

**CONTACT INFORMATION**    **The FIRC Institut of Molecular Oncology IFOM**    Phone: (39) 02 5743 03200  
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    **Web site:** <http://www.ifom.eu/en/>

**RESEARCH INTEREST**    Cell Biology  
Biophysics  
Membrane Dynamics (Endocytosis, Membrane Trafficking, Exocytosis, Phagocytosis)  
Cytoskeleton remodeling  
Cellular Microbiology  
Host Pathogen Interaction  
Bacterial Toxins

**ACADEMIC APPOINTMENTS**    **At IFOM Milan and University of Milan**  
**□Jan 2016-current:** Group leader IFOM Milan Italy. Assistant Professor European School of Molecular Medicine (SEMM) Milan Italy  
**At National University of Singapore**  
**□Nov 2011-Jan 2016:** MBI Fellow (Junior Group Leader)  
Mechanobiology Institute  
**□Nov 2010-Oct 2011:** Senior research Fellow  
Mechanobiology Institute  
**At Columbia-University, New York, NY USA**  
**□Jul 2005-Jul 2010:** Post-Doctoral Fellow  
Supervisor: Pr Michael Sheetz

**EDUCATION**    **University of Nice-Sophia Antipolis, Nice, France**  
**2004** Ph.D in Cell and Molecular Biology  
Supervisor: Pr Patrice BOQUET, Unité INSERM U627  
Subject: Endocytosis and intracellular traffic of the Helicobacter-pylori VacA cytotoxin  
**2000** DEA in cell biology  
**1999** Master's degree in Biochemistry  
**1998** Bachelor's degree in Biochemistry

**FUNDING**    Seed Grant Group Leader IFOM  
January 2016-December 2020  
100.000 EUR a year for 5 years (500.000 Euros)  
  
Junior Group leader grant WBS R-714-016-007-271  
600.000 SGD for 4 years as lab support funds, Feb 2012- Jan 2016, Mechanobiology Institute, National University of Singapore, Singapore  
  
French Association against Cancer (ARC), 1 year fellowship (15.000 EUR), awarded but refused because of other support (2003-2004 teacher position).  
  
LIGUE association against cancer, France, 1 year supports (15.000 EUR), awarded but refused because of other support (2003-2004 teacher position).  
  
Teacher Assistant Full Fellowship one year 2003-2004 (25.000 EUR) , Ministry of Education, France  
  
PhD Fellowship, 3 years 2000-2003 (50.000 EUR), Ministry of Education, France, ranked first position (1 against 24)  
  
Teacher Assistant Supplementary Fellowship, 3 years 2000-2003 (10.000 EUR) Ministry of Education, France

**TEACHING**    **2013-current:** Membrane Trafficking. 8 hours lecture MB5102 course Structure, **Mechanobiology Institute Singapore**  
**2012-current:** Microbial Pathogenesis: Hijacking cell function by Pathogen: How new discovery where made, 2 hours lecture, MB5102 course Structure, **Mechanobiology Institute Singapore**  
**2011:** Mechanobiology: Force sensing and Cytoskeleton Remodeling with A. Bershadsky, 8 hours class, **Mechanobiology Institute Singapore**  
**2008-2009:** Cell as a machine: introduction to membrane dynamics (2 hours lecture), **Columbia University, New York USA**  
**2000-2004:** Teacher assistant Fellowship given in complement to the first position ranking of PhD Fellowship (96 hours of classroom a year 384 hours of class total) at the **University of Nice**

biology.

#### MENTORING (AS PI)

##### **Current lab members**

Dr Pascale Monzo, **Senior research Scientist** IFOM Milan (January 2016-current)  
Camilla Galli **PhD** student IFOM Italy (October 2015-current)  
Dr Bruno Pontes, **Post Doc**, (Brazilian, November 2012-September 2014, September 2016-current)

##### **Past lab members**

Dr Charlotte Guetta, former **PhD** student, (January 2012-december 2016, co-direction with Pr Benoit Ladoux, MBI-University Paris Diderot, France), Post Doc Brown University USA  
Dr Anita Joanna Kosmalska, former **PhD** student (Feb 2012-May 2016, co-direction with Pere Roca-Cusachs, IBEC, Barcelona, Spain). Grant Admin Work University of Barcelona  
Dr Jagadish Sankaran, former **Post Doc**, (Indian, January 2012 –May 2015)  
Dr Thomas Masters, former **Post Doc**, (English, now in Cambridge University UK) (July 2011-May 2013)  
Malte Ohmstede, former **Undergraduate**, (German, 2 months internship July-August 2012)  
Sophie Kan, former **Undergraduate** now Graduate Student, (French, 4 months internship part of the Master's training January-May 2012)

