Prof. Dr. Mario Waser
Institute of Organic Chemistry
T +43 732 2468 5411
mario.waser@jku.at
www.jku.at/orc/goech

JOHANNES KEPLER
UNIVERSITY LINZ

CHEMIE KOLLOQUIUM
PROGRAMMVORSCHAU

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Dr. Yolanda SALINAS

Institute of Polymer Chemistry

„Hybrid functional materials based on phosphazenes and silica for nanomedical applications"

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Dr. Yolanda Salinas
Assist. Prof. at Institute of Polymer Chemistry, Johannes Kepler University Linz, AUSTRIA

Profile Weblink:
Google Scholar: https://scholar.google.com/citations?hl=es&user=OXQlV6UAAAAJ&view_op=list_works&sortby=pubdate
LIT: https://www.jku.at/en/linz-institute-of-technology/research/research-projects/salinas
ORCID: https://orcid.org/0000-0002-1828-5839 (Researcher ID: B-2361-2018)

Short Biography:

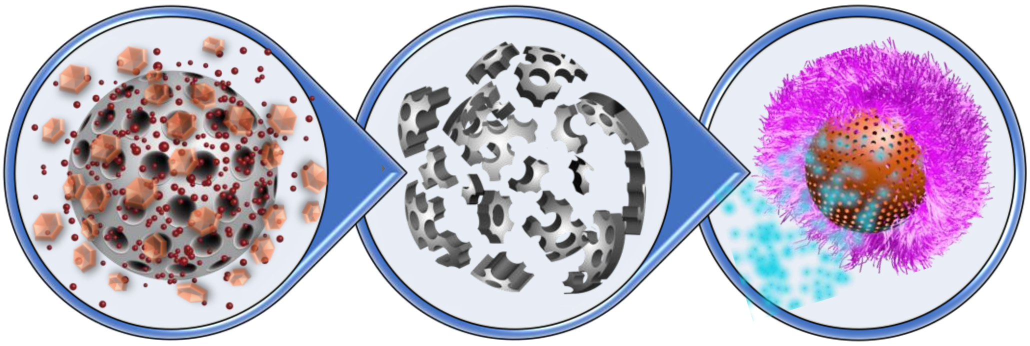
Dr. Yolanda Salinas was graduated as Chemical Engineer in 2008 at the University of Valencia, and she finished her PhD in Chemistry in 2013 at the Polytechnic University of Valencia (Spain), based on mesoporous silica particles for optical recognition of explosives involving supramolecular interactions. Then, a two-years Marie Curie postdoc position enabled her to work in polymeric nanomaterials for cancer treatment, at the Queen Mary University of London (UK). Since 2015, Dr. Salinas is University Assistant in the team of Prof. Brüggemann at Institute of Polymer Chemistry (ICP) to proceed with her habilitation and to develop her own research about functional hybrid polymeric materials for nanomedicine. In 2017 she was awarded with her first independent funding (Young Career Project) from the JKU's elite funding system, Linz Institute of Technology. That allowed her to build up her own sub-group, consisting of one PhD student and few master and bachelor students, working on novel degradable organosilica-based nanomaterials. She has published 26 peer-reviewed papers in well-known chemistry and materials journals (two of them highly cited reviews), and she is Guest Editor of a Special Issue in MDPI journals ("Optical Hybrid Chemosensor Materials").

Contact e-mail: yolanda.salinas@jku.at

Abstract of the talk:

Hybrid functional materials based on phosphazenes and silica for nanomedical applications

Among different synthetic platforms, hybrid silica-based materials have gained much attention in many potential nanotechnology areas (such as optoelectronics, catalysis, biosensing or nanomedicine).[1] In particular, mesoporous silica nanoparticles have set a precedent in the area of controlled drug delivery.[2] Their thermal stability, biocompatibility, rigid framework, large pore volume to allow loading various drugs, and large surface area to easily functionalize gates-like responsive units for controlling the release on-demand under pathological conditions, are features that makes them stand out candidates.[3-5] Nevertheless, such materials typically do not show an inherent biodegradability, an essential requirement for long-term use in therapeutic applications.[6] Interestingly, the incorporation of emerging potential degradable units, such as polyphosphazenes within the silica framework may drive towards future promising purposes,[7] such as degradable drug delivery carriers. Thus, we combined both materials to create advanced functional organosilica phosphazene-based hybrid nanoparticles as future degradable nanomedicines. Moreover, precise movement manipulations, like the control over the velocity and direction, are still limited but particularly desirable on the fabrication of more efficient cellular nanovehicles.[8] Mesoporous silica micro/nanomotors are our more recent focus of investigation[9] and we believe that these advanced responsive systems could solve the challenges for future active drug delivery.



Keywords: mesoporous silica nanoparticles, controlled delivery, nanomedicine, stimuli-responsive molecular gates, micro/nanomotors.

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