

Curriculum Vitae

DUCHESNE Laurence

Born the 27/03/1976 – French nationality

<p><u>Personal address:</u> 100 Avenue Sergent Maginot 35000 Rennes Tel: +33(0)6 62 23 14 54</p>	<p><u>Professional address:</u> Group "Tubulin and Interacting Proteins" UMR 6290 CNRS / University of Rennes 1 B13, Campus de Beaulieu / 35042 Rennes; France Tel: +33 (0)2 23 23 48 82 / e-mail: Laurence.duchesne@univ-rennes1.fr</p>
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I. DEGREES

- 1999/2002 **PhD in Biological Sciences**, University of Rennes I, France.
Obtained the 24th of October 2002 at the University of Rennes I.
- 1998-99 **DEA (Mrs) in Cellular and Molecular Biology and Health Sciences**, University of
Rennes I. Top student, Options: Endocrinology et Molecular genetic
- 1997-98 **Master in Biochemistry**, University of Rennes I.

II. PROFESSIONAL EXPERIENCE

➤ **Research:**

- 2011- present: **Lecturer** in Dr. D. Chretien's team: "Tubulin and interacting Proteins", UMR 6290 /
University of Rennes 1 (France).
Subject: **+TIPs macromolecular complexity**
- 2010-2011: **Research associate** in Dr. R.-M. Mège's team: "Adhesion and Cell Migration", UMRS
839 / INSERM / University Pierre and Marie Curie (France).
Subject: **Signal transduction at cell-cell contacts**
- 2005- 2009 **Research associate** in Prof. D.G. Fernig's team, School of Biological Sciences / Center
for Nanoscale Science, Engineering and Technology, University of Liverpool (United
Kingdom).
Subject: **Single molecule receptor oligomerisation sensor**
- 2002-2005 **Post-doctoral researcher** in Prof. D.G. Fernig's team, School of Biological Sciences,
University of Liverpool (United Kingdom).
Subject: **"FGF receptor : FGF : heparan sulfate" complex**
- 1999-2002 **PhD**, University of Rennes I; lab « Canaux et Récepteurs Membranaires », UMR 6026
CNRS (France) led by D. Thomas; PhD supervisor: J.-F. Hubert.
Thesis title: **Relations structure-fonction des protéines de la famille MIP**

Keywords: cell communication, cell signalling, extracellular matrix, cytoskeleton, protein/protein interaction and nanotechnology

Funding: French Ministry of Research and Teaching (1999-2002), Marie Curie (2002-04), Biotechnology and Biological Sciences Research (2004-05), Japan Society for the Promotion of Sciences (J.S.P.S), 2007, Council Human Frontier Science Program (2005-08), Wellcome Trust 'Value in People Award' (VIP) (2008-09) Medical Research Council (2009), Association pour la Recherche sur le cancer (2010-2011).

➤ **Teaching and student supervision:**

- 2011-present: **Lecturer in Biochemistry**, University of Rennes 1
- 1999-2002: **Moniteur du CIES (Demonstrator)**, University of Rennes 1
Practical and theoretical courses in Microbiology and Human genetic (96 hrs/years)
- 1999-2013: Degree, master, master research and PhD students supervision

III. MISCELLANEOUS

- Member of the French society of Biochemistry and Molecular Biology (SFBBM) of the French Society of Biophysics (SFB) (Since 2000), of the French Society of Cell Biology (SBCF) (since 2010) and of the French Society of Microscopies (SFmu) (since 2012).
- Referee for "Journal of Immunological Methods", "Journal of Nanomedicine", "Analytical Biochemistry", "Journal of the American Chemical Society", "Journal of Membrane Science", "Advanced Drug Delivery Reviews".
- Awards: "Bourse du mérite du 3ème cycle" (1998); Poster Prize, Gordon research conferences: FGFs in development and diseases (2006); Poster prize "Nanoparticles 2008: Synthesis, Properties and Applications of Nanoparticles conference" (2008).

