

10 YEARS OF THE BELT AND ROAD INITIATIVE

BELT AND ROAD CONFERENCES



JOÃO RODRIGUES

28TH NOVEMBER 2023

AT
UNIVERSITY OF AVEIRO – RECTORY



joaor@uma.pt

© 2023 JR

November 28, Aveiro (on-line)

10 YEARS OF
THE BELT AND
ROAD INITIATIVE

BELT AND ROAD CONFERENCES

28TH NOVEMBER 2023

AT
UNIVERSITY OF AVEIRO - RECTORY



Cooperation between Portugal and China in the field of science - a personal experience

JOÃO RODRIGUES

(joaor@uma.pt)

© 2023 JR

November 28, Aveiro



University of Madeira location



Outline



01

How did this collaboration start ?

02

Cooperation in scientific research

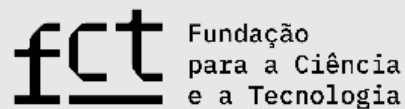
03

Main Outputs

04

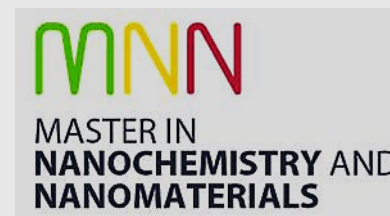
Work Underway & Future prospects

01 How did this collaboration start?

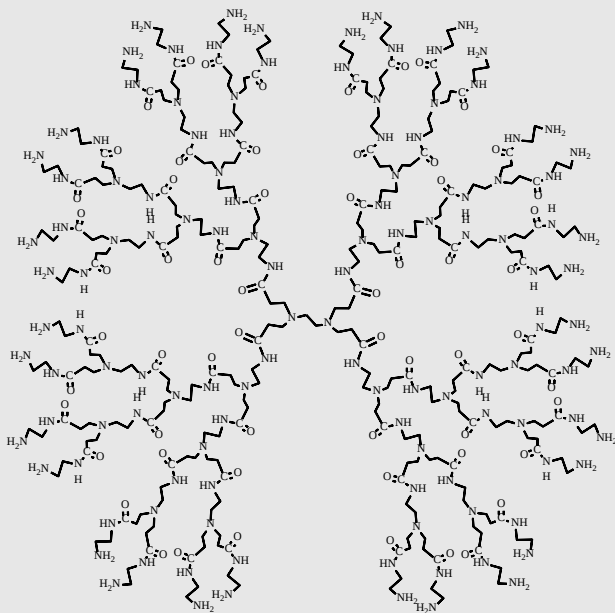


In **2009**, we hired Dr. Yulin Li as Assistant Researcher (Five years non-tenure position)

In **2010**, with the support of  **Santander**,
Professor Xiangyang Shi was hired as a Full Professor (Invited Chair in Nanotechnology)



01 How did this collaboration start?

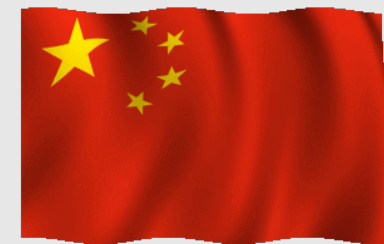


Dendrimers,
Hydrogels,
Inorganic
nanoparticles,
Hybrid materials

Carbon materials
Biomaterials,
Tissue repairing
and regeneration
In vitro studies



