

## **Molecular mechanisms underlying immuno-modulation of PDT in dermatological melanoma**

Iman O Gomaa<sup>1</sup>, Aya A Sebak<sup>2</sup>, Mohamed A Abdel-Halim<sup>2</sup>, Gehad G Mohamed<sup>3</sup>, Tarek A El-Tayeb<sup>3</sup>

<sup>1</sup>Galala University, Egypt

<sup>2</sup>German University, Egypt

<sup>3</sup>Cairo University, Egypt

Increased exposure to the ultra violet radiation (UVR) from the sun, as well as lack of proper consciousness, has led to fatal malignancy with an increased mortality rate in the last ten years due to skin melanoma development, especially in people with fair and light skin. The current treatment scheme for melanoma includes chemotherapy, radiotherapy and surgery. Tumorigenesis is complex and dynamic at three levels: initiation, progression and metastasis. In addition, there is a tight connection with the tumors, the tumor microenvironment (TME) and the extracellular matrix, in each level (ECM). Photodynamic therapy (PDT) is a minimum-invasive therapy, which combines the use of a photosensitizer (PS) with laser exposure. When the laser beam of a specific wavelength is exposed to photosensitizers, it produces reactive oxygen free radicals which can kill the exposed cells in the vicinity. A specific wavelength enables each photosensitizer to produce its action. This wavelength can determine the extent to which the light can pass through the body. Moreover, PDT is associated with immune-stimulation that inhibits cancer progression through apoptosis and tumor cell necrotization. Immune system stimulation can be detected with several biomarkers like IL10, IL12, TGF- $\beta$  and TNF- $\alpha$ .

This work aims at studying some of the genetic markers

involved in the molecular mechanisms of PDT mediated immunomodulatory treatment of skin melanoma. Our target is to explore the relation between PDT as a recent efficient method for treating oncogenic tumors and the role of a tumor microenvironment in monitoring the development of skin cancer.

**Key Words:** Skin Cancer, PDT, Tumor Microenvironment, Immunomodulation, Tumor Markers

### **Biography**

Iman O Gomaa had her BSc in Biology at the Faculty of Science, Cairo University. She was awarded research fellowship from the European Union Community (EUC) to conduct her M.Sc. between Cairo Uni. & Panum Institute, Copenhagen University –Denmark. She then fulfilled her PhD between Ain Shams Uni. & the Medical School of the Technical University of Munich, Germany through a DAAD scholarship. This was followed by four years of postdoctoral studies between Mount Sinai School of Medicine, NY - USA and the Faculty of Medicine, Marie Curie University, Paris - France. She is currently an associate professor of Molecular and Cell Biology at the Molecular Biotechnology Program – Galala University. She has 20 peer-reviewed publications (Journals + Book Chapters), in addition to a worldwide patent. Her research interest is directed towards molecular oncology and is dedicated to basic science, besides applied research to improve early diagnosis and prognosis of cancer.

iman.emam@gu.edu.eg

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