

# MECHANICAL ENGINEERING COLLOQUIUM

## SPRING 2016 SEMESTER

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**Dr. Claude Verdier**  
**Research Director, CNRS**  
**Laboratory of Interdisciplinary Physics**  
**Grenoble, France**

**Friday, May 20, 2016**  
11:00-12:30 p.m., MEC 224

### **“Mechanical cues in cancer metastasis”**

In this talk, I will describe our recent experimental results on the mechanisms by which cancer cells transmigrate through blood vessels covered by endothelial cells. In particular, we employ two techniques: traction force microscopy (TFM) to measure forces exerted by cells during migration on a deformable substrate [1]. Atomic Force Microscopy (AFM) is also used for the investigation of receptor-ligand bonds between cancer cells and endothelial cells [2]. Alternatively, it may be used as a probe to measure local cell rheology by dynamic indentation. This allows us to obtain the elastic and viscous responses of the cell components. Cells of different invasiveness are chosen so that such methods can possibly help differentiate cells with respect to their metastatic potentials. We are also developing models of transmigration which incorporate experimental measurements of our and other research groups.

[1] V. Peschetola et al., Cytoskeleton, 70, 201 (2013)

[2] V.M. Laurent et al., 9, e98034, PLOS One (2014)

[3] Y. Abidine et al. EPJ Plus, 130, 202 (2015)

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Bio:

After receiving an engineering degree from Ecole Centrale Paris in France (1986), Claude VERDIER obtained his PhD at the University of Minnesota (1990), where he studied viscoelastic fluids. Then he joined the Institute of Mechanics of Grenoble in France for 2 years (1990-1992) as a postdoctoral fellow. He was appointed by the CNRS as a researcher in 1992 at the Laboratory of Rheology. His research focused on adhesion properties and wave propagation in polymeric materials. As he moved along in his career, his research became more focused on cell and tissue rheology.

Dr. Verdier is 1st class Research Director at CNRS, in the Laboratory of Interdisciplinary Physics (LIPhy) in Grenoble. His group focuses on cell mechanics, in particular recent advances have been made thanks to the AFM platform that he has in charge. He heads a national research group (GDR3570) on "biomechanics" (around 30 teams involved) and is president of the mechanics sector at the national committee at CNRS. He has been involved in two european networks on "cancer modelling" and other research grants (Agence Nationale de la recherche). He has co-authored over 70 publications and co-published a book on cell mechanics.