The role of the extracellular matrix in liver tissue engineering and liver disease

Thursday, February 9, 2023 at 4:00 p.m.

Summary:

Extracellular matrix (ECM) remodelling is a hallmark of liver disease and cancer, but its role in the development of disease-specific microenvironments and how this can affect surrounding cell behaviour is unclear, mainly due to the lack of complex and tissue-specific 3D culture models of disease. My work aims at understanding how specific proteins of the ECM and its 3D topology change in liver disease and cancer, and what is the direct effect on the local microenvironment including the immune system. We believe that the ECM is a key element to better understand liver disease progression, predict response to therapeutic treatment, and identify novel biomarkers of pathological stages and new targets for therapy.

To explore these different aspects of the ECM, we use tissue engineering techniques that originate from the regenerative medicine field. ECM properties are studied in ECM-enriched samples obtained via decellularisation of patient-derived tissue samples, a technique used to remove the cellular compartment while maintaining the ECM architecture and protein composition. Decellularised ECM-scaffolds are used to i) determine tissue- and cell culture-derived ECM composition and biophysical properties; ii) to explore the cell-matrix interactions that drive liver disease; iii) to decode the ECM immune modulatory properties in primary and secondary liver cancer, and iv) to establish 3D models of liver disease that also contain the matrix compartment of the microenvironment.

Speaker:

Dr. Luca Urbani, Head of Liver Regeneration & Tissue Engineering Group, Institute of Hepatology, Foundation for Liver Research, London, UK.

Affiliation and CV Summary:

I obtained by PhD in Tissue Engineering and Regenerative Medicine at the University of Padua and then trained as postdoc in Prof Paolo De Coppi's group at UCL on extracellular matrix biology, 3D cultures, tissue engineering, stem cell biology and bioengineered models of disease. I am the now Senior Lecturer at King's College London, and Principal Investigator of the Liver Regeneration and Tissue Engineering group at the Roger Williams Institute of Hepatology, which focuses on the study of the cellular and extracellular components of the microenvironment in liver disease and cancer. My group's work aims to understand how extracellular matrix remodelling typical of fibrosis and cancer drives disease progression and response to treatment, using novel 3D bioengineered systems and organoids cultures. I am also the Director of the 2022 EASL Basic School of Hepatology with title: Precision Cut Liver Slices and Liver Organoids – versatile ex-vivo models of liver disease.

Organizers:

Grupo de Investigación en Patologia Digestiva. Instituto de Investigación Sanitaria Aragón (IIS Aragón). Facultad de Medicina, Universidad de Zaragoza

Registration form:

https://forms.gle/6r4ufATGj63B1FEJA

📍 Place: Sala de Grados. Facultad de Medicina. Universidad de Zaragoza.

📅 Date: 09 de Febrero de 2023

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