



Daniel Lévy **EQUIPE IMAGERIE CELLULAIRE ET TISSULAIRE**

Chef d'équipe

Coordinateur - Electroniques - Bât Curie

daniel.levy@curie.fr Tél : +33 1 56 24 67 82

2006-now Group Leader Team MMM Institut Curie UPMC

2012-Now Scientific Co-coordinator Cell and Tissues Imaging Center Institut Curie.

2005-now DR2 CNRS, Institut Curie UPMC, Paris, France

1992. Research Scientist CR2 CNRS, France

1990-1992 Postdoctoral Fellow, MPI, Martinsried, Germany. (Dir. D. Oesterheld).

PhD thesis

Publications

(51) Pierman, B., Toussaint, F., Bertin, A., Lévy, D., Smargiasso, N., De Pauw, E., and Boutry, M. (2017) Activity of the purified plant ABC transporter NtPDR1 is stimulated by diterpenes and sesquiterpenes involved in constitutive and induced defenses. *J. Biol. Chem.* 10.1074/jbc.M117.811935

(50) Toussaint, F., Pierman, B., Bertin, A., Lévy, D., and Boutry, M. (2017) Purification and biochemical characterization of NpABCG5/NpPDR5, a plant pleiotropic drug resistance transporter expressed in *Nicotiana tabacum* BY-2 suspension cells. *Biochem. J.* 474, 1689-1703

(49) Guichard, P., Hamel, V., Le Guennec, M., Banterle, N., Iacovache, I., Nemčíková, V., Flückiger, I., Goldie, K. N., Stahlberg, H., Lévy, D., Zuber, B., and Gönczy, P. (2017) Cell-free reconstitution reveals centriole cartwheel assembly mechanisms. *Nat. Commun.* 8, 1-9

(48) Casiraghi, M., Damian, M., Lescop, E., Point, E., Moncoq, K., Morellet, N., Lévy, D., Marie, J., Guittet, E., Banères, J. L., Catoire, L. J., Banères, J. L., and Catoire, L. J. (2016) Functional Modulation of a G Protein-Coupled Receptor Conformational Landscape in a Lipid Bilayer. *J. Am. Chem. Soc.* 138, 11170-11175

(47) van Niel, G., Bergam, P., Di Cicco, A., Hurbain, I., Lo Cicero, A., Dingli, F., Palmulli, R., Fort, C., Potier, M. C., Schurgers, L. J., Loew, D., Lévy, D*, and Raposo*, G. (2015) Apolipoprotein E Regulates Amyloid Formation within Endosomes of Pigment Cells. *Cell Rep.* 13, 43-51. * co-senior authors.

Plateforme d'imagerie Cellulaire et Tissulaire

(46) Yamada, A., Mamane, A., Lee-Tin-Wah, J., Di Cicco, A., Prévost, C., Lévy, D., Joanny, J.-F., Coudrier, E., and Bassereau, P. (2014) Catch-bond behaviour facilitates membrane tubulation by non-processive myosin 1b. *Nat. Commun.* 5, 3624

(45) Fribourg, P. F., Chami, M., Sorzano, C. O. S., Gubellini, F., Marabini, R., Marco, S., Jault, J. M., and Lévy, D. (2014) 3D cryo-electron reconstruction of BmrA, a bacterial multidrug ABC transporter in an inward-facing conformation and in a lipidic environment. *J. Mol. Biol.* 426, 2059-2069

(43) Lévy, D., and Milhiet, P.-E. (2013) Imaging of transmembrane proteins directly incorporated within supported lipid bilayers using atomic force microscopy. *Methods Mol. Biol.* 950, 343-57

(42) Dezi, M., Di Cicco, A., Bassereau, P., and Lévy, D. (2013) Detergent-mediated incorporation of transmembrane proteins in giant unilamellar vesicles with controlled physiological contents. *Proc. Natl. Acad. Sci. U. S. A.* 110, 7276-81

