.

Biography

Chandramathi S is a senior lecturer from the Department of Medical Microbiology, University of Malaya. As a senior lecturer, she has been teaching and supervising students in the field of Microbiology, Virology and Immunology. Her research mainly focuses on the association of intestinal microorganisms (bacteria, viruses, intestinal parasites) with CRC. She has successfully demonstrated that *Blastocystis* sp. infection exacerbates the CRC progression. Her novel ideas coupled with her enthusiasm to unravel the pathogenesis and mechanisms employed by the gut microbes allows her to remain significant in this research field. She has received a number of grants at both local and international levels. She has published more than 30 papers in peer reviewed journals and has more than 45 conference papers.

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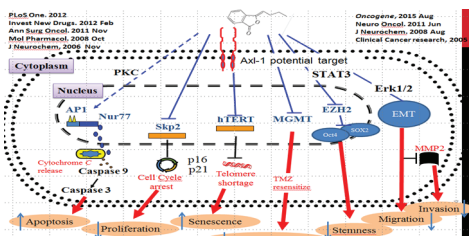
Targeting Axl/EZH/Sox2 for glioblastoma multiform by novel biodegradable interstitial delivery system

The IND of Cerebraca® wafer has been approved by FDA for phase I/IIa. This clinical trial has been conducted at Tzu-Chi University Hospital in, Hualien, Taiwan

Horng-Jyh Harn
Buddhist Tzu Chi Medical Foundation, Taiwan

Targeting Cerebraca ® wafer, also known as BP/polymer wafer, is a biodegradable wafer for interstitial implantation comprises butylidenephthalide (BP; the active moiety; EF-001) and Carboxyphenoxypropane-Sebacic Acid Copolymer (CPPSA).



The anti-glioblastoma pharmacology effect of BP was identified in yellowish brown root of the plant Angelica sinensis, a well-known Chinese medicine. The antitumor effects of A. sinensis extracts were firstly evaluated in several human cancer cell lines, including a human glioblastoma multiform (GBM) cell line. These antitumor activity was suggested resulting from the effects of BP in suppression of telomerase level (Lin et al. 2011), up-regulation of nuclear receptor Nur77 (an apoptosis mediator) (Lin et al., 2008), reducing glioma migration and invasion mediated by Axl-1 tyrosine receptor (Yen et al., Oncogene, 2016) and tumor stem cell Sox-2 genes (unpublished data). More importantly, BP further showed the effects on reversing Temozolomide (TMZ) resistance by suppressing O6-methylguanine-DNA-methyltransferase (MGMT) mRNA and protein expression (Harn et al., 2013). Taken together, the targeting genes of BP are Axl/EZH2/SOX2, telomerase, DNA repair gene MGMT.

In order to overcome the limitation of blood-brain barrier, a local interstitial delivery system which BP incorporated into a biodegradable polyanhydride material CPPSA, namely, the BP/polymer wafer was applied. This novelty contributes the efficient effects on survival (2.44 time prolonged more than Gliadel® wafers).

At present, we have completed the project in a chemical manufacturing and control, preclinical efficacy and preclinical safety assessment and other tests. The IND of Cerebraca® wafer has been approved by FDA for phase I/IIa. This clinical trial will be conducted at Tzu-Chi University Hospital in, Hualien, Taiwan.

So far, we have finished cohort II six patients study. No safety issue is found. The first patient has been extending eleven months.

Biography

Horng-Jyh Harn, M.D. Ph.D current serves at the department of pathology at Tzu-Chi University as a professor and surgical pathologist and associate vice president, Bioinnovation Center, Tzu Chi foundation. He also owns PhD degree at pathology department of Duke University, Durham, USA (1987-1991). Previously, he was a professor in the Department of Pathology at the National Defense Medical Center, Taipei, Taiwan (1997-2002). He received his surgical pathology training at Tri-Service General Hospital, Taipei, Taiwan. He was appointed as a Director of Molecular Medicine, Tzu-Chi Buddhist General Hospital, Hualien, Taiwan; Chairman of Pathology, China medical university, Taichung, Taiwan. He is the author of over 120 original research articles and has been granted over 30 patents, both nationally and internationally. His main research interesting fields are molecular biology, tumor oncology, stem cell research and new drug development against neurological disease.

