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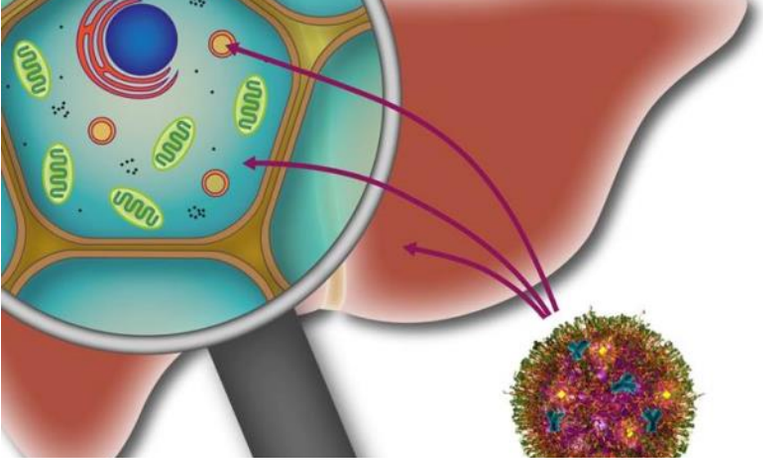
Collaborative Research Center
CRC 1278

PolyTarget

Polymer-based Nanoparticle Libraries for Targeted Anti-inflammatory Strategies

PolyTarget

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

Subject Area A: CORE

A01 Tailor-made multifunctional polymers and nanoparticles with optimized compatibility between biodegradable core and encapsulated drug

A02 Multifunctional nanoparticles based on polysaccharides for targeted drug delivery with two-step release behavior

A03 Photoacids and bases as responsive elements in block copolymer nanostructures for uptake and transport

A04 Spatial and temporal targeting of membrane-bound mPGES-1 and FLAP / 5-LO by dual inhibitors employing polymer-based nanocarriers

A05 Targetable nanoparticles for efficient translocation across gastrointestinal barriers

A06 Controlling stealth and barrier breaking behavior: Hybrid protein nanofibers and POxylation on polymeric nanoparticles with structurally tailored thermal properties

Subject Area B: SHELL

B01 Targeted nanoparticle mediated delivery of nucleic acids into muscle stem cells for prevention of critical illness myopathy

B02 Macromolecular prodrug nanoparticles for antimicrobial therapy

B03 Bioinspired guanidinium-containing nanoparticles for gene delivery

B04 Nanoscale monitoring of surface effects, structural changes, and encapsulation in block copolymer nanostructures using tip-enhanced Raman spectroscopy

Subject Area C: MEDIUM

C01 Biophotonic characterisation of the interaction of nanoparticles and drugs with hepatic stellate cells

C02 Tailored delivery of anti-inflammatory natural drugs using polymer-based nanocarriers to prevent cytokine and eicosanoid storms in infectious inflammation

C04 Investigation of cellular response to nanoparticle uptake by dual TEM and superresolution fluorescence imaging

C06 Prevention of late phase liver damage by targeted modulation of the liver's immune response

Subject Area D: VIRAL

D01 Mimicking viral entry mechanisms with polymeric nanoparticles

D02 Delivery platforms for antiviral and anti-inflammatory agents targeting infections of respiratory viruses with pandemic potential

Subject Area T: TRANSFER

T01 Targeting renal phosphoinositide 3-kinase γ (PI3Kγ) by dye-tagged nanoparticles

Subject area Ö: Educational institutions and the public

Ö01 Science education on target: Didactic reconstruction of current research at the interface between nanotechnology and medicine

Subject area Z: Central research platform and supporting projects

Z01 Research platform for the synthesis, formulation, and advanced physicochemical characterization of polymers and nanoparticles

Z02 Integrated Research Training Group

Z03 Central tasks of the Collaborative Research Center