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Stress Axis Hormones Induce Triglyceride Filled Nodule Formation in Vascular Smooth Muscle Cells

Jodi F. Evans Ph.D.

Molloy College, jevans@molloy.edu

Michelle Vigliotti

Pamela Tello

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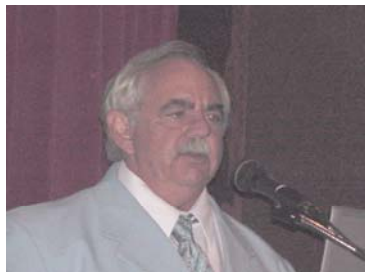
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Stress Axis Hormones Induce Triglyceride Filled Nodule Formation in Vascular Smooth Muscle Cells. Pamela Tello, Michelle Vigliotti, and Jodi F Evans, Molloy College, Rockville Centre, NY.

Homeostatic stress, such as that which occurs in diabetes, is associated with increased risk for the development of atherosclerosis. Atherosclerotic plaques of the artery wall are associated with both lipid accumulation and fibrous and/or calcified tissue accumulation. Vascular smooth muscle cells (VSMC) are derived from mesenchymal stem cells (MSC) which are capable of differentiating into adipocytes, chondrocytes and osteoblasts. MSC of the bone marrow are pushed toward the chondrogenic and adipogenic phenotypes in the presence of the stress hormones glucocorticoid and adrenocorticotropin (ACTH). This led us to hypothesize that the proliferative VSMC of the Goto-Kakizaki (GK) diabetic rat, when exposed to stress hormones will present an adipocytic and/or chondrogenic-like phenotype. VSMC of the GK rat were cultured using conditions that favor the multi-potential differentiation of MSC and were either left untreated, were treated with ACTH, dexamethasone (DEXA) or both. Cells were stained for lipid using oil-red-o, proteoglycan matrix using alcian blue and cell density using methylene blue. DEXA increased lipid nodule formation above the untreated control but the combined ACTH and DEXA treatment led to a significant increase above DEXA alone (lipid nodule #'s per field, DEXA 2.56 ± 1.63 vs. A+D 6.67 ± 1.68). These data suggest that stress hormones may contribute to VSMC matrix accumulation and lipid production during atherosclerosis development in diabetes.

Preliminary Investigations of Distyly in *Primula acaulis*: Morphological and Molecular Characterization of Short- and Long-Styled Plants. Andres Thomas and Farshad Tamari, Ph.D. Kingsborough Community College, Brooklyn, NY.

Distyly is a mating system in which a dimorphism exists in the reproductive organs of hermaphroditic angiosperms. Self-incompatibility, which is often associated with distyly, refers to a strong self- and intra-morph incompatibility. The molecular biology of distyly and self-incompatibility in the Primulaceae remains relatively unknown. We hypothesize that *P. acaulis* is distylous. To ascertain distyly in this species we measured the female and male reproductive organs of five short-styled and five long-styled plants using a pair of Vernier calipers. A one way analysis of variance (ANOVA), comparing the lengths of female and male reproductive organs, indicates that *P. acaulis* is distylous, but not reciprocally herkogamous. It is also hypothesized that there are molecular differences in the reproductive tissues of short- and long-styled plants for genes involved in self-incompatibility such as alpha-dioxygenase. Our preliminary results indicate that alpha-dioxygenase does PCR amplify from the genome of both short- and long-styled plants, however, this finding needs to be confirmed. In the future, a proteomics investigation will be initiated to compare protein profiles of the reproductive tissues of short- and long-styled plants. The ultimate goal of this research is finding and removing self incompatibility barriers in *P. acaulis* to increase seed and plant yield. This work was supported by grants 2R25GM06003 of the Bridges to the Baccalaureate Program of NIGMS and grant 0537101091 of the CSTEP Program of the NYS Department of Education.

Phenol Power: A Study of the Antimicrobial Effects of Polyphenolic Tea Compounds. Jennifer Todd, Lauren Strawn, Jonathan Jimenez and Tin-Chun Chu. Seton Hall University, South Orange, NJ.

Both green and black tea contains polyphenolic compounds which are responsible for the antimicrobial characteristics of both teas. The major polyphenols in black tea are theaflavins. The theaflavins tested were theaflavin (TF-1), theaflavin-3-monogallate (TF-2A), theaflavin-3'-monogallate (TF-2B), and theaflavin-3,3'-digallate (TF-3). In addition, black tea crude extract, black tea powder, and oligonol were tested. Five concentrations of the tea compounds were made: 1.0, 2.5, 5.0, 7.5, and 10.0g/L. *Pseudomonas aeruginosa*, *Enterobacter aerogenes*, *Escherichia coli* and *Staphylococcus epidermidis* were the bacteria used in this study. The antimicrobial abilities of the compounds were determined by the zone of inhibition (ZOI) and the bacterial growth. Against *S. epidermidis*, the minimum concentration was 5.0g/L for TF1, TF2, TF3, and oligonol and 2.5g/L for black tea crude extract and black tea powder. Against *P. aeruginosa*, the minimum concentration was 5.0g/L for all compounds except TF3, whose minimum concentration was 7.5g/L. Black tea crude extract had the largest ZOI against *S. epidermidis* while oligonol had the largest ZOI against *P. aeruginosa*. The tea compounds showed synergistic antimicrobial effects with various antiseptics including mouthwashes and hand sanitizers.

Extra-pair Paternity in Birds: Studying Variations Among Populations With the Genetic Diversity Hypothesis. Lainga Tong and Mohamed Lakrim, Kingsborough Community College, Brooklyn, NY.

Extra-pair paternity is highly variable in birds between species and between populations of the same species. In intra-specific level, the genetic diversity hypothesis suggests that females seek extra-pair copulation to increase the genetic diversity of their broods so that females are more likely to seek extra-pair copulation when there is more genetic variation among males. It has been proposed that island populations have a lower genetic variation than their mainland counterparts. Here I made a comparison analysis of the frequency of EPP in island populations and their mainland counterparts. The result showed that the frequency of EPP was consistently lower in island populations. The result suggested: (1) island populations characterized by low frequency of EPP, (2) the frequency of EPP and genetic variation may have positive correlation in intra-specific variation, (3) the frequency of EPP should be depend on the percentage of broods showing at least one extra-pair young.