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Source: Journal of Wildlife Diseases, 6(4) : 494-495

Published By: Wildlife Disease Association

URL: <https://doi.org/10.7589/0090-3558-6.4.494>

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Cell Cultures from Marine Mammals*

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Abstract

Cell cultures grown from the gray seal *Halichoerus grypus* and the dolphin *Lagenorhynchus obliquidens* support the replication of several human viruses. Further evidence indicates the gray seal kidney cell culture has transformed.

Introduction

Kniazeff and Groyon¹ have determined the virus susceptibility of cell lines derived from *Eumetopias jubata* (sea lion), *Balaenoptera physalus* (finback whale), and *Stenella plagiodon* (spotted dolphin). These cell cultures were susceptible to some of the picornaviruses, adenoviruses, herpes simplex, reovirus 3, and vesicular stomatitis virus. Kniazeff *et al*² submitted a continuous cell line obtained from the kidney of a spotted

dolphin to the American Type Culture Collection. This line is very susceptible to some human viruses. Pirtle and Kniazeff³ have shown that certain cultured cetacean cells are susceptible to virulent and modified hog cholera virus.

In this laboratory cell cultures from the gray seal *Halichoerus grypus* and the Pacific dolphin *Lagenorhynchus obliquidens* have been grown in culture for 5 months.

Materials and Methods

Tissues were removed from the animals at autopsy. The tissues were washed in Earle's balanced salt solution several times, finely minced, and placed in T-15

flasks or square milk dilution bottles in Eagle's minimum essential medium and grown at 35 C.

Results and Discussion

After one week in culture cells began to proliferate from the explanted tissue. In two or three weeks cellular proliferation had progressed sufficiently to form partial monolayers. At the end of the fourth week the cells could be transferred with EDTA. Fibroblast-like cells were recovered from the gray seal mesentery, lung, heart, kidney, and the dolphin mesentery.

Human viruses from the picornavirus, herpesvirus, adenovirus, and reovirus

groups have been shown to replicate in these cells by Cecil and Nigrelli.⁴

It is believed that the gray seal kidney culture has undergone cellular transformation. This culture shows the following characteristics of cellular transformation:

1. Loss of contact inhibition
2. Altered morphology
3. Increased growth rate
4. Persistence in serial subcultures

* This research was supported by a grant from the Scaife Foundation to the Osborn Laboratories of Marine Sciences.

Further investigations are being undertaken to determine if transformation has indeed taken place, to determine if the agent responsible for the transformation

is a virus, and to ascertain if the karyotype and viral susceptibility of the altered cells has been changed.

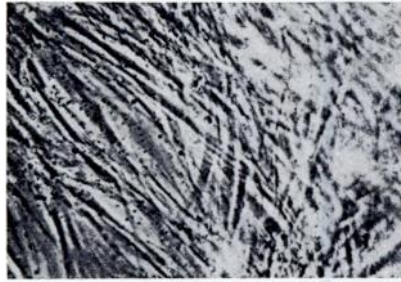


FIGURE 1. Cells from lung of gray seal — 3 weeks in culture.



FIGURE 2. Cells from mesentery of dolphin — 1 month in culture.



FIGURE 3. Cells from lung of gray seal — 2 months in culture.

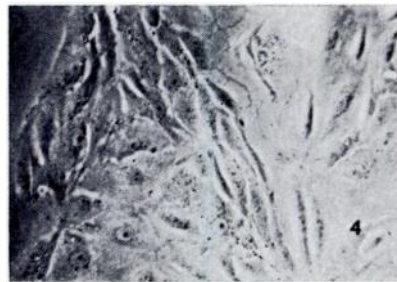


FIGURE 4. Cells from kidney of gray seal — epithelial-like and possibly transformed.

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