Biomedical
applications
+
Nanomedicine



Dendrimers,
Polymers,
Inorganic
nanoparticles,

Hybrid materials
Metal alloys
Biomaterials,
In vivo studies



02 Cooperation in scientific research



Research



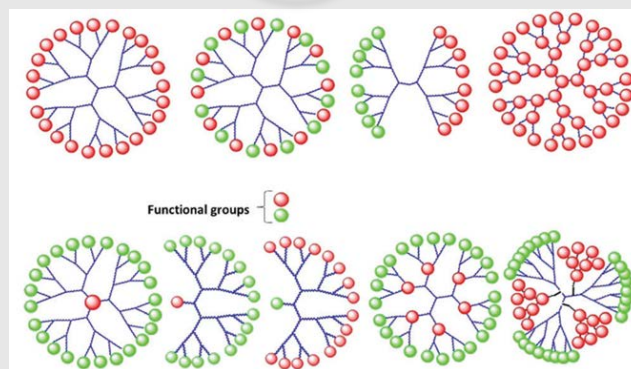
Teaching



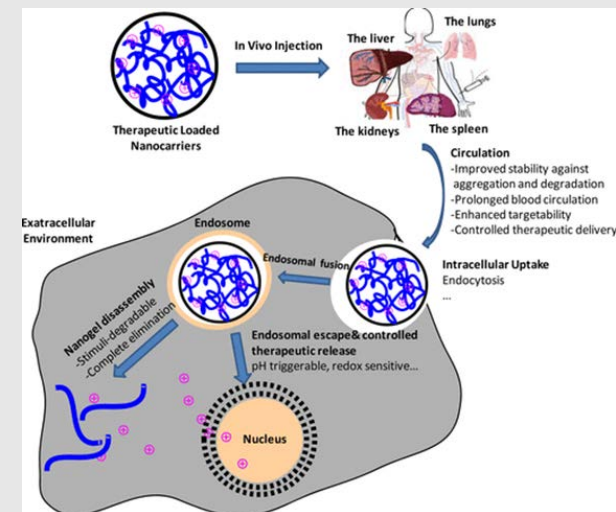
Exchange



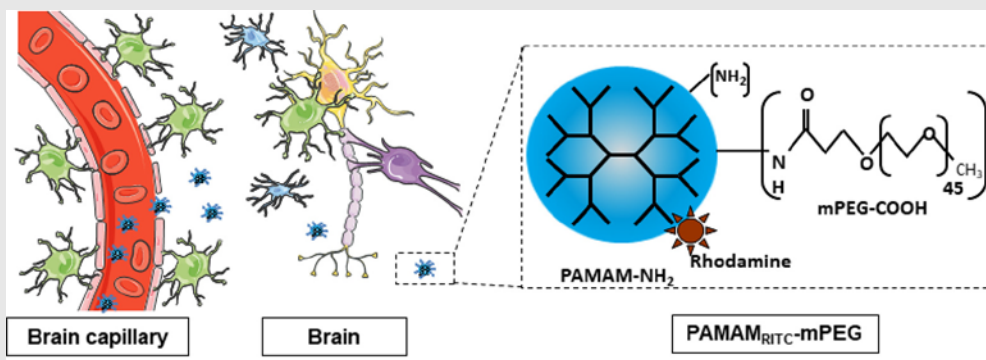
Friendship and Common Research Interests



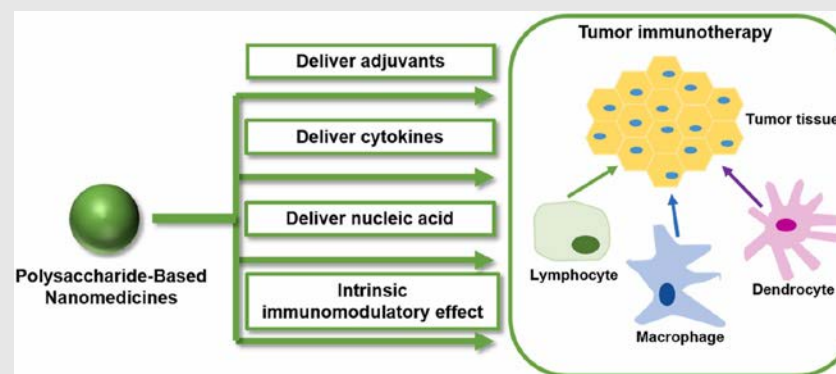
Chem. Soc. Rev., 2018, 47, 514-532



Chem. Rev. 2015, 115, 16, 8564-8608



J. Controlled Release 2018, 291, 65-79



Bioact. Mater. 2021, 3358-3382



02 Cooperation in scientific research



Research



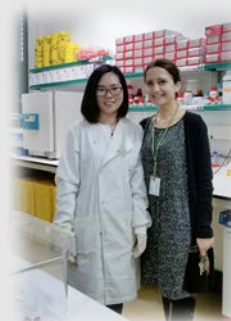
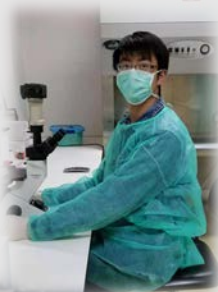
Teaching