#### PUBLICATIONS

##### **31 publications published in peer review journals**

**h index: 21** (Google Scholar) as of december 2016

**times cited: 1706** (Google Scholar) as of december 2016

**31-How cells respond to environmental cues—insights from bio-functionalized substrates**  
V Ruprecht, P Monzo, A Ravasio, Z Yue, E Makhija, PO Strale, N Gauthier, GV Shivashankar, Vincent Studer, Corinne Albiges-Rizo, Virgile Viasnoff  
**J Cell Sci, in press**

**30- $\alpha$ -actinin links ECM rigidity sensing contractile units with periodic cell edge retractions.**  
Meacci G, Wolfenson H, Liu S, Stachowiak MR, Iskratsch T, Mathur A, Ghassemi S, Gauthier N, Tabdanov E, Lohner J, Gondarenko A, Chander AC, Roca-Cusachs P, O'Shaughnessy B, Hone J, Sheetz MP.  
**Mol Biol Cell.** 2016 Apr 27.

**29-F-actin waves, actin cortex disassembly and focal exocytosis driven by actin-phosphoinositide positive feedback.**  
Masters TA\*, Sheetz MP, Gauthier NC\*.  
**Cytoskeleton.** 2016 Apr;73(4):180-96.  
**\* Corresponding authors**

**28- Mechanical confinement triggers glioma linear migration dependent on formin FHOD3.**  
Monzo P, Chong YK, Guetta-Terrier C, Krishnasamy A, Sathe SR, Yim EK, Ng WH, Ang BT, Tang C, Ladoux B, Gauthier NC, Sheetz MP.  
**Mol Biol Cell.** 2016 Apr 15;27(8):1246-61

**27- Protrusive Waves Guide 3D Cell Migration along Nanofibers**  
Charlotte Guetta-Terrier, Pascale Monzo, Jie Zhu, Hongyan Long, Lakshmi Venkatraman, Yue Zhou, PeiPei Wang, Chew Sing Yian, Alexander Mogilner, Benoit Ladoux\*, Nils C. Gauthier1\*  
**J. Cell Biol.** 2015  
**\* Corresponding authors**

**26- Physical principles of membrane remodelling during cell mechanoadaptation.**  
Kosmalska AJ, Casares L, Elosegui-Artola A, Thottacherry JJ, Moreno-Vicente R, González-Tarragó V, del Pozo MÁ, Mayor S, Arroyo M, Navajas D, Trepat X, Gauthier NC\*, Roca-Cusachs P\*.  
**Nat Commun.** 2015 Jun 15;6:7292.  
**\* Corresponding authors**

**25-The effects of nanofiber topography on siRNA uptake and gene silencing**  
Winifred Wing Yiu Yau; Hongyan Long, Nils C Gauthier, Jerry Kok Yen Chan and Sing Yian Chew  
**Biomaterials** 2014 Volume: 37 Pages: 94-106

**24-Plasma membrane tension orchestrates membrane trafficking, cytoskeletal remodeling, and biochemical signaling during phagocytosis**  
Thomas A. Masters, Virgile Viasnoff, You Li and Nils Gauthier\*  
**Proc Natl Acad Sci USA** 2013 Volume: 110 Issue: 29 Pages: 11875-11880  
**\* Corresponding author**

**23- Myosin 1E localizes to actin polymerization sites in lamellipodia, affecting actin dynamics and adhesion formation.**  
Gupta P, Gauthier NC, Cheng-Han Y, Zuanning Y, Pontes B, Ohmstede M, Martin R, Knölker HJ, Döbereiner HG, Krendel M, Sheetz M.  
**Biol Open.** 2013 Dec 15;2(12):1288-99. doi: 10.1242/bio.20135827.