(41) Campillo, C., Sens, P., Köster, D., Pontani, L.-L., Lévy, D., Bassereau, P., Nassoy, P., and Sykes, C. (2013) Unexpected membrane dynamics unveiled by membrane nanotube extrusion. *Biophys. J.* 104, 1248-1256

(40) Jia, L., Lévy, D., Durand, D., Impéror, M., Cao, A., and Li, M. H. (2011) Smectic Polymer Micellar Aggregates with Temperature-Controlled Morphologies, *Soft Matter* 7, 7395 - 7403

(39) Yang, H., Jia, L., Wang, Z., Di Cicco, A., Lévy, D., and Keller, P. (2011) Novel photolabile diblock copolymers bearing truxillic acid derivative, *Macromolecules* 44, 159-165.

(38) Seantier*, B., Dezi*, M., Gubellini, F., Berquand, A., Godefroy, C., Dosset, P., Lévy, D., and Milhiet, P. E. (2011) Transfer on hydrophobic substrates and AFM imaging of membrane proteins reconstituted in planar lipid bilayers, *J. Biomol. Recognition* 23, 1-6. * First co-authors.

(37) Galián, C., Manon, F., Dezi, M., Torres, C., Ebel, C., Lévy, D., and Jault, J. M. (2011) Optimized purification of a heterodimeric ABC transporter in a highly stable form amenable to 2D crystallization, *PlosOne* 6, e19677.

(36) Dezi, M., Fribourg, P. F., Di Cicco, A., Jault, J. M., Chami, M., and Lévy, D. (2011) Binding, reconstitution and 2D crystallization of membrane or soluble proteins onto functionalised lipid layer observed in situ by reflected light microscopy. *J. Struct. Biol.* 174, 307-314.

(35) Yang, H., Jia, L., Zhu, C., Di Cicco, A., Lévy, D., Albouy, P. A., Li, M., and Keller, P. (2010) Amphiphilic Poly(Ethylene Oxide)-block-Poly(Butadiene-graft-Liquid Crystal) Copolymers: Synthesis via Thiol-Ene Click Chemistry and Self-Assembly in Water, *Macromolecules* 43 10442-10451.

(34) Dezi, M., Fribourg, P. F., Di Cicco, A., Arnaud, O., Marco, S., Falson, P., Di Pietro, A., and Lévy, D. (2010) The multidrug resistance half-transporter ABCG2 is purified as a tetramer upon selective extraction from membranes, *Biochim Biophys Acta. Biomembrane* 1798, 2094-2101.