Exchange



Long-term partnership in teaching, scientific research and talent exchange



02 Cooperation in scientific research



Gathering on international conferences



02 Cooperation in scientific research

 Research  Teaching  Exchange



03 Main Outputs

Joint Publications & Exchange – 2011-2023



- Total of joint papers with IF: **215** (ca. 18 papers/year)



- Exchange of students and researchers: 30 (ca. 2/year)

Main Outputs

Selected joint papers



Prog. Polym. Sci. **2015**, *44*, 1
Biomaterials **2013**, *34*, 470
Biomaterials **2013**, *34*, 1570
Biomaterials **2013**, *34*, 5200
Biomaterials **2012**, *33*, 1107
Biomaterials **2011**, *32*, 2979
Nanoscale **2014**, *6*, 4521

Single mode or
dual mode
imaging agents

Nanoscale **2018**, *10*, 6113
ACS Appl. Mater. Interfaces **2018**, *10*, 6146
Nanoscale **2017**, *9*, 12295;
Nanoscale **2016**, *8*, 13568
Nanoscale **2016**, *8*, 5567;
Anal. Chem. **2015**, *87*, 3949
ACS Appl. Mater. Interfaces **2016**, *8*, 19883

Single mode or
combinational
therapy

Dendrimers

Theranostics

Chem. Soc. Rev. **2018**, *47*, 1874
ACS Appl. Mater. Interfaces **2017**, *9*, 47
Adv. Colloid Interface Sci. **2017**, *249*, 374
Drug Discovery Today **2016**, *21*, 1873
ACS Appl. Mater. Interfaces **2015**, *7*, 5420
Nanoscale **2015**, *7*, 14538
Small **2015**, *11*, 4584-4593
Biomaterials **2015**, *38*, 10

Chem. Soc. Rev. **2018**, *47*, 514
Adv. Drug Deliver. Rev. **2018**, DOI: 10.1016/j.addr.2017.11.007
Coord. Chem. Rev. **2018**, *358*, 80; *Theranostics* **2018**, *8*, 1923.
ACS Appl. Mater. Interfaces **2017**, *9*, 15995
Chem. Rev. **2015**, *115* (16), 8564; *Nanoscale* **2015**, *7*, 18169
ACS Appl. Mater. Interfaces **2015**, *7*, 4833
ACS Appl. Mater. Interfaces **2015**, *7*, 19798
ACS Appl. Mater. Interfaces **2014**, *6*, 16416
Adv. Healthcare Mater. **2016**, *5*, 3203

