

2 years Postdoc position 2022-2024

BRM team, CEA/IRIG & LSIV group/LETI CEA Grenoble

INSERM U1292 Biosanté & CNRS EMR 5000 BRM

**Development of metastases trap on chip
MetasTRAP****Context**

In close collaboration with the group of O. Filhol-Cochet (IMAC team, Unit Biosanté), with the Laboratoire Systèmes d'Imagerie pour le Vivant (LSIV) and the laboratoire des systèmes microfluidiques et bio-ingénierie (LSMB) at Leti-CEA, the MetasTRAP project aims to develop a microfluidic device containing a biomimetic metastatic niche to analyze the metastatic process of tumor cells by optical techniques (**Figure 1**). The majority of the solid tumors generate metastasis in the bone. Developing a bone on chip will therefore permit to study the aggressiveness of metastatic cells and, in the future, to test anti-metastatic drugs [1, 2]. So far, only few organ on chip devices have been developed for this purpose [2, 3]. The complementarity of the three teams involved in this multidisciplinary approach, is a great advantage and a source of originality.

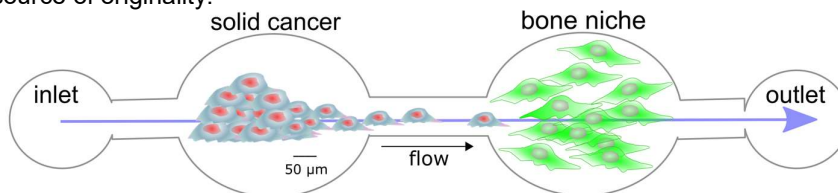


Figure 1: schematic representation of the fluidic device that will be developed to study the invasion of metastatic cells

Project description

The objective of the present project is to engineer a biomimetic model of cancer metastasis to bone. To this end, a microfluidic device will be designed, aiming to revolutionize the field of diagnosis and treatment of metastatic tumors. Indeed, if successful, this approach can be optimized to evaluate the level of aggressiveness of different patient tumors and to test their cellular responses to clinical drugs. The bone tissue will be created in a biomimetic environment by functionalizing the bottom of the microfluidic devices with biomaterials already developed at BRM team and known to trigger the osteogenic differentiation [4, 5]. The device will be developed thanks to the expertise of our collaborators at LETI, CEA Grenoble. The aim is to observe and quantify the migration and invasiveness of the cancer cells in the bone niche to evaluate their metastatic potential.

Postdoc profile

We offer a 2 years postdoc position, starting from October 2022, to a young researcher with a PhD degree in microfluidics and/or biomaterials and/or biomedical engineering or nanotechnology, who is interested in working in a multidisciplinary environment. The postdoc will be part of a dynamic & international research team and will make the bridge between the three teams at Unit Biosanté and CEA LETI. Working language is mainly English but the majority of team members are fluent in French.

Related Publications**Supervisor : Dr. Elisa Migliorini (BRM)****Laboratory :** Inserm U1292 Biosanté et CNRS EMR 5000 BRM<https://biosante-lab.fr/BRM>**Contact for your application:**Please send to elisa.migliorini@cea.fr

- your CV
- a motivation letter
- 2 names of referees

References:

- [1] S. Giacosa, C. Pillet, I. Séraudie, L. Guyon, Y. Wallez, C. Roelants, C. Battail, B. Evrard, F. Chalmel, C. Barette, E. Soleilhac, M.-O. Fauvarque, Q. Franquet, C. Sarrazin, N. Peilleron, G. Fiard, J.-A. Long, J.-L. Descotes, C. Cochet, O. Filhol, *Cancers* 13(3) (2021) 576.
- [2] S. Hao, L. Ha, G. Cheng, Y. Wan, Y. Xia, D.M. Sosnoski, A.M. Mastro, S.Y. Zheng, *Small* 14(12) (2018) e1702787.
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- [4] E. Migliorini, P. Horn, T. Haraszti, S. Wegner, C. Hiepen, P. Knaus, P. Richter, E. Cavalcanti-Adam, *Advanced Biosystems* 1(4) (2017) 1600041.
- [5] J. Sefkow-Werner, P. Machillot, A. Sales, E. Castro-Ramirez, M. Degardin, D. Boturyn, E.-A. Cavalcanti-Adam, C. Albiges-Rizo, C. Picart, E. Migliorini, *Acta biomaterialia* (2020).