

## **QUANTITATIVE IMAGING AND GENE EXPRESSION ANALYSIS OF A DOLPHIN LUNG ENDOTHELIAL CELL LINE: BASELINE DATA TO ASSESS MARINE MAMMAL HEALTH.**

Annalaura Mancia<sup>1,2,3</sup>, John T. Elliott<sup>3</sup>, Michael Halter<sup>3</sup>, Alessandro Tona<sup>3</sup>, Gregory W. Warr<sup>1</sup>, Anne L. Plant<sup>3</sup>.

(1) *Marine Biomedicine and Environmental Science Center, Medical University of South Carolina, Hollings Marine Laboratory, 331 Ft. Johnson Road, Charleston, SC, 29412, USA.*

(2) *Department of Experimental Evolutionary Biology, University of Bologna, Via Selmi 3, Bologna, 40126, Italy.*

(3) *Biochemical Sciences Division, National Institute of Standards and Technology, Gaithersburg, MD, 20899, USA.*

Development of stable dolphin cell lines is critical for studying biological differences between land-based and sea-based mammals and for understanding the molecular basis of dolphin health. Almost no baseline data for dolphin cell lines exists in the literature, and very few studies have characterized both the phenotypic and gene expression profile of a specific dolphin cell line. The goal of this project is to provide baseline data that describes the phenotypic properties and gene expression levels of a cultured primary dolphin lung endothelial cell line. We began with a comprehensive characterization of the growth and morphological characteristics of the cell line during *in vitro* culture. Interestingly, in some cases, we observed a systematic decrease in the distribution of cell volumes and cell spread area during extended passages of the cell line. This appeared to be a result of spontaneous conversion of the original symmetrical morphology of endothelial cells to a spindly, more migratory and more rapidly proliferating cell type. This phenotypic change is similar to changes that have been observed in endothelial cells from land mammals and may represent a “trans-differentiation” event. Expression of endothelial protein biomarkers and RNA transcripts are being monitored during culture to establish the endothelial nature of this cell line and develop baseline transcriptome information. These studies will likely be of significance to endothelial cell biology of many species, in addition to dolphin. In the future, analysis of the dolphin cells under different conditions and challenging with specific treatment (e.g. biotoxin) will open new insights on the marine mammal biology-physiology-health status and their relationship with human-health.

*This study was performed under permit 932-1489-09 from the National Marine Fisheries Service (NMFS) and supported by awards from the National Institute of Standards and Technology.*