Plateforme d'imagerie Cellulaire et Tissulaire

- (33) Xu, B., Piñol, R., Nono-Djamen, M., Pensec, S., Keller, P., Albouy, P. A., Lévy, D., and Li, M. H. (2009) Self-assembly of liquid crystal block copolymer PEG-b-smectic polymer in pure state and in dilute aqueous solution., *Faraday Discussion* 143, 235-250.
- (32) Mabrouk, E., Cuvelier, D., Pontani, L. L., Xu, B., Lévy, D., Keller, P., Brochard-Wyart, F., Nassoy, P., and M.H.Li. (2009) Formation and material properties of giant liquid crystal polymersomes., *Soft Matter* 5, 1870-1878.
- (31) Jia, L., Cao, A., Lévy, D., Xu, B., Albouy, P. A., Xing, X., Bowick, M. J., and M.H.Li. (2009) Smectic polymers vesicles. , *Soft Matter* 5, 3446-3451.
- (30) Hussein, W., Ross, B. P., Lévy, D., Landsberg, M., Hankamer, B., and RP., M. (2009) Synthesis of Nickel-chelating fluorinated lipids for protein monolayer crystallization., *Journal of Organic Chemistry* 74,
- (29) Orelle, C., Gubellini, F., Durand, A., Marco, S., Lévy, D., Gros, P., Di Pietro, A., and Jault, J. M. (2008) Conformational change induced by ATP binding in the multidrug ATP-binding cassette transporter BmrA, *Biochemistry* 47, 2404-2412.
- (28) De, E., Saint, N., Glinel, K., Meli, A. C., Lévy, D., and Jacob-Dubuisson, F. (2008) Influence of the passenger domain of a model autotransporter on the properties of its translocator domain, *Mol Membr Biol* 25, 192-202.
- (27) Piñol, R., Jia L., Gubellini, F., Lévy, D., Albouy, P. A., Keller, P., .A., C., and Li, M. H. (2007) Self-Assembly of PEG-b-Liquid Crystal Polymer: The Role of Smectic Order in the Formation of Nanofibers. , *Macromolecules* 40, 5625-5627.
- (26) Gubellini, F., Francia, F., Turina, P., Lévy, D., Venturoli, G., and Melandri, B. A. (2007) Heterogeneity of photosynthetic membranes from *Rhodobacter capsulatus*: size dispersion and ATP synthase distribution, *Biochim Biophys Acta* 1767, 1340-1352.
- (25) Busselez, J., Cottevieille, M., Cuniasse, P., Gubellini, F., Boisset, N., and Lévy, D. (2007) Structural basis for the PufX-mediated dimerization of bacterial photosynthetic core complexes, *Structure* 15, 1674-1683.
- (24) Berquand, A., Lévy, D., Gubellini, F., Le Grimellec, C., and Milhiet, P. E. (2007) Influence of calcium on direct incorporation of membrane proteins into in-plane lipid bilayer, *Ultramicroscopy* 107, 928-933.
- (23) Milhiet, P.-E., Gubellini, F., Berquand, A., Dosset, P., Rigaud, J.-L., Le Grimellec, C., and Lévy, D. (2006) High-resolution AFM of membrane proteins directly incorporated at high density in planar lipid bilayer. *Biophys. J.* 91, 3268-3275
- (22) Scheuring, S., Lévy, D., and Rigaud, J.-L. (2005) Watching the components of photosynthetic bacterial membranes and their in situ organisation by atomic force microscopy. *Biochim. Biophys. Acta - Biomembr.* 1712, 109-127

Plateforme d'imagerie Cellulaire et Tissulaire

(21) Scheuring, S., Sturgis, J. N., Prima, V., Bernadac, A., Lévy, D., and Rigaud, J.-L. (2004) Watching the photosynthetic apparatus in native membranes. *Proc. Natl. Acad. Sci. U. S. A.* 101, 11293-11297

(20) Scheuring, S., Francia, F., Busselez, J., Melandri, B. A., Rigaud, J.-L., and Lévy, D. (2004) Structural Role of PufX in the Dimerization of the Photosynthetic Core Complex of *Rhodobacter sphaeroides*. *J. Biol. Chem.* 279, 3620-3626

(19) Rigaud, J.-L., and Lévy, D. (2003) Reconstitution of Membrane Proteins into Liposomes *Methods Enzymol* 372, 65-86.

(18) Scheuring, S., Seguin, J., Marco, S., Lévy, D., Robert, B., and Rigaud, J.-L. (2003) Nanodissection and high-resolution imaging of the *Rhodospseudomonas viridis* photosynthetic core complex in native membranes by AFM. Atomic force microscopy. *Proc. Natl. Acad. Sci. U. S. A.* 100, 1690-3

(17) Scheuring, S., Seguin, J., Marco, S., Lévy, D., Breyton, C., Robert, B., and Rigaud, J.-L. (2003) AFM characterization of tilt and intrinsic flexibility of *Rhodobacter sphaeroides* light harvesting complex 2 (LH2). *J. Mol. Biol.* 325, 569-580

Hagnerelle, X., Plisson, C., Lambert, O., Marco, S., Rigaud, J.-L., Johannes, L., and Lévy, D. (2002) (16) Two-dimensional structures of the shiga toxin B-subunit and of a chimera bound to the glycolipid receptor Gb3. *J. Struct. Biol.* 139, 113-121

(15) Lévy, D., Chami, M., and Rigaud, J. (2001) Two-dimensional crystallization of membrane proteins: the lipid layer strategy. *FEBS letters*, 504, 3, 187-193.