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Chitinase production from *Paenibacillus sp.* BISR-047 utilizing seafood waste as substrate under solid-state fermentation

Saavi Pradhan
Banasthali University, India

Chitinases have huge potential applications and biological value in industries; they are used in generating single cell proteins, sweeteners, insecticides, antifungal drugs, anti cancer agents, biopesticides, food processing agents, degrading agents for sea waste etc. Chitinases are used for the conversion of chitin a polysaccharide into monomers. Extraction of chitin involves two steps, demineralisation and deproteinisation, which can be conducted by two methods, chemical or biological. The chemical method requires the use of acids and bases, while the biological method involves microorganisms.

Solid-state fermentation (SSF) is a low-cost fermentation technology, particularly suitable for the needs of developing countries. This bioconversion technology of chitinous materials through chitinolytic process is an alternative waste treatment that not only solves environmental problems but also decreases the production costs of microbial chitinases. Therefore, efforts were made in the present study to utilize seafood waste for chitinase production under SSF. A novel thermo-tolerant bacterium Paenibacillus sp. BISR-047, previously isolated from the Great Indian Desert soils, was used and various process parameters were studied. We obtained 346 IU/ml of chitinase production in a medium containing crab and prawn waste (5:2; waste: water), 1.5 g/kg yeast extract (w/w), 0.5 g/kg NaCl (w/w), 40% moisture content, pH 8 and at 45 ºC temperature. We obtained 29% dry weight reduction after 10 d of incubation under SSF. Our results indicate scope for the utilization of seafood waste for industrial production of chitinase using SSF.

Biography

Saavi Pradhan has her expertise in the field of Microbiology and analytical research studies with experience contribution in microbiological studies of Great Indian Desert soils. Phytopathogens which cause severe damage to commercial crops were also studied and successful field trials have been done. Her work also involved pest control biological methodologies to overcome disease causing pest issues.

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Comparative study on how low cost in clinic activities increases patient satisfaction during waiting time at OPD in selected oncology clinic

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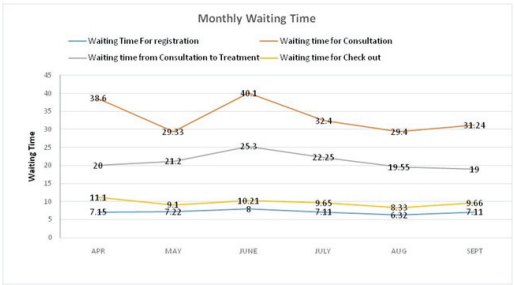
D Y Patil University, India



In today's competitive healthcare market OPDs are considered to be the face of any hospital, as it is the first point of contact between the patients and healthcare service providers. The impression about a hospital & OPD services often influences the patients' opinion towards the hospital. Therefore it is important to ensure that OPD services provide an excellent experience to the customers. With the increase in the outpatient volume of patient flow, there may be an increase in the waiting time. Patients perceive long awaiting time as barriers to actually obtaining services and thus lead to a dissatisfaction of care of service.

However, reducing waiting time of patients by way of engaging them during their wait time at the lounge will create significant beneficial impact on the quality of patient care. In turn, this will improve patient outcomes and increase the patient satisfaction.

A study was carried out in a Oncology Clinic in Pune, Maharashtra, India to determine the average waiting time spent by the patient in the OPD, to identify the factors leading to high waiting time and assess the patients experience regarding the Out Patient service provided by the hospital.

It was found that the average time a patient spends in the OPD was 70 mins. The major bottleneck causing this high waiting time was found to be the waiting time for consultation which was 35 minutes on an average. Information gathered during the survey also revealed that 33% patients waited for 30-60 minutes for the doctor while 28% patients waited for over an hour. This was one of the major causes of discontent among the OPD patients to which a fall in OPD numbers can be attributed. Therefore, the study was a comparative study on how low cost in-clinic activities increased the Patient Satisfaction during the waiting period in OPD in the selected Oncology Clinic.

