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A90
APPROACH TO DELIVER ANTIOXIDANTS WITH SILICA NANOPARTICLES INTO CELLS

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We showed that antioxidant N-acetylcysteine (NAC) inhibits cellular lipid accumulation during adipocyte differentiation, we carried out in vitro assays in which 0,01 mM to 5 mM NAC doses were added to culture media of the preadipocyte cell line 3T3-L1 (Soto et al, 2016). Here we evaluated Oil-Red-O stained lipid content in 5mM NAC treated adipocytes (ACN) compared to adipocytes (AC), which is set to 100 (100±4 [AC] *vs* 80±2 [ACN] arbitrary units (AU), $p< 0.05$). NAC cellular uptake was 17.4% of total NAC added for 5 mM treatment; with lower doses treatments, 5% of total NAC was absorbed by the cells. We developed 5 mM NAC encapsulated silica nanoparticles ($NPsSiO_2$-NAC) and evaluated their cellular toxicity on 3T3-L1, by colorimetric test using 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide. We prepared silica nanoparticles ($NPsSiO_2$) using organic mold with tetraethylorthosilicate as precursor. We obtained spherical porous $NPsSiO_2$, size of 20 ± 4.5 nm, with an inner hollow of 16 ± 1.3 nm. These $NPsSiO_2$ were a homogeneous population (dynamic light scattering analysis), potential Z negatively charged. We prepared $NPsSiO_2$-NAC by 2 procedures, percentage of loaded NAC: (1) 32.7 ± 2.3% (constant agitation at 500 rpm at 4 °C) and, (2) 96.4 ± 3.1% (sonication pulses at room temperature). NAC release was completed within 28 h. We evaluated $NPsSiO_2$-NAC from procedure (2); samples of 0.25 mg/mL of $NPsSiO_2$-NAC showed cytotoxicity of 84% (OD: 0.11±0.01 [$NPsSiO_2$-NAC-0.25] *vs* 0.71±0.04 [nontoxic control], $p < 0.01$). Samples of 0.05 mg/mL showed lower cytotoxicity such as 57.75%, but only with a cover (8 nm) of bovine sera albumin we obtained nontoxic $NPsSiO_2$-NAC (OD: 0.91±0.09 [$NPsSiO_2$-NAC-0.05] *vs* 0.90±0.08 [nontoxic control], no significant difference). This tool for drug delivery could increase cellular NAC absorption and its anti-lipogenic effect.

A91
EVALUATION OF PATIENTS WITH ORAL MUCOSITIS FOLLOWING ONCOLOGICAL TREATMENT AND TREATED WITH LOW INTENSITY LASER

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Oral mucositis (OM) is the secondary reaction to chemotherapy (CT) and/or radiotherapy (RT) that is characterized by the presence of erythematous areas and ulcerative lesions in the buccal mucosa, causing pain and limitations in diet, being one of the most important and common side effects in oncological treatment. More than 90% of patients with RT treatment in head and neck can present this complication. The World Health Organization (WHO) classifies OM in: Grade 0 (no subjective or objective evidence of mucositis), Grade 1 (oral pain with or without erythema, without ulcers), Grade 2 (erythema and ulceration, can swallow solids), Grade 3 (erythema and ulceration and can not swallow solids), Grade 4 (erythema and ulceration and can not feed). Low Level Laser therapy (LLLT) is suggested as a coadjuvant in the treatment and prevention of OM with positive results. The Multinational Association for the Treatment of Cancer Support/International Society of Oral Oncology (MASCC / ISOO) recommends the use of LLLT in prevention and treatment of OM in adult patients who received therapy with high doses of chemotherapy, with or without total body radiation To help prevent the partial or complete interruption of oncological treatment, the onset of OM contributes to weight loss, depression, decreased quality of life of the patient while increasing the cost of maintaining health. The objective of the present study is to evaluate the results of the use of LLLT in patients with indication of CT and/or RT in head and neck region due to squamous cell carcinoma. LLLT was used in a double wavelength (660 nm + 808 nm) and 100 mW of power each with an energy of 8 to 12 J per application point for 80 to 120 seconds until the symptomatology of the patient was eliminated. Approximately 16% of patients who received RT in head and neck cancer were hospitalized by MO. In addition, 11% of patients who received RT due to head and neck cancer had unplanned ruptures in RT due to the presence of MO. No patient in the present study treated with LLLT had catheter placement or gastric button and all of the patients maintained semisolid feeding and the oncological treatment was not interrupted in any case.

