**Research# 1-2021**

**Journal of Materials Science: Materials in Medicine (2021) 32:113** https://doi.org/10.1007/s10856-021-06585-9

 **Assessment of novel surgical procedures using decellularised muscle and bioactive ceramic: a histological analysis**:

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**Abstract**

Tissue regeneration and neovascularisation in cases of major bone loss is a challenge in maxillofacial surgery. The hypothesis of the present study is that the addition of resorbable bioactive ceramic Silica Calcium Phosphate Cement (SCPC) to Declluraized Muscle Scaffold (DSM) can expedite bone formation and maturation. Two surgical defect models were created in 18 nude transgenic mice. Group 1(n = 6), with a 2-mm decortication calvarial defect, was treated with a DSM/SCPC sheet over the corticated bone as an onlay then seeded with human Mesenchymal Stromal Cells hMSC in situ. In Group 2 (n = 6), a critical size (4 mm) calvarial defect was made and grafted with DSM/SCPC/in situ human bone marrow stromal cells (hMSCs). The control groups included Group 3 (n = 3) animals, with a 2-mm decortication defect treated with an onlay DSM sheet, and Group 4 (n = 3) animals, treated with critical size defect grafted with plain DSM. After 8 weeks, bone regeneration in various groups was evaluated using histology, immunohistochemistry and histomorphometry. New bone formation and maturation was superior in groups treated with DSM/SCPC/hMSC. The DMS/ SCPC scaffold has the ability to augment and induce bone regeneration and neovascularisation in cases of major bone resorption and critical size defects.

**Research# 2-2020**

**Environmental Science and Pollution Research (2020) 27:25082–25092 https://doi.org/10.1007/s11356-020-08856-4**

**What is the possible therapeutic effect of Ginkgo biloba on gastric ulcer induced by ammonia in albino rats?**

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 **Abstract**

 Gastric ulcer is a worldwide disease. Helicobacter pylori is one of the most common chronic bacterial infections that induce chronic inflammation in the gastric mucosa, mediated by an array of pro-and inflammatory cytokines. The aim of this study was to investigate the possible therapeutic effects of Ginkgo biloba extract on gastric ulcer induced by ammonium hydroxide in rats and the potential underlying mechanisms. The study was done on 32 adult male Wistar albino rats, divided equally into 4 groups: normal control, gastric ulcer–induced group using 1 ml of 1% NH4OH orally, ulcer control group; rats received 1% carboxymethyl cellulose daily for 14 days after induction of ulcer and treated rats received orally 200 mg/kg Ginkgo biloba once daily for 14 days after induction of ulcer. The study revealed administration of ammonia showed multiple gastric lesions; edema, hyperemia, hemorrhage, and ulcers with a significant increase in ulcer score, myeloperoxidase (MPO), and interleukin1β (IL-1β) and a significant decrease in reduced glutathione (GSH), mucus amount, and gastric pH. After the administration of Ginkgo biloba, there was an improvement in gastric lesions, with a significant reduction of ulcer score, MPO, and IL-1β and a significant increase in GSH, mucus content, and gastric pH. Moreover, collagen types I and IV were gradually increased in the treated group.

**Research# 3-2020**

**International Journal of Pharmaceutical Research & Allied Sciences, 2020, 9(3):163-171**

**Immunohistochemical Overexpression of nNOS, S100 Protein, and α-Synuclein in Myenteric Plexus of AS/AGU Rats**:

 Muhammad Atteya, Aly Mohamed Ahmed , **Raeesa Abdel-Tawab Mohammed** , Musaad Abdulaziz Alfayez , Shimaa Abdellah Mohammed , Abdulaziz Siyal , Tahani Ahmad Al-Matrafi1 , Amal AlRabiah , Hamad Mohammed Alqahtani, Anthony Payne.

**ABSTRACT Objective**

There are four currently motor features characterizing Parkinson's disease (PD). These include rigidity of muscles, bradykinesia, tremors at rest, and instability of posture. Along the course of PD, the impairment of motor functions is commonly preceded by nonmotor symptoms (NMS) such as olfactory deficit, difficult swallowing (dysphagia), drooling (sialorrhea), constipation, urinary bladder dysfunction, depression, and sleep disorder. It was suggested that the enteric nervous system could be the initial site for the pathological process leading to PD. Materials and Methods: Six male adult control AS rats (normal control) and six male adults AS/AGU rats (model of PD) were sacrificed. A rectangular strip from the body of the stomach and a cross-section from the duodenum were dissected and processed for histological staining with hematoxylin and eosin, and immunohistochemical staining for detection of nNOS (neuronal NOS), S100 protein (astrocyte marker), and alpha-synuclein (α-synuclein). Results: The histological analysis of the stomach and duodenum of AS/AGU rats demonstrated necrotic smooth muscle cells of muscularis externa. The immunohistochemical analysis of AS/AGU rats showed a statistically significant increase in the expression of nNOS, S100 protein, and α-synuclein expression of myenteric plexuses compared to the control strain AS rats. Conclusion: Gastroduodenal tract of AS/AGU rats showed marked histopathological changes and immunohistochemical overexpression of nNOS, S100, and α-synuclein.