**22- Integrin-dependent force transmission to the extracellular matrix by  $\alpha$ -actinin triggers adhesion maturation**

Pere Roca-Cusachs, Armando del Rio, Eileen Faucher, Nils C. Gauthier, Nicolas Biais, Michael P. Sheetz

**Proc Natl Acad Sci USA** 2013 Volume: 110 Issue: 15 Pages: 1361-E1370

**21-Mechanical Feedback between Membrane Tension and Dynamics**

Nils C. Gauthier\*, Thomas M. Masters, Michael P. Sheetz

**Trends in Cell Biology**, 2012 Volume: 22 Issue: 10 Pages: 527-535

\* **Corresponding author**

**20-Physarum polycephalum percolation as a paradigm for topological phase transitions in transportation networks**

Adrian Fessel, Christina Oettmeier, Erik Bernitt, Nils C. Gauthier, Hans-Günther Döbereiner

**Physical Review Letter**, 2012 Volume: 109 Issue: 7 Article Number: 078103

Cover featured August 17

Science News reviewed August 2012

**19-Easy fabrication of thin membranes with through holes. Application to protein patterning**

Thomas Masters, Wilfried Engl, Zhe Lancelot Weng, Bakya Ashwin, Nils C. Gauthier, Virgile Viasnoff.

**PLoS ONE**, 2012 Volume: 7 Issue: 8 Article Number: e44261

**18-Cell crawling mediates collective cell migration to close undamaged epithelial gaps"**

Ester Anon, Xavier Serra-Picamal, Pascal Hersen, Nils C. Gauthier, Michael P. Sheetz, Xavier Trepat, Benoit Ladoux

**Proc Natl Acad Sci USA** 2012 Volume: 109 Issue: 27 Pages: 10891-10896

**17-Temporary Increase in Plasma Membrane Tension Coordinates the Activation of Exocytosis and Contraction during Cell Spreading.**

Gauthier N.C., Fardin M.A., Roca-Cusachs P., and Sheetz M.P.

**Proc Natl Acad Sci USA** 2011 Volume: 108 Issue: 35 Pages: 14467-14472

Faculty of 1000 evaluated: FFA10, 2 evaluations

Cover Featured in the August 30 2011 issue of PNAS

Commented in the August 30 2011 issue of PNAS by Kinneret Keren: Membrane tension leads the way, Proc Natl Acad Sci USA 2011 Aug 30, 14379-80

**16-Physiological response to membrane protein overexpression in E. coli.**

Gubellini F, Verdon G, Karpowich NK, Luff JD, Boel G, Gauthier N, Handelman SK, Ades S, Hunt JF.

**Mol Cell Proteomics**. 2011 Jun 30.

**15-Bacillus sphaericus binary toxin elicits host cell autophagy as a response to intoxication.**

Opota O, Gauthier NC, Doye A, Berry C, Gounon P, Lemichez E, Pauron D.

**PLoS ONE**. 2011 Volume: 6 Issue: 2 Article Number: e14682

**14-Filamin depletion blocks endoplasmic spreading and destabilizes force-bearing adhesions.**

Lynch CD, Gauthier NC, Biais N, Lazar AM, Roca-Cusachs P, Yu CH, Sheetz MP.

**Mol Biol Cell**. 2011 Volume: 22 Issue: 8 Pages: 1263-1273

Faculty of 1000 : poster selected ASCB meeting 2009

**13-Cell spreading as a hydrodynamic process**

Fardin MA, Rossier OM, Rangamani P, Avigan PD, Gauthier NC, Vonnegut W, Mathur A, Hone J, Iyengar R, Sheetz MP

**Soft Matter** 2010 Volume: 6 Issue: 19 Pages: 4788-4799

**12-Force generated by actomyosin contraction builds bridges between adhesive contacts.**

Rossier OM, Gauthier N, Biais N, Vonnegut W, Fardin MA, Avigan P, Heller ER, Mathur A, Ghassemi S, Koeckert MS, Hone JC, Sheetz MP.

**EMBO J**. 2010 Volume: 29 Issue: 6 Pages: 1055-1068

**11-Cytoskeletal coherence requires myosin-IIA contractility.**

Cai Y, Rossier O, Gauthier NC, Biais N, Fardin MA, Zhang X, Miller LW, Ladoux B, Cornish VW, Sheetz MP.

**J Cell Sci**. 2010 Volume: 123 Issue: 3 Pages: 413-423

**10-Plasma membrane area increases with spread area by exocytosis of a GPI-anchored protein compartment.**

Gauthier NC, Rossier OM, Mathur A, Hone JC, Sheetz MP.

