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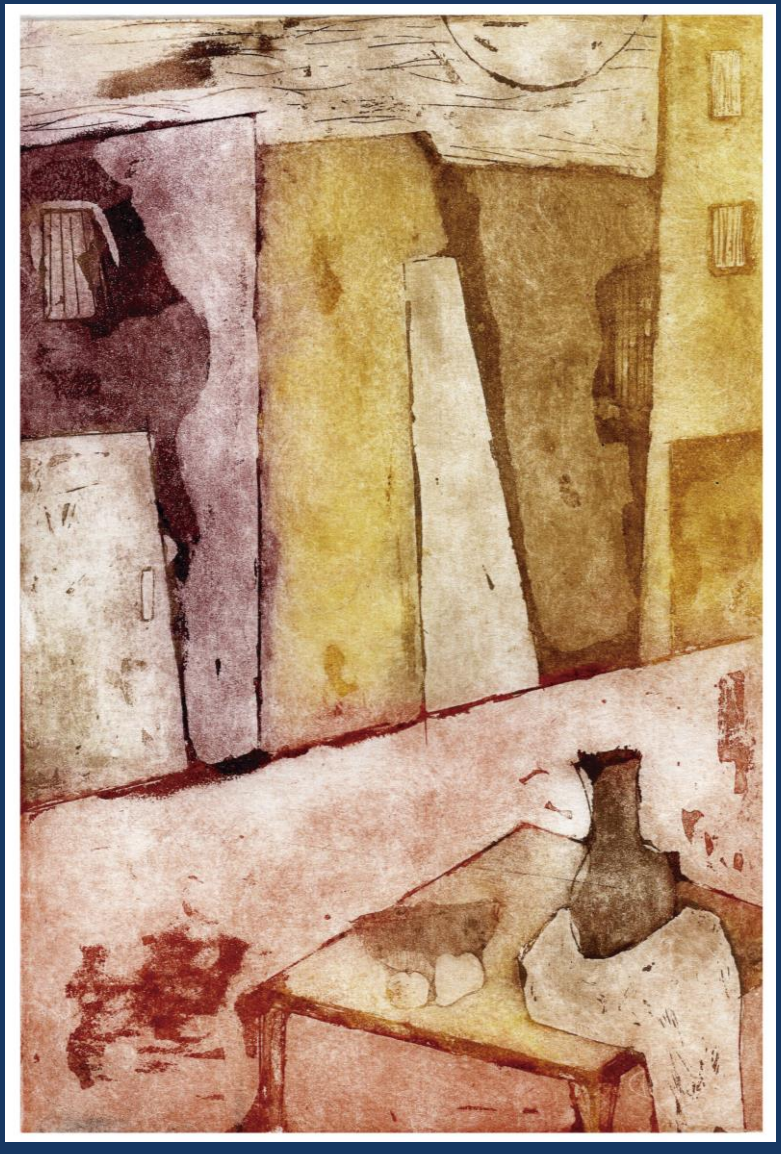

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La Tapa (Ver pág. 4)
Atardecer en la tarde
Antonella Ricagni

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IX Reunión Anual de la
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(NANOMED-ar)

VI Reunión Científica Regional de la Asociación Argentina de Ciencia y Tecnología de Animales de Laboratorio (AACyTAL)

con la participación de
The Histochemical Society

13 - 16 de noviembre de 2019
Hotel 13 de Julio - Mar del Plata

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Abstract/Resumen: Endocrine disruptor compounds (EDCs) comprise naturally occurring and synthetic substances widely spread in the environment that adversely affect human and wildlife. Screening methods and ideal biomarkers to determine EDC potency need to be exhaustively improved. Soluble guanylyl cyclase alpha1 subunit (sGC alpha1) is an abundant cytosolic protein ubiquitously expressed in most tissues. We previously showed that sGC alpha1 is specifically and highly up-regulated by estrogen (E2) in vivo and in vitro, although it lacks estrogen responsive elements. The aim of this work was to evaluate sGC alpha1 protein expression as a potential marker for xenoestrogenic EDC exposure. First, the effect of E2 on sGC alpha1 expression was tested in several E2-dependent cell lines (MCF-7, ECC-1 and GH3). Following experiments were performed using GH3 cells since they are commonly included in in vitro EDCs screening tests. Cells were incubated for 48 h with a wide variety of xenoestrogenic EDCs: Cd, Pb, Cr, Ni, As, ethynylestradiol, diethylstilbestrol, bisphenol A, hexachlorobenzene, and chlorpyrifos at a range of doses from nM to pM. sGC alpha1 protein levels were determined by Western blot. E2 increased sGC alpha1 expression in all cell lines tested: MCF-7 (% of control (C), 130.53 ± 8.06*), ECC-1 (232.26 ± 6.94***), and GH3 (208.7 ±10***), (*p<0.05, ***p<0.001 vs. respective C). E2 augmented sGC alpha1 through estrogen receptor (ER) activation (sGC alpha1 protein levels, % of C; E2: 208.7 ± 10***, ICI 182,780: 113 ± 9, ICI 182,780+E2: 86 ± 5###, p<0.001 vs. respective C). sGC alpha1 expression was strongly up-regulated by all the EDCs tested even by those exhibiting low or null ER binding capacity (p<0.05). Natural hormones not binding ER (progesterone, prolactin, and insulin) were unable to modify sGC alpha1 levels. Here we provide evidence that in vitro sGC alpha1 protein assay may be a very sensitive and powerful tool to identify compounds with estrogenic activity, which could improve current mammalian-based screening methods.

