Collaborative topic:

Drug-Discovery

Part 1

By

Dr. K.T. Petrova
Contents

• Identified Calls

• Who we are

Sustainable Organic Chemistry Group @ LAQV-REQUIMTE
Prof. Dr. M.T. Barros, mtb@fct.unl.pt, and Dr. K.T. Petrova, k.petrova@fct.unl.pt

• Our expertise

In our laboratories we have synthesized various small organic molecules, functional polymers, polymeric conjugates and polymeric nanoparticles, useful for targeted drug delivery. Our work mainly involves carbohydrates, but is not limited to them. We are able to produce a large variety of structures on demand and we are open for collaborations.
Identified Calls

• The synthetic organic chemists need strong collaborations, first to identify target compounds, which to design and produce, and then to test them and prove their activities.

IMI – Innovative Medicines Initiative
https://www.imi.europa.eu/content/overview-imis-calls-how-participate

InfectEra

EuroNanoMed 2
http://www.euronanommed.net/

Worldwide Cancer Research
https://grants.worldwidecancerresearch.org/Login.aspx?ReturnUrl=%2f

Safe by Design
http://www.h2020-prosafe.eu/prosafe/?cat=4

Chronic kidney diseases
Chemical Processes with Microwaves: mild, fast and energy–efficient procedures

• Use of especially designed equipment
• The energy is uniformly distributed
• Advanced sensor technologies
• Simplified process monitoring and control
• Reduced amount of solvents, short reaction times

References:
We have developed protocols for the fast synthesis of various useful carbohydrate intermediates and biologically active compounds. Many of them have been studied for their antibacterial, antifungal, and cytotoxic activities.

![Chemical structures and reactions](image)

**References:**
We have synthesized a number of novel monomers, focusing on the selectivity of the transformations. These were used to obtain functional biodegradable polymers and carbohydrates-decorated polymeric nanoparticles.

References:
Synthesis of amphiphilic and biodegradable polymers based on renewable compounds

Reference:
Potential applications: sugars-containing polymeric nanoparticles for drug-delivery systems

Glucose-containing spherical and core-shell polymeric beads

Cross-linked polymeric microparticles containing hexa-O-benzylsucrose.

References:
Smart Nanoparticles for Targeted Drug Delivery

Scheme of PLGA-GAL conjugate synthesis and doxorubicin-loaded nanoparticles formation. Representative scanning electron microscope photographs.

In collaboration with M.M. Cardoso and I.N. Peça

References:
Doxorubicin-loaded galactoseconjugated poly(d,l-lactide-co-glycolide) nanoparticles as hepatocyte-targeting drug carrier. J. Microencapsul. 2016, DOI: 10.1080/02652048.2016.1185474
Thank you for your kind attention!