

# Loïc Lemiègre

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French  
Date of Birth : June, 7, 1976  
Married, 1 son  
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## Associate Professor of Organic Chemistry

### TEACHING & ADMINISTRATIVE EXPERIENCES

#### Teaching courses :

Organic chemistry (24h) + Teaching lab (150h)  
Spectroscopy (NMR, MS) (19h)  
Nanoobjects (4h)

#### Administrative :

Responsibility of