



This project is co-financed by the
European Union and the Republic of Turkey
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finanse edilmektedir



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HORIZON-MISS-2021-CANCER-02-01: Develop new methods and technologies for cancer screening and early detection
HORIZON-MISS-2021-CANCER-02-03: Better understanding of the impact of risk factors and health determinants on the development and progression of cancer

IdISBa is one of the 31 ISCIII *Health Research Institutes* in Spain

IdISBa has experience in managing EU projects from different Calls.

The EU projects **currently active belong to the following Calls:**

- JTI-CP-IMI - Joint Technology Initiatives - Collaborative Project (IMI)
- Join Action on Antimicrobial Resistance and Healthy care- Associated Infections
- 2nd Call SUDOE 2017
- EuroNanoMed II JTC 2014
- H2020-MSCA-IF-2018 Individual Fellowships
- H2020-WIDESPREAD-2018-2020





Lipids in Human Pathology in 2018

GROUP MEMBERS

Lipids in Human Pathology is an interdisciplinary group of chemists, biochemists, biologists, medical doctors and dietitians committed to understand the role of membrane lipids in cell pathophysiology. With this, our overall aim is to apply this knowledge to the development of new tools for early diagnosis and treatment monitoring for conditions such as inflammatory bowel disease and colorectal cancer.

We are currently focused on three main research areas:

- 1) Role of **membrane lipids**, particularly phospholipids, in the tumorigenic process in **colorectal cancer** and in chronic diseases as **inflammatory bowel disease**.
- 2) Obtain the necessary lipidomic data for the development of **new diagnostic and treatment tools**.
- 3) Changes in the lipidome occurring in **immune cells** during immune response



On 2021 started a **new EU project** wherein **Lipids in Human Pathology** participates as **collaborator**: ERA-HDHL“Development of targeted nutrition for prevention of undernutrition for older adults (PREVNUT)”



On Oct 2021 a **project** submitted to the **TRANSCAN-3** call and having **Lipids in Human Pathology** as **coordinator** successfully passed the first stage of the evaluation process.
Waiting for the final evaluation!



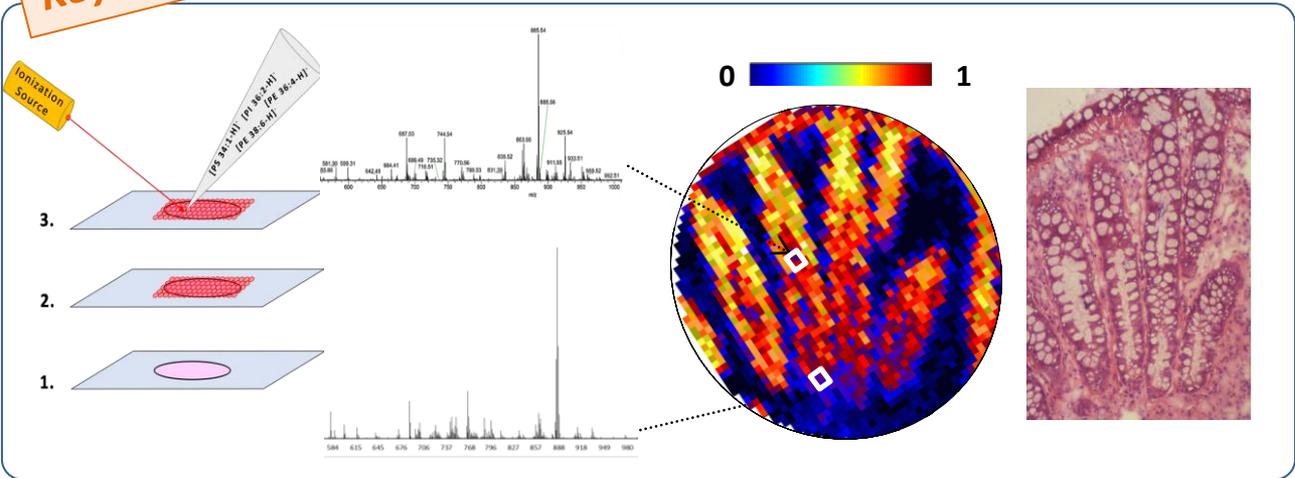
SPATIALLY RESOLVED MOLECULAR PROFILES:

focused on LIPIDOMICS



In collaboration with the **Group of Spectroscopy and Mass Spectrometry of the University of the Basque Country**, we employ cutting edge techniques in IMS to understand cell malignization and identify new diagnostic biomarkers.

