Liposomal Curcumin and Sorafenib Synergistically Inhibit Hepatocellular Carcinoma
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Abstract

Synergy and Cytotoxicity Assays

Flow Cytometry Analysis

Western Blot Analysis of Synergy
Liposomal Curcumin and Sorafenib Synergistically Inhibit Hepatocellular Carcinoma

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Abstract

Flow Cytometric Analysis

Synergy and Cytotoxicity Assays

Effect on Hepatocellular Carcinoma

Introduction

Chronic Liver Disease

Growth Factor Expression

Conclusions
Liposomal Curcumin and Sorafenib Synergistically Inhibit Hepatocellular Carcinoma

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Abstract

Introduction

Synergy and Cytotoxicity Assays

Effect of Curcumin on Autophagy

Flow Cytometry Analysis

Western Blot Analysis of Synergy

Conclusions
Purification and Quantification of *Pneumocystis jirovecii* DNA

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**Abstract**

1. Inventory of Collected Samples and Testing of Standard
2. Standard and Plasmid
3. DNA Isolation
4. DNA Isolation Results

**Introduction**

*P. jirovecii* is a ubiquitous protozoan that produces pneumonia in immuno-compromised patients. The organism is not an efficient lung colonizer, however, because of low osmotic pressure, the species is not retained in the lungs and is eliminated in the sputum. The species is an important cause of life-threatening infections in the HIV-infected population. In order for the study to be possible, the *P. jirovecii* DNA must be isolated from tissue samples. Therefore, it is necessary to develop a method for producing high-quality DNA from *P. jirovecii* infected tissue samples. The development of a method for producing high-quality DNA from *P. jirovecii* infected tissue samples is crucial for the success of the study. The developed method for producing high-quality DNA from *P. jirovecii* infected tissue samples is crucial for the success of the study.

**Conclusions**

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Exploring the Use of Chitosan as a Drug Delivery Mechanism and as a Biofilm Inhibitor
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Introduction
Biofilm formation is a major problem in medicine, particularly in medical devices, where it can lead to infections. Chitosan is a biodegradable, biocompatible polysaccharide derived from chitin, a component of the exoskeleton of crustaceans and insects. It is a non-toxic substance that has been used as a wound dressing, a drug delivery system, and a biofilm inhibitor.

Materials and Methods
A solution of chitosan was prepared by dissolving chitosan from a mixture of chitin and chitosan. The solution was then applied to the medical device and allowed to dry. The device was then incubated in a biofilm culture to observe the formation of biofilms. The effects of chitosan on biofilm formation were then evaluated.

Results
The results showed a significant reduction in biofilm formation on the device treated with chitosan compared to the control. The graph below illustrates the reduction in biofilm formation.

Discussion
The data were analyzed using an unpaired Student's t-test. There were no significant differences in the number of adherent bacteria on the surface of the disks.

Possible reasons for the lack of significant differences may be the absence of a chitosan-based biofilm model. The number of MRSA used in the biofilm model (1 x 10^6 CFU/ml) is likely much higher than the number of bacteria that actually colonize a dental implant in a human.

The medium used for biofilm formation (rich microbiological broth) is very different from the oral environment. MRSA implants are not found in the human body. Chitosan coatings may have been more effective in preventing biofilm formation in a more realistic environment.

Conclusions
Although the data suggest that chitosan would not be an effective drug delivery system, it is worth exploring its potential as a wound dressing and biofilm inhibitor. The results of this study provide evidence that chitosan may have potential applications in reducing biofilm formation on medical devices.

References
Constructing a functional assay to find the workaholic FXN promoter

Junru Yan, Anasheh Halabi, Ed Grabczyk
Department of Genetics, LSUHSC

Abstract

Introduction

Hypothesized genetic mechanism

Further procedure

Proposed methodology

Conclusions

Figure 1: The FXN promoter contains a region with high potential to be a functional workaholic.

Infection associated with prosthetic joints. N


Bacterial biofilms within the clinical setting: should know. J Hosp Infect 64:313-325.


Chitosan burn: antimicrobial and wound healing. THER 9: 875-879.
Constructing a functional assay to find the to find the workaholic FXN promoter

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Abstract

The promoter region of the FXN gene plays a crucial role in regulating the expression of this gene. This study aimed to develop a functional promoter assay to identify the workaholic FXN promoter. The assay involves reporter gene expression analysis using a luciferase reporter system. The results indicate that the identified promoter region is highly active in liver cells, suggesting its potential role in FXN expression.

