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European Technology Platform
for Sustainable Chemistry

SusChem 2017 Brokerage Event

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High-Throughput Calorimetry

A novel concept of microcalorimeters with enhanced features for chemical and biological applications

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University of Santiago of Compostela

CiQUS research center

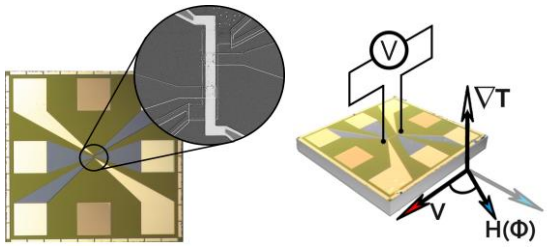
CiQUS Center for Research on Biological Chemistry and Molecular Materials

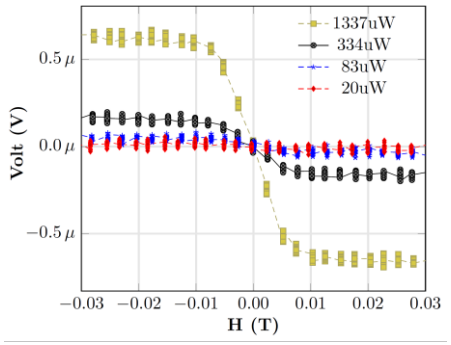
Center for Research in Biological Chemistry and Molecular Materials

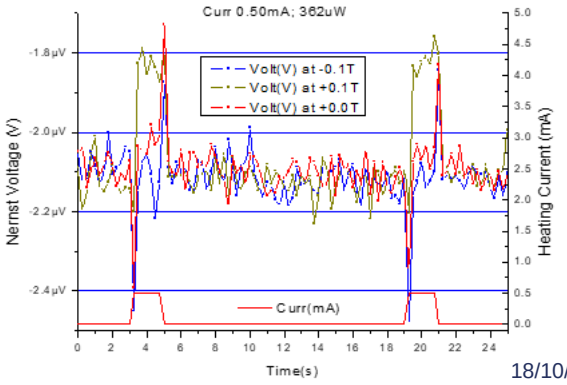
- ✓ CiQUS hosts 19 research groups, including 4 ERC projects, and around 180 researchers.
- ✓ We publish 80-90 JCR papers/year, average impact factor of IF=7,1 (JCR 2016).
- ✓ 3,6 M €/year (2013-2016) from competitive R&D funds (30% international, 18% private)

STARTING POINT: Prototype from ERC - Proof of Concept project "ANTS" (2017).

- Principle of operation is the **Nernst effect**, so we use a single-material device.
- The active sensing element is a ferromagnetic permalloy line **4x28 µm** x **20 nm thick**: affordable, standard fabrication techniques, miniaturization.
- We have demonstrated its sensitivity for **applications in microcalorimetry.**







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High-Throughput Screening Calorimetry

This new **microthermal sensing technology** (“ANTS”) aims to be the basis of a breakthrough in the micro/nano-calorimeter technology, going beyond the current capabilities on Isothermal Titration Calorimetry (ITC).

- ✓ **Spatial resolution** & **miniaturization**: micron-square size, active sensing easily deposited by sputtering, multi-test…
- ✓ **Temporal resolution**: as fast milliseconds.
- ✓ Accurate & easy quantification of binding rates & enthalpy changes.
- ✓ Easy adoption: compatible with standard configuration of MicroCal.
- ✓ IPR: European Patent, USA, China, Korea, Japan.

Relevant H2020 calls and deadlines

H2020 topics: DT-NMBP-02-2018, DT-NMBP-12-2019… and other EU schemes/initiatives.

Expected Impact "ANTS-HTS Calorimetry"

Novel microcalorimeter with highly improved temporal, spatial and thermal resolution

Thus, ANTS-HTS Calorimeter can be expected to join the ranks of **best practices to decrease attrition rates**, contributing to reduce the staggering costs of drug development.

Regarding **pharmaceutical development**, the project answers these challenges:

- ✓ Accurate knowledge on drug-target kinetics, a factor usually neglected in drug-target behaviour to which the pharma industry has paid enormous attention lately. (*e.g. K4DD IMI Consortium)*
- ✓ Quantitative information of a ligand binding to several targets obtained at once.

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Current partners and contacts:

- Sofware Co. specialized in software for Isothermal Titration Calorimetry (ITC) data analysis (ES).
- Experts on High Throughput Screening (HTS) combined with high yield molecular profiling to determine the pharmacological/biological activity of compounds (ES).
- Clean-room microfabrication facilities (PT).

We are looking for partners...

- Involved in development of instrumentation for biophysical characterization (INDUSTRY).
- With expertise in microfluidic technologies (ACADEMY/INDUSTRY).
- End users for biophysical/biochemical characterization (INDUSTRY).
- …

Note: We would also need International partners for regional “proof of concept” funds.

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Contact details for project idea(s):

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