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Although progress in basic research has led to the design of new generations of anticancer targeted drugs with some notable achievements further progress in cancer treatment may be accomplished through other existing, but still under-appreciated, therapeutic approaches.[1,2] Among these, sonodynamic treatment takes advantage from the use of non-thermal ultrasound to activate chemical compounds known as sonosensitizers.[3] The activated sonosensitizer agent is then able to kill cancer cells through the generation of highly reactive products, such as reactive oxygen species (ROS), through apoptotic and/or necrotic mechanism. The great advantage of this technique relies on its low systemic toxicity, the possibility of highly controlled non-invasive treatments/practices and the non-occurrence of drug resistance even after repeated treatment. Within this framework, we will present the use of biocompatible, polymeric core-shell nanoaparticles (NPs) as multi-functionalized carriers of a properly selected sensitizer for *in vitro* and *in vivo* tumor treatment.[4] In addition, PET and MRI *in vivo* bio-distribution data of our porphyrin loaded nanoparticles will be discussed.

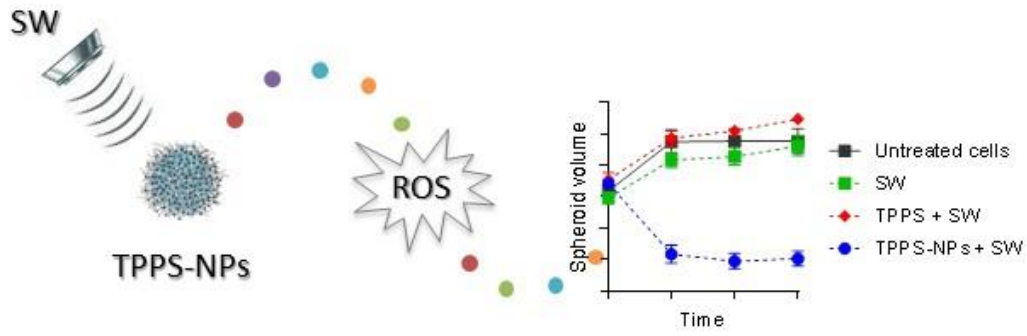

Figure 1. Schematic representation of the sonodynamic treatment mediated by TPPS-NPs and its effect on human neuroblastoma SH-SY5Y spheroids volume after different treatment conditions

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