03 Main Outputs

Evolution of joint publications - Portuguese universities– 2006-2020

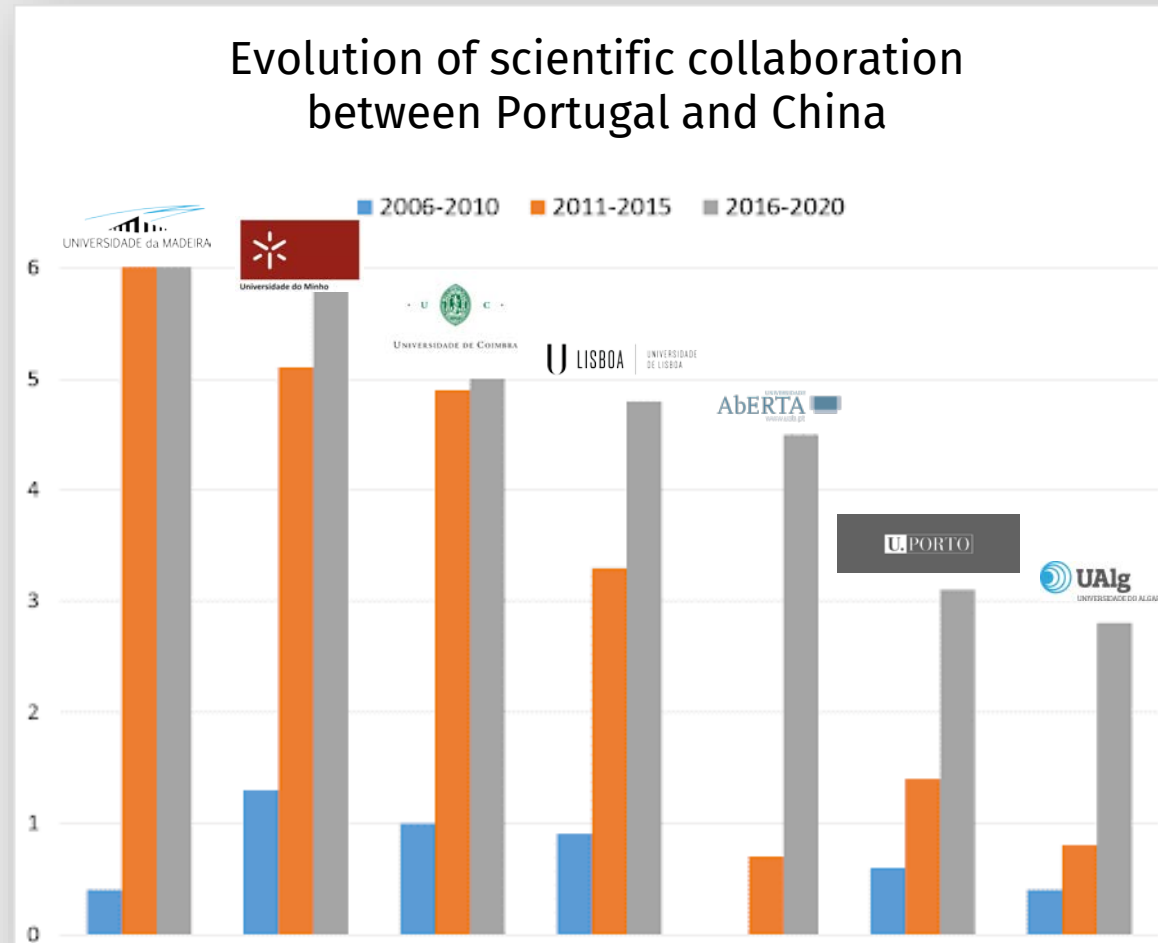


Image adapted from: <https://pacheco-torgal.blogspot.com/2021/11/desempenho-de-16-instituicoes-de-ensino.html> (presented with the author permission)

03 Main Outputs

Selected joint research projects



1

RESEARCH ON THE PERSONALIZED MECHANICAL ADAPTIVE BIOACTIVE TITANIUM IMPLANTS
Shanghai Jiao Tong University (School of Medicine) (SJTU), Shanghai
Science and Technology Commission of Shanghai Municipality (STCSM)

2

CONSTRUCTION OF FUNCTIONAL DENDRIMER-BASED NANOGELS FOR ULTRASOUND-ENHANCED TUMOR THERANOSTICS
Donghua University (DHU), Shanghai
Science and Technology Commission of Shanghai Municipality (STCSM)

3

NOVEL CORE-SHELL TECTO DENDRIMER-BASED NANOPLATFORMS: DESIGN, SUPRAMOLECULAR ASSEMBLY AND THERANOSTICS OF TRIPLE NEGATIVE BREAST CANCER.
Donghua University (DHU), Shanghai.
Ministry of Science and Technology

4

DENDRIMER-BASED MULTIFUNCTIONAL HYBRID NANOPARTICLES AS PROBES FOR DUAL-MODE TARGETED TUMOR DIAGNOSIS.
Donghua University (DHU), Shanghai
Science and Technology Commission of Shanghai Municipality (STCSM)

