

## **The Use of Photodynamic Therapy (PDT) in the Treatment of Oesophageal and Breast Cancer**

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Oesophageal cancer, of which the two major contributory factors are alcohol consumption and opium and tobacco smoking, is one of the most commonly occurring types of cancer in the South African male population. Two different types of oesophageal cancer are found, viz. squamous cell cancer and adenocarcinoma. Squamous cell cancer was the more commonly occurring form of oesophageal cancer, however the incidence of adenocarcinoma has recently increased greatly. Breast cancer is the most common form of cancer occurring in women in South Africa (1). Ductal and lobular carcinoma are two of the earliest forms of breast cancer, and are also the two most common types of breast cancer which occur (2).

Photodynamic therapy is a form of cancer treatment that utilizes a light-sensitive dye which is activated by light at a specific wavelength. For this reason lasers are the chosen light source when conducting PDT, as the monochromaticity of the laser at the specific wavelength required to activate the photosensitizer results in maximum effectiveness of this treatment. Therefore in the absence of light, the photosensitizer is considered harmless.

The objectives of this study are to establish the effect of laser light (700 nm), the influence and specificity to malignant cells of various photosensitizers and then to determine the effect of PDT on the cellular and molecular reactions in oesophageal and breast cancer cells. This will be compared to the effect of PDT on healthy cells, and finally the effect of PDT after adaptive response to ionizing radiation will also be studied.

<sup>1</sup>Vorobiof, D. A., Sitas, F. and Vorobiof, G. (2001) Breast Cancer Incidence in South Africa, *J Clin Oncol*, **19**, 125s-127s

<sup>2</sup>National Cancer Institute (1995) Breast cancer, <http://www.mdanderson.org/app.pe/index.cfm>