therapeutic strategies against the mTOR-reinforced NAFLD-associated HCC.

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IDDF2019-ABS-0229 BIOCHEMICAL AND MOLECULAR EFFECTS OF 17 β ESTRADIOL ON MEMBRANE FUNCTIONS IN AGED RAT LIVER

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Background Free radical production and oxidative stress are known to increase in the liver during aging and may contribute to the oxidative damage. Aging in females and males is considered as the end of natural protection against age-related diseases like osteoporosis, coronary heart disease, diabetes, Alzheimer's disease, and Parkinson's disease. These changes increase during the menopausal condition in females when the level of estradiol is decreased.

The objective of this study was to observe the changes in activities of membrane-linked ATPases (Na⁺/K⁺ ATPase, Ca²⁺ ATPase), antioxidant enzymes (superoxide dismutase, glutathione-S-transferase), lipid peroxidation levels, lipofuscin content, glucose transporters 2 (GLUT 2) expression and membrane fluidity occurring in livers of female rats of 3, 12 and 24 months age groups, and to see whether these changes are restored to 3 months control levels rats after exogenous administration of 17- β -estradiol (E2).

Methods The aged rats (12 and 24 months old) (n= 8 for each group) were given subcutaneous injection of 17 β estradiol (0.1 μ g/g body weight) daily for one month. Controls animals received an equal volume of vehicle. After 30 days of hormone treatment, experimental animals of all the groups were sacrificed and livers were isolated for further study. A detailed study was carried on membrane linked enzymes, membrane fluidity, lipofuscin and GLUT2 expression with immunohistochemistry to identify the antiaging role of E2 using biochemical, molecular and histochemical study.

Results The results obtained in the present work revealed that normal aging was associated with significant decrease in the activities of membrane-linked ATPases, antioxidant enzymes, membrane fluidity, GLUT 2 expression and an increase in lipid peroxidation and lipofuscin content in livers of aging female rats. Our data showed that exogenous administration of E2 brought these changes to near normalcy in aging female rats.

Conclusions The present study showed that E2 treatment reversed the changes to normal levels. E2 treatment may be beneficial in preventing some of the age-related changes in the liver by increasing antioxidant defenses.

IDDF2019-ABS-0230 CHANGE IN THE LIPID PROFILE, LIPOGENIC AND RELATED ENZYMES IN THE LIVERS OF EXPERIMENTAL DIABETIC RATS: EFFECT OF TRIGONELLA FOENUM GRAECUM AND VANADATE

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Background Diabetes has been considered as one of the fastest growing epidemic worldwide; the number of people with diabetes is estimated to increase from 381.8 million in 2013 to 591.9 million in 2030. Oxidative stress in diabetic tissues is accompanied by a high level of free radicals and the simultaneously declined antioxidant enzymes status leading to cell membrane damage.

In the present study, the effect of sodium orthovanadate (SOV) and *Trigonella foenum graecum* seed powder (TSP) administration has been studied on hepatic glucose homeostasis, lipogenic enzymes and lipid metabolism in liver tissues of the alloxan-induced diabetic rats and to see whether the treatment with SOV and TSP is capable of reversing these effects.

Methods Diabetes was induced by administration of alloxan monohydrate (15 mg/100gm b.wt.) and rats were treated with 2IU insulin, 0.6 mg/ml SOV, 5% TSP in the diet and a combination of 0.2 mg/ml SOV with 5% TSP separately for 21 days. Control animals were given only the vehicle. The activities of two lipogenic enzymes, glucose-6-phosphate dehydrogenase and malic enzyme; and related enzymes, hexokinase and glucose-6-phosphatase were measured in the liver cytosolic fractions of diabetic rats and diabetic rats treated separately with TSP and SOV. The total lipids, triglycerides and cholesterol levels were estimated in the livers of the diabetic and the treated rats.

Results Diabetic rats showed hyperglycemia with almost four-fold high blood glucose levels. The activities of both the lipogenic enzymes and hexokinase isozymes were significantly decreased whereas the activity of glucose-6-phosphatase was significantly increased in the diabetic liver. During diabetes, the levels of total lipids and triglycerides increased significantly with a decrease in the cholesterol levels in the liver. TSP and SOV were able to restore the altered enzyme activities to almost control levels. Rats treated with the combined dose of SOV and TSP had glucose levels comparable to controls, similar results were obtained with the triglycerides and cholesterol levels in the liver of diabetic rats.

Conclusions Our results showed that lower doses of SOV (0.2 mg/ml) could be used in combination with TSP to effectively counter diabetic alterations without any toxic side effects.

IDDF2019-ABS-0234 ROLE OF MOMORDICA CHARANTIA FRUIT EXTRACT AGAINST HEPATIC FIBROSIS INDUCED BY CARBON TETRACHLORIDE IN RATS

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Background *Momordica charantia* Linn. (Karela) commonly known as Bitter melon or Bitter gourd is a tropical and sub-tropical climber of the family Cucurbitaceae. Its fruit is also used for the treatment of diabetes and related conditions amongst the indigenous populations of Asia, South America, India and East Africa.

The aim of the present study was to investigate the *Momordica charantia* fruit (MCF) extract as hepatoprotective agent verse hepatic damages caused by carbon tetrachloride (CCl₄).

