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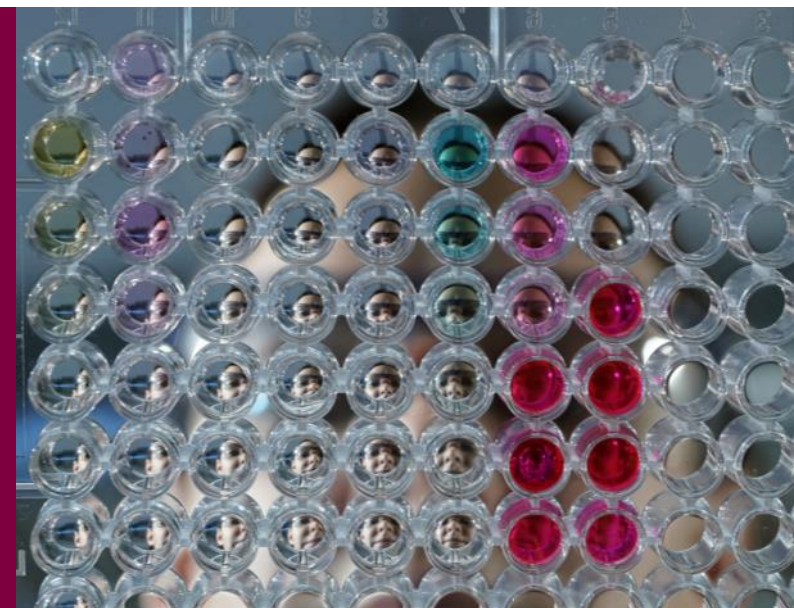
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Jena Center for Soft Matter

www.jcsm.uni-jena.de

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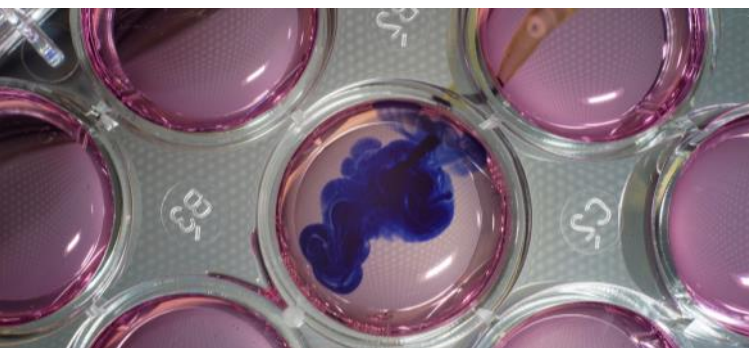


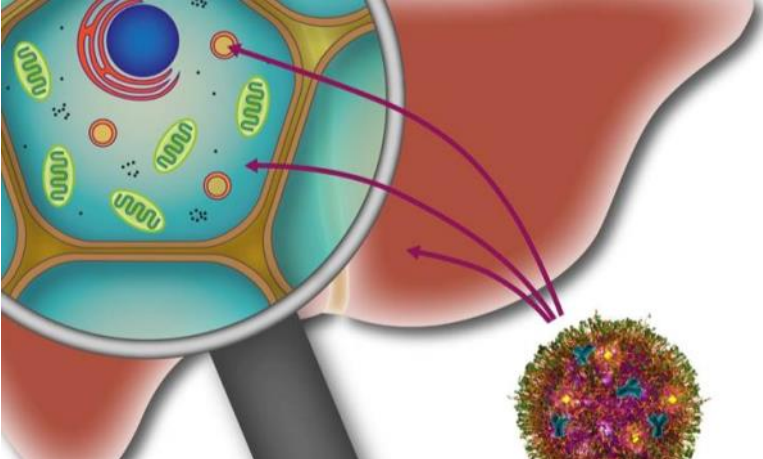
POLYTARGET

Polymer-based Nanoparticle
Libraries for Targeted
Anti-inflammatory Strategies



www.polytarget.uni-jena.de





THE CRC POLYTARGET

The goal of the CRC PolyTarget is the development of new strategies for the treatment of infection-triggered inflammatory states, centered on a rational design of tailor-made nanoparticulate drug carriers. Pharmacologically active nanoparticles based on functional synthetic polymers and (modified) biopolymers are utilized and characterized to address the fundamental questions of targeted nanomedicine from the bottom up. Based on the establishment of polymer libraries and a detailed molecular and morphological characterization of the nanoparticles, structure-property relationships are studied to optimize the nanoparticles with respect to their biological and pharmaceutical function.

Systematic polymer and particle libraries

Multiple, advanced characterization methods combined with detailed biological studies, GMP laboratory

Elucidation of quantitative structure-property relationships

Transition from trial & error experimentation towards knowledge-based design of multifunctional polymer-based nanoparticles

Cell and organ specific delivery systems for inflammation-related diseases

PROJECTS

CORE—Project Area A (*Felix Schacher*)

- A01 Tailor-made multifunctional polymers and nanoparticles with optimized compatibility between biodegradable core and encapsulated drug (*U. S. Schubert, M. Sierka*)
- A02 Tailored nanoparticles with two-step release pattern: New tool for drug delivery (*T. Heinze, T. Heinzel*)
- A03 Photo-triggered swelling and release from core-shell-corona micelles (*B. Dietzek, F. Schacher, K.-D. Jandt*)
- A04 Dual inhibitors of prostaglandin E2 synthase-1 and 5-lipoxygenase as anti-inflammatory payloads in nanoparticles (*O. Werz, U. S. Schubert*)
- A05 Targetable nanoparticles for efficient translocation across gastrointestinal barriers (*A. Stallmach, J. Brendel*)
- A06 Controlling the degradation behavior of polymeric nanoparticles by structurally tailored thermal properties (*K.-D. Jandt, U. S. Schubert*)

SHELL—Project Area B (*Dagmar Fischer*)

- B02 Macromolecular prodrug nanoparticles for antimicrobial therapy (*A. Brakhage, C. Guerrero-Sanchez*)
- B03 Guanidinium-containing nanoparticles for gene delivery (*K. Peneva, D. Fischer*)
- B04 In-depth monitoring of surface characteristics and structural changes in block copolymer nanoparticles using tip-enhanced Raman spectroscopy (*V. Deckert, F. Schacher*)

- B06 Circumventing the immune response by targeted nanoparticle mediated delivery of nucleic acids (*A. Träger*)

MEDIUM—Project Area C (*Britta Qualmann*)

- C01 Raman spectroscopic characterization of the linkage- and interaction mechanism of nanoparticles and drugs with hepatic stellate cells (*J. Popp, S. Schubert, M. Bauer*)
- C02 Exploiting polymer-based delivery systems for anti-inflammatory indirubin-based 6BIGOE derivatives in *in vitro* and *in vivo* proof-of-principle studies (*D. Fischer, O. Werz*)
- C03 Selective targeting of hepatocytes using multifunctional block copolymer micelles to restore critical cellular signaling functions (*M. Bauer, B. Qualmann, F. Schacher*)
- C04 Investigation of cellular uptake mechanisms by dual TEM and superresolution fluorescence imaging (*R. Heintzmann, S. Höppener*)

Z-PROJECTS

- Z01 JCSM research platform for synthesis, formulation, and advanced physico-chemical and biological characterization of nanocarriers (*C. Guerrero-Sanchez, I. Nischang, S. Höppener, S. Lorkowski, M. T. Figge*)
- Z02 Integrated Research Training Group (*B. Dietzek, S. Schubert, O. Werz*)
- Z03 Central tasks of the Collaborative Research Center (*U. S. Schubert, M. Bauer, D. Fischer*)