Design of NanoMOFs Capsules for Drug Delivery and Bioimaging.

Fact Sheet

Project Information

NanoMOFdeli
Grant agreement ID: 726380
Project website
Status
Ongoing project
Start date
End date
1 September 2017
31 August 2022

Funded under
H2020-EU.1.1.

Overall budget
€ 1 903 685

EU contribution
€ 1 903 685

Hosted by
THE CHANCELLOR MASTERS
AND SCHOLARS OF THE
UNIVERSITY OF CAMBRIDGE
United Kingdom

Objective

Cancer is a major health problem worldwide, being the most common cause of death after cardiovascular diseases. The major goal of new anticancer therapies is to specifically kill tumour cells while leaving healthy cells unharmed. A main challenge to achieve this aim is the development of better drugs, including novel treatments based on the use of siRNAs. These macromolecules are potentially the most powerful anti-cancer drugs that exist, but still there is no efficient way of getting them delivered specifically to the tumour. Indeed, lifetime of such molecules is generally too short and therefore need to be protected in a carrier until they are delivered into tumour target cells.

This project focuses in the development of nanocarriers based on metal-organic frameworks (MOFs), one of the most exciting developments in recent porous materials science. The study of the mechanisms that control drug delivery is of
critical importance to nanomedicine applications, where nanotechnology has the potential to revolutionise cancer therapy. Given the challenging nature of the drug delivery problem for cancer therapy, this project builds on 4 interrelated main concepts: i) the design of bio-compatible MOFs for drug delivery applications; ii) the post-synthesis engineering of MOFs to enhance stability, controlled drug release, and targeting; iii) the identification of optimal textural properties (i.e. pore size distribution, surface area, pore volume) and surface chemistry of MOFs for siRNA delivery using experiments and molecular simulation techniques; iv) the assessment of their performance in vitro and in vivo, giving a translational dimension to the proposed research. The novelty of this work lies therefore in the synergistic combination of tools from different areas and disciplines (chemistry, biochemical engineering and medicine) to produce advances that are of both fundamental scientific interest and of bioengineering relevance in nanomedicine applications.

Field of science

/engineering and technology/nanotechnology
/medical and health sciences/medical biotechnology/nanomedicine
/engineering and technology/chemical engineering/biochemical engineering
/medical and health sciences/clinical medicine/oncology/cancer
/medical and health sciences/clinical medicine/cardiology/cardiovascular diseases

Programme(s)

Topic(s)

Call for proposal

ERC-2016-COG

Funding Scheme

ERC-COG - Consolidator Grant

Host institution

THE CHANCELLOR MASTERS AND SCHOLARSOF THE UNIVERSITY OF CAMBRIDGE

<table>
<thead>
<tr>
<th>Address</th>
<th>Activity type</th>
<th>EU contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trinity Lane The Old Schools, CB2 1TN Cambridge</td>
<td>Higher or Secondary Education Establishments</td>
<td>€ 1 903 685</td>
</tr>
</tbody>
</table>
THE CHANCELLOR MASTERS AND SCHOLARSOF THE UNIVERSITY OF CAMBRIDGE
United Kingdom
EU contribution
€ 1 903 685
Address
Trinity Lane The Old Schools
CB2 1TN Cambridge
Activity type
Higher or Secondary Education Establishments

Last update: 11 December 2019
Record number: 210035

Permalink: https://cordis.europa.eu/project/id/726380/

© European Union, 2020