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CD105 Deficieny in Mouse Aorta-derived Mesenchymal Stem Cells Promotes An Enhanced Inflammatory Response to Lipolysaccharide.

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IN VIVO is published three times yearly during the Fall, Winter, and Spring. Original research articles in the field of biology in addition to original articles of general interest to faculty and students may be submitted to the editor to be considered for publication. Manuscripts can be in the form of a) full length manuscripts, b) mini-reviews or c) short communications of particularly significant and timely information. Manuscripts will be evaluated by two reviewers.

Articles can be submitted electronically to *invivo@mec.cuny.edu* or mailed as a printed copy (preferably with a diskette that contains the file) to the Editorial Board at Medgar Evers College. All submissions should be formatted double spaced with 1 inch margins. The title of the article, the full names of each author, their academic affiliations and addresses, and the name of the person to whom correspondence should be sent must be given. As a rule, full length articles should include a brief abstract and be divided into the following sections: introduction, materials and methods, results, discussion, acknowledgments and references. Reviews and short communications can be arranged differently. References should be identified in the text by using numerical superscripts in consecutive order. In the reference section, references should be arranged in the order that they appeared in the text using the following format: last name, initials., year of publication. title of article, journal volume number: page numbers. (eg. - [1]Hassan, M. and V. Herbert, 2000. Colon Cancer. *In Vivo* **32:** 3 - 8). For books the order should be last name, initial, year of publication, title of book in italics, publisher and city, and page number referred to. (eg. - Prosser, C.L., 1973. *Comparative Animal Physiology*, Saunders Co., Philadelphia, p 59.). Abbreviations and technical jargon should be avoided. Tables and figures should be submitted on separate pages with the desired locations in the text indicated in the margins.

In This Issue:

CD105 Deficieny in Mouse Aorta-derived Mesenchymal Stem Cells Promotes An Enhanced Inflammatory Response to Lipolysaccharide. Joseph Granata, Hugo Sanchez, Philip Loeschinger, Anthony Goez and Jodi F. Evans, Molloy College, Rockville Centre, Rockville Centre, NY.

Mesenchymal stem cells (MSCs) are being widely studied for their ability to regulate macrophage cell responses. Previous works have demonstrated that mouse aorta-derived MSC (mAo-MSC) support the macrophage inflammatory response. mAo-MSC have been characterized phenotypically for MSC-associated surface antigens and express CD90 and CD105 but do not express CD73. CD105, also known as endoglin, is a co-receptor in the TGFβ superfamily of receptors. Mouse adipose-derived MSC lacking CD105 have an increased capacity to regulate T-cells by reducing their proliferation while elevated CD105 expression is consistently associated with inflammatory disease. Therefore, we hypothesized that suppression of CD105 in mAo-MSC will reduce the immunosupportive capacity of the mAo-MSC. We used siRNA to reduce expression of CD105 in mAo-MSC and subsequently examined the effect of this deficiency on their response to lipopolysaccharide (LPS) and their ability to support the macrophage inflammatory response. Contrary to our hypothesis, CD105 deficient mAo-MSC cultured alone and in co-culture with macrophage secreted increased levels of the inflammatory indicators nitric oxide (NO) and interleukin 6 (IL-6) after exposure to LPS. The increase in NO and IL-6 observed in the co-cultures is additive and therefore points to the mAo-MSC as the primary origin. Overall our data suggest that CD105 acts as a regulator of the TLR-4 pathway and may represent an important target for modification of MSC to be used in therapeutics.

Recent Fluctuation of Atlantic Horseshoe Crab (*Limulus polyphemus*) Egg Density on Plumb Beach, Brooklyn, NY. Kelvin Gutierrez and Christina Colon, Kingsborough Community College, Brooklyn NY.

Plumb Beach is a favoured location for horseshoe crabs to spawn during May through July. It was hypothesized that there will be an increase in egg density on both the eastern and western sides in 2016, compared to previous years when there was a downward trend likely exacerbated by Super storm Sandy. Estimating horseshoe crab eggs is done to monitor spawning activity and assess the amount of forage available to migratory birds (Pooler et Al. 2003). Horseshoe crabs have been around for 450 million years. Their blood makes them essential to the biomedical industry and their eggs are important food for migratory shore birds and fish. To monitor egg density, grids were created at the intertidal zone wherein samples were collected randomly, at 5cm and 20cm deep, every two weeks from May to August. Eggs were brought to the lab to be sorted then counted. Data showed a decrease of 12,692 compared to 2015 (41,834), however, 2016 counts (29,142) were higher than 2012 – 2014. Also, the high survival (17% of hatchlings) was the highest since 2011, thus my hypothesis was in part supported. Furthermore, on the western beach (restored in 2012) there was an increase in density (2,029) and much higher survival than previously observed (33%). The increased density and survival on the restored side supports my hypothesis, and is an indication that the beach restoration was successful. The high survival on the eastern beach is a sign that the habitat is healthy, while reduced egg counts may be due in part to the migration of crabs to the restored western beach; however only time will tell. This work was supported by grant 2R25GM06003 of the Bridges Program of NIGMS and grant 0537171091 of the CSTEP Program of the NYS Department of Education.

Comparison of N-methyl-d-aspartate NR2B Subunit Proportions Between Control, Gonadectomized, and Hormone Replaced Male Rats. Catherine Hernandez[1] and Mary F. Kritzer [2], [1]Nassau Community College and [2]Stony Brook University, NY.

The prefrontal cortex (PFC) mediates cognitive functions that are dependent on dopamine (DA) input coming from the ventral tegmental area (VTA). PFC regulates how much DA it receives. Previous studies show that androgens regulate PFC/DA networks and DA sensitive PFC behaviors by modulating glutamate drive over PFC-to-VTA projections. My study asked whether androgens exert this control by influencing the subunit composition of glutamate receptors on PFC neurons that project to VTA. Specifically I examined the effects of gonadectomy and hormone replacement on NR2B NMDA receptor subunit. In situ hybridization was used to visualize NR2B subunit mRNA. This was combined with retrograde fluorescent labeling of PFC-to-VTA projections neurons. I quantified the proportions of these neurons that contained NR2B mRNA. Results indicated that NR2B subunit is not necessarily hormone regulated in the adult brain. The proportions of the remaining subunits should be quantified to determine the possible influence androgen may have on the subunit composition of NMDA receptor and DA-dependent PFC behaviors.

Regulation of Gene Expression by HRE's Under Chemically Induced Hypoxic Mimic Condition. Alberto Herrera, George Coricor and Jane L Ko. Seton Hall University, South Orange, NJ.

Hypoxia is a condition of inadequate oxygen supply, which can induce cell death. Neuronal cells treated with DFO resulted in hypoxic mimic conditions. Our lab reported previously that the outcome of such a treatment did result in the decrease of cell viability. However, there were still surviving neurons. The surviving cells did not exhibit significant morphological changes under confocal microscopy analysis using annexin-V-FLUOS and propidium iodide staining, indicating that they were not at apoptotic or necrotic stages. These surviving neurons, therefore, developed adaptive responses under hypoxic challenge. Several changes were observed, including an