**Mol Biol Cell**. 2009 Volume: 20 Issue: 14 Pages: 3261-3272

Incytes from MBC July, Vol 20

Cover caption of the October 15 2009 issue of MBoC

**9-Clustering of alpha(5)beta(1) integrins determines adhesion strength whereas alpha(v)beta(3) and talin enable mechanotransduction.**

Roca-Cusachs P, Gauthier NC, Del Rio A, Sheetz MP.

**Proc Natl Acad Sci U S A**. 2009 Volume: 106 Issue: 38 Pages: 16245-16250

Faculty of 1000 evaluated : FFA9 : 2 evaluations

**8-Early endosomes associated with dynamic F-actin structures are required for late trafficking of H. pylori VacA toxin.**

Gauthier NC, Monzo P, Gonzalez T, Doye A, Oldani A, Gounon P, Ricci V, Cormont M, Boquet P.

**J Cell Biol**. 2007 Volume: 177 Issue: 2 Pages: 343-3547

**7-Helicobacter pylori VacA toxin: a tool to study novel early endosomes.**

Gauthier NC, Ricci V, Landraud L, Boquet P.  
**Trends in Microbiology**. 2006 Volume: 14 Issue: 7 Pages: 292-294

**6-Disruption of autophagy at the maturation step by the carcinogen lindane is associated with the sustained mitogen-activated protein kinase/extracellular signal-regulated kinase activity.**  
Corcelle E, Nebout M, Bekri S, **Gauthier N**, Hofman P, Poujeol P, Fénichel P, Mograbi B.  
**Cancer Res. 2006 Jul 1;66(13):6861-70.**

**5-Helicobacter pylori VacA cytotoxin: a probe for a clathrin-independent and Cdc42-dependent pinocytic pathway routed to late endosomes.**  
Gauthier NC, Monzo P, Kaddai V, Doye A, Ricci V, Boquet P.  
**Mol Biol Cell**. 2005 Volume: 16 Issue: 10 Pages: 4852-4866

**4-Clues to CD2-associated protein involvement in cytokinesis.**  
Monzo P, Gauthier NC, Keslair F, Loubat A, Field CM, Le Marchand-Brustel Y, Cormont M.  
**Mol Biol Cell**. 2005 Volume: 16 Issue: 6 Pages: 2891-2902

**3-Glycosylphosphatidylinositol-anchored proteins and actin cytoskeleton modulate chloride transport by channels formed by the Helicobacter pylori vacuolating cytotoxin VacA in HeLa cells.**  
Gauthier NC, Ricci V, Gounon P, Doye A, Tauc M, Poujeol P, Boquet P.  
**J Biol Chem**. 2004 Volume: 279 Issue: 10 Pages: 9481-9489

**2-Rac GTPase instructs nuclear factor-kappaB activation by conveying the SCF complex and Ikbalpha to the ruffling membranes.**  
Boyer L, Travaglione S, Falzano L, Gauthier NC, Popoff MR, Lemichez E, Fiorentini C, Fabbri A.  
**Mol Biol Cell**. 2004 Volume: 15 Issue: 3 Pages: 1124-1133

**1-Gastric cell apoptosis and H. pylori: has the main function of VacA finally been identified?**  
Boquet P, Ricci V, Galmiche A, Gauthier NC.  
**Trends in Microbiology**. 2003 Volume: 11 Issue: 9 Pages: 410-413

CONFERENCES  
(SPEAKER ONLY)

**As a group leader:**

- Gordon Conference Fibronectin and adhesion February 2017
- Randall Seminar, King's College, may 2016 London
- ASCB 2015 San Diego (student work selected)
- IMB-MBI 2015 Brisbane
- Cell Mech 2015 Barcelona
- UNSW Sydney 2014
- ASCB 2014 Philadelphia
- CRBM-CNRS 2014, Montpellier, France
- "Biomembrane Days" from September 1 to 3, 2014 in Berlin Germany Invited Speaker
- Curie Institut Paris France, 2014 Invited speaker
- MBI Manchester university meeting 2013, Singapore Speaker and organizer
- MBI-WEISMAN meeting 2013, Singapore Speaker and organizer
- Mechanical manipulations of the cell and beyond 2013, NCBC India Invited Speaker
- Institut Jacques Monod, 2013, France Invited speaker

**As a Post Doc**

ASCB 2007, Washington Dc, USA,  
Speaker, Myosin II contraction is synchronized with exocytosis during cell spreading.

**As a PhD**

ELSO meeting 2003, Dresden, Germany,  
Speaker: The channel formed by Helicobacter pylori vacA toxin triggers its pinocytosis.