Biography

Saurav Bhowmik is a writer and an Author with 23 years of rich experience in Teaching and Mentoring Students in Hospital and Healthcare Management. He is a Visiting faculty for Hospital & Healthcare management in "Global Business School & Research Centre D.Y.Patil University, India. He is also a Faculty for Hospital & Healthcare management in Suresh Gyan Vihar University India. He is a management Consultant with various health care organizations for Quality management system.

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Bioinsilico analysis of c-MYC gene association with Burkitt's Lymphoma

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Background: MYC gene is an important proto-oncogene transcriptional factor encodes a nuclear phosphoprotein for central cellular processes. Dysregulated expression or function of c-MYC is one of the most common abnormalities in human malignancies. The normal c-MYC gene is encoded in three separate exons divided by two large intervening sequences in this study we focused on detection of single nucleotide polymorphisms SNPs in MYC gene associated with formation of Burkitt's lymphoma, and to confirm or exclude most reported SNPs relationship with the disease, and detect novel mutations associated with the disorder.

Materials and methods: MYC gene was investigated in NCBI database http://www.ncbi.nlm.nih.gov/) and SNPs were analysed by computational softwares. SNPs in the coding region (exonal SNPs) that are non-synonymous (nsSNP) were analysed by (sift, polyphen2, I-mutant, SNPs&GO and PHD-SNP softwares.

Result: we analysed 2868 SNPs from(NCBI) 286 of them found in Homo sapiens,48 of them deleterious furtherly investigated.

Conclusion: eight SNPs were considered most disease causing (rs4645959, rs4645959, rs141095253, rs141095253, rs150308400, rs150308400, rs150308400, rs150308400) according to the four softwares used. Two ofwhich have not been reported previously[rs4645959 (N25S), rs141095253 (P396L)].

Biography

Enas Abdalla Mohammed Ahmedon is a student. Currently pursuing her master's in University of Khartoum, Sudan and she is interested in hematology and immunohematology. She is good learner, interested in knowing, learning and developing skills, knowledge and competencies. And she works as Scientist at Jafar IBin Auf Specialized Hospital for Children – Khartou.

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Probing the mechanism of action of anti-AML heterocyclic diamidines

Van Ha
Georgia State University, USA

Acute myeloid leukemia (AML) is associated with one of the top mortalities among all the hematologic neoplasms. Chemotherapy or radiotherapy alone, or with stem cell transplantation are current treatment strategies. Due to dose-limiting myelosuppressive toxicity and possible disease relapses after remission by chemotherapy, an urgent AML therapeutic strategy is necessary to diminish the tremendous human tolls of cancer. The ETS-family transcription factor PU.1 plays a tumor suppressive role in many forms of AML and shows depressed activity in leukemogenic stem cells. Recent studies have shown that abolition of the residual PU.1 activity in low-PU.1 AML terminates leukemia in patient cells and a mouse AML model. A small molecules class known as heterocyclic diamidines had been designed and tested out as a target inhibitor of PU.1.

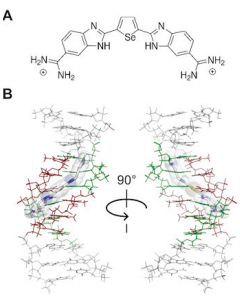

Figure 1 | **Structure of DB1976. A**, Shown is the diamidinium cation, the expected ionization state under physiologic pH. **B**, Docked model of DB1976 in complex with 5'-d(CGCA$_3$T$_3$GCG)$_2$-3' in which dA is colored in green and dT in red.