5

DENDIMAGE - DEVELOPMENT OF NOVEL DENDRIMER-BASED NANOPARTICLES FOR DUAL MODE COMPUTED TOMOGRAPHY AND MAGNETIC RESONANCE IMAGING OF TUMORS.
Madeira University (UMa), Funchal
Fundação para a Ciência e a Tecnologia (FCT), PTDC/CTM-NAN/1748/2012

03 Main Outputs

Others



2017 – 2022: Adjunct Professor at the School of Materials Science and Engineering/Center for Nano Energy Materials, **Northwestern Polytechnical University**

2018 - *International Dendritic and Hyperbranched Polymer Application Innovation Center* co-sponsored by the **Weihai CY Dendrimer Technology Corp.**, Ltd., Shandong Province.

2018 - Invited international expert in the “111 Project - Advanced Fiber Materials Manufacturing and Technology”, from the State Key Laboratory for Modification of Chemical Fibers and Polymer Materials (SKLFPM) – Shanghai, **Donghua University**,

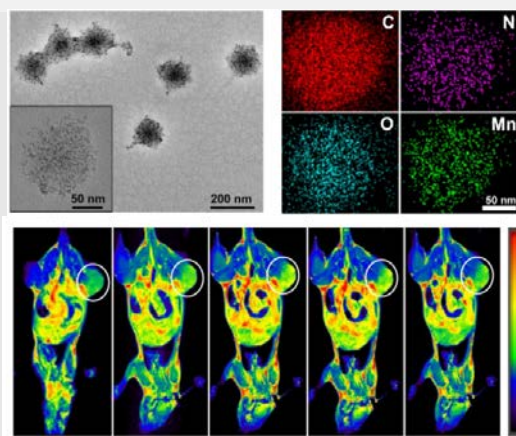
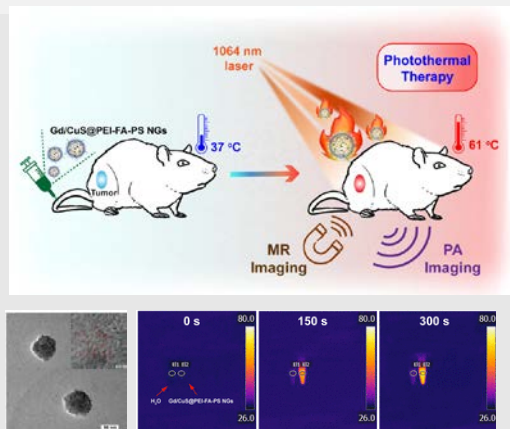
2018 - Steering Committee of the Portugal-China Joint Innovation Centre for Advanced Materials (PCJICAM). **FCT(Portugal) + MOST (China)**

2020 - “SUES Distinguished Overseas Professor Program – Nanotechnology, Nanosciences, Nanomaterials and Nanochemistry” – **Shanghai University of Engineering Science**

2021 - Management Committee of the Sino-Portugal “The Belt and Road” joint lab on advanced materials located at Haining Campus, **Zhejiang University**

04 Work Underway & Future prospects

Nanogel-based theranostic platforms

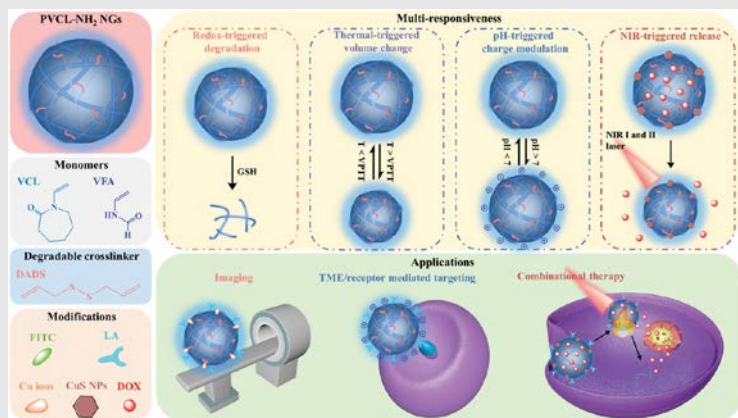


Hybrid nanogel for MR/PA imaging-guided photothermal therapy or chemotherapy of tumors

