

Porphyrin functionalized silicon microdevices for photo-induced cell death

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Abstract

Photodynamic therapy is a promising cancer treatment strategy. A specific light source induces the excitation of photosensitizers which, under irradiation, are able to trigger the production of ROS that cause cell death. Porphyrins are one of the most promising photosensitizers, and their performance can improve through conjugation to delivery systems. We have studied the use of porphyrin-functionalized chips in photodynamic experiments with HeLa and Raw 264.7 cell lines.

The results have showed that porphyrin-functionalized chips retain their ability to be internalized by HeLa cells. Photoactivation induced a dose dependent cytotoxic effect in the presence of soluble porphyrin. Moreover, the internalization by HeLa cells of a number of functionalized chips can induce their death under irradiation conditions, while the internalization of non-functionalized chips does not produce observable cell alterations. A more marked effect and a higher microchips internalization ability was observed in the phagocytic Raw 264.7 cell line.

References

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Figures

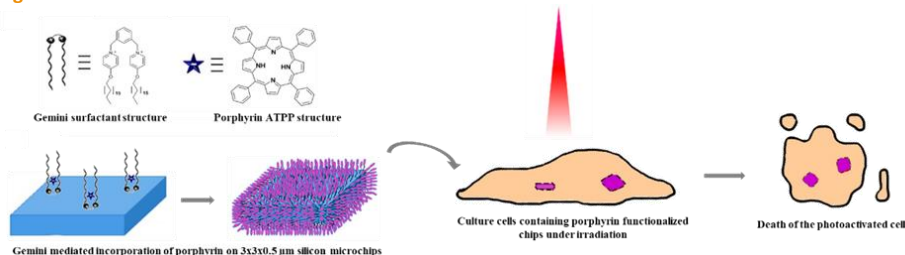


Figure 1: Scheme of the photoactivation experiments with porphyrin functionalized microchips in cultured cells.