Key result 1

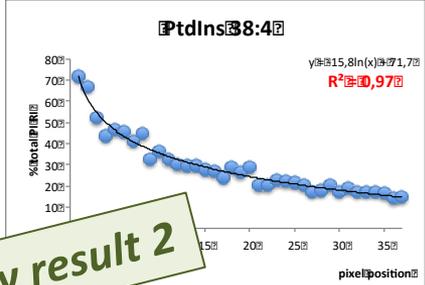
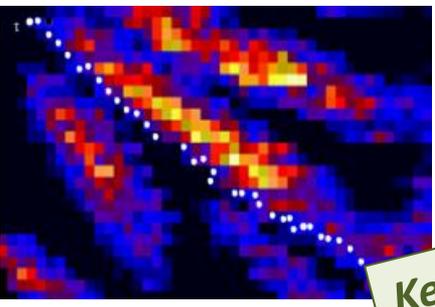


Lipidome is cell type specific

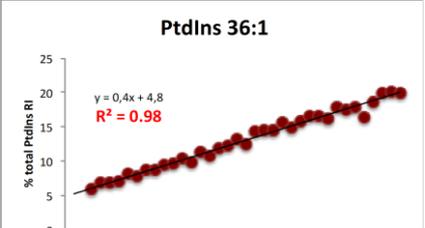
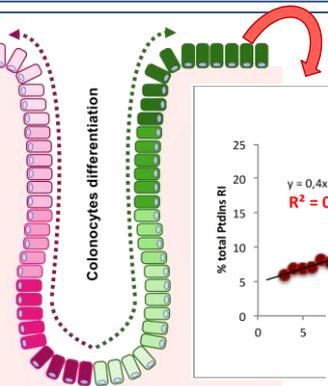
Garate et al *Anal Bioanal Chem.* 2015;407(16):4697-708.

The lipidome is highly sensitive to the cell differentiation

Healthy mucosa

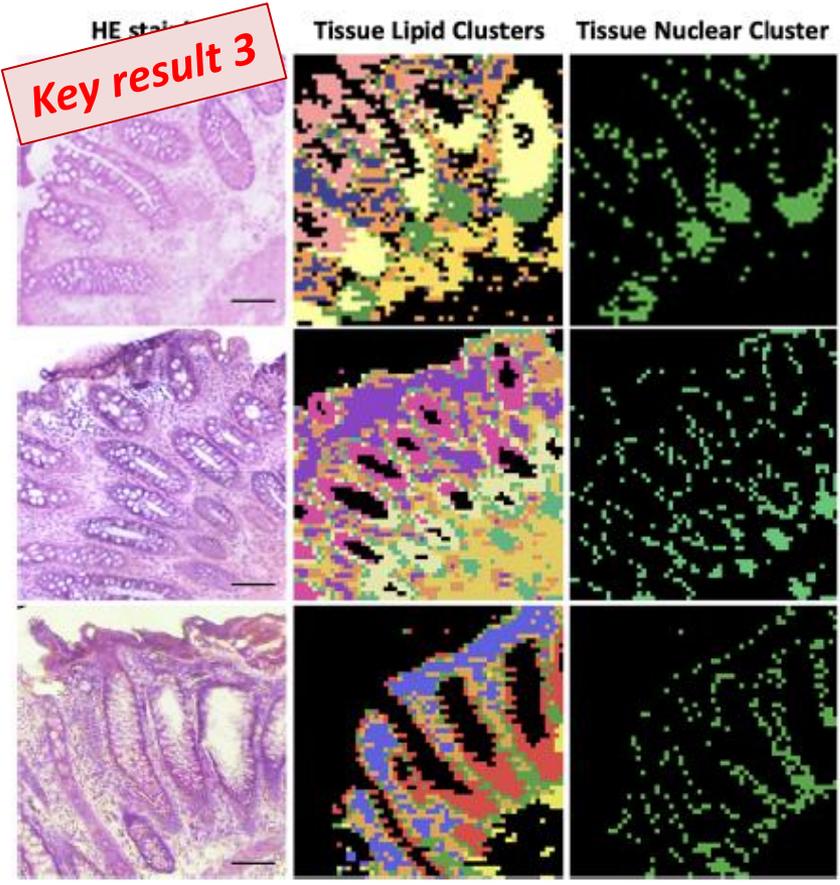


Key result 2



Bestard-Escalas J, et al *BBA- Mol. Cell Biol of Lipids* 2016
Lopez, DH et al *BBA- Mol. Cell Biol of Lipids* 2018

SPATIALLY RESOLVED MOLECULAR PROFILES: focused on LIPIDOMICS ...



