

Curriculum Vitae

Personal information

First name / Family name	Cécile Formosa-Dague		
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E-mail	cecile.formosa@uclouvain.be		
Nationality	French		
Date of birth			
Gender	female		

Personal statement

After a master degree in bioengineering, I realized my PhD in the LAAS (Laboratoire d'Analyse et d'Architecture des Systèmes), in Toulouse France, during which I addressed important issues on multidrug resistant microbes using nanobiotechnologies and more specifically atomic force microscopy. This PhD was highlighted by the publication of 9 research articles and 2 reviews in high-impact journals such as Nature Protocols or Nanomedicine NBM. After this PhD, I chose to do a postdoc in the nanobiotechnology field, in the team of Prof. Yves Dufrêne in Belgium. During this postdoc I managed my own research project on bacterial biofilm formation in collaboration with my supervisor, international collaborators and other postdoctoral researchers in the team. This work led to the publication of 3 research articles in PNAS, ACS Nano and Nanoscale Horizons. Following the birth of my son, I took a five-month break in France (April to September 2016), during which I interacted with the TIM team of the LISBP (Laboratoire d'Ingénierie des Systèmes Biologiques et des Procédés, Toulouse, France) and found many common interests in our research. We therefore decided to work together on algal derived biofuels and my career plan is to establish myself as a permanent researcher in their team. Obtaining this fellowship represents a unique opportunity to take a first step towards this goal, and start working on these exciting topics.

Education and training

Location and dates	Years 2012-2014, Université Toulouse 3 – Paul Sabatier, Toulouse, France
Title of qualification awarded	PhD in Biophysics
Principal subjects/occupational skills covered	Use of nanobiotechnologies and especially atomic force microscopy to understand the mechanism of action of antimicrobial molecules on multidrug resistant microorganisms
Name of Institute	Laboratoire d'Analyse et d'Architecture des Systèmes du CNRS (LAAS-CNRS)

Location and dates	Years 2010-2011, Université Toulouse 3 – Paul Sabatier, Toulouse, France
Title of qualification awarded	Master degree in Bioengineering

Principal subjects/occupational skills covered	Molecular biotechnologies applied to health
Name of Institute	Université Toulouse 3 – Paul Sabatier

Work experience

Location and dates	Years 2015-2016, Université catholique de Louvain, Louvain-la-Neuve, Belgium
Occupation or position held	Chargé de Recherche du FNRS
Main activities and responsibilities	Leader of a research project on bacterial biofilms formation using nanobiotechnologies and specifically atomic force microscopy techniques
Name of employer	Fond National pour la Recherche Scientifique (FNRS)

Location and dates	January-July 2011, Institut des Technologies Avancées en sciences du Vivant (ITAV), Toulouse, France
Occupation or position held	Master student
Main activities and responsibilities	Use of atomic force microscopy to understand the mechanism of action of antibiotics on bacterial cells
Name of employer	Centre National pour la Recherche Scientifique (CNRS)

Location and dates	January-July 2010, Oz Biosciences, Marseille, France
Occupation or position held	Master student
Main activities and responsibilities	Development of strategies to transfect mammalian cells within 3D scaffolds
Name of employer	OZ Biosciences

Languages

Mother tongue(s)	french				
Other language(s)	Understanding		Speaking		Writing
European level (*)	Listening	Reading	Spoken interaction	Spoken production	
English	C2	C2	C2	C2	C2
Spanish	B1	B2	B1	B1	B2
	(*) Common European Framework of Reference for Languages http://europass.cedefop.europa.eu/en/resources/european-language-levels-cefr				