Hypothesized promoter location

Further procedure

Introduction

FXN is a well-studied gene, and its promoter region is essential for regulating its expression. Previous studies have identified several regions within the FXN promoter that contribute to its activity. However, the exact regulatory elements are yet to be fully elucidated.

Proposed method

The proposed method involves the use of a luciferase reporter gene assay. This assay utilizes a plasmid containing the FXN promoter region upstream of a luciferase reporter gene. The activity of the luciferase reporter gene is measured in liver cells to assess promoter activity.

Conclusions

The identified promoter region is highly active in liver cells, suggesting its potential role in FXN expression. Further studies are needed to characterize the regulatory elements within this region and understand its role in FXN expression.

References

Regulation of Cyclophilin A Expression by a Molecular Scaffold Protein in Leishmania

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Introduction

Leishmaniasis: The disease
- Caused by protozoans of the genus Leishmania
- Transmitted by the bite of phlebotomine sandflies
- 12 million people in 80 countries affected (especially in the tropics/subtropics)
- Geographic range extending from tropical areas to Southern Europe
- Symptomatic cutaneous lesions in fatal visceral disease

TREATMENT
- No effective, low toxicity treatments available
- Known side effects of available antileishmanial drugs
- Poor patient compliance and high drug cost

Background
- The LACK protein is important for Leishmania major replication and virulence
- LACK is a cytoskeleton-associated scaffold protein, regulating signaling and translation
- LACK-deficient L. major show decreased sensitivity to Cyclosporin A

Hypothesis: Decreased expression of Cyclophilin A in LACK-deficient L. major will result in abrogation of its sensitivity to the Cyclophilins A (CypA)

Development of a High-Throughput Leishmania viability assay

Effect of CypA on LACK-deficient L. major is specific to CypA

Conclusions

Reference:
1. Muh A, Cardenas D, Kelly B. Regulation of Cyclophilin A Expression by a Molecular Scaffold Protein in Leishmania. 2023. LSUHSC Department of Microbiology, Immunology, and Parasitology.
RNA Binding ability of FUS mediates toxicity in a Drosophila model of ALS

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Abstract

I. FUS Gene Model

II. A Drosophila model of FUS

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III. RNA Binding ability is essential for FUS-related neurodegeneration.

Conclusions
Targeting Plasmodium Kinesin-5 as Novel Malaria Treatment

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Abstract

Kinesin-5 motor proteins use energy from ATP hydrolysis to organize the mitotic spindle and are essential for cell division. If there is a failure in the function of the spindle protein the cell cannot divide and will enter apoptosis. Because of its essential role in the early and mid-anaphase components. These complexes inhibit kinesin-5 kinases without inhibiting other motor proteins. In working with this, we hypothesize that Plasmodium kinesin-5 can be specifically inhibited. These inhibitors would be promising candidates for the treatment of malaria.

Results

PvK95 has catalytic behavior similar to other kinesin-5 proteins.

Introduction

Kinesin-5 (KIF11) motor proteins are essential in formation of mitotic spindles. This has made human KIF11 (KIF11) a popular target for anti-cancer therapy. Our hypothesis is that inhibiting the motor functions of kinesin-5 can also be a target for drug treatment. We identified kinesin-5 in the malaria parasite Plasmodium vivax (PvK95), using bioinformatics tools.

Acknowledgments

The work is supported by NIH R01 AI119269 and awarded by the Dean of School of Medicine.
Differential Effects of Alcohol Exposure and SW Proteins on Mesenchymal Stem Cell Adipogenesis and Osteogenesis

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Abstract

Methods

Ethanol Alternates Osteogenesis Differentiation

Introduction

Ethanol Enhances Adipogenesis

Conclusions

Time Line of Alcohol or Surfact Administration. Bar Graph Induction and Sample Collection
Differential Effects of Alcohol Exposure and SIV Proteins on Mesenchymal Stem Cell Adipogenesis and Osteogenesis

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Abstract

Introduction

Methods

Ethanol and SIV Proteins Differentially Regulate Cellular Metabolism

Ethanol Alternates Osteogenic Differentiation

Ethanol Enhances Adipogenic Differentiation

Summary

Conclusions

This research was supported by NIH/NIAAA grants AA026312, AA09803, and T35AA021067.
Short-term stability and cell permeability of nanoemulsions using FITC-BSA

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Introduction

Purpose

Methods

Results

Conclusions

Acknowledgements
The Effects of Noradrenaline and Action Potential Activity on CPEB3 Expression in Cerebellar Neurons

**Introduction**

- Noradrenaline and action potentials are known to regulate gene expression.
- The impact of noradrenaline and action potentials on CPEB3 expression in cerebellar neurons is not well understood.

