

**Position: 2-year post-doctoral position,
Field: biophysics**

Place: CRCL, Lyon, France

EMPLOYMENT PORTAL SECTION	2-YEAR POST-DOCTORAL RESEARCHER
Title of position	Decyphering the physical mechanisms of pyroptotic cell lysis (H/F).
General information	Lyon, 18-months contract (6 months extension possible), beginning October 2021, 100 %, gross salary ~2800€, PhD degree required
Missions	<p>Experiments in biophysics.</p> <p>The post-doctoral researcher will work under the guidance of Sylvain Monnier [Institut Lumière Matière (iLM)], Virginie Petrilli [Centre de recherche en cancérologie de Lyon (CRCL)] and Pierre Recho [Laboratoire Interdisciplinaire de physique (LiPhy)] in the framework of the ANR project SurVol coordinated by M. Piel.</p> <p>P. Recho is the local coordinator.</p> <p>The post-doctoral researcher will be in charge of single cell experiments, carrying out quantitative microscopy and data analysis and potentially modelling/simulation of the observed phenomena. The candidate will spend most his/her time in Lyon at the iLM and at the CRCL to perform experiments. The theoretical side of the project will be handled at the LiPhy in Grenoble.</p>
Activities	<p>Cell death can revet various forms (necrosis, apoptosis, pyroptosis) that share different signatures in volume variations and include the formation of pores within the cell membrane. Such pores break the cell osmotic equilibrium inducing large fluxes at the plasma membrane.</p> <p>We propose to characterize the biophysics of pyroptosis – a cell death inducing pro-inflammatory response – under the control of optogenetic activation. Using state-of-the-art quantitative microscopy (FXm, holography and fast confocal microscopy), the candidate will provide high temporal resolution characterization of pore formation, cellular and blebs volume dynamics during pyroptosis. Such dataset will first allow deciphering the biophysics at play in this key biological event, second to test/validate a general theoretical framework integrating the coupling between cell mechanics and fluxes at the membrane that can have broader applications to general mechanisms involved in volume homeostasis.</p>

Expected skills	<p>Excellent academic records with a PhD in biophysics and scientific papers of high quality.</p> <p>Skills in cell experimentation. Additional expertise in modelling in biophysics (theoretical, numerical) will be strongly appreciated ;</p> <p>Knowledge of cell culture, microscopy techniques (fluorescence), image processing and data analysis ; ability to work in a team on interdisciplinary projects ; writing capacities, ability to publish and present research ; working within the respect of rules/ethics ; autonomy, organizing skills, synthesis and open mind ; mastering english written-oral.</p>
Context of work	<p>The iLM is a physics institute with a strong interdisciplinary component. Throughout the years, the biophysics team has developed multiple tools to quantify the behavior of single cells and multicellular assemblies and control their environment. Among other approaches, the team is developing microfluidics and microfabricated tools in order to control cells and tissue environment combined with quantitative microscopy. At the CRCL, the group of V. Petrilli has a strong expertise in the innate immune response and its dysregulation in pathological context, and more precisely in cancer. The team has recently developed innovative tools in cell biology to study the activation of inflammasomes. The Liphy develops various researches such as the mechanics/physics of fluids and solids, statistical physics, optics, applied mathematics and biology in interaction with biologists and medical physicians.</p> <p>Contacts : pierre.recho@univ-grenoble-alpes.fr sylvain.monnier@univ-lyon1.fr virginie.petrilli@lyon.unicancer.fr</p>
Constraints and risks	<p>Short periods of travel within France and abroad should be expected, concerning collaborations and/or conferences.</p>
Supplementary information	<p>Closing date for the receipt of applications : december 1st, 2021</p>