



Tumor ecosystem:
Cancer, endothelium, immune cells, fibroblasts

Paris, September 2018

Post-doctoral position in Cancer Cell Biology at Institut Curie – Paris

Project title: Lung-cancer-on-chip: immunocompetent tumor ecosystems reconstitution as a novel experimental paradigm for pre-clinical immunotherapy studies

A major challenge in cancer research is the complexity of the tumor microenvironment which includes the host immune cells. Inspired by the emerging technology of organ-on-chip, we achieved 3D co-cultures in microfluidic devices (integrating four cell populations: cancer, immune, endothelial and fibroblast) to reconstitute and visualize ex vivo human tumor ecosystems. These tumors-on-chip are powerful novel platforms to study ex vivo immunocompetent tumor microenvironments, to characterize ecosystem-level drug responses, and to dissect the roles of stromal components.

By combining advanced microfluidics and cell biology, we aim at developing a biomimetic lung-cancer-on-chip platform for pre-clinical studies, with a perfused vascular compartment, cancer-associated fibroblasts, and autologous immune cells. Immune Checkpoint Inhibitors (ICI) drugs led to a therapeutic revolution for lung cancer patients, however, only 20-30% of lung cancer patients are sensitive to ICI, and resistance mechanisms emerge. In the context of this lung-cancer-on-chip, we will evaluate the efficacy of anti-cancer ICI drugs and the influence of various controllable parameters, in order to better understand the mechanisms underlying immunotherapy efficacy and resistance.

We are seeking for a **post-doc candidate** with a background in Cell Biology and/or Microfluidics (organ-on-chip). Some experience in Immunology and/or Cell Image analysis will be a plus.

Net salary will be approximately 2300-2500 €/month, depending on experience, for 28 months. The candidate will develop this project at Institut Curie, which is located in the heart of Paris, and will qualify for all social/health benefits of Curie employees.

Candidates should send application (CV, motivation letter, 2-3 recommendation contacts) to maria-carla.parrini@curie.fr

Recent relevant publications

1) Dissecting effects of anti-cancer drugs and of cancer-associated fibroblasts by on-chip reconstitution of immunocompetent tumor microenvironments

Nguyen M, ..., Parrini MC

Submitted to **Cell Reports**, available on Cell Sneak Peek <https://ssrn.com/abstract=3188441>

2) Fibroblast Heterogeneity and Immunosuppressive Environment in Human Breast Cancer.

Costa A, ..., Mehta-Grigoriou F.

Cancer Cell. 2018 Mar 12;33(3):463-479.e10.

3) Transient microfluidic compartmentalization using actionable microfilaments for biochemical assays, cell culture and organs-on-chip.

Yamada A, ..., Descroix S.

Lab Chip. 2016 Nov 29;16(24):4691-4701.