0489 - CYTOTOXICITY OF ZINC NANOPARTICLES BIOSYNTHESIZED BY MICROORGANISMS ON HUMAN KERATINOCYTE CELL LINE

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Abstract/Resumen: Metal nanoparticles –NPs– (10-100 nm) have an important antimicrobial activity which suggests possible biomedical applications. Zinc NPs (ZnNPs) are widely used for different products. The aim of this work was to investigate the toxicity of ZnNPs biosynthesized by microorganisms, in a human keratinocyte cell line (HaCaT). ZnNPs were synthesized using Pseudomonas aeruginosa (ATCC 27853) and were characterized by UV-Vis spectroscopy and by transmission electron microscopy. HaCaT cells were incubated for 4 h and 24 h at different ZnNPs dilutions (1/2, 1/5 and 1/10). RPMI 1640 culture medium with 5% FBS, a metal precursor salt solution of $ZnSO_4$ (0.1 and 0.25 mM), and a bacterial growth control of biosynthesis (BGC), were used as controls. Cell viability was evaluated by MTT assay, crystal violet and neutral red tests; reactive oxygen species (ROS) were studied by DCF-DA; superoxide dismutase (SOD) activity was determined by riboflavin-NBT method; and reduced glutathione (GSH) by Ellman reactive. ZnNPs cell capture assays were performed by fluorescence microscopy and changes in cell migration were evaluated by wound healing assay. As determined by fluorescence microscopy ZnNPs were able to enter HaCaT cells. The toxicity assays indicated that cell viability was significantly altered by ZnNPs 1/2 and BGC conditions after 4 h and 24 h incubation. ROS levels increased after 4 h incubation with ZnNPs 1/2, 1/5, and BGC, while a 24 h incubation, 1/10 dilution also augmented ROS. SOD activity increases at all ZnNPs dilutions tested, and with BGC. GSH was not modified by any treatment. Finally, the presence of ZnNPs and BGC in the culture media affected cell migration. Altogether these results suggest that ZnNPs are able not only to enter into skin cells but also to modify human keratinocyte viability, oxidant/antioxidant cell balance and cell migration. More studies are needed to unravel the mechanisms underlying these alterations.

Bioinformática, genoma, proteoma y nuevas tecnologías / Bioinformatic III

Chair: Ezequiel Lacunza

0481 - RESPONSE OF MACROPHAGES IN CONTACT WITH SYNTHETIC BIOMATERIALS BASED ON POLY-N-ISOPROPYLACRYLAMIDE AND COPOLYMER HYDROGELS

Virginia CAPELLA (1) | Rebeca E RIVERO(2) | Ana Cecilia LIAUDAT(1) | Cesar A BARBERO(2) | Pablo BOSCH(1) | Claudia Rosana RIVAROLA(2) | Nancy RODRIGUEZ(1)

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Abstract/Resumen: Biomaterials are being developed in the last decades, in regenerative medicine field, to create tissue constructs that possess mechanical and physiological similarities with the tissue to be simulated. Hydrogels are one of the most promising materials due to their innate similarity with extracellular matrix (ECM), with mechanical properties adjustable and a good biocompatibility that allow cell adhesion and proliferation. Previously to use the biomaterial in vivo conditions, it is essential to study the macrophage-material interaction and consider it as a variable that influences the biocompatibility and the processes that govern tissue regeneration. The aim of this study was to analyze the response of macrophage RAW 264.7 in contact with biomaterials. Polymeric hydrogels based in poly-N-isopropylacrylamide with positive (3-acrylamidopropyl-trimethylammonium chloride, APTAC), negative (2-acrylamido-2-methylpropanesulfonic acid, AMPS) and neutral (N-acryloyl-tris-hydroximethylaminomethane, HMA) net charges were synthesized. MTT and neutral red uptake, nitric oxide quantification and attachment assays were performed at 1, 4 and 7 days of exposition, in order to assess cell viability and macrophage polarization, respectively. Cells without treatment were included as negative control. The results of cell viability and nitric oxide production did not differ among macrophages exposed to hydrogels and negative control (p>0.05). Cell adhesion and morphology varied according to the hydrogel charge net. These preliminary results indicate that PNIPAM based hydrogels could be used in futures applications as cell scaffold for tissue-engineered construct.

0579 - BULL SPERM SELECTION BY ATTACHMENT TO HYALURONIC ACID SEMI-INTERPENETRATED HYDROGLES

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