Understanding the physicochemical driving forces that confer high-affinity and selectivity is essential for the development of therapeutic agents. To this end, we are investigating the DNA sequence selectivity of DB1976, one diamidine that shows anti-AML activity *in vivo*, through its volumetric properties to site-specific and nonspecific binding. Volumetric measurements complement calorimetric studies with more direct insights into hydration and dynamic properties of ligands-DNA interaction. From volumetric measurements, we observed unexpectedly significant differences in volume change upon the formation of DB1976 to each DNA sequences, suggesting correspondingly large differences in hydration or dynamics associated with binding. Using explicit-solvent MD simulation, we detected the terminal base pairs of DNAs undergo transient opening events and confirmed differential dynamics of sequence-dependent DNA manner in both bound and unbound state. This structural feature allows us to correlate the stability of drug-DNA complexes with binding affinity and selectivity. This study suggested that hydration and conformational dynamics play an equally important role as intermolecular contacts in contributing to the mechanism of drug actions.

Biography

Van Ha graduated from Georgia State University with a Bachelor of Science in Chemistry (biochemistry concentration). She is currently a research assistant in Dr. Gregory Poon's lab at Georgia State University (GSU). She will start her Master study in Chemistry at GSU in August 2019. She focuses on investigated hydration contributions to DNA selectivity of minor-groove binding ligand by high-precision volumetric measurements; studied the cellular properties of designed DNA-targeting therapeutics *in vitro*; determined the affinity and thermodynamics of transcription factor/DNA binding.

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Testing the efficacy of vitamin D3 and metformin to retard the development of subcutaneous ehrlich ascites carcinomas *in-vivo*

Prashant kumar M V
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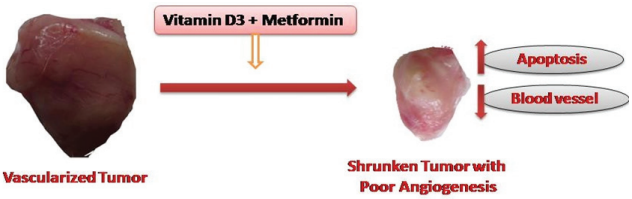
Vitamin D3 and metformin are widely used in humans for regulating mineral metabolism and blood glucose levels, respectively. Interestingly these two agents have also shown to exhibit chemo preventive effects against various carcinoma cells *in vitro* and *in vivo*. But it is not known, whether combining these two anti-cancer agents helps in synergistic tumor growth inhibition. Therefore, in this study the potency of combining Vitamin-D3 and Metformin was investigated against EAC cells injected solid tumor model. Experimentally, EAC bearing mice were given Vitamin D3 (125µg/kg and 250µg/kg) and Metformin (125mg/kg and 250mg/kg) alone or in combination (VD3 125µg/kg + M 125mg/kg) in a simultaneous and sequentially treatment regimens and tumor weight recorded at the end of the experiment. Analysis of the data showed an about 52% and 59% growth inhibition with VD3 125µg/kg and 250µg/kg, respectively, whereas the administration of Metformin yielded 57% and 62% growth inhibition at 125mg/kg and 250mg/kg, respectively. Simultaneous administration of 125µg/kg VD3 and 125mg/kg Metformin reduced the tumor weight by 63% indicating a marginal increase in the treatment efficacy. However, no such increase in the efficacy was observed when these two drugs administered sequentially. Mechanistically, VD3 and Metformin inhibited the development of blood vessels and induced apoptosis in tumors. In conclusion, our data suggest simultaneous administration of VD3 and Metformin for treating cancers.



Simultaneous VD3 and Metformin inhibit EAC solid tumors in mice by promoting apoptosis and retarding angiogenesis:

Biography

Prashanth kumar M V is an Indian council of medical research (ICMR) Senior Research Fellow at Centre for excellence in Molecular Biology and Regenerative Medicine (CEMR), Department of Biochemistry, JSS Medical College, JSS Academy of Higher Education and Research (JSS- AHE&R), Mysuru. His work focuses on developing the combination therapies on anti-cancer agent for treating breast cancers by repurposing the existing drugs. He has identified Vitamin D3 and Anti-diabetic drug Metformin combination for breast cancer treatment *in vitro* and *in vivo* model. As a Principle Investigator he has received research fund from the home university for his excellence work on V-D3 and Metformin as anti-cancer agents on Breast cancer cell line. He has published his work in national and international reputed peer reviewed journals. He has Presented posters, delivered an oral talk as delegate speaker and received best oral presentation award in national and international conferences.

