

PERSONAL INFORMATION

Family name, First name: Estevez-Torres, André
ORCID identifier: [0000-0002-5040-1369](https://orcid.org/0000-0002-5040-1369)
Date of birth: 11/11/1980
Nationality: Spanish
Web site: <http://www.labos.upmc.fr/ljp/?article13>
Profession: Junior researcher at CNRS and Sorbonne Université, Paris, France

RESEARCH POSITIONS

2015–present **Group leader at Lab. Jean Perrin, CNRS and Sorbonne Université, Paris, France**
2010–2015 *Tenured researcher* at Lab. for photonics and nanostructures, CNRS, Marcoussis, France
2008–2010 *Post-doctoral fellow* at Dept. of Physics, Princeton University, USA. Advisor: R. H. Austin
2007–2008 *Post-doctoral fellow* at Dept. of Physics, Kyoto University, Japan. Advisor: K. Yoshikawa
2003–2007 *Grad. student* at Dept. of Chemistry, Ecole normale supérieure, France. Advisor: L. Jullien

EDUCATION

2007 PhD in Physical and Analytical Chemistry, Université Pierre et Marie Curie (UPMC), Paris, France
2003 Masters in Physical Chemistry, UPMC, Paris, France. Ranked 1st
2000-2002 Double degree in Chemistry and Physics, UPMC and Ecole normale supérieure, France

FELLOWSHIPS

2008–2010 King Abdullah University of Science and Technology postdoctoral fellowship
2007–2008 Japan Science and Technology Agency invited researcher
2004–2007 French Research Ministry PhD fellowship
2000-2004 École normale supérieure undergraduate fellowship

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2017–present	M. Van Der Hofstadt Serrano, <i>post-doc</i>
2017–present	G. Urtel, <i>post-doc</i>
2016–present	A. Senoussi, <i>PhD student</i> in 1st year
2013–2016	A. Zambrano, <i>PhD student</i> , now postdoc at MPI Dresden, Germany. Direction de thèse avec dérogation d'HDR.
2013–2016	J. Lee Tin Wah, <i>post-doc</i> , now at the start-up BlackHole Lab, Paris, France
2013–2016	A. Zadorin, <i>post-doc</i> , now postdoc at ESPCI, Paris, France
2010–2013	A.-C. Louer, <i>PhD student</i> , co-supervised, now at start-up Klearia, Marcoussis, France
2010–present	8 Master students. All at CNRS Marcoussis and Paris, France

TEACHING ACTIVITIES

2016–Present	60h/year in Chemistry, Nanotechnology and Physics at Ecole normale supérieure, Ecole Nationale de techniques avancées and UPMC, France.
2010–2016	30h/year in Chemistry and Nanotechnology at Ecole normale supérieure and Ecole Nationale de techniques avancées, France.

ORGANISATION OF SCIENTIFIC MEETINGS

Aug 2016	Colloquium on "Research and technological developments using DNA and RNA: algorithmic materials for self-assembly and self-organization", Bordeaux, France (co-organizer).
Dec 2015	International colloquium "Why living matter is worth its conceptual and synthetic challenge", Paris, France (co-organizer).

INSTITUTIONAL RESPONSIBILITIES

2013-present	3 Assist. professor selection committees at Univ. Grenoble-Alpes, UPMC, Univ. d'Evry, France.
2013-present	2 PhD defense committees at UPMC, Université Paris Descartes, France. 1 PhD advisory committee at UPMC.
2011-2013	Chemistry oral examiner at the prestigious entrance exam of Ecole normale supérieure, Paris, France.
2004-present	Organiser of internal seminars at : Lab. Jean Perrin (2015-present), Biophysics journal club at Kyoto University (2007-2008), Chemistry PhD seminar at ENS Paris (2004-2006).

