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Poly(glycerol sebacate) nanoparticles for encapsulation of hydrophobic anti-cancer drugs

Application Note

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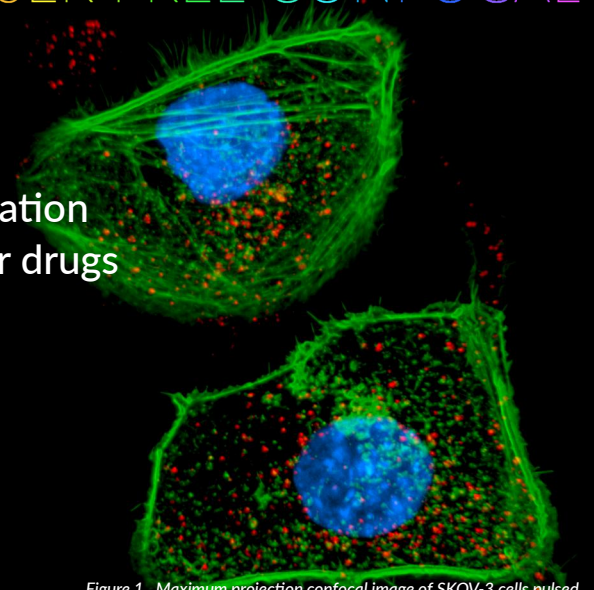

Figure 1. Maximum projection confocal image of SKOV-3 cells pulsed with Cy5-N3 labelled PGS nanoparticles (red).

Introduction

Bruno De Geest is a Professor of Biopharmaceutical Technology at the University of Ghent. His interdisciplinary laboratory is working at the interface between materials chemistry and life science to design novel drug delivery systems and to investigate how these interact with living cells and tissues *in vitro* and *in vivo*. The two main areas of interest of the group are the design of nano/micro-particulate vaccines and the design of new strategies for anti-cancer therapy.

Physical encapsulation of hydrophobic compounds into nano-carriers that are stable in aqueous medium is of high interest as it can increase solubility of the drug, lower its toxicity, control its pharmacokinetic profile and thus improve the overall therapeutic efficacy. In their paper,[1] Bruno and co-workers, report the design of poly(glycerol sebacate) (PGS), an inexpensive water insoluble, but biodegradable and biocompatible polymer, into nanocarriers for hydrophobic drugs.

Experimental

Confocal microscopy was carried out on a Leica DMI6000B inverted microscope equipped with a 63x 1.4 NA oil immersion objective and attached to an Aurox/Andor DSD2 confocal unit.

Results

Figure 1 shows a confocal microscopy image (maximum intensity projection) of SKOV-3 cells pulsed with Cy5-N3 labelled PGS nanoparticles (red). The cell membrane was stained in green with phalloidin-AlexaFluor488 and the cell nuclei were stained in blue with Hoechst.

Conclusions

The study shows that PGS is capable of forming well defined nanoparticles and that the produced PGS nanoparticle dispersion is stable in aqueous medium. Further studies are now needed to assess if PGS nanoparticles could serve as a nanomedicine platform for physical encapsulation of hydrophobic drugs.

" The Aurox system allows a fast multi-color image acquisition at high speed and in multiple dimensions. It is particularly well suited for us to investigate the interaction between nanoparticles and living cells, including dendritic & cancer cells. "

Prof. Bruno De Geest

1. Bruno G. De Geest et al, Polymer Chemistry (2017).