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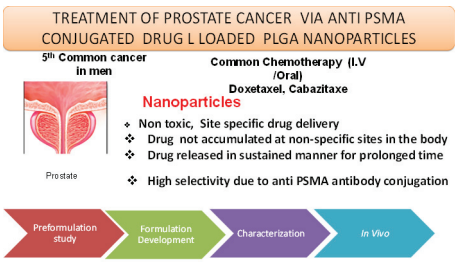
Enhanced targeting of chemotherapeutic drug to prostate cancer cells by antibody conjugated polymeric nanoparticles

Iman Ehsan
Jadavpur University, India



Prostate cancer has become common cause of cancer associated mortality in males across the world. Prostate cancer is not perpetually lethal, it is a heterogeneous disease ranging from asymptomatic to a rapidly fatal systemic malignancy. Although recent advancement has been made in the field of prostate cancer therapy, but low survival rates persist among patients due to metastatasis, drug toxicity/ resistance and high rates of recurrence. In recent years, polymeric nanoparticles have demonstrated marked progress in the field of oncology. Polymeric nanoparticles are widely used in tumor targeting as they possess ability to shrink and eliminate tumors without damaging healthy tissue, overcoming the lacunas of drug such as poor solubility, oral bioavailability and low therapeutic indices. An increased site specificity and internalization was obtained by conjugating specific antibody to the nanoparticles to improve the efficacy of treatment of prostate cancer and decrease the possibility of the serious side effects that cancer patients often experience. Biodegradable nanoparticles (NP) containing an anti-cancer drug was prepared and tagged with anti-PSMA monoclonal antibody as an active targeting to prostate cancer because anti-PSMA monoclonal antibody recognizes and binds with the PSMA on the surfaces of prostate. PSMA is prostate specific membrane antigen, a transmembrane receptor whose expression is largely restricted to prostatic epithelium and prostate cancer cells with its expression level increasing during the progression of malignancy, the drug was released from the nanoparticles leading to cell death. Pre-formulation studies such as drug excipient interaction studies, followed by preparation and optimization of the NP were carried out and characterized for physiochemical characterization such as particle size, zeta potential, morphology, drug loading capacity, drug encapsulation, *in vitro* drug release from NP was performed. Confirmatory studies to determine the presence of the antibody on the surface of NP was evaluated. Storage stability study was conducted. The NP and conjugated NP were utilized to evaluate its efficacy in the cellular uptake, quantification of it, cell viability, apoptosis in the prostate cancer cells (PC3, LNCaP cell lines). Biodistribution and pharmacokinetic analysis were carried. Therefore, antibody conjugated nanoparticle based therapy represents a novel approach to eliminate prostate cancer cells and is a promising potential treatment strategy and may lead to development of prostate cancer model by xenograft model in mice.

Biography

Iman Ehsan is currently pursuing her PhD in Jadavpur University, India. She is working on novel drug delivery, her current area of research is nanoformulations for site specific targeting of prostate and liver cancer. She has completed her M.Pharm from West Bengal University of Technology, Kolkata, West Bengal, India.

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Targeting to prostate cancer cells by using ligand conjugated polymeric nanoparticles as drug carrier