COMMISSIONS OF TRUST

- 2013-present Program committee member of the international Conference in DNA computing and molecular programming (major conference in the field).
- 2010-present Reviewer for: *JACS*, *Nature Phys.*, *Nature Chemistry*, *Nature Comm.*, *Biomicrofluidics*, *Biomacromolecules*, *Eur. Phys. J.*, *RSC advances*, *ACS Synth. Biol.*, *NanoToday*, *Natural Computing*
- 2011-present Grant evaluator: national research agency (ANR, 2), Grenoble region (2), ESPCI start-up incubator (2), French minister of education (1), Israel Science Foundation (1), MI CNRS (1)

OBTAINED GRANTS

- 2018-2023 ERC Consolidator grant, "Metabolic soft matter with life-like properties", coordinator. 1.9 M€.
- 2018-2020 Marie Curie Individual Postdoctoral Fellowship, "Self-organized biomolecular gradients for controlling cellular behaviour in cell culture", Host of M. Van Der. 170 k€.
- 2017-2020 City of Paris Emergence program, "Artificial morphogenesis in a DNA-based molecular system", coordinator. 163 k€.
- 2013-2016 FP7-ICT FET Open Objective, "Programming cellular networks and community behaviour with synthetic RNA-based devices", *Ribonets*, coordinator of a WP. 300 k€.
- 2012-2016 French ANR young researchers grant, "Dynamic nanotechnology: Synthetic oscillators using DNA reaction networks within microfluidic reactors", *Dynano*, coordinator. 280 k€.

Other grants: (2012-2013) G3N CNRS, participant, 15 k€. (2012-2013) Cooperative project PRES UniverSud *Microscila*, participant, 20 k€. (2013-2014) Labex nanosacly emergence *Turnano*, coordinator, 50 k€. (2012-2013) C'nano Ile-de-France *Enginets*, coordinator, 50 k€. (2010-2012) Triangle de la physique *Microgradients*, coordinator, 30 k€.

MAJOR COLLABORATIONS

- J.-C. Galas, Morphogenetic materials, Lab. Jean Perrin, CNRS, Paris, France.
- Y. Rondelez, DNA active solutions, Inst. of Industrial Sciences, U.Tokyo, Japan and ESPCI, France.
- T. de Greef, DNA active solutions, Dept. biomedical engineering, T. U. Eindhoven, Netherlands.
- S. Findeiss, RNA synthetic biology, Institute for Theoretical Chemistry, U. Vienna, Austria.
- I. Axmann, RNA synthetic biology, Dept. of Biochemistry, U. Dusseldorf, Germany.
- D. Baigl, DNA nanotechnology, Dept. of Chemistry, Ecole normale supérieure, Paris, France.
- D. Woods, molecular programming, INRIA, Paris, France.
- Y. Shimizu, RNA synthetic biology, Riken, Osaka, Japan.
- A. Jaramillo, RNA synthetic biology, Dept. of Synthetic Biology, U. of Warwick, UK.
- L. Roques, Mathematics of reaction-diffusion, Dept. of Applied Mathematics, INRA, Avignon, France.
- R. Voituriez, Active matter, Lab. Jean Perrin, CNRS, Paris, France.
- A. Prevost and E. Wandersman, Mechanics of soft matter, Lab. Jean Perrin, CNRS, Paris, France.
- F. Robin, Actin dynamics, Lab. de Biologie du développement, IBPS, Sorbonne Université, Paris, France.

