EINLADUNG

Am Dienstag, 25. Februar 2020, spricht um 11:00 Uhr
im Hörsaal des ZAF, Philosophenweg 7, 07743 Jena

Frau Dr. Barbara Lonetti

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zum Thema

“The role of polymer nanocarriers in Photo Dynamic Therapy
efficiency. An experimental study of interactions with membranes”

Alle Interessenten sind herzlich eingeladen.

gez. Prof. Dr. Ulrich S. Schubert

Es handelt sich um eine Veranstaltung i.R.d. Jena Center for Soft Matter (JCSM)
The role of polymer nanocarriers in Photo Dynamic Therapy efficiency. An experimental study of interactions with membranes.

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Polymer based nanocarriers have great potential to incorporate and transport photosensitizers commonly used in photodynamic therapy (PDT) to locally generate Reactive Oxygen Species subsequently leading to the death of the cells.

In the last years we worked with polymer based nanovectors and we showed a strong improvement of the therapeutic efficiency of the encapsulated photosensitizer, pheophorbide a.\textsuperscript{1-2} These results stimulated us to assess more closely the mechanisms of release and possible internalization of photosensitizers inside cells. For this purpose we used simple model membranes (i.e. giant and large unilamellar lipid vesicles, GUV and LUV), a valid experimental tool in order to help interpreting the results of in vitro studies.\textsuperscript{3}

Photosensitizers-loaded polymer nanocarriers were incubated with lipid vesicles and further irradiated. Leakage assays and confocal microscopy on the lipid vesicles give us experimental evidence of important modifications in lipid membranes (Figure 1). We demonstrated that these modifications are related to singlet oxygen production and lipid damages, which were quantified and followed upon irradiation. All our results help to rationalize the influence of the nature and composition of the carriers on their efficiency in PDT.

Figure 1. CLSM images of GUVs after interaction with pheophorbide a in inside a)-c) poly(ethyleneoxide-b-c-caprolactone) 5k-4k; d) poly(ethyleneoxide-b-D,L-lactide); e) poly(ethyleneoxide-b-c-caprolactone) 5k-4k cross-linked. Scale bar: 25μm.

Barbara Lonetti is a research associate at CNRS, the French National Centre for Scientific Research and since 2008 she has been working at the IMRCP Laboratory in Toulouse. She received her bachelor’s degree from University of Florence (Italy) in 2000 and her PhD in Chemical Sciences from the University of Florence in 2004. She then undertook postdoctoral studies first at ESPCI in Paris (France, 2004-2005) and then at Forschungszentrum Jülich in Jülich (Germany, 2005-2008). She has acquired experience in soft matter and the link between molecular structure, interactions and macroscopic properties of different macromolecular systems. Her research interests are focused on the self-assembly of block-copolymers and in particular their role in the delivery of active molecules such as photosensitizers. She devotes particular attention to the interactions between block-copolymer nanocarriers and the molecular machinery in order to improve their treatment efficiency.