Ashique Al Hoque
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Presently wide-ranging research has been carried out to develop nano drug carriers, to overcome the lack of specificity of conventional chemotherapeutic agents for the treatment of prostate cancer, the second most common cancer in men. The aim of the current study is to develop and characterize PLGA nanoparticles (NPs) containing an anticancer agent, tagged with a suitable ligand for targeted delivery of the drug. Nanoparticles were prepared by a multiple emulsion solvent evaporation method. Drug-excipients interaction, surface morphology, zeta potential and size distribution, cellular uptake were carried out using Fourier transform infrared spectroscopy (FTIR), Field emission scanning electron microscopy (FESEM), Zeta sizer Nano ZS90, particle size analyzer and confocal microscopy respectively. No chemical interaction was observed between the drug and the selected excipients. NPs had a smooth surface, and a nanosize range (250–380 nm) with a negative surface charge. Drug loadings of the prepared particles were 1.5%±0.02% weight/weight (w/w), 2.68%±0.5% w/w, 4.09%±0.2% w/w, 8.50%±0.58% w/w for NP1–NP4, respectively. A sustained drug release pattern was observed from the nanoparticles and they were internalized well in the PC3, LnCap, cancer cells on a concentration dependent manner. Drug loaded nanoparticles were found to be more cytotoxic than the free drug and the cellular internalization was observed in PC3, LnCap cancer cells *in vitro*. Further the prepared nanoparticles will be conjugated with suitable ligand for the site-specific targeting to the prostate cancer cells *in vivo*. Thus, the formulation might be suitable for the effective treatment of prostate cancer.

Biography

Ashique Al Hoque is a research fellow and pursuing his Ph.D in Department of Pharmaceutical Technology, Jadavpur University, India. He has completed his master's degree in Medicinal Chemistry from Aliah University, India. He has very good knowledge of Medicinal Chemistry, QSAR, Pharmacology, Pharmacognosy, Biotechnology, Biochemistry, Pharmacokinetics, Pharmacodynamics, Toxicology etc. Currently he is working on a project entitled "Development and characterization of ligand conjugated biodegradable polymeric nanoparticles system for targeted prostate cancer therapy: *in vitro* and *in vivo* study".

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Development of aptamer conjugated nanoliposomal flavonoid: A novel therapeutic approach to treat hepatocellular carcinoma

Moumita Dhara
Jadavpur University, India

Hepatocellular carcinoma (HCC) is one of the major causes of cancer related death globally. Successful treatment of liver cancer remains a formidable challenge in modern drug development due to sub-therapeutic permeation of conventional chemotherapeutics to the proper site of action along with its toxic side effects. Ligand conjugated nanoliposomes are an emerging formulation in the treatment of cancer. Flavonoids are abundantly present in fruits and vegetable are believed to carry preventive and therapeutic potential against cancer. Here we have optimized the aptamer conjugated nanoliposomes which is encapsulated with a bio-flavonoid and we studied its preferential uptake and efficacy on liver cancer. Various physiochemical and biopharmaceutical characterization studies such as drug-excipients interaction, surface morphology, energy dispersive X-ray analysis, zeta potential, *in vitro* drug release and cytotoxicity along with cellular uptake were conducted. Drug loaded nanoliposomes (D-NL) and aptamer conjugated drug loaded nanoliposomes (D-NL-A) showed 3.51±0.26% and 3.23±0.05% drug loading values, respectively. Average diameters (z-average) of the nanoliposomes were within 100 nm; it was also showed negative zeta potentials along with smooth surface and intact lamellarity. Predominant uptake of both the types of nanoliposomes was visualized. *In vivo* pharmacokinetic and biodristribution study in swiss albino rats showed that the drug availability significantly increased in carcinogenic liver upon (D-NL-A) treatment in comparison with free drug and (D-NL). Ligand conjugated nanoliposomal drug delivery substantially controlled the severity of hepatocellular carcinoma and could be a future hope for lingering the survival in hepatic cancer patients.

Biography

Moumita Dhara has four years of research expertise in development of novel drug delivery system with its physical and molecular pharmacological characterization of different nanoformulations upon cancer therapy. Additionally had a previous five years of pharmaceutical industrial experience in product development and regulatory field. Completed Masters in Pharmacology and presently pursuing PhD in Pharmacy in Jadavpur University, Kolkata, India.