ACS Appl. Mater. Interfaces 2020, 12, 9107

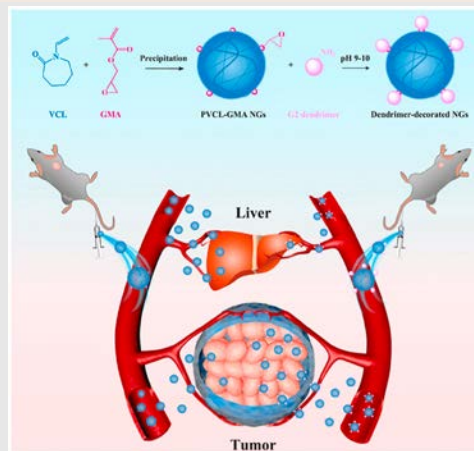
Theranostics 2020, 10, 4349

Multi-Responsive Biodegradable Nanogels



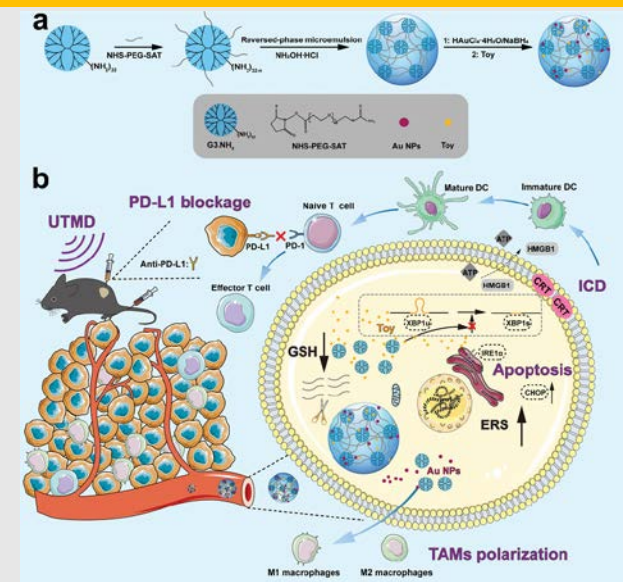
Adv. Funct. Mater. 2021, 2100227

Dendrimer-incorporated nanogel



Bioactive Materials, 2021, 6, 3244

Redox-Responsive Dendrimer Nanogels



Adv. Sci. 2023, 2301759

04 Work Underway & Future prospects

Nanogel-based theranostic platforms

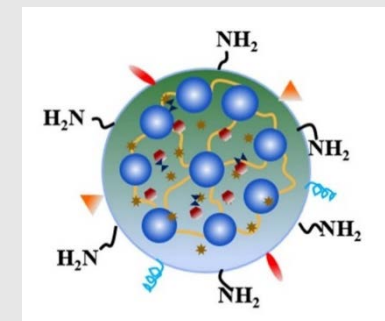
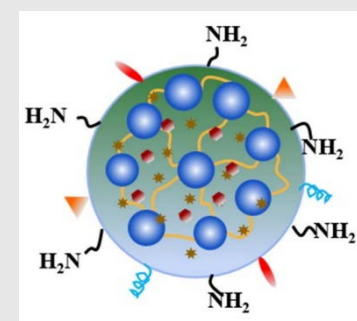
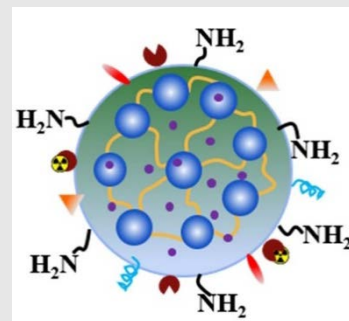
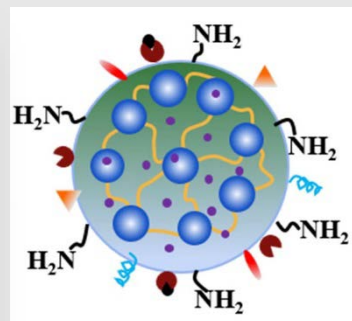


Donghua University & University of Madeira

PIs in charge:

Mingwu Shen,
João Rodrigues

Development of series of multifunctional low-generation dendrimer nanogel for novel theranostics of pancreatic cancer.



