



Project number: ETB-2013-14

Acronym: CryNaPhot

Type of biotech: Health

Project title: Crystalline Nanoparticles from Chlorin Derivatives – a New Concept in Biophotonics for Cancer Diagnosis and Therapy

Total budget of the project: 1617 K€

Participating countries/regions:

- Germany
- Russia

Summary of the project:

Nanoparticles from crystalline compounds such as chlorins, porphyrins and phthalocyanines are not fluorescent in aqueous suspension and after uptake in healthy tissue. However, in inflammatory tissue environment like cancer tissue, fluorescence appears because single molecules are dissolved from the particles under such specific conditions. Uptake of the nanoparticles by stimulated macrophages seems to be the specific reason for this behaviour as first experiments indicated.

This discovery will be the basis of a new strategy for cancer diagnosis and non invasive phototherapy directly using nanoparticles produced from such compounds instead of applying solutions of such hydrophobic molecules at different formulations. With this background, crystalline nanoparticles made from Temoporfin (mTHPC; active substance in medicinal product Foscan®), are highly selective and more specific for the fluorescence diagnosis of cancerous lesions and phototherapy than molecular solutions.

It is necessary, however, to study the fluorescence and photodynamic effectiveness, singlet oxygen production and the cellular reaction pathways in selected cell lines, bioassays and ex-vivo models as well as in animal experiments. Besides applications for cancer (CA) diagnosis and therapy (e.g. squamous cell CA, BCC, bladder CA) applications for treatment of inflammatory lesions are also possible.

Parallel to the scientific research, the developments of optical and spectroscopic fibre based diagnostic and therapeutic tools are necessary to shorten the time to market for specific devices as sets adapted for the use of the nanoparticles. Biolitec is a leading company in developing photoactive compounds for cancer therapy, in producing optical fibers and diode lasers for photodynamic therapy. Biospec complements such products by manufacturing optical and spectroscopic diagnostic devices for fluorescence spectroscopic detection and imaging inclusive software modules for objective data evaluation.