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Nanoformulated betulinic acid analogue distinctively improves colorectal carcinoma: An advanced technology for cancer therapy

Debasmita Dutta
Jadavpur University, India

Recently Betulinic acid, a naturally occurring plant secondary metabolite, has gained significant attention due to its antiproliferative activity over a range of cancer cells. In our previous study, we have reported a promising betulinic acid analogue (2c) with better therapeutic efficacy than the parent molecule to colon carcinoma cells. Despite its impressive biological activity, poor water solubility and low bioavailability creates difficulties in its pharmacological activity. To overcome these lacunas and making it a promising drug candidate we have formulated PLGA encapsulated 2c in the present study followed by evaluated its *in vitro* and *in vivo* therapeutic efficacy in both mice and rat colon carcinoma model. Nanoformulated drug delivery provides several advantages over free drug such as large loading capacity, minimum drug loss, sustained drug release and long-term *in vivo* stability. Additionally, due to enhanced permeability and retention effect in the tumor microenvironment, nano sized drug molecules preferentially penetrate the tumor vessel and retain at that site which ensures minimum cytotoxicity to normal cells. Herein we observed that nanoformulation of 2c developed a perfect nano size sphere with smooth surface area, effective cellular uptake, 8% drug loading and *in vitro* sustained drug release profile. *In vitro* antiproliferative activity significantly enhanced over free drug, which is measured by MTT assay, Annexin V positivity, JC1 analysis, DNA degradation and cell cycle study. *In vivo* therapeutic potential measured in mice and rat model also reflects its ability as a promising drug candidate for treatment of colon carcinoma and future potential clinical aspect.

Biography

Debasmita Dutta is presently pursuing Post-doctoral research as a DBT-Research Associate, in Department of Pharmaceutical Technology, Jadavpur University, India. She was associated with West Bengal State University, India as a Guest Faculty in Department of Microbiology for last three years. She has completed her PhD in Cancer Biology from CSIR-Indian Institute of Chemical Biology. She has published her research findings in highly circulated reputed international journals like Nature Communications, ACS Applied Biomaterials, European Journal of Medicinal Chemistry etc. She has received many scholarships and awards like Post-doctoral fellowships from Department of Biotechnology, Government of India in 2016 and Council of Scientific and Industrial Research (CSIR), Government of India in 2017, International Travel Grant Award from Indian Council of Medical Research (ICMR), Government of India to attend 23rd EACR (European Association for Cancer Research) in Munich, Germany in 2014, best oral presentation award at "3rd Pharm Tech IAPST International Conference" at Centurion University, India in 2019.

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Wharton's Jelly-derived Mesenchymal Stem Cell - Conditioned media induces apoptosis of pancreatic cancer

Neha Chopra
Sir Ganga Ram Hospital, India

Pancreatic cancer has an extremely poor prognosis, due to not only being a highly complex and aggressive malignancy but also due to its chemo-resistance. Stem cell-based treatments are being increasingly explored especially for those cancers that cannot be treated with targeted therapy. In the last decade, Mesenchymal Stem Cells (MSCs) have attracted significant attention as a result of their accessibility, tumor-oriented homing capacity and the transplantation feasibility. Till date, MSC-based therapy for pancreatic cancer has not been demonstrated.

To study the interaction between human Wharton's jelly-derived mesenchymal stem cells (hWJMSCs) and pancreatic cancer cells, co-culture assays were performed (ratio of 1:1; 48 hrs). An inverse proportionate expression of Bax and Ki67 was observed when MiaPaCa-2/PanC-1 was treated with hWJMSCs (32.5% and 13% respectively). To verify these results, PKH-26 -labeled hWJMSCs were overlaid on pancreatic tumor cells (1D). It was observed microscopically that PKH-26 -labeled hWJMSCs proliferated two-fold in comparison to tumor cells. The effect of MSCs directly affecting the pancreatic tumor cell was reconfirmed with a proliferative marker Ki67. Functional properties EpCAM/CXCR4 (metastatic markers), Vimentin & E-cadherin (EMT markers) were evaluated using Flow cytometry and qPCR. EpCAM was significantly ($p=0.0002$) decreased when treated with hWJMSCs in comparison to untreated tumor cells (MiaPaCa-2- 23% vs 37%; PanC1- 20% vs 50%). However, no significant change in CXCR4 expression was observed.

