

## WINGS-LST セミナーご案内

前欧州人工臓器学会の会長である Prof. Legallais 先生が、来日に併せて、本郷キャンパスで講演会を開催します。培養肝細胞を用いる人工肝臓や Liver on-a-chip のご研究に関する研究をご発表されます。多数ご参加下さい。

### “Building a bioartificial liver : multi-scale and biomechanical considerations”

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●日時場所：2019年11月11日（月）16:00-17:00

●場所：工学部3号館6階，6B04号室（大会議室）

\*工学部3号館はフロアーがロックされていますので，6Fでエレベータを降りられたら，内線27073までお電話下さい。開錠いたします。

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WINGS-LST プログラム教員

## **Abstract**

Organ on chip or organoids are promising platforms for preclinical studies of new drugs, in predictive toxicology for chemicals, for studies that are more fundamental or for further organ supply.

In the presentation we will focus on two major approaches, considering biological behavior in links with biomechanics and mass transfer:

- 1) The culture of cells in biochips or microstructured devices, in an adequate environment, demonstrated better and prolonged maintenance of cells' functions or differentiation. However, such devices are not easy to handle, which might limit their use in classical laboratories. To overcome this limit, we have developed at UTC a specific platform where 24 biochips can be positioned in series or in parallel. ADME processes can thus be mimicked in such configuration. The biotransformation of xenobiotics achieved in the liver represents usually a key element to assess their toxicity either in the same organ or in others located downstream. Coupled to omics approaches, it may lead to the improved knowledge on the effects of substances alone or in mixture on different intracellular pathways.
- 2) The culture of cells as spheroids/organoids in alginate beads, for application in bioartificial liver as a supply to failing liver. We evaluated some of the major functions of hepatic cells in such environment and propose a complete set up at human scale for liver supply. We will discuss here the advantages of microencapsulation and the questions regarding the type of cells to be used in such system.

## **Short biography:**

Dr Cécile Legallais is Head of the CNRS/UTC joint laboratory "Biomechanics & Bioengineering. She coordinates research on "Bioartificial liver". Her group possesses a large experience on hepatic cells culture (cell lines, primary from human or animal origin) on different 3D scaffolds perfused or not, designed the fluidized bed bioreactor validated in the ANR SUPPLIVER project (2011-2015) and under investigation at lower scale in the PIA RHU iLite (Coordinator: Pr JC Duclos-Vallée). The multidisciplinary nature of her work reveals her expertise in biomedical engineering and tissue engineering for the design of bio-artificial organs, fluid mechanics and microfluidics, transport phenomena, and the interactions between cells and tissues with the biomaterials. Bronze Medal of CNRS in 2003, she published more than 90 papers in peer reviewed journals. She has supervised 22 PhD thesis. She is Past-President of the European Society of Artificial Organs.