A92
IONIC DISSOLUTION PRODUCTS FROM BIOACTIVE GLASS-CERAMIC SCAFFOLDS 45S5.2B POSITIVELY MODULATE THE IN VITRO CELL RESPONSE UNDER CONDITIONS OF HYPERGLYCEMIA

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One of the main complications of diabetes mellitus (DM) is the failure in the process of tissue repair due to cellular dysfunction as a result of hyperglycemia. Under hyperglycemic conditions, the main cells involved in restoring the functionality and integrity of tissues

are unable to migrate, proliferate, and secrete growth factors and components of the extracellular matrix, all of which is favored by altered mechanisms of glycation and oxidation. This alteration invariably contributes to failures in repair processes. Thus, it is of biomedical interest to study different therapeutic strategies to optimize the repair and/or regeneration of tissues under hyperglycemic conditions. These strategies may include the use of different biomaterials in the form of three-dimensional porous matrices, known as scaffolds. The ideal design of these scaffolds should provide temporary biocompatible mechanical support and positively modulate the cellular response. Since it has been established that boron (B) plays a role in angiogenesis and tissue repair, it can be expected that the controlled and localized release of B ions from the bioactive glass-ceramicscaffolds could represent a promising alternative therapy in regenerative medicine of vascularized tissues in patients with DM. The aim of this work was to study the *in vitro* cellular response of ionic dissolution products from bioactive scaffolds manufactured from the controlled crystallization of a 45S5 glass (% w/w composition: 45% SiO_2, 24.5% Na_2O, 24.5% CaO, and 6%P_2O_5) addedwith 2% of B_2O_3 (45S5.2B), in primary cultures of fibroblasts (HDF) and endothelial cells (HUVECs) grown in hyperglycemic conditions (30 mM D-glucose). The results demonstrated, for the first time, that the ionic dissolution products released from the 45S5.2B bioactive glass-ceramic scaffolds positively modulate the *in vitro* cellular response of fibroblasts and endothelial cells grown under hyperglycemic conditions. This was corroborated by an increased proliferative and migratory response, greater ability to form tubules *in vitro* and an increase in the secretion of growth factors. These findings may be relevant in vascularized tissue engineering since scaffolds obtained from the 45S5.2B bioactive glass could act as inorganic agents that positively modulate the cellular response and favor processes of tissue repair and/or regeneration in patients with DM.

A93
MESOPOROUS TITANIA COATING: DETERMINATION OF ITS PHYSICOCHEMICAL PROPERTIES AND YEAST BEHAVIOR

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We have synthesized titania mesoporous films using titanium (IV) chloride as sol-gel precursor and surfactants from Pluronics® (Pluronic F-127, POE-POP-POE) and Brij ™ series (B96 y B58, alquil-POE) that act like molds for pore size and distribution. Nanotopography is known to be key for adhesion and cellular growth. In this experiment, we demonstrate that nanotopography is also determinant for proliferation of eukaryotic microorganisms such as *Candida albicans* (ATCC 10231). We cultivated the microorganism in the presence of the films, the films derivatized with APTES ((3-Aminopropyl)triethoxysilane) and the films derivatized with APTES and then doped with $CuCl_2$ (a known fungicide). Results show that mesoporous films prepared with Brij-96 presented the best outcome in regards of controlling cellular proliferation (up to a 75% inhibition of development in the Brij-96 derivatized with APTES-$CuCl_2$). We also characterized the mesoporous films by performing a scratch essay, which determines damage resistance of the material, and a contact angle assay. Results showed that every film tested can resist up to 40N without tearing and the contact angle that determines superficial hydrophilicity, allowed us to establish that the coating made with Brij-96 is the least hydrophilic coating of all. This is in accordance with minor cellular proliferation results using this surface. We observed our films through scanning electron microscopy (SEM) and demonstrate that films derivatized with APTES or with APTES-$CuCl_2$ did not change the original nanotopography of the coating. Lastly, we did an EDS (Energy-dispersive X-ray spectroscopy) essay to ratify the presence of Ti in all of the films, C and N in the ones derivatized with APTES, and C, N and Cu in the ones derivatized with APTES-$CuCl_2$.

A94
CELL ADHESION AND BIOCOMPATIBILITY OF PVA SPONGES CROSSLINKED WITH HEXAMETHYLENE DIISOCYANATE FOR REGENERATION OF BONE TISSUE

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PVA sponges crosslinked with hexamethylene diisocyanate (HDI) were developed to obtain hydrophilic and slowly-degradable scaffolds for biomedical purposes with good biocompatibility and better mechanical properties. The obtained PVA-crosslinked with different concentrations of HDI was characterized by IR spectroscopy where it was possible to observe a reduction in the peaks intensity at 3300 cm^{-1} corresponding to O–H stretching, indicating the effective reaction of HDI with PVA hydroxyl groups. It was also possible to determine that the NCO stretching peak at 2280^{-1} disappeared after the reaction with PVA except for the highest concentration. Also we observed an increment in the signal at 1750 cm^{-1} corresponding to free C=O stretching as the mobility of molecular chains was restrained by the reaction between –OH and –NCO, which prevents the formation of hydrogen bonds. The materials were also observed by electron microscopy and the increment in nitrogen content due to HDI was measured by EDX. The swelling radio and degradation was evaluated with the intention to demonstrate the long-term physical integrity of the material. PVA sponges swelling ratio was 400% while for HDI crosslinked sponges this value was modified to 150%. Materials with the highest percentage of HDI did not show significant degradation after three weeks of incubation. Furthermore, an osteoblastic cell line 3T3 E1 was used to evaluate cell adhesion to the materials and their cytocompatibility. According to these studies, PVA is an attractive