HORIZON 2020

Integrated Tissue Slice Culture and NMR Metabolomics – A Novel Approach Towards Systemic Understanding of Liver Function And Disease

Fact Sheet

Project Information

TISuMR

Grant agreement ID: 737043

Project website

DOI
10.3030/737043

Project closed

EC signature date
29 November 2016

Start date
1 January 2017

End date
31 December 2021

Funded under
EXCELLENT SCIENCE - Future and Emerging Technologies (FET)

Total cost
€ 3 138 432,50

EU contribution
€ 3 138 432,50

Coordinated by
UNIVERSITY OF SOUTHAMPTON
United Kingdom

Objective

We propose the development of a groundbreaking technology platform that, for the first time, integrates nuclear magnetic resonance metabolomics and micro-imaging with microfluidic perfusion tissue slice culture. This will revolutionise life science research with unprecedented local insight into life processes in intact tissues under

highly controlled conditions. We focus on liver tissue slice culture, with the immediate target of elucidating the mechanism of liver damage by drug-induced cholestasis. In the long term, the new technology will find wide application in other tissues, including intestinal, pancreatic, and brain slices. It will form the foundation of a new approach in the life sciences, allowing the detailed metabolic
study of tissues at the system level.

Liver disease is a significant and growing public health problem: 29 million people currently suffer from a serious liver condition in the EU. While the causes for some liver conditions are known, the mechanism of liver damage is generally poorly understood, largely due to the difficulty of studying live liver tissue at the systemic level.
The proposed comprehensive research programme leads to a new technological platform for microfluidic tissue slice culture with direct observation of tissue metabolism and transport processes through nuclear magnetic resonance.

It joins the expertise and creativity of four leading academic groups and one SME representing the disciplines of micro-engineering, physical chemistry, magnetic resonance, biochemistry, toxicology, and clinical hepatology across three institutions from three EU countries. Due to its high level of interdisciplinary integration, TISuMR is uniquely able to provide emerging researchers with a career springboard.

TISuMR will have a profound impact on wider society by providing alternatives to animal testing, by increasing the efficiency and specificity of drug safety testing, and by enabling new treatments in the management of liver disease.

Fields of science (EuroSciVoc)

natural sciences > biological sciences > **biochemistry**

natural sciences > physical sciences > optics > spectroscopy > **absorption spectroscopy**

medical and health sciences > clinical medicine > **hepatology**

natural sciences > mathematics > pure mathematics > **geometry**

natural sciences > chemical sciences > **physical chemistry**

Keywords

Nuclear Magnetic Resonance | Tissue Slice Culture | Liver Pathology

Programme(s)

H2020-EU.1.2. - EXCELLENT SCIENCE - Future and Emerging Technologies (FET) MAIN PROGRAMME

H2020-EU.1.2.1. - FET Open

Topic(s)

FETOPEN-01-2016-2017 - FET-Open research and innovation actions

Call for proposal

H2020-FETOPEN-2016-2017

See other projects for this call

Sub call

H2020-FETOPEN-1-2016-2017

Funding Scheme

RIA - Research and Innovation action

Coordinator

UNIVERSITY OF SOUTHAMPTON

Net EU contribution

€ 1 256 126,25

Total cost

€ 1 256 126,25

Address

Highfield
SO17 1BJ Southampton
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Region

South East (England) > Hampshire and Isle of Wight > Southampton

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Participants (2)

RIJKSUNIVERSITEIT GRONINGEN

Netherlands

Net EU contribution

€ 935 121,25

Address

Broerstraat 5
9712CP Groningen

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
Participation in EU R&I programmes
HORIZON collaboration network

Total cost

€ 935 121,25

KARLSRUHER INSTITUT FUER TECHNOLOGIE

Germany

Net EU contribution

€ 947 185,00

Address

KAISERSTRASSE 12
76131 Karlsruhe

Region

Baden-Württemberg > Karlsruhe > Karlsruhe, Stadtkreis

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website
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Total cost

€ 947 185,00

Last update: 6 September 2024

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