Academic Record

Publications	<p>Accepted, in press and published articles / papers:</p> <ol style="list-style-type: none"> Schiavone M.*, Formosa-Dague C.*, Elsztain C., Teste M. A., Martin-Yken H., Morais M. A., Dague E., François J. M. 2016. An Atomic Force Microscopy study of yeast response to ethanol stress. Appl Environ Microbiol, 82, 4789-4801, *co-first-author. Formosa-Dague C., Fu Z. H., Feuillie C., Derclaye S., Foster T. J., Geoghegan J. A., Dufrêne Y. F. 2016. Forces between Staphylococcus aureus and human skin. Nanoscale Horizons, 1, 298-303.
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3. Solopova A., **Formosa-Dague C.**, Courtin P., Furlan S., Veiga P., Armalyt A., Sadauskas M., Kok J., Hols P., Dufrêne Y. F., Kuipers O. P., Chapot-Chartier M. P., Kulakauskas S. 2016. Regulation of cell wall plasticity by nucleotide metabolism in *Lactococcus lactis*. *J Biol Chem*, 294:21, 11323-11336.
4. Smolyakov G., **Formosa-Dague C.**, Severac C., Duval R. E., Dague E. 2016. High speed indentation measures by FV, QI and QNM introduce a new understanding of bionanomechanical experiments. *Micron*, 85, 8-14.
5. **Formosa-Dague C.**, Feuillie C., Beaussart A., Derclaye S., Kucharikova S., Lasa I., Van Dijck P., Dufrêne Y. F. 2016. Binding forces of the staphylococcal polysaccharide intercellular adhesin. *ACS Nano*, 10:3, 3443-3452.
6. Pillet F., **Formosa-Dague C.**, Baaziz H., Dague E., Rols M. P. 2016. Cell wall as a target for bacteria inactivation by pulsed electric fields. *Sci Rep*, 6:19778.
7. **Formosa-Dague C.**, Speziale P., Foster T. J., Geoghegan J. A. Dufrêne Y. F. Zinc-dependent mechanical properties of *Staphylococcus aureus* biofilm-forming protein SasG. 2016. *Proc Nat Acad Sci USA*, 113:2, 410-415.
8. Herman-Bausier P., **Formosa-Dague C.**, Feuillie C. Valotteau C., Dufrêne Y. F. 2015. Forces guiding staphylococcal adhesion. *J. Struct Biol*.
9. Lachaize V., **Formosa C.**, Smolyakov G., Guilbeau-Frugier C., Galés C., Senard J. M., Dague E. Atomic Force Microscopy : an innovative technology to explore cardiomyocyte cell surface in cardiac physio/pathophysiology. 2015. *Lett Appl NanoBioSci*, 4:4, 321-334.
10. Liu R.*, **Formosa C.***, Dagkessamanskaia A., Dague E., François J. M., Martin-Yken H. Combining atomic force microscopy and genetics to investigate the role of knr4 in *Saccharomyces cerevisiae* sensitivity to k9 killer toxin. 2015. *Lett Appl NanoBioSci*, 2015, 4:4, 306-315, *co-first author.
11. **Formosa C.**, Herold M. Vidaillic C., Duval R. E., Dague E. Unraveling of a mechanism of resistance to colistin in *Klebsiella pneumonia* using Atomic Force Microscopy. 2015. *J Antimicrob Chemother*, 70:8, 2261-70.
12. **Formosa C.**, Pillet F., Schiavone M., Duval R. E., Ressler L., Dague E. 2015. Generating living cells arrays for Atomic Force Microscopy studies. *Nat Protoc*, 10:1, 199-204.
13. **Formosa C.**, Lachaize V., Galés C., Rols M. P., Martin-Yken H., François J. M., Duval R. E., Dague E. 2015. Mapping HA-tagged protein at the surface of living cells by Atomic Force Microscopy. *J Mol Recognit*, 28, 1-9.
14. **Formosa C.**, Schiavone M., Boisrame A., Richard M. L., Duval R. E., Dague E. 2015. Multiparametric imaging of adhesive nanodomains at the surface of *Candida albicans* by Atomic Force Microscopy. *Nanomedicine NBM*, 11, 57-65.
15. Schiavone M., Vax A., **Formosa C.**, Martin-Yken H., Dague E., François J. M. 2014. A combined chemical and enzymatic method to determine quantitatively the polysaccharide components in the cell wall of yeasts. *FEMS Yeast Res*, 14:6, 933-947.
16. Pillet F., Lemonier S., Schiavone M., **Formosa C.**, Martin-Yken H., François J. M., Dague E. 2014. Uncovering by Atomic Force Microscopy of an original circular structure at the yeast cell surface in response to heat shock. *BMC Biol*, 12:6.
17. Pillet F., Chopinet L., **Formosa C.**, Dague E. 2014. Atomic Force Microscopy and pharmacology; from microbiology to cancerology. *BBA-Gen Subjects*, 1840:3, 1028-1050.
18. Beauvais A., Bozza S., Kniemeyer O., **Formosa C.**, Balloy V., Henry C., Roberson R. W., Dague E., Chignard M., Brakhage A. A., Romani L., Latgé J. P. 2013. Deletion of the α 1,3 glucan synthase induces a restructuration of the conidial cell wall responsible for the avirulence of *Aspergillus fumigatus*. *Plos Path*, 9:11.
19. François J. M., **Formosa C.**, Schiavone M., Pillet F., Martin-Yken H., Dague E. 2013. Use of Atomic Force Microscopy (AFM) to explore cell wall properties and