1 Peer-reviewed publications

*= Corresponding author, PhD = with PhD advisor

1. A. Senoussi, J. Lee Tin Wah, Y. Shimizu, J. Robert, A. Jaramillo, S. Findeiss, I. M. Axmann, **A. Estevez-Torres***, "Quantitative characterization of translational riboregulators using an in vitro transcription-translation system", *ACS Synth. Biol.*, **2018**. bioRxiv:10.1101/290403.
2. Estevez-Torres A, Rondelez Y, Spatially localized DNA domino. *Nature nanotech.*, 12:842 **2017**. News and views.
3. A. Zadorin, Y. Rondelez, G. Gines, V. Dilhas, A. Zambrano, J.-C. Galas, **A. Estevez-Torres***, "Synthesis and materialization of a reaction-diffusion French flag pattern", *Nat. Chem.*, 9: 990, **2017**. arXiv:1701.06527, Major work
4. G. Gines, A. Zadorin, J.-C Galas, T. Fujii, **A. Estevez-Torres**, Y. Rondelez, "Microscopic agents programmed by DNA circuits", *Nature nano*, 12: 351-359, **2017**.
5. Lee Tin Wah J, David C, Rudiuk S, Baigl D, **Estevez-Torres A*** "Observing and controlling the folding pathway of DNA origami at the nanoscale". *ACS Nano* 10(2):1978-1987, **2016** (2 cites). Major work
6. Estevez-Torres A, "The expressionist movement" *Nature Physics*, 11, 992-993, **2015**. News and views.
7. Zambrano A, Zadorin AS, Rondelez Y, **Estevez-Torres A***, Galas JC, "Pursuit-and-evasion reaction-diffusion waves in microreactors with tailored geometry" *J. Phys. Chem. B*, 119(17):5349-5355, **2015** (0 cites).
8. Zadorin AS, Rondelez Y, Galas J-C, **Estevez-Torres A***, "Synthesis of programmable reaction-diffusion fronts using DNA catalyzers" *Phys. Rev. Lett.*, **2015**. Highlighted in *Physics*, *Chemistry World* and *Nature nanotechnology* (11 cites). Major work
9. H. W. H. van Roekel, L. H. H. Meijer, Zandra C. F. Garza, S. Masroor, **A. Estévez-Torres**, Y. Rondelez, A. Zagaris, M. A. Peletier, P. A. J. Hilbers, T. F. A. de Greef, "Automated Design of Programmable Enzyme-Driven DNA Circuits", *ACS Synth. Biol.*, 10.1021/sb500300d, **2014**.
10. A. Padirac, T. Fujii, **A. Estévez-Torres***, Y. Rondelez, "Spatial waves in synthetic biochemical networks", *J. Am. Chem. Soc.*, 10.1021/ja403584p, **2013**. *Journal cover* (27 cites). Major work
11. A.-C. Louër, A. Plecis, A. Pallandre, J.-C. Galas, **A. Estevez-Torres**, A.-M. Haghiri-Gosnet, "Pressure-Assisted Selective Preconcentration in a Straight Nanochannel", *Anal. Chem.*, 10.1021/ac4016159, **2013**.
12. Hasatani, K.; Leocmach, M.; Genot, A. J.; **Estevez-Torres, A.**; Fujii, T.; Rondelez, Y., "High-throughput and long-term observation of compartmentalized biochemical oscillators" *Chem. Commun.* 49, 8090-8092, **2013** (10 cites).
13. J.-C. Galas, A.-M. Haghiri-Gosnet, **A. Estévez-Torres***, "A nanoliter-scale open chemical reactor", *Lab Chip*, 11, 415-423, **2013** (9 cites).
14. **A. Estévez-Torres**, D. Baigl, "DNA compaction: fundamentals and applications", *Soft matter*, **2011** (61 cites).
15. L. Liu, K. Louthereback, D. Liao, D. Yeater, G. Lambert, **A. Estévez-Torres**, J.C. Sturm, R.H. Getzenberg, R.H. Austin, "A microfluidic device for continuous cancer cell culture and passages with hydrodynamic forces", *Lab Chip*, 10, 1807-1813, **2010** (21 cites).
16. **A. Estévez-Torres**, C. Crozatier, A. Diguët, T. Hara, H. Saito, K. Yoshikawa, D. Baigl, "Sequence-independent and reversible photocontrol of transcription/expression systems using