★ MnO₂ NP
 — FITC
 ▲ NHS-PEG-SQ2
 ~ (1,3-PS)
 ● DTPA
 ● Gd³⁺
 ☢ ^{99m}Tc
 ● Gem
 ◀▶ Toyo

Funded by the Science and Technology
Commission of Shanghai Municipality

Adv. Sci. 2023, 2301759

Nanomedicine, 2023, 0124

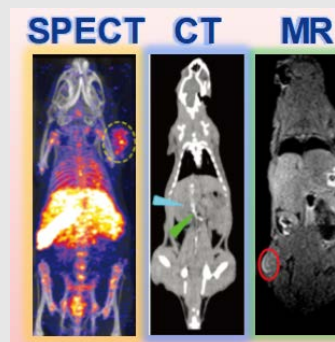
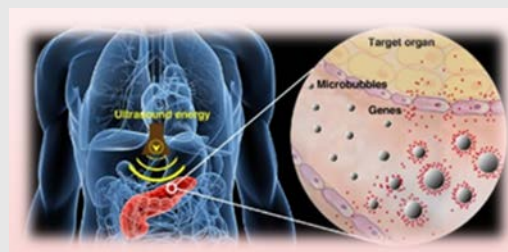
Pharmaceutics, 2022, 14, 2239

J. Mater. Chem. B, 2022, 10, 8945

Drug Discovery Today, 2022, 27, 1251

Bioconjugate Chem., 2022, 33, 87

UTMD



Treatment of pancreatic cancer



04 Work Underway & Future prospects



- 2022 - 4th Call to Scientific Employment Stimulus – Individual – FCT

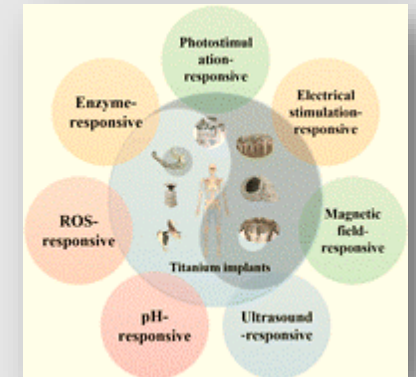


fct Fundação
para a Ciência
e a Tecnologia

- **Project underway:** *Research on the Personalized Mechanical Adaptive Bioactive Titanium Implants*
 - **Science and Technology Commission of Shanghai Municipality (STCSM)**



Mater. Horizons., 2023, Advance online publication
Engineered Regeneration, 2022, 3, 163



- **Project submitted:** *Study on the preparation and anticancer mechanism of surface-functionalized dendrimers loaded with natural antitumor active components of Dicranostigma leptopodum (Maxim.) Fedde.*
 - **Henan Province International Science and Technology Cooperation Project in 2024**

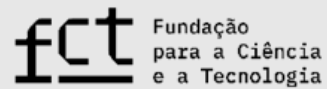


05/12/2023



Acknowledgements

All the students and researchers from Portugal & China involved in this cooperation program



BASE FUND: UIDB/00674/2020



Cofinanciado por:



Professor Xiangyang Shi



Professor Yulin Li



Weihai CY Dendrimer Technology Corp.

et al.



10 YEARS OF THE BELT AND ROAD INITIATIVE

BELT AND ROAD CONFERENCES



JOÃO RODRIGUES

28TH NOVEMBER 2023

AT
UNIVERSITY OF AVEIRO – RECTORY



Thank you!



joaor@uma.pt
November 28, Aveiro