**Methods**

1. Neuronal cultures were treated with noradrenaline and/or action potentials.
2. CPEB3 expression was quantified using qPCR and Western blot analysis.
3. Pharmacological inhibitors were used to elucidate the mechanism of action.

**Conclusions**

- Noradrenaline and action potentials significantly increase CPEB3 expression.
- The increase is mediated through cAMP signaling pathways.
- CPEB3 upregulation is critical for long-term memory formation.
Role of Heat shock protein 90 in Plasmodium falciparum Malarial Infections and its drug target potential

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Introduction

Hsp90 Construct Design

Construct and Vector Ligation

Hsp90 PCR Constructs

Construct and Vector Digestion

Conclusions

Phenotypes associated with the disruption of the Hsp90 pathway include increased inflammatory responses, cell death, and decreased tumor growth. The role of Hsp90 in regulating the activity of these molecules suggests potential therapeutic targets for the treatment of disease.

Hsp90 is a molecular chaperone that plays a crucial role in the folding and stabilization of proteins. Its dysfunction can lead to the accumulation of misfolded proteins, which can result in cell death and disease. The study of Hsp90 and its role in disease is an active area of research, and understanding its function and regulation may provide new therapeutic strategies.

Fig. 1 shows the schematic representation of the constructs used in the study. The constructs were designed to express Hsp90 under the control of a specific promoter. The constructs were then transfected into cell lines and the expression levels were assessed using western blotting.

Chronic alcohol consumption can lead to increased human immunodeficiency virus (HIV) and reduced bone density, which can result in increased risk of bone fractures. The study found that chronic alcohol consumption can lead to increased expression of Hsp90, which may contribute to reduced bone density and increased risk of fracture.

Fig. 2 shows the expression levels of Hsp90 in samples from alcoholics and non-alcoholics. The expression levels were assessed using real-time PCR and were found to be significantly higher in samples from alcoholics compared to non-alcoholics.

Alcohol abuse is a significant public health problem, with over 40 million people worldwide suffering from alcohol use disorders. The study found that chronic alcohol consumption can lead to increased expression of Hsp90, which may contribute to the development of alcohol-related diseases.

Fig. 3 shows the expression levels of Hsp90 in samples from alcoholics and non-alcoholics, with and without treatment. The expression levels were assessed using real-time PCR and were found to be significantly lower in samples from alcoholics with treatment compared to alcoholics without treatment.
Predisposition of ICF (Immunodeficiency, Centromeric region instability, Facial Anomalies) Syndrome to Foodborne Pathogens

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Introduction
DNA Methylation

ICF Syndrome
ICF (immunodeficiency, centromeric region instability, facial anomalies) syndrome is an autosomal recessive disorder characterized by immunodeficiency, skeletal anomalies, and hematologic abnormalities. Patients with ICF syndrome typically present with recurrent infections, bone abnormalities, and other clinical features.

ICF Syndrome Genetics
ICF syndrome is caused by mutations in the NEMO gene (NEMO), which encodes a protein involved in the NF-kB signaling pathway. Mutations in NEMO prevent the proper activation of the NF-kB pathway, leading to the clinical features observed in ICF syndrome.

Immunology of ICF Syndrome
Immunodeficiency in ICF syndrome is a result of dysregulated immune responses, which can lead to recurrent infections and autoimmune disorders. Abnormalities in T-cell function, antibody production, and natural killer cell activity are common in ICF syndrome patients.

Salmonella Strains Which Affect ICF Patients
ICF patients are particularly susceptible to infections with certain strains of Salmonella enterica. These strains are more virulent and can cause more severe infections in ICF patients due to their impaired immune response.

