BioMEMS – Integrative bio-engineering

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iPS-derived hepatocytes profiling in biochips

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Host Professor: **Pr. Y. Sakai**

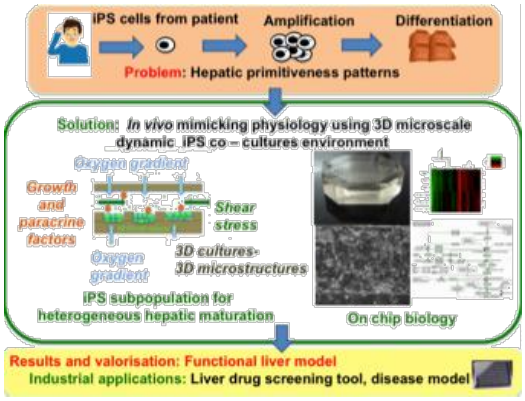
Keywords: **iPS, liver-on-chip, drug screening**

Context

iPS therapeutic strategy against liver failure

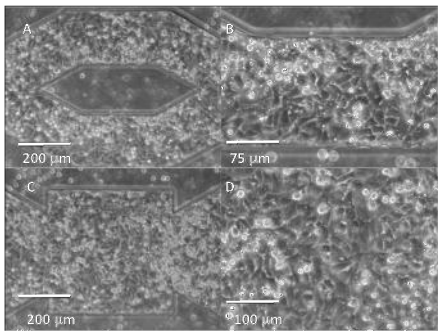
Goals of the study:

- **Optimize differentiation protocols of iPS**
- **Transcriptomic comparison of iPS in biochips *versus* Petri cultures**



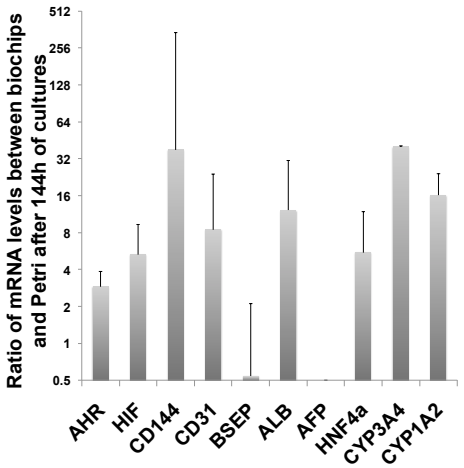
Materiel and Methods

- **Microfluidic PDMS bioreactor**
- **Perfusion culture**
- **3D hepatic differentiation protocol on-chip**
- **Microarray, RT-qPCR, immunostaining assays**



Results

- **Hepatic progenitor proliferation in biochip**
- **Foetal patterns with hepatic and biliary markers**
- **2015 probes differentially expressed (P-value <5%, Fc>2)**
- **Hepatic biomarkers over expression in biochips**
- **Periveneous-like profile in biochips**
- **Needs improvement for maturation**



Perspectives

- **Improvement of the hepatic differentiation protocol**

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