Methods Male Wistar albino rats were divided into two equal groups (n=8) and treated as follows: Group 1, kept as control group and orally given saline; Group 2, kept as control

positive and were administered daily oral doses of MCF extract (150 mg/kg) daily for 21 days and subsequently injected i.p. with CCl₄ (50% v/v in olive oil; 1 ml/kg) on the 22nd day. CCl₄-induced damages were assessed through liver function markers viz.; alkaline phosphatase, alanine transaminase, aspartate transaminase, and lactate dehydrogenase. Changes in lipid profile were checked by measuring serum total cholesterol, triglycerides, high-density lipoproteins and low-density lipoproteins. Antioxidant status was checked by the activities of antioxidant enzymes (superoxide dismutase, glutathione peroxidase), malondialdehyde (MDA) content. The histopathological changes were observed with Masson staining.

Results Administration CCl₄ induced an elevation of serum amino- and glutamyl transferases activities and an increased peroxidation, as well as a decrease of superoxide dismutase and glutathione peroxidase activities in the liver. Administration of CCl₄ in rats caused a significant increase in liver function and lipid profile indicating hepatic damages which were restored by co-administration of MCF extract. Cellular and DNA damages in hepatic tissues were caused by CCl₄ which shown clear hepatic fibrosis in addition to disturbing antioxidant enzyme level. Co-treatment with MCF extract regulated these markers of oxidative dysfunctions. **MCF extracts** enhance hepatic glutathione and may contribute to the antioxidant defense of the liver.

Conclusions It may be concluded that MCF extracts have the ability to reverse CCl₄ induced hepatic damages. *Momordica charantia* fruit has been used to treat alcoholic liver disease, acute and chronic viral hepatitis and toxin-induced liver diseases.

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ANDROGEN RECEPTOR PROMOTES GASTRIC CARCINOGENESIS VIA UPREGULATING THE EXPRESSION OF CELL CYCLE-RELATED KINASE

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Background Gastric cancer (GC) is a leading global health problem. In most areas of the world, the incidence rate of GC in males was 1.5- to 3- fold higher than that in females. The androgen receptor (AR) is an independent adverse prognostic factor in patients with GC. However, the mechanism of AR regulating the progression of GC remains unclear. The aim of this study is to determine the effect of AR on the progression of GC and the mechanism behind these effects, which will provide novel ideas for the treatment of GC.

Methods The relative expression of AR were detected by semi-quantitative RT-PCR and real-time quantitative PCR. The functions of AR in GC were determined by colony formation experiment, transwell migration and invasion assay. The clinical data were obtained from the website cBioPortal and XENA database. The potential mechanism of AR in GC was searched by Gene Set Enrichment Analysis (GSEA) and DAVID. Chromatin immunoprecipitation (ChIP) and PCR

were performed to explore the function of AR as a transcriptional factor. The xenograft mouse models in nude mice were used to verify the function of CCRK in vivo.

Results The expression of AR was upregulated in 6/8 GC cell lines. Compared to adjacent tissues, its expression of GC was higher. Ectopic expression of AR promoted the colony-formation ability, migration and invasion of GC cells. In contrast, the knockdown of AR showed the opposite effects. Remarkably, we found that AR regulated the expression of cell cycle related kinase (CCRK) through transcriptional regulation. The AR-CCRK axis promoted GC development through phosphorylation of GSK3 β and β -catenin. Furthermore, TCGA data revealed that high expression of AR or CCRK was related with poor prognosis of GC patients. The prognosis of patients with concurrent high expression of AR and CCRK was significantly worse than that of patients with low expression of both AR and CCRK.

Conclusions The expression of CCRK is increased by AR in GC. Low expression levels of AR and CCRK are related to better prognosis in GC patients, suggesting they are also candidates as prognostic indicators in GC.

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HEPATIC CELL CYCLE-RELATED KINASE SHAPES A METASTATIC-PRONE LIVER MICROENVIRONMENT VIA CROSSTALK BETWEEN MYELOID-DERIVED SUPPRESSOR CELL AND NATURAL KILLER T CELL

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Background Metastasis is a prominent cause of cancer-related death governed by both cancer cell-intrinsic mechanisms and extrinsic microenvironment. Clinical observations demonstrated liver as a common metastatic site for various cancers, which may be due to its immune tolerant environment. Myeloid-derived suppressor cell (MDSC) is a heterogeneous cell population of immature myeloid cells that contribute to the formation of a favorable metastatic environment partially via suppression of immune effector cells. However, the underlying mechanisms in liver tropism of tumor metastasis remain poorly understood. We have previously discovered that cell cycle-related kinase (CCRK) can promote primary hepatocellular carcinoma (HCC) development via MDSCs. Here we hypothesize that the accumulation of hepatic MDSCs induced by CCRK may contribute to the formation of a favorable metastatic liver microenvironment.

Methods We constructed a liver-specific CCRK inducible transgenic (TG) mouse model by a Cre/loxP system. Orthotopic and metastatic mouse models were used to investigate the role of CCRK in promoting tumor growth and metastasis. PMN-MDSC was depleted by anti-Ly6G antibody. Cytokine, chemokine, and immune cells profiling were performed after sacrifice.

Results Induction of CCRK expression by tamoxifen injection could increase CD11b⁺Gr-1⁺Ly6G⁺Ly6C^{low} polymorphonuclear (PMN)-MDSCs liver accumulation specifically in male mice with upregulated *Cxcl1* and *Gcsf* expression. Intrahepatic injection of a mouse hepatoma cell line Hep1-6 in male TG mice developed larger tumors compared to control and positively associated with increased PMN-MDSCs levels in liver.