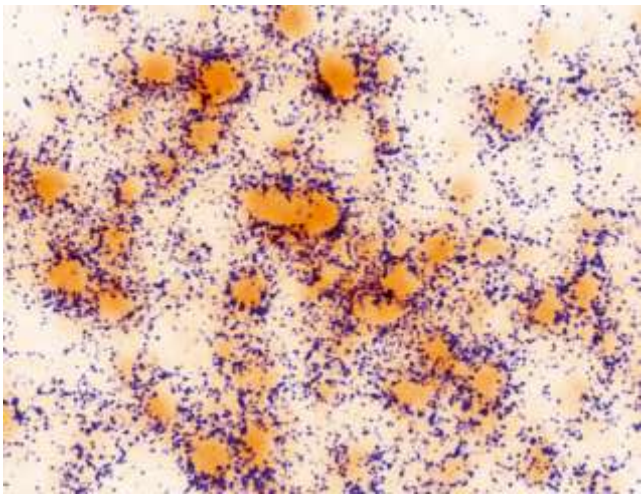
Postdoctoral position

Architecture/force relationship of macrophage podosomes

The Institute of Pharmacology and Structural Biology (www.ipbs.fr**) has an open postdoctoral position** to work on podosomes, cell structures involved in adhesion, matrix proteolysis, mechanosensing and cell migration in 3D environments (*1-9*). Macrophage tissue infiltration plays beneficial roles in protective immunity and detrimental roles in several diseases. Tissue infiltrated macrophages favor the progression of e.g. most cancers and chronic inflammations. Therefore, it is a challenging issue to control macrophage migration as a new therapeutic strategy.

Our team has reported that podosomes are instrumental in the protease-dependent 3D migration of macrophages. To progress in the knowledge of this cell structure, we developed a method called Protrusion Force Microscopy (*3,10,11*) and we used STORM-SAF microscopy (*12*) that allowed drawing a preliminary picture of the podosome architecture which explains the generation of protrusive force (*13*). Now, we plan to further characterize the architecture/force generation relationship of podosomes in human monocyte-derived macrophages.

In this context, the candidate will be part of an interdisciplinary research program that combines cutting-edge and innovative techniques in optical and electronic imaging and cell mechanics, which will lead us to determine with nanoscale accuracy the molecular architecture of podosomes according to substrate rigidity, and identify key proteins regulating podosome architecture and protrusive force.



dSTORM image of vinculin (purple) around podosome F-actin cores (ochre)

References

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5. E. Van Goethem *et al. Eur. J. Cell. Biol.* 2011,90,224
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8. I. Maridonneau-Parini *Immunol. Rev.* 2014,262,216
9. R. Guiet *et al. J. Immunol.* 2011,187,3806
10. A. Proag *et al. ACS nano* 2015,9,3800
11. A. Proag *et al. Methods* 2016,94,75
12. N. Bourg *et al. Nature Photonics* 2015,9,587
13. A. Bouissou *et al. ACS nano* 2017

Applicants should be trained in cell biology and have experience in biophysics to carry out an interdisciplinary project. PhD or MD/PhD are required. The position is opened for at least three years. Salaries (from 33000€/year, social security included) are in accordance with the French state public service. To apply, please send a motivation letter, a CV including the publication list and at least two contacts for references to imp.job@ipbs.fr

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