Distinguishing subcellular structures

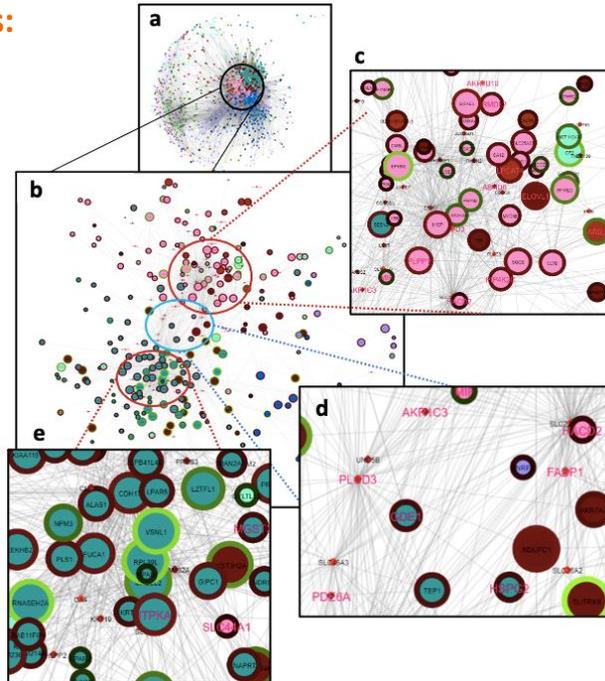
We were able to distinguish the presence of the nucleus of the colonocyte, just based on its differential lipidome.

Demonstrating the great potential of these techniques.

Maimó-Barceló et al, Anal. Bioanal. Chem. 411, 7935–7941 (2019)

LHP current research: Using the Lipidome established by *Imaging Mass Spectrometry* (IMS) as a *resourceful* tool to *refine* CRC subtypes classification

WGCNA analysis:
Transcriptomic
+
Lipidomic data



Importantly, these studies are currently being developed using **human samples** and **colon organoids** models.

Human samples

Human organoids

Visceral adipose tissue



Tumor mucosa

Healthy mucosa

Improve an HORIZON –MISS-2021-CANCER project by including Spatially resolved techniques

Call Topic of Interest:

HORIZON-MISS-2021-CANCER-02-01: Develop new methods and technologies for cancer screening and early detection

HORIZON-MISS-2021-CANCER-02-03: Better understanding of the impact of risk factors and health determinants on the development and progression of cancer

Please indicate relevant project ideas:

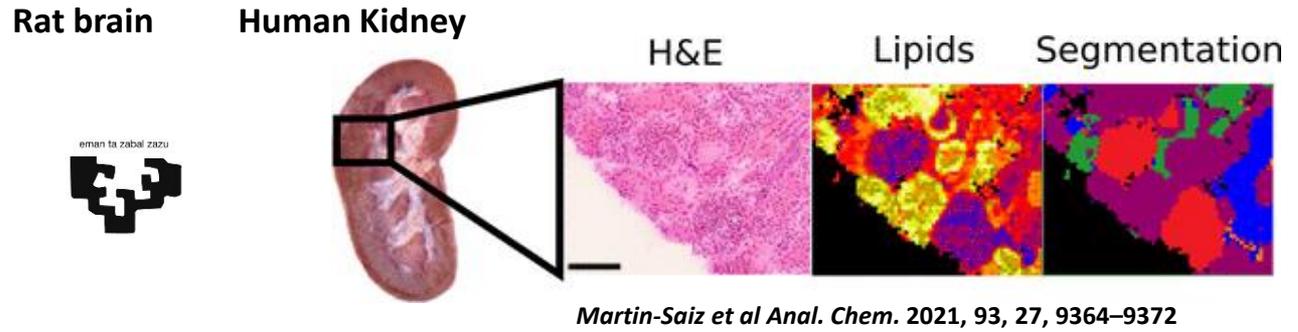
Combination of
Spatial **LIPIDOMICS** + Spatial **TRANSCRIPTOMICS**

1) We have a 10-year experience analyzing several tissues, celly types & experimental models (xenografts)

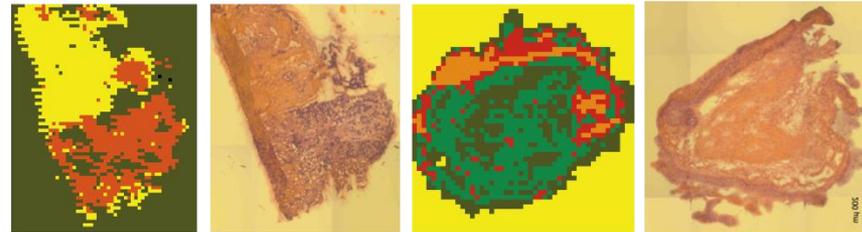
2) We have in the lab the expertise to run this type of measurements

SPATIALLY RESOLVED MOLECULAR PROFILES:

focused on **LIPIDOMICS** 



Human Lung



3) We develop our work in an hospital enviroment so we have access to collaborate with a diversity of deparments: **access to human tissues**

Consortium - profile of known partners *(if any)*

No	Partner Name	Type	Country	Role in the Project
01				
02	IdISBa	RTD	Spain	Collaborator. Spatially resolved techniques
03				
04				
05				
06				



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