To understand the cellular cross-talk between hWJMSCs and pancreatic tumor cells, the conditioned media derived from hWJMSC (CM) was studied. Expression of Bax was significantly further increased (58%) when treated with CM in comparison to hWJMSCs alone (32.5%). However, inhibition of EpCAM expression did not differ from hWJMSCs alone treatment. Migration and invasion potential of tumor cells were inhibited when treated with CM (MiapaCa-2- 2.2 vs 9 cells/field; PanC-1- 5 Vs 10.5 cells/field), compared to untreated tumor cells. On frequency distribution histograms (flow cytometry) apoptotic events were characterized by a distinctive "sub-G1" peak that represents oligonucleosomal DNA fragments. MiaPaCa-2 and PanC1 cells treated with CM showed significant ($p<0.005$) reduced number of cells entering G1 phase of the cell cycle ie., at G0M phase. This result was also evident as per DNA-fragmentation assay.

Thus, our results suggest that Wharton's jelly derived mesenchymal stem cells secretome can modulate the proliferation and migratory (oncogenic) capabilities of pancreatic tumor cells. In other words, paracrine factors released by hWJMSC might be act as a cytotoxic biological agent.

Biography

Neha Chopra is pursuing her PhD from Jamia Hamdard in association with Sir Gangaram hospital, New Delhi. She was a university topper in post graduate program and presently a DST-INSPIRE fellow. Her work from post graduate thesis is under publication in an international journal. She has presented her PhD research work at national and international conferences (AACR). She has co-authored a book chapter and currently in process of submitting 2 original research papers.

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Adopting laughter therapy to get dosage of happy hormones to remove stress caused by being in slight pain, being depressed, being unhappy anxious or sad. Saying positive affirmations aloud changes body cell energy

Suchi
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Statement of the Problem: There is a lack of awareness about what happy hormones are, how to use positive words to feel energetic and what can be done to get happy hormones. People tend to feel unhappy for multiple reasons and neuropathic pain adds on Stress levels of not only the patient but the caregivers as well. Being in pain leads to feeling depressed and anxious in some cases.

Methodology & Theoretical Orientation: Review of Books and Research shows that getting a dosage of happy hormones will not only ease slight pain of the patient but feeling happy will also have a positive impact on the recovery of the patient. Adopting Laughter therapy and getting hormones which makes one feel good will help many to recover from Neuropathic pain /Long term sadness caused by having grief, Anger or Resentment, Depression & Anxiety.

Findings: One needs to work on his/her energies using Laughter Therapy which is a positive approach for not having Depression & Anxiety caused by Neuropathic pain. The therapy can be used as a Holistic way to recovery.

Conclusion & Significance: The Laughter therapy which includes ways to get the dosage of happy hormones promotes overcoming Depression & Anxiety caused by Neuropathic pain, is a fun way to manage pain. Repeated sessions to be conducted to remind patients that life while having pain or during the recovery should go beyond just seeking medical and counselling help and also include rebuilding Spiritual, Physical, Emotional, Relational and Mental health. The model has been put together from for testing in many settings including hospitals, elderly homes and senior citizen centres. This is not a research book or paper. It is just an effort to demystify the help available for Depression & Anxiety caused by pain. It is an attempt to motivate and encourage people to seek help and take a simple approach to remember and work on all aspects of their recovery.

Biography

Suchi is an experienced International Pre School Principal/Manager who picked up Laughter exercises from many coaches around the world. She then designed 'Laughter Therapy' which is being used in many places such as hospitals and Senior Activity Centres. She provides individual and group therapy in educational and home settings.

A former Manager / Trainer is now engages in building social awareness about Holistic approach for recovery. Be it Depression, Anxiety caused by physical or emotional pain, Death in the family and the harm the unhappiness brings to people, families and communities. Her aim is to encourage people to seek help early and get on the path to recovery. Her works has been featured in local press, TV and Radio and has been an invited speaker at various community clubs and educational Institutions. She has also been awarded by MINDS and various community clubs in recognition of her social work.

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