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ACTH Promotes Osteogenesis of Rat Mesenchymal Stem Cells through the Melanocortin-2 Receptor

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Haplosporidium nelsoni (MSX) Small Subunit rRNA Gene is Detected in the Eastern Oyster (Crassostrea virginica) in Jamaica Bay, NY. Keisha Rogers, Craig Hinkley, Gary Sarinsky. Kingsborough Community College, Brooklyn, NY.

Haplosporidium nelsoni (MSX) is a parasitic protozoan which is responsible for extensive mortality in the Eastern Oyster (Crassostrea virginica) populations along the eastern coast of North America. The origin of MSX to these waters is unknown. However, it is speculated that it was introduced when the Pacific Oyster (Crassostrea gigas) was attempted to be used as a replacement for the declining native oyster stocks in the Delaware and Chesapeake Bays during the late 1950’s. As of now, the intermediate host or hosts that transmit MSX to oysters are unknown. There has been no known oyster populations observed in Jamaica Bay since the 1920’s. Oysters used in this experiment were grown from spats in Taylor Floats in the Bay. It is hypothesized that the unknown host or hosts would be present in Jamaica Bay and there will be oysters found infected with MSX. DNA was isolated from gill and mantle tissues. PCR amplifications were carried out using the MSX small subunit rRNA and the mitochondrial cytochrome c oxidase 1 (CO1) gene primer sets respectively. The MSX amplified products and a positive control for MSX were then subjected to agarose gel electrophoresis to determine correct size (564-bp). One of the six oyster’s gill and mantle tissue and the control were positive for MSX. To verify that DNA was obtained from all of the oysters, the CO1 amplified products were subjected to agarose gel electrophoresis to determine correct size (702 bp) and was found to be present in all six samples. The MSX amplified and CO1 amplified products were sequenced and they are enzymes called polyketide synthase (PKS). We investigate whether the conserved ketosynthase (KS) domain of PKS is present in lichens from areas of New York and Sub-Sahara Africa Areas. Mojisola Rotibi and Ivan Shun Ho. Kingsborough Community College, Brooklyn, NY.

Lichens are symbiotic organisms of fungi, algae, and cyanobacteria. There are approximately 13500 Lichen species worldwide and more than 1200 can be found in South Africa. Lichens can synthesize numerous secondary metabolites, known as the “lichen acids”. To date over 1000 lichen secondary metabolites have been identified. Just like the amount of lichen species, these metabolites have diverse functions: antiviral, antibiotic, antitumor, etc. Some of them even allow lichens to thrive in locales that are deemed uninhabitable. An essential step in the production of secondary metabolites is conducted by an enzyme called polyketide synthase (PKS). We investigate whether the conserved ketosynthase (KS) domain of PKS is present in lichens from areas of New York and Sub-Sahara Africa Areas. We hypothesize that samples from New York will possess PKS for the poor air quality of lower Manhattan. In addition, we hypothesize that the more populated Cape Town has considerable air pollution and therefore lichens of that region will have PKS, whereas lichens found in the coastal, less populated Mozambique Archipelago will not. Lichen DNA was isolated using a protocol involving Edward’s Buffer. The KS domain of PKS was targeted and amplified by polymerase chain reaction (PCR) using degenerate primers. A region of tubulin was also amplified as a control. The PCR products were separated by agarose gel electrophoresis to verify the correct size. Our preliminary data shows that the lichen species collected Blaekenlager has PKS, whereas lichens found in the coastal, less populated Mozambique Archipelago will not.

The Effects of Exogenous Carbohydrates on Notch Binding to Its Ligand Delta. Stacy-Ann Robinson, Ailimra Mohammed and Dan Moloney Queensborough Community College, Bayside, NY.

Notch signaling is vital to many cell processes including cell-cell communication and cell fate decisions. Notch malfunction has been implicated in such diseases such as Leukemia, Aaligage syndrome and CADASIL. Glycosylation of Notch receptor impacts signaling. The carbohydrates on the exterior domain of Notch are an integral part of Notch’s functionality as changes to the O-linked carbohydrates have been shown to affect Notch signaling. The enzyme Fringe is a glycosyltransferase that modifies O-linked fucose on the extracellular domain of Notch and alters receptor signaling. In this experiment we tested the impact of exogenously added sugars including fucose on Notch binding to its ligand Delta using cell based ligand binding assays. In the ligand binding assay, Delta tagged with heavy chain (Fc) from human immunoglobulin was applied to cells expressing Notch, and binding was measured using a flow cytometer. A region of tubulin was also amplified using MC1-R primers. A region of tubulin was also amplified using MC1-R primers and was sequenced with a confirmatory primer. Horseradish peroxidase. The results of our assay showed that addition of exogenous fucose reduced Delta binding to Notch, whereas addition of exogenous para-Nitrophenyl fucose surprisingly increased Delta binding to Notch. Discovering compounds that impact ligand binding to Notch will help researchers to manipulate cell differentiation pathways and better understand Notch signaling.