Unité 1109 – CRBS
Centre de **R**echerche en **B**iomédecine de **S**trasbourg
1, rue Eugène Boeckel
67084 STRASBOURG
e-mail : jacky.goetz@inserm.fr
web: www.goetzlab.fr

Institut national
de la santé et de la recherche médicale

TUMOR BIOMECHANICS LAB

Open position – Post-Doctoral Fellow or Research Engineer

URGENT - Theranostic targeting of Breast Cancer

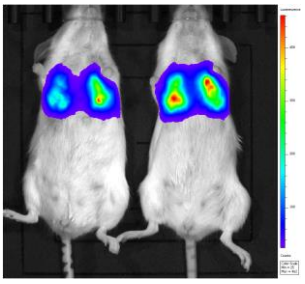
The **Tumor Biomechanics Lab at INSERM U1109** (CRBS, Strasbourg) is seeking a talented postdoctoral fellow or research engineer with experience in **mice experimentation** and a background in **cancer biology**. The candidate will lead a collaborative project aiming at dissecting the impact of several brush-arm drug conjugates on **breast cancer progression and therapy.**

Environment

Our lab uses advanced imaging techniques coupled to microfluidics and animal models to study **tumor metastasis at multiple scales**. The lab is actively investigating the contribution of mechanical forces as well as extracellular vesicles in metastasis onset and **recently identified therapeutic targets for treating metastatic progression**. Our approach permits real-time imaging ranging from single-cell metastatic events to whole body tumor progression. Doing so, we aim at understanding how metastasis occurs in relevant and controlled zebrafish and mouse models (Follain et al., 2018; Ghoroghi et al., 2021; Goetz et al., 2011, 2014; Hyenne et al., 2019; Osmani et al., 2019), with the ultimate goal of impairing it (Follain et al., 2021).

The "Theranostic targeting of Breast Cancer" Project

We initiated a collaboration with Alexandre Detappe (ICANS) and Loïc Charbonnière (IPHC) for the development of **several nanoparticle-based drug-delivery approaches**. Nanomedicine is promising in particular in the Drug Delivery Systems' development useful for the detection and treatment of infectious, genetic and cancer pathologies (Mittelheisser et al., 2020). Nanovectors developed until now allow a more or less effective encapsulation of hydrophilic or very hydrophobic drugs. Because efficient cancer and metastasis treatment is still hindered by many obstacles such as tumor targeting and toxicity, we have **described, in collaboration, several new means for efficient delivery of powerful chemotherapeutic agents** (Bouchaala et al., 2016; Perton et al., 2019). We have recently demonstrated that doxorubicin-loaded NEs efficiently targeted and delayed growth of subcutaneous tumors in an immuno-compromised mouse model (Liu et al., 2021).



Breast cancer is known to display resistance to current clinical therapies. Synergistic delivery of 3+ drugs combination remains an emerging challenge in cancer drug delivery due to the unique biodistribution and pharmacokinetics profile of each drug. **This project aims to validate *in vivo* a subset of in-house produced and available bottlebrush drug delivery platform, in mice model**. This includes the in vivo biodistribution characterization and evaluation of therapeutic efficacy of the drugs. It will provide a novel approach for breast cancer therapy, whereby combinations of several therapeutic agents are packed within the same bottlebrush polymer and delivered selectively to tumors using as a proof of concept, in triple negative breast cancer models . It should ultimately improve the specificity of the delivery while also reducing the toxicity of chemotherapy. These therapies could **maximize efficacy and overcome treatment resistance in cancer**.

The candidate will develop his project independently, under the close supervision of **Olivier LEFEBVRE** (mouse models and drugs) and **Jacky GOETZ**. The candidate is also expected to present his results in the form of publications and international conference presentations, and to participate to writing of grant applications. We will present the candidate to upcoming Post-Doctoral Fellowship AAP (ARC, La Ligue contre le Cancer)

For more information on the group's research, see www.goetzlab.fr

All applications must be sent to: Jacky G. Goetz & Olivier Lefebvre
(jacky.goetz@inserm.fr ; lefebvre@unistra.fr)

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Contract: The position is full time with an initial "up to Dec. 2023" contract with strong prospects for renewal. The salary will be adapted to the experience of the candidate. The candidate will apply to additional funding (at national and European level) with similarly urgent deadlines (February 8th 2023).

About the candidate

Skills

- Mouse (handling and classical procedures) and experimental metastasis models
- Whole-animal longitudinal imaging in mice
- Experience with photonic microscopy
- Ability to work independently and collaboratively with biologists and physicists in the team
- Being a team player, organized and curious, and able to drive the dynamics of the project
- Great communication and writing skills
- Fluency in English (lab comp. of people from France, Italy, Taiwan, Czech Republic, etc.)
- Experience in Image analysis software

Please include the following in your application:

- A cover letter
- Your resume including at least 2 referees with supporting letters/contact details

This position will remain open until filled.

We are reviewing applications as they are received:
as such candidates are encouraged to **submit their application as soon as possible**

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Hyenne, V., Ghoroghi, S., Collot, M., Bons, J., Follain, G., Harlepp, S., Mary, B., Bauer, J., Mercier, L., Busnelli, I., Lefebvre, O., Fekonja, N., Garcia-Leon, M. J., Machado, P., Delalande, F., López, A. A., Silva, S. G., Verweij, F. J., van Niel, G., … Goetz, J. G. (2019). Studying the Fate of Tumor Extracellular Vesicles at High Spatiotemporal Resolution Using the Zebrafish Embryo. Developmental Cell, 48(4), 554-572.e7. https://doi.org/10.1016/j.devcel.2019.01.014

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