



Education Silent Abstracts

E-2000

Cold-inducing *P. fusiformis* Prior to Cryopreservation Causes an Increase in Irregular Cell Morphology and Nucleic Fragmentation Post-cryopreservation. SAVANNAH E. DEL CID. Sherando High School, Associates of Science Student at Lord Fairfax Community College Middletown, VA. Email: savannah@delcids.us, sed2994@email.vccs.edu

Dinoflagellates, a variety of bioluminescent marine phytoplankton, isolate themselves from unfavorable environmental changes by forming a protective cyst (Marine Species Identification Portal, Dinoflagellate Cysts). If the change is rapid, dinoflagellates form a temporary cyst, which entails the replacement of the cell membrane with a cyst, or dinocyst for dinoflagellates (Roy, Letourneau, Morse, Cold-Induced Cysts of the Photosynthetic Dinoflagellate *L. polyedrum* have an Arrested Circadian Bioluminescence Rhythm and Lower Levels of Protein Phosphorylation). Dinoflagellate cysts have been found unscathed amongst sediment that has remained stagnant for a century (Keafer, Buesseler, Anderson, Burial of living dinoflagellate cysts in estuarine and nearshore sediments). The experimenter hypothesized 40 hours of exposure to 8°C before cryopreservation at -80°C for 1.5 hours would allow *P. fusiformis* dinoflagellates the maximum time to synthesize protective, temporary cysts, resulting in less morphological and nucleic damage overall. The Control retained 108 (84.4%) cells of regular morphology and 22 (15.6%) irregular cells. The 40-Hour experienced 70 (54.8%) cells of irregular morphology and 38 (35.2%) cells of regular morphology. The 24-hour experienced 59 (52.7%) cells of regular morphology and 53 (47.3%) irregular cells. The 0-Hour cells, which were not exposed to 8°C, retained 76 (59.4%) regular cells and experienced 52 (40.6%) irregular cells. Ethidium bromide was used to determine nucleic fragmentation. The hypothesis was not supported by the data and observations. Instead, the 40-Hour exposure resulted in the highest incidence of irregular morphological condition and nucleic fragmentation, not the least. Based on the data, even though two organisms dwell in the same phylum, such as *P. fusiformis* and *L. polyedrum*, the way the cells react to cryogenics can differ significantly and must be treated

independently. Further research of dinocysts may allow science to utilize their protective properties, such as during long-term preservation of gametes.

E-2001

Healing Effect of Chitosan Gel Produced by an Environmental Friendly Method. IRINA A.ROLDÁN, Aylen A. Oviedo, and María P. Ruiz. Student Escuela Agropecuaria Provincial N° 1, Gobernador Gregores, Santa Cruz., ARGENTINA. Email: betra_154@yahoo.com.ar

Among the most abundant polymer molecules is chitin, component of the exoskeletons of invertebrates, fungi and algae, presents a very high replacement rate in the biosphere. The shores of Argentina are one of the main sources of crustaceans, but, at the same time, the shells of crustaceans, constitute a serious pollutant residue. Chitosan constitutes the most important derivative of chitin. Chitosan market lies mainly in nutraceuticals, protective food, medical applications, applications in agriculture and flocculation among others. The aim of this trial was to obtain Chitosan from prawn shell using an environmental friendly method as well as a development of a Chitosan medical application. As raw material, were used exoskeletons of prawn *Pleoticus muelleri*, the exoskeletons of prawn were cleaned, dried and mashed. For the removal of the shell's calcium carbonate and protein, organic products like chymotrypsin and lactic acid were used. At the obtaining stage, pressure and temperature's times were handled. Chitosan, with the following results, was obtained: solid waste: 15%, humidity: 9%, values of DA% (average obtained by FTIR): 65%, performance 20%. In this phase of the trial we used rabbits which presented ulcers in the rear legs because of the injuries produced by the contact with their cages. We made a healing gel with chitosan (1% concentrate), as active ingredient. We apply the gel to the injuries and observed the healing process during the treatment. Under the experimental conditions used in this trial, Chitosan was obtained from the exoskeletons of prawn with an acceptable degree of deacetylation with a suitable

methodology, environmental friendly method of production, presented as a gel in its veterinary pharmaceutical form in order to use it as a healing gel for external wounds.

E-2002

The Impact of Artificial Electromagnetic Fields on Planarian Magnetoreception. ADELE SHIRMER. West Perry High School, 2608 Shermans Valley Road, Elliptsburg, PA 17024. Email: adeleshirmer@gmail.com

Electromagnetic fields (EMFs) can be both naturally occurring and artificial generated, so they are found nearly everywhere in modern society. It is commonly believed that animals are guided by the Earth's natural magnetic field and links between artificial EMFs and disturbed migratory patterns are strongly suggested in many studies. This experiment was designed to test this theory by measuring the time required for *Dugesia tigrina* to complete a maze after being exposed to EMFs. This organism was chosen based on its natural abundance and ability to quickly adapt to intelligent patterns such as mazes. Using food, the planarian were trained to complete a Y-maze until they could consistently navigate it by memory. The time required to complete the maze was measured. Then, the test group was exposed to a fixed electromagnetic field. Initially, forty-seven percent of the planarians could not finish the maze within the allotted 30 minute span. This increased to ninety-seven percent on the second day. However, on the third day all but two finished the maze, roughly seven percent. As the experiment progressed the number of planaria who could complete the maze increased until many could actually complete the maze faster than the control group. Based on these results, it can be inferred that the planarians were initially disoriented by the artificial EMFs. However, as the week progressed the planarians were able to adapt to the new electromagnetic source and actually complete the maze more quickly than they did without exposure to EMFs. It could be concluded that, at least for brown planarians, EMFs may initially disrupt the ability to use magnetoreception, however

they may be eventually advantageous to the same organisms if they are given enough time to adapt to these changes.

E-2003

Does Parkinson's Disease Protein α -synuclein Protect Melanoma Cells from the Anti-cancer Drug Hydroxyurea? ALEX WITT. Caddo Parish Magnet High School, Shreveport LA. Email: alexwitt231999@gmail.com

The protein alpha-synuclein is thought to be the causative agent in Parkinson's disease (PD). Brain neurons, which synthesize dopamine have been found to express alpha-synuclein, which is also expressed in malignant melanoma, an aggressive form of skin cancer. It has been recently discovered that alpha-synuclein protects yeast cells from the chemotherapeutic agent hydroxyurea. Therefore, it might be possible that alpha-synuclein also protects human melanoma cells from hydroxyurea. If alpha-synuclein protects human cancer cells from hydroxyurea, then discovering how alpha-synuclein protects cancer cells from hydroxyurea could give insight into the function of alpha-synuclein, since currently the normal function of this PD protein is not readily known. Therefore, if alpha-synuclein protects against reactive oxygen species generated by the chemotherapeutic agent hydroxyurea, then alpha-synuclein will also protect human cancer cells from hydroxyurea. To evaluate this hypothesis, the amount of alpha-synuclein in two lines of melanoma cells was determined. Next the effect of hydroxyurea on the rate of cell growth was evaluated. Thirdly, it was determined whether or not hydroxyurea induced alpha-synuclein to move into the cell nucleus. It was determined that the two cell lines expressed very similar amounts of alpha-synuclein contradicting previous published studies. Both cells lines expressed stunted growth in the presence of alpha-synuclein, but more biological replicates are needed to solidify the data. Finally, alpha-synuclein was found to localize in the nucleus when in the presence of hydroxyurea.