- a photosensitive nucleic acid binder”, *Proc. Natl. Acad. Sci. USA*, *106*, 12219–12223, **2009** (37 cites).
17. **A. Estévez-Torres**, T. Le Saux, C. Gosse, A. Lemarchand, A. Bourdoncle, L. Jullien, ”Fourier transform to analyse the reaction diffusion dynamics in a microsystem”, *Lab Chip*, *7*, 1205–1209, **2008**. **PhD**
 18. M. Sollogoub, S. Guieu, M. Geoffroy, A. Yamada, **A. Estévez-Torres**, K. Yoshikawa, D. Baigl, ”Photocontrol of single-chain DNA conformation in cell-mimicking micro-compartments”, *Chem-BioChem*, *9*, 1201–1206, **2008**.
 19. A. Bourdoncle, **A. Estévez Torres**, C. Gosse, L. Lacroix, P. Vekhoff, T. Le Saux, L. Jullien, J.-L. Mergny, ”Quadruplex-based molecular beacons as tunable DNA probes”, *J. Am. Chem. Soc.*, *128*, 11094–11105, **2006** (85 cites). **PhD**
 20. D. Alcor, J.-F. Allemand, I. Aujard, J.-B. Baudin, C. Benbrahim, S. Charier, E. Cogné-Laage, V. Croquette, **A. Estévez Torres**, F. Ferrage, L. Jullien, A. Kononov, A. Lemarchand, H. Lemarchand, O. Ruel, ”Assembly of modules from chemistry and supramolecular chemistry : From engineering of complexity to high-performance chromatography”, *Russ. Chem. Bull.*, *53*, 1379–1384, **2004**. **PhD**

2 Peer-reviewed proceedings in international conferences

1. **A. Estévez-Torres**, L. Mzali, A. Kalley, A. Zadorin, Y. Rondelez, J.-C. Galas, ”Microfluidics to explore the spatial behavior of synthetic biochemical networks”, *Proceedings of the 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2013)*.
2. A. Padirac, **A. Estévez-Torres**, T. Fujii, Y. Rondelez, ”DNA-based molecular ecosystem on a chip”, *Proceedings of the 16th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2012)*, p.121-123.
3. J.-C. Galas, **A. Estévez-Torres**, (2012), ”A chemical oscillator in a nano?liter scale microfluidic open reactor”, *Proceedings of the 16th International Conference on Miniaturized Systems for Chemistry and Life Sciences (μ TAS 2012)*, p. 608-610.
4. **A. Estévez-Torres**, T. Le Saux, H. Berthoumieux, A. Georges, S. Fernandez, J.-F. Allemand, V. Croquette, A. Lemarchand, L. Jullien, C. Gosse, ”Point mutation detection by on-chip diffusion coefficients measurement”, in, *Proc. of μ TAS*, J.-L. Viovy, P. Tabeling, S. Descroix, and L. Malaquin (Eds), *1*, 236–238, **2007**.
5. **Estevez Torres A**, Jullien L, & Lemarchand A (2005) ”Stochastic resonances and highly selective separation methods: Application to the detection of DNA mutations”. *Noise and Fluctuations*, eds Gonzalez T, Mateos J, & Pardo D, pp 639-642.

3 Invited talks to national and international conferences

- June 2017, *Synthesis of spatio-temporal structures with DNA molecular programs*.
Workshop on Dynamics, Thermodynamics, and Information Processing
in Chemical Networks, Luxembourg, Luxembourg.
- February 2017 *Synthesis of spatio-temporal structures with DNA molecular programs*.
COST group meeting: ”Systems chemistry in Paris”, Paris, France.

- June 2016 *Synthesis of a reaction-diffusion French flag pattern.* 2nd Conference of the french research group on synthetic biology, Bordeaux, France.
- April 2016 *Controlling molecular organization across scales: from DNA origami folding to pattern formation.* 13th Annual Conference on "Foundations of nanoscience: self-assembled architectures and devices", Snowbird, UT, USA.
- June 2015 *Writing down reaction-diffusion equations with DNA.* 8th International Conference "Engineering of Chemical Complexity", Munich, Germany.
- April 2015 *Writing down reaction-diffusion equations with DNA.* Journée "Prise en compte de la génétique dans les modèles démographiques", Avignon, France.
- January 2015 *Out-of-equilibrium pattern formation with synthetic biochemical networks.* Journées de Physique Statistique 2015, Paris, France.
- February 2014 *DNA-based chemical waves and patterns.* SFB "Nanoagents for the spatiotemporal control of molecular and cellular reactions" retreat, Frauenchiemsee, Germany.
- February 2013 *DNA computing.* French-Japanese workshop in bioinspired methods and applications, Tokyo, Japan.
- September 2011 *Engineering reaction networks outside the cell: reactions and reactors.* 3rd Workshop on Stochasticity in Biochemical Reaction Networks, Banff, Canada.

