

CHARACTERIZATION OF SURFACTANT PROTEIN B IN PYGMY SPERM WHALE (*Kogia breviceps*): COMPARISON BETWEEN MARINE AND LAND MAMMALS.

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Pulmonary surfactant lipid-protein complex produced by type II alveolar cells. Water molecules rest on the surface of the alveolus and because each water molecule has a positive and negative charge distribution a strong attraction between molecules creates a high surface tension at the air/water interface. If the surface tension inside an alveolus is not decreased sufficiently the forces will become so great that the human alveolus will collapse thus not permitting air to enter the alveolus. When a human lung collapses it cannot be inflated without medical intervention. The lungs of all mammals have a complex lipid-protein mixture that is essential for lowering this surface tension and preventing lung collapse. The surfactant protein B (SP-B) is the primary component required for this functions. Deep diving marine mammals such as dolphins and whales will physically collapse their lungs when diving great depths and inflate them before coming back up to surface.

The focus of this research is to identify the amino acid sequence of SP-B in the pygmy sperm whale lung and compare it to the amino acid sequence of dolphins and terrestrial mammals. The central hypothesis is that the pygmy sperm whale SP-B sequence is more closely related to the sequence of the dolphin (another deep diving marine mammal) rather than to the sequence of land mammals.

To test this hypothesis, primers designed using the dolphin SP-B sequence (known) will be used to amplify the pigmy sperm whale SP-B from pygmy sperm whale lung cDNA. Lung mRNA was obtained from lung sections of a stranded pygmy sperm whale. RNA was successfully extracted from the lung tissue then converted into cDNA to use as a template for PCR to amplify portions of the pigmy sperm whale SP-B.

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