(14) Chami, M., Pehau-Arnaudet, G., Lambert, O., Ranck, J.-L., Lévy, D., and Rigaud, J.-L. (2001) Use of Octyl β -Thioglucopyranoside in two-dimensional crystallization of membrane proteins. *J. Struct. Biol.* 133, 64-74.

(13) Rigaud, J.-L., Chami, M., Lambert, O., Lévy, D., and Ranck, J.-L. (2000) Use of detergents in two-dimensional crystallization of membrane proteins. *Biochim. Biophys. Acta - Biomembr.* 1508, 112-128

(12) Lambert, O., Moeck, G. S., Lévy, D., Plançon, L., Letellier, L., and Rigaud, J.-L. (1999) An 8-A projected structure of FhuA, A "ligand-gated" channel of the *Escherichia coli* outer membrane. *J. Struct. Biol.* 126, 145-55

(11) Lévy, D., Mosser, G., Lambert, O., Moeck, G. S., Bald, D., and Rigaud, J.-L. (1999) Two-dimensional crystallization on lipid layer: A successful approach for membrane proteins. *J. Struct. Biol.* 127, 44-52

(10) Lambert, O., Lévy, D., Ranck, J.-L., Leblanc, G., and Rigaud, J.-L. (1998) A new "gel-like" phase in dodecyl maltoside-lipid mixtures: implications in solubilization and reconstitution studies. *Biophys. J.* 74, 918-930

(9) Rigaud, J.-L., Lévy, D., G, Mosser., and Lambert, O. (1998) Detergent removal by Bio-Beads. Application to membrane protein reconstitution and two-dimensional crystallisation. *Eur J. Biophys.* 27, 305-319

(8) Rigaud, J.-L., Mosser, G., Lacapere, J. J., Olofsson, A., Lévy, D., and Ranck, J.-L. (1997) Bio-Beads: an efficient strategy for two-dimensional crystallization of membrane proteins. *J. Struct. Biol.* 118, 226-235

(7) Rigaud, J.-L., Pitard, B., and Lévy, D. (1995) Reconstitution of membrane proteins into liposomes: application to energy-transducing membrane proteins. *BBA - Bioenerg.* 1231, 223-246

(6) Lévy, D., Bluzat, A., Seigneuret, M., and Rigaud, J.-L. (1995) Alkali Cation Transport Through Liposomes. *Biochem. Pharmacol.* 50, 2105-2107

(5) Lévy, D., Guiik, A., and Rigaud, J.-L. (1992) Reconstitution of the sarcoplasmic reticulum Ca²⁺ + -ATPase: mechanisms of membrane protein insertion into liposomes during reconstitution procedures involving the use of detergents. *Biochim Biophys Acta.* 1107, 283-298

(4) Seigneuret M, Neumann JM, Lévy D, Rigaud JL. (1991) High-resolution ¹³C NMR study of the topography and dynamics of methionine residues in detergent-solubilized bacteriorhodopsin. *Biochemistry* 30, 3885-92.

(3) Lévy D, Seigneuret M, Bluzat A, Rigaud JL. (1990 a) Evidence for proton countertransport by the sarcoplasmic reticulum Ca²⁺(+)-ATPase during calcium transport in reconstituted proteoliposomes with low ionic permeability. *J Biol Chem* 15, 19524-34

(2) Lévy D, Gulik A, Seigneuret M, Rigaud JL. (1990) Phospholipid vesicle solubilization and reconstitution by detergents. Symmetrical analysis of the two processes using octaethylene glycol mono-n-dodecyl ether. *Biochemistry* 29, 480-8.