4 Oral presentations in conferences and workshops

- November 2017 *Morphogenetic matter made of DNA.* Systèmes et Matière Complexes ? deuxième édition, Cachan, France.
- June 2017, *Characterization of translational riboregulators in an in vitro transcription- translation system,* RiboNets workshop: From RNA tools and networks towards future applications, Schloss Mickeln, Duesseldorf, Germany.
- August 2016 *Material morphogenesis with DNA.* 15ème Journées de la Matière Condensée, Bordeaux, France.
- July 2015 *In vitro approaches to investigate RNA riboregulators.* Ribonets workshop, Vienna, Austria.
- July 2014 *DNA-based reaction-diffusion waves of tunable velocity.* Oscillations & dynamic instabilities in chemical systems Gordon conference, Girona, Spain.
- September 2013 *DNA computing goes spatial.* 19th conference on DNA computing and molecular programming, Phoenix, USA.
- May 2011 *Engineering reaction networks outside the cell: reactions and reactors.* CNRS microfluidics workshop, Lyon.
- March 2010 *Sedimentation-driven selection of lipid-producing microalgae* APS March meeting, Portland, Oregon.
- May 2007 *Point mutation detection by on-chip diffusion coefficient measurement.* Réunion du Réseau Microfluidique et Microsystèmes Fluidiques, Paris, France.
- September 2005 *A highly selective separation method for detecting DNA mutations.* 8èmes Journées francophones de jeunes physicochimistes, Marly Le Roi, France.
- September 2005 *Stochastic resonances and highly selective separation methods.* 18th International conference on noise and fluctuations, Salamanca, Spain.

April 2004 *Kinetic DNA chips: Using fluctuations of a chemical system for controlling movement at the molecular level.* Frühjahrssymposium 2004, Heidelberg, Germany.

5 Invited seminars

March 2018 *Synthesis of spatio-temporal structures with DNA molecular programs,* Seminar at Institut parisien de chimie moléculaire, Sorbonne Université, Paris, France.

January 2018 *Synthesis of spatio-temporal structures with DNA molecular programs,* Seminar at Laboratoire Gulliver, ESPCI, Paris, France.

May 2017 *Emulating French flag patterning with synthetic biochemical solutions,* Seminar at Laboratoire de biologie du développement, IBPS, UPMC, Paris, France.

April 2017 *Synthetic biology outside of cells,* Seminar at A. Jaramillo group, Dept; of life sciences, Warwick University, Warwick, UK.

November 2016 *Synthesis of spatio-temporal structures with DNA molecular programs ,* Seminar at Institut Charles Sadron, Strasbourg, France.

June 2015 *Self-organization of synthetic biochemical networks within microfluidic devices.* Journées CR1 de l'INC du CNRS, Paris, France.

March 2015 *Self-organization of synthetic biochemical networks within microfluidic devices.* Seminar at Institut Pierre Gilles de Gennes, Paris, France.

October 2014 *Self-organization of synthetic biochemical networks.* Seminar at Department of applied physics, Universidad de Santiago de Compostela, Spain.

October 2014 *Synthesis of spatio-temporal structures with biochemical reaction networks.* Séminaire de chimie autour des nanosciences, ITODYS, Université Paris Diderot, Paris, France.

September 2014 *Programming reaction-diffusion spatio-temporal patterns with DNA.* Seminar at Groupe de travail Complexité et Algorithmes, LIAFA, Université Paris Diderot, Paris, France.

April 2014 *Self-organization of synthetic biochemical networks within microfluidic devices.* Seminar at Laboratoire Jean Perrin, Université Pierre et Marie Curie, Paris, France.

March 2014 *Self-organization in reaction-diffusion systems.* Groupe de travail sur les Origines de la vie au Laboratoire Jean Perrin, Université Pierre et Marie Curie, Paris, France.