Materials and Methods
Calculation and demonstration analysis
The infected control and normal negative controls were grown in RPMI 1640 medium supplemented with 10% fetal bovine serum. After 72 hours, the supernatants were collected, and the concentration of TNF-α was determined using a commercially available ELISA kit.

Fluorescence in situ Hybridization (FISH)
The chromosomes 14q32.33 probe was used for ICF syndrome analysis.

Conclusions
The findings from this study highlight the importance of understanding the molecular mechanisms underlying ICF syndrome to develop targeted therapeutic strategies.

Selectively Slaying Metastatic Carcinomas by Osmotic Lysis
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Abstract
Video Clips
Images of lysed vs. unconcentrated Cancer Cells

Lysis Time of Cancer Cells
Results and Conclusions

Summary of Results

(G-band) Results
Selectively Slaying Metastatic Carcinomas by Osmotic Lysis

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Abstract

On the tablet is a video presentation of a complete experiment of the cell line MDA-MB-231 (metastatic breast cancer). Cells were incubated in 102 psi of air for 23 min, then a 300 psi gas stimulus across the cell via the electrodes.

Images of lysed vs. control cells

Table 2: Time to Lysis of Cultured Cancer Cells

Table: Controls vs. No Sodium

Results and Conclusions

Metastatic carcinoma uses lysis time ranged from the 29 sec of MDA-MB-231 to 9 min for MCF-7. Normal Stewart cells did not lyse.

Our sodium positive Ringer solution’s mass flow times ranged from MDA-MB-231 814 sec to A549 1444 sec. The same cell lines in the sodium-free medium did not lyse within 5 min. This confirmed that sodium’s presence was the mediating factor to the osmotic lysis.

Table 3: Time to Lysis of Cultured Cancer Cells

Table: Controls vs. No Sodium

Table: Controls vs. No Sodium

The short lysis times indicate that, rather than months of prolonged experience a relatively painless, free, safe cancer treatment that only expresses the toxic chemicals or sterilizes harmless radiation, patients treated disease cells in minutes.
Chronic Δ9-THC differentially downregulates gene expression of IgJ, DMBT1, and CDC20 in duodenum of SIV-infected macaques

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Introduction

We hypothesized that THC alters SIV pathogenesis by modulating expression of genes that influence inflammation in the gut, enhancing the severity of the gut phenotype and impairing the immune response to the virus.

Methods

We used a combination of reverse transcription polymerase chain reaction (RT-PCR) and qPCR to quantify the expression of genes of interest in the gut mucosa of SIV-infected macaques treated with THC.

Analysis and Results

Gene expression was significantly decreased in the THC-treated group compared to the control group. The most affected genes included IgJ, DMBT1, and CDC20.

Conclusions

Our findings suggest that THC may contribute to the pathogenesis of SIV infection by modulating the expression of genes involved in inflammation and immune response.

This research was supported by grant #T35AA021987 from the National Institute of Alcohol Abuse and Alcoholism at the National Institutes of Health.
Alcohol's Affect on Physical Function in the HIV-infected Population

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Introduction

Hand Grip Strength Data

Discussion

6 Minute Walk Data

Conclusions

Chair Stand Data

This research was supported by grant 1TT5AA00997 from the National Institute of Alcohol Abuse and Alcoholism at the National Institutes of Health.
Alcohol Use and Cognitive Function in HIV-Infected Individuals

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Introduction

AIDS-related cognitive impairments (ARCIs) in patients living with HIV (PLWH) are a major concern for public health. ARCIs may affect daily living, increase health care utilization, and may negatively impact the quality of life. The negative impact of ARCIs is further increased by the complex comorbidities associated with HIV. The declining global epidemic of ARCIs in PLWH living with HIV is observed in clinical trials and real-world settings. However, the evaluation of ARCIs in the context of the complex comorbidities associated with HIV is necessary to better understand the etiology and potential risk factors associated with ARCIs. The current study aimed to evaluate the cognitive function of PLWH with and without ARCIs using neuropsychological tests. The results showed that PLWH with ARCIs had significantly lower cognitive function scores compared to those without ARCIs. These findings highlight the need for further research to identify the risk factors associated with ARCIs in PLWH.

Results: Mini Mental State Exam

Results: Trail Tests

Results: Clock-drawing test

Demographics

Conclusions

This research was supported by grant 1R01DA027405 from the National Institute of Alcohol Abuse and Alcoholism of the National Institutes of Health.