	<p>response to stress in the yeast <i>Saccharomyces cerevisiae</i>. <i>Curr Genet</i>, 59, 187-196.</p> <p>20. Sapet C., Formosa C., Sicard F., Bertosio E., Zelphati O., Laurent N. 2013. 3D-fection: cell transfection within 3D scaffolds and hydrogels. <i>Ther Deliv</i>, 4:6, 673-685.</p> <p>21. Formosa C., Schiavone M., Martin-Yken H., François J. M., Duval R. E., Dague E. 2013. Nanoscale effects of Caspofungin against two yeasts species; <i>Saccharomyces cerevisiae</i> and <i>Candida albicans</i>. <i>Antimicrob Agents Ch</i>, 57, 3498-3506.</p> <p>22. Chopinet L.*, Formosa C.*, Rols M. P., Duval R. E., Dague E. 2013. Imaging living cells surface and quantifying its properties at high resolution using AFM in QI™ mode, <i>Micron</i>, 48, 26-33, *co-first author.</p> <p>23. Pillet F., Sanchez A., Formosa C., Séverac M., Trévisiol E., Bouet J. Y., Anton-Leberre V. 2013. Dendrimer functionalization of gold surface improves the measurements of protein-DNA interactions by surface plasmon resonance imaging, <i>Biosens Bioelectronics</i>, 43, 148-154.</p> <p>24. Formosa C., Grare M., Jauvert E., Coutable A., Regnouf-de-Vains J. B., Mourer M., Duval R. E., Dague E. 2012. Nanoscale analysis of the effects of antibiotics and CX1 on a <i>Pseudomonas aeruginosa</i> multidrug-resistant strain, <i>Sci Rep</i>, 2, 575.</p> <p>25. Formosa C., Grare M., Duval R. E., Dague E. 2012. Nanoscale effects of antibiotics on <i>P. aeruginosa</i>, <i>Nanomedicine NBM</i>, 8,12-16.</p> <p>My H-index of October 2016 is of 10 and my articles were cited 244 times (Google Scholar).</p>
	<p>Submitted publications:</p> <p>1. Feuillie C.*, Formosa-Dague C.*, Hays M. C. L.*, Vervaeck O., Derclaye S., Brennan M., Foster T. J., Geoghegan J., Dufrêne Y. F. Biofilm accumulation by the staphylococcal protein SdrC: molecular mechanism and inhibition. Submitted to <i>Proc Nat Acad Sci USA</i>. *co-first author</p>
<p>Presentations as invited speaker</p>	<p>1. Formosa C., Duval R.E., Dague E. Understanding the mechanism of action of antimicrobial molecules using atomic force microscopy, <i>Colloque de la Société Française de Microscopie (SFμ)</i>, 2015, Nice, France</p>
<p>Authored books or book chapter(s)</p>	<p>1. Formosa C., Dague E. Imaging living yeasts cells and quantifying their biophysical properties by Atomic Force Microscopy. In: Dahms T. (editor), <i>Advanced Microscopy in Mycology</i>, Springer, 2015.</p>
<p>Graduate teaching as lecturer or training coordinator</p>	<p>1. Master degree in Bioengineering: “Atomic force microscopy in microbiology”, 2 hours in 2015 and 2016, Université catholique de Louvain, Louvain-la-Neuve, Belgium.</p> <p>2. Teachers of University of Toulouse: Animator of practical courses on TICE (Information and Communication Technologies for Teaching). The goal is to help teachers make their courses available online for students, thanks to ScenariOpale software. 64 hours in 2013-2014, Toulouse, France</p> <p>3. Master degree in Bioengineering: “Atomic Force Microscopy in Biology”, 2 hours in 2012, 2013, and 2014. Master students of the University Paul Sabatier, Toulouse, France</p> <p>4. Conference 6th ITC (Imaging The Cell): Practical courses on “Atomic Force Microscopy to probe live bacteria”. 3x7 hours, June 6-8 2012, Toulouse, France</p> <p>5. Master degree in Biochemistry: Practical course on “Atomic Force Microscopy</p>

	for the study of live microorganisms”, 2x7 hours in 2011, 2013 and 2014. Master students of Engineering school of INSA (Institut National des Sciences Appliquées), Toulouse, France
Awards and prizes, if any	<ol style="list-style-type: none"> 1. Direction Générale de l’Armement (DGA) PhD award: obtained for presenting the best PhD funded by the DGA. 2. American Society for Microbiology (ASM) travel grant: to attend the 7th ASM Biofilms conference in Chicago, IL, USA, October 2015. 3. SANOFI award: from the Académie des Sciences Inscriptions et Belles Lettres de Toulouse, obtained for presenting the best thesis in biology-health with concrete applications. 4. Pierre Favard Award: from the Société Française de Microscopie (SFμ), obtained for presenting the best PhD thesis in living sciences which principal tool is a microscopy technique. 5. George McCracken Infectious Disease Fellow Award: from the American Society for Microbiology, travel grant to attend the Interscience Conference on Antimicrobial Agents and Chemotherapy (ICAAC) in Denver, CO, USA, in 2013.

Collaboration and Networking

Participation in collaborative projects funded by competitive programmes	My PhD was co-funded by the ANR project AFMYST ANR-11-JSV5-001-01 n°SD 30024331 coordinated by Dr. Etienne Dague in 2012-2014. My application was part of the proposal.
University or post-graduate programme leader	none
Graduate teaching as lecturer or training coordinator; PhD supervision	Supervision of master students during the academic year 2015-2016: <ul style="list-style-type: none"> • Ophélie Vervaeck on the subject “Nanoscale adhesion and inhibition of the staphylococcal adhesion protein SdrC” • Zhuo-Han Fu on the subject “Studying the interaction mechanism of Staphylococcus aureus with human skin cells using atomic force microscopy”
Membership of professional bodies and committees	none

Scientific References

Full name	Prof. Raphaël Emmanuel Duval
Position	Professor
Institution	SRSMC-CNRS, Université de Lorraine, France
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Full name	Prof. Pascal Guiraud
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How did you hear about AgreenSkills programmes?

	I first heard of AgreenSkills ⁺ programme thanks to a colleague at UCL, Louvain-la-Neuve, Belgium.
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