IV- PUBLICATIONS

➤ **Articles**

1. **Duchesne L.**, Pellerin I., Delamarche C., Deschamps S., Lagrée V., Froger A., Bonnec G., Thomas D. and Hubert J-F. (2002). Role of C-terminal domain and transmembrane helices 5 and 6 in function and oligomerization of MIP proteins. *J. Biol. Chem.*, 277, 20598-20604.
<http://dx.doi.org/doi:10.1074/jbc.M201179200>
2. Thomas D., Bron P., Ranchy G., **Duchesne L.**, Cavalier A., Rolland J-P., Raguenes-Nicol C., Hubert J-F., Haase W. and Delamarche C. (2002). Aquaglycéroporins, one channel for two molecules. *Biochem. Biophys. Acta.*, 1555, 181-186.
[http://dx.doi.org/10.1016/S0005-2728\(02\)00275-X](http://dx.doi.org/10.1016/S0005-2728(02)00275-X)
3. **Duchesne L.**, Hubert J-F., Verbavatz J-M., Thomas D. and Pietrantonio P-M. (2003). Mosquito (*Aedes aegypti*) aquaporin, present in tracheolar cells, transports water, not glycerol, and forms orthogonal arrays in *Xenopus* oocytes membranes. *Eur. J. Biochem.*, 270, 422-429.
<http://dx.doi.org/10.1046/j.1432-1033.2003.03389.x>
4. Hubert J-F., **Duchesne L.**, Delamarche C., Vaysse A., Gueuné H., Raguenes-Nicol C. (2005). Pore selectivity analysis of an aquaglyceroporin by stopped-flow spectrophotometry on bacterial cell suspensions. *Biol. Cell.*, 97, 675-686.
<http://dx.doi.org/doi:10.1042/BC20040125>
5. West D.C., Rees C., **Duchesne L.**, Patey S.J., Turnbull J.E., Delehedde M., Heegaard C.W., Allain F., Vanpouille C., Ron D. and Fernig D.G. (2005). Interactions of multiple heparin-binding growth factors with neuropilin-1 and potentiation of the activity of fibroblast growth factor-2. *J. Biol. Chem.*, 280, 13457-13464.
<http://dx.doi.org/doi:10.1074/jbc.M410924200>

6. Lévy R., Wang Z., **Duchesne L.**, Doty R.C., Cooper A.I., Brust M. and Fernig D.G. (2006). A generic approach to monofunctionalized protein-like gold nanoparticles based on immobilized metal ion affinity chromatography. *ChemBioChem.*, 7, 592-594.
<http://dx.doi.org/10.1002/cbic.200500457>
7. **Duchesne L.**, Tissot B., Rudd T.R., Dell A. and Fernig D.G. (2006). N-glycosylation of FGFR1 regulates fibroblast growth factor-2 ligand and heparan sulfate co-receptor binding and intracellular signalling. *J. Biol. Chem.*, 281, 27178-27189.
<http://dx.doi.org/doi:10.1074/jbc.M601248200>
8. **Duchesne L.** and Fernig D.G. (2007). Silver and gold nanoparticle-coated membranes for femtomole detection of small proteins and peptides by Dot- and Western blot. *Anal. Biochem.*, 362, 287-289.
<http://dx.doi.org/10.1016/j.ab.2006.12.022>
9. Rudd T.R., Guimond S.E., Skidmore M.A., **Duchesne L.**, Guerrini M., Torri G., Cosentino C., Brown A., Clarke D.T., Turnbull J.E., Fernig D.G. and Yates E.A. (2007). Influence of substitution pattern and cation binding on conformation and activity in heparin derivatives. *Glycobiology*, 17, 983-993.
<http://dx.doi.org/doi:10.1093/glycob/cwm062>
10. **Duchesne L.**, Wells G., Fernig D.G., Harris S.H. and Lévy R. (2008). Supramolecular domains in mixed peptide self-assembled monolayers on gold nanoparticles. *ChemBioChem*, 9, 2127-2134.
<http://dx.doi.org/doi:10.1002/cbic.200800326>
11. **Duchesne L.**, Gentili D., Comes-Franchini M. and Fernig D.G. (2008). Robust ligand shells for biological applications of gold nanoparticles. *Langmuir*, 24, 13572-13580.
<http://dx.doi.org/doi:10.1021/la802876u>
12. Oceau V., Cognet L., **Duchesne L.**, Lasne D., Schaeffer N., Fernig D. and Lounis B. (2009) Photothermal Absorption Correlation Spectroscopy (PhACS). *ACS Nano*, 3, 345-350.
<http://dx.doi.org/doi:10.1021/nn800771m>
13. Polanska U.M., **Duchesne L.**, Harries J.C., Fernig D.G. and Kinnunen T.K. (2009). N-Glycosylation regulates fibroblast growth factor receptor/EGL-15 activity in *Caenorhabditis elegans in vivo*. *J. Biol. Chem.*, 284, 33030-33039.
<http://dx.doi.org/doi:10.1074/jbc.M109.058925>
14. Zhu H., **Duchesne L.**, Rudland P.S. and Fernig D.G. (2010). The heparan sulfate co-receptor and the concentration of fibroblast growth factor-2 independently elicit different signalling patterns from the fibroblast growth factor receptor. *Cell Commun Signal.*, 24, 8-14.
<http://dx.doi.org/doi:10.1186/1478-811X-8-14>
15. Bruning M., Kreplak L., Leopoldseder S., Müller S.A., Ringler P., **Duchesne L.**, Fernig D.G., Engel A., Ucurum-Fotiadis Z. and Mayans O. (2010). Bipartite Design of a Self-Fibrillating Protein Copolymer with Nanopatterned Peptide Display Capabilities. *Nano Lett.*, 10, 4533-4537.
<http://dx.doi.org/doi:10.1021/nl1024886>
16. **Duchesne L.**, Oceau V., Bearon R.N., Beckett A., Prior I.A., Tampé R., Lounis B. and Fernig D.G. (2012). Transport of fibroblast growth factor 2 in the pericellular matrix is controlled by the spatial distribution of its binding sites in heparan sulphate. *PLoS Biol.*, 10(7):e1001361.
<http://dx.doi.org/doi:10.1371/journal.pbio.1001361>
17. Strale P.O., **Duchesne L.**, Peyret G., Montel L., Nguyen T., Png E., Tampé R., Troyanovsky S., Hénon S., Ladoux B. and Mège R.-M. (2015). The formation of ordered nanoclusters controls cadherin anchoring to actin and cell-cell contact fluidity. *J. Cell. Biol.* 210(2):333-46.
<http://dx.doi.org/doi:10.1083/jcb.201410111>