(1) Lévy D, Bluzat A, Seigneuret M, Rigaud JL. (1990) A systematic study of liposome and proteoliposome reconstitution involving Bio-Bead-mediated Triton X-100 removal. *Biochim Biophys Acta* 1025, 179-90

Publications clés

Année de publication : 2019

Jamecna D, Polidori DJ, Mesmin B, Dezi M, Lévy D, Bigay J, Antony B (2019 Mar 22)

An intrinsically disordered region in OSBP acts as an entropic barrier to control protein dynamics and orientation at membrane contact sites

Developmental cell * : * highlighted Trend in Cell Biology 2019 : [DOI](#) :

[10.1016/j.devcel.2019.02.021](https://doi.org/10.1016/j.devcel.2019.02.021)

Simon C*, Kusters R*, Caorsi V*, Allard A, Abou-Ghali M, Manzi J, Di Cicco A, Lévy D, Lenz M, Joanny J-F, Campillo C, Plastino J, Sens P*, Sykes C* (2019 Mar 18)

Actin dynamics drive cell-like membrane deformation

Nature Physics : [DOI : 10.1038/s41567-019-0464-1](https://doi.org/10.1038/s41567-019-0464-1)

Beber A, Taveneau C, Nania M, Tsai FC, Di Cicco A, Bassereau P, Lévy D, Cabral JT, Isambert H, Mangenot S*, Bertin A* (2019 Jan 24)

Membrane reshaping by micrometric curvature sensitive septin filaments

Nature communications : [DOI : 10.1038/s41467-019-08344-5](https://doi.org/10.1038/s41467-019-08344-5)

Année de publication : 2017

P Guichard, V Hamel, M Le Guennec, N Banterle, I Iacovache, V Nemčíková, I Flückiger, K N Goldie, H Stahlberg, D Lévy, B Zuber, P Gönczy (2017 Mar 24)

Cell-free reconstitution reveals centriole cartwheel assembly mechanisms.

Nature communications : 14813 : [DOI : 10.1038/ncomms14813](https://doi.org/10.1038/ncomms14813)

Année de publication : 2014

Guillaume van Niel, Ptissam Bergam, Aurelie Di Cicco, Ilse Hurbain, Alessandra Lo Cicero, Florent Dingli, Roberta Palmulli, Cecile Fort, Marie Claude Potier, Leon J Schurgers, Damarys Loew, Daniel Levy, Graça Raposo (2014 Nov 13)

Apolipoprotein E Regulates Amyloid Formation within Endosomes of Pigment Cells.

Cell reports : 43-51 : [DOI : 10.1016/j.celrep.2015.08.057](https://doi.org/10.1016/j.celrep.2015.08.057)

Ayako Yamada, Alexandre Mamane, Jonathan Lee-Tin-Wah, Aurélie Di Cicco, Coline Prévost, Daniel Lévy, Jean-François Joanny, Evelyne Coudrier*, Patricia Bassereau* (2014 Apr 7)

Catch-bond behaviour facilitates membrane tubulation by non-processive myosin 1b.

Nature communications : 3624 : [DOI : 10.1038/ncomms4624](https://doi.org/10.1038/ncomms4624)

Année de publication : 2013

Pierre Frederic Fribourg, Mohamed Chami, Carlos Oscar S Sorzano, Francesca Gubellini, Roberto Marabini, Sergio Marco, Jean-Michel Jault, Daniel Lévy (2013 Aug 7)

3D cryo-electron reconstruction of BmrA, a bacterial multidrug ABC transporter in an inward-facing conformation and in a lipidic environment.

Journal of molecular biology : 2059-69 : [DOI : 10.1016/j.jmb.2014.03.002](https://doi.org/10.1016/j.jmb.2014.03.002)

Manuela Dezi, Aurelie Di Cicco, Patricia Bassereau, Daniel Lévy (2013 Apr 15)

Detergent-mediated incorporation of transmembrane proteins in giant unilamellar vesicles with controlled physiological contents.

Proceedings of the National Academy of Sciences of the United States of America : 7276-81 : [DOI : 10.1073/pnas.1303857110](https://doi.org/10.1073/pnas.1303857110)

Année de publication : 2010

Nicolas Manel, Brandon Hogstad, Yaming Wang, David E Levy, Derya Unutmaz, Dan R Littman (2010 May 27)

A cryptic sensor for HIV-1 activates antiviral innate immunity in dendritic cells.

Nature : 214-7 : [DOI : 10.1038/nature09337](https://doi.org/10.1038/nature09337)