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Commentary

# Photodynamic Therapy: A New Approach in Cancer Treatment

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## DESCRIPTION

Cancer remains a global health problem. Breast cancer, in particular, is the disease that has the greatest impact on the health of the world. Despite all recent technological improvements, recurrence and metastasis remain the leading cause of death. In fact, the high mortality rate as a result of distant metastasis of patients remains a bottleneck for effective treatment in the clinic [1]. All known treatments, i.e., hormonal therapy, chemotherapy, biological and targeted therapies are all associated with side effects (sometimes severe) and have negligible beneficial effects on survival. Oxysterols are oxygenated derivatives of cholesterol [2].

Photodynamic Therapy (PDT) is a two-step treatment that combines light energy with a drug (photosensitizer) designed to destroy cancerous and precancerous cells after light activation. Photosensitizers are usually activated by the light energy of a particular wavelength from the laser. Photosensitizers are non-toxic until activated by light. However, when light is activated, the photosensitizer becomes toxic to the target tissue. Today, some photosensitizers cause a variety of diseases, including acne, psoriasis, age-related macular degeneration, and various cancers such as brain, bladder, pancreas, bile ducts, skin, lungs, esophagus, and head and neck. It can be used to treat. Photosensitive agents and light have been used for medical purposes for a very long time. However, Photodynamic Therapy (PDT) only began to form in the 1960s after Lipson and Baldes reported that neoplastic tissues containing photosensitizer of porphyrin mixture could fluoresce under ultraviolet light irradiation.

Photodynamic Treatment (PDT) is based on the idea that exposing an inactive chemical to light causes it to become active. In urology, the most often used photosensitizing drugs are Hematoporphyrin Derivative (HpD) and Photofrin, which are mostly used to treat transitional cell carcinoma of the bladder. Several investigations on the optical features of prostate tissue and prostate carcinoma tissue *in vitro* and *in vivo* , as well as the penetration depths of different laser wavelengths, were conducted to examine the essentials for PDT of prostate cancer.

Dunning tumours in rats were used in the first experimental experiments to treat prostate cancer with PDT using HpD. Photodynamic therapy, when combined with interstitial applicators, appears to have a lot of promise in the treatment of prostate cancer.

PDT helps in the treatment of bacterial, fungal, and viral infections in addition to these disorders. According to studies, this light-based treatment can trigger an immunological response in the body, giving it another tool to help fight cancer cells and precancerous lesions. Although the majority of PDT applications target different forms of cancer, ALA has already been approved for use in a number of formulations, ranging from mild to moderate actinic keratosis to non-keratotic proliferative actinic keratosis. Bowen`s disease and basal cell carcinoma are also treated with it.

Porphymer Sodium (Photofluin) was the first PS licenced for clinical use in PDT for the treatment of bladder cancer by Health Canada in 1993. The Food and Drug Administration (FDA) and several other nations have since licenced it for the treatment of a variety of cancers, including lung cancer, esophageal cancer, gastric cancer, cervical cancer, and cervical dysplasia. This photosensitizer is still commonly used in Photodynamic Therapy (PDT) to treat a range of ailments. In addition, a clinically authorised PS called verteporfin is currently in use for serious eye disorders such as age-related macular degeneration and myopia choroidal neovascularization. Talaporfin, a monolaspartylchlorin, was approved as a PDT for lung cancer in Japan, but it is also used in patients with early-stage head and neck cancer, and is used as a treatment for colorectal cancer [3]. Phase testing is currently undergoing. Other FDA-approved drugsfor the treatment of PDT in cutaneous T-cell lymphoma and cholangiocarcinoma [4]. Endogenous tumor resistance, molecular heterogeneity and metastasis are obstacles in the fight against cancer [5].

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