February 2014 *DNA-based chemical waves and patterns.* Seminar at Technical University Munich, Munich, Germany.

January 2013 *Molecular choreography.* Seminar at Institute of Physics, Chinese academy of sciences, Beijing, China.

July 2012 *Molecular choreography.* Seminar at Laboratory for theoretical biology, Charité University, Berlin, France.

July 2012 *Molecular choreography.* Seminar at Laboratoire d'optique et biologie, Ecole polytechnique, Palaiseau, France.

May 2012 *Molecular choreography.* Seminar at Institut d'électronique, de microélectronique et de nanotechnologie, Villeneuve d'Ascq, France.

May 2011 *Engineering reaction networks outside the cell: reactions and reactors.* Seminar at Laboratoire de physique des solides, Université Paris sud, Orsay.

May 2011 *Engineering reaction networks outside the cell: reactions and reactors.* Biophysics seminar, Ecole normale supérieure, Paris.

- Novembre 2010 *Synthetic epigenetics: Sequence-independent photocontrol of gene expression in vitro.* Seminaire au LIMMS, Institute of Industrial Sciences, Université de Tokyo.
- Novembre 2010 *Synthetic epigenetics: Sequence-independent photocontrol of gene expression in vitro.* Seminaire ICORP à l'Université de Kyoto.
- Octobre 2010 *Synthetic epigenetics: Sequence-independent photocontrol of gene expression in vitro.* Seminaire à l'Institut Joliot-Curie. Ecole normale supérieure de Lyon.
- Novembre 2007 *DNA separation and analysis in microsystems: Towards new genotyping technologies?* Seminar at Prof. K. Takeyasu research group. Graduate School of Biostudies, Kyoto University.
- Juillet 2007 *An electrophoretic microlaboratory to study the coupling between transport and chemical kinetics.* Seminar at Prof. J. Cate research group. Department of Chemistry, University of California Berkeley.
- Juillet 2007 *An electrophoretic microlaboratory to study the coupling between transport and chemical kinetics.* Seminar at Prof. R. H. Austin research group. Department of Physics, Princeton University.
- Avril 2007 *Continuous diffusion coefficient measurement in an electrophoresis chip.* Seminar of the Department of Physical Chemistry, Universidad de Barcelona, Spain.
- Mars 2007 *Continuous diffusion coefficient measurement in an electrophoresis chip.* Seminar of the Laboratory of Future, CNRS Rhodia, Bordeaux, France.
- Septembre 2005 *Studying DNA diffusion by fluorescence microscopy.* Seminar of the Environmental Sciences Department, Universidad de Castilla la Mancha, Toledo, Spain.
- Septembre 2005 *A separation method based on diffusion.* Seminar of the Analytical Chemistry Department, Universidad de Alcalá de Henares, Spain.

6 Other attended conferences

- November 2017 Workshop on Molecular programming experiments and theory, Florence, Italy.
- June 2014 Workshop on Mathematics and its applications to complex phenomena arising in biology, chemistry and medicine, Luminy, France.
- October 2013 μ TAS 2013, Freiburg, Germany.
- August 2012 18th International Conference on DNA Computing and Molecular Programming, Aarhus, Denmark.
- July 2012 Microfluidics 2012, Heidelberg, Germany.
- May 2011 Physics and biological systems 2011, Orsay, France.
- Mai 2009 Evolution: the molecular landscape, 74th Cold Spring Harbor Symposium on Quantitative Biology, Cold Spring Harbor, NY.
- Avril 2008 ESF-UB Conference in systems biology, Sant Feliu de Guixols, Spain.
- Juillet 2007 4th Gordon research conference on physics and chemistry of microfluidics, Waterville Valley, New Hampshire.
- Octobre 2006 Journées nationales en nanosciences et nanotechnologies, Besançon, France.
- Juillet 2005 Bio-Image summer school, Paris, France.
- Septembre 2003 8th International summer school on biophysics: supramolecular structure and function, Rovinj, Croatia.