Reviews

18. **Duchesne L.**, Deschamps S., Pellerin I., Lagrée V., Froger A., Thomas D., Bron P., Delamarche C. and Hubert J-F. (2001). Oligomerization of water and solute channels of the major intrinsic protein (MIP) family. *Kidney Int.*, 60, 422-426.
19. Yates EA, Terry CJ, Rees C, Rudd TR, **Duchesne L.**, Skidmore MA, Levy R, Thanh NT, Nichols RJ, Clarke DT and Fernig DG (2006). Protein-GAG interactions: new surface-based techniques, spectroscopies and nanotechnology probes. *Biochem. Soc. Trans.*, 34, 427-430.
20. Yates E.A., Rudd T.R., **Duchesne L.**, Skidmore M.A., Nichols R.J., Clarke D.T. and Fernig D.G. (2007). Revealing the hidden dimensions of GAGs in solution and protein complexes with saccharide libraries, FTIR and SRCD. Glycobiology. Scion Publishing Ltd.

➤ **Congress articles / Book chapters**

21. **Duchesne L.**, Pellerin I., Lagrée V., Froger A., Delamarche C., Le Caer J-P., Bron P., Thomas D., Hubert J-F. and Deschamps S. (2000). Different behavior of MIP proteins in N-lauroyl Sarcosine. *Molecular Biology and physiology of water and solute transport*. Kluwer academic Plenum publishers, New York, 23-28.
22. Froger A., Rolland J-P., Rodriguez M., Garvia Lobo M., **Duchesne L.**, Pellerin I., Cavalier A., Hubert J-F., Deschamps S., Bron P., Delamarche C. and Thomas D. (2000). Study of fast water movements in bacteria by cryoelectron microscopy. *Molecular Biology and physiology of water and solute transport*. Kluwer academic Plenum publishers, New York, 383-387.
23. Rudd T., **Duchesne L.**, Fernig D.G. and Nichols R.J. (2004). The analysis of the fibroblast growth factor ligand-receptor complex using a quartz crystal microbalance-dissipation. *Int. J. Exp. Pathol.*, Blackwell publishing LTD, Oxford, 85, 72-73.
24. Boujard B. Anselme B., Cullin C. and Raguene C., (2012). Fiche: Suivi de Particule Unique (Duchesne L.). Biologie Cellulaire et Moléculaire – Licence, éditions Dunod, fiche 81, 182-183.

➤ **Patents**

25. Fernig D.G. & **Duchesne L.** Nanoparticle conjugates. Brevet International, PCT/GB2009/ 050107.