Future of PDT in Head and neck cancer treated by photodynamic therapy with peptide-targeted nanoparticles

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Photodynamic therapy (PDT) is an innovative treatment for advanced cancers. PDT is based on the principle of excitation of a photoactivable molecules (also called photosensitizers or PS) by a light of an appropriate wavelength in an oxygenated medium to produce Reactive Oxygen Species (ROS), including singlet oxygen, which are cytotoxic species and can kill cancer cells [1]. One of the advantages of PDT is that it can be included in the treatment protocol for clinical cancers, before or after conventional therapies such as surgery, chemotherapy and radiotherapy.

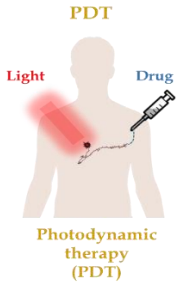

Figure: *Caption (Calibri 10 pts Italics)*

Head and neck cancer is fought worldwide and causes a huge number of deaths annually (262,000 deaths in 2002). It has been suggested that PDT could be an alternative local treatment option for patients with HNSCC (Head and neck squamous cell carcinoma) at an early stage (stage I/II) and for patients with advanced HNSCC (stage III/IV) who have exhausted all treatment options [2].

For this purpose, we synthesized and characterized a chitosan biopolymer of about 300 KDa, coupled to a Chlorine-based PS and to a peptide targeting head and neck cancer cells. The biopolymer showed ROS production after illumination and high stability in the aqueous medium. Biological and pre-clinical experiments will be performed to confirm the efficacy of the compound (collaboration with Dr Norhafiza Mat Lazim, USM, Malaysia, MATCH project)

REFERENCES (Calibri 10 pts)

[1] BECHET D, MORDON SR, GUILLEMIN F, BARBERI-HEYOB MA. PHOTODYNAMIC THERAPY OF MALIGNANT BRAIN TUMOURS: A COMPLEMENTARY APPROACH TO CONVENTIONAL THERAPIES. CANCER TREAT REV. 2014 MAR;40(2):229-41. DOI: 10.1016/J.CTRV.2012.07.004. EPUB 2012 AUG 2. PMID: 22858248.

[2] HOSOKAWA ET AL., LASERS SURG. MED. 2016;50:420-6 ; LOU ET AL., TECHNOL. CANCER RÉS. TRAITER. 2003;2(4):311-7