**Research# 4-2020**

**Dose-Response: An International Journal**

**July-September 2020**: DOI: 10.1177/1559325820949797-Journals.sagepub.com/home/dos

**Manipulation of Quercetin and Melatonin in the Down-Regulation of HIF-1, HSP-70 and VEGF Pathways in Rat’s Kidneys Induced by Hypoxic Stress**:

 Aliah R. Alshanwani , Sameerah Shaheen , Laila M. Faddah , Ahlam M. Alhusaini3 , Hanaa M. Ali, Iman Hasan, Hanan Hagar, **Raeesa Ahmed**, Fatima M. B. Alharbi, and Alaa AlHarthii:

 **Abstract**

Hypoxia may lead to inflammatory responses by numerous signaling pathways. This investigation intended to inspect the defensive role of Quercetin (Quer) and/ or Melatonin (Mel) against reno toxicity induced by Sodium nitrite (Sod ntr). Sod ntr injection significantly decreased blood hemoglobin concentration (Hb) with a concurrent increase in serum tumor necrosis factor- a, interleukin-6, C-reactive protein, creatinine, and urea levels. Over protein-expression of vascular endothelial growth factor and heat shock, protein-70 and mRNA of HIF-1a were also observed. Pretreatment of the Sod ntr- injected rats with the aforementioned antioxidants; either alone or together significantly improved such parameters. Histopathological examination reinforced the previous results. It was concluded that the combined administration of Quer and Mel may be useful as a potential therapy against renal injury induced by Sod ntr. HIF-1a and HSP-70 are implicated in the induction of hypoxia and its treatment.

**Research# 5-2020**

**Drug and Chemical Toxicology.**

 Received 10 May 2020 Revised 17 August 2020 Accepted 27 September 2020

**The beneficial effects of antioxidants combination on cardiac injury induced by tetrachloromethane**

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 **ABSTRACT**

The purpose of this research was to evaluate the efficacy of carsil (CAR) either alone or in combination with a-tocopherol (a-TOCO) and/or turmeric (TUMR) against tetrachloromethane (TCM)-induced cardiomyocyte injury in rats. Administration of CAR either alone or in combination with a-TOCO and/or TUMR post-TCM injection, significantly mitigated the increases in serum troponin T, creatine kinase-MB (CK-MB) as well as interleukin-6 (IL-6), interferon c (IFN-c), tumor necrosis factor-a (TNF-a), C-reactive protein (CRP). They also decline the elevation of caspase-3, vascular endothelial growth factor (VEGF) protein expression as well as DNA damage in cardiac tissues induced by TCM. The biochemical results were confirmed by histopathological investigation. Conclusion: The combination of the three antioxidants showed greater cardioprotective potential, compared to individual drugs. Therefore, this combination may be recommended as a complementary therapy to antagonize cardiac injury induced by different insults.

**Research# 6-2020**

**Journal of Biochemical and Molecular Toxicology**

**Biotin, coenzyme Q10, and their combination ameliorate aluminium chloride-induced Alzheimer's disease via attenuating neuroinflammation and improving brain insulin signaling.**

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### **Abstract**

Insulin is important for brain function and neuronal survival. Insulin signaling is initiated by the phosphorylation of insulin receptor substrate-1 (IRS-1) at tyrosine (pTyr) residue. However, IRS-1 is inhibited by phosphorylation at serine (pSer). In Alzheimer's disease (AD), oxidative stress and accumulation of amyloid beta (Aβ) induce neuroinflammation, which augments pSer-IRS-1 and reduces pTyr-IRS-1 disturbing insulin signaling pathway. Coenzyme Q10 (CoQ10) and biotin possess antioxidant and anti-inflammatory properties, and, in this study, their impact on insulin signaling is investigated in an aluminium chloride (AlCl3) model of AD. AD was induced by oral administration of AlCl3 (75 mg/kg) for 60 days. Biotin (2 mg/kg), CoQ10 (10 mg/kg), and their combination were supplemented concomitantly with AlCl3 for 60 days. Memory test and histological examination were performed. Brain levels of lipid peroxides, antioxidants (reduced glutathione and superoxide dismutase), inflammatory markers (tumor necrosis factor-α, interleukin-6 [IL-6], IL-1, and nuclear factor κB), and phosphorylated Akt (survival kinase) as well as protein levels of Aβ, IRS-1 (pTyr and pSer), and caspase-3 (apoptotic marker) were determined. AlCl3 resulted in impaired memory, significant increase in Aβ, lipid peroxides, inflammatory markers, caspase-3, and pSer-IRS-1, with significant reduction of the antioxidants, pTyr-IRS-1, and p-Akt reflecting Aβ-induced inflammation and defective insulin signaling. Histological examination revealed focal aggregations of inflammatory cells and neuronal degeneration. The biochemical deviations and histological changes were attenuated by the concomitant treatment with biotin and, to greater extent, with CoQ10 and the combination. In conclusion, biotin and CoQ10 could protect against AD via attenuating inflammatory response and enhancing insulin signaling.