

Drug delivery systems for photosensitizers. Current state of art and future directions.

Photodynamic therapy (PDT) utilizes a combination of non-toxic dyes, photosensitizers, molecular oxygen and visible light of appropriate wavelength, in order to treat, *e.g.* cancer and infections. PDT is currently used to treat superficial, thin malignant or premalignant lesions located on the surface of the skin or mucosa, such as basal cell carcinoma, actinic keratosis, head and neck cancer, cervical cancer. Photosensitizers which are drug candidates for PDT are often characterized by low solubility, extensive aggregation in aqueous environments and resulting limited bioavailability.

A new promising way to overcome these problems is the development of nanoparticulate drug delivery systems. They can be used to increase biological effects of photosensitizers, reduce side effects and to exert an additional beneficial effect. Studies published so far gave no clear answer in respect to which nanocarriers are the most suitable for use in PDT. However there are numerous examples of enhancing photosensitizer's *in vivo* activity by use of drug delivery system, tailor-made for given photosensitizer.

The talk aims to present the state of art of the photodynamic therapy, current and future uses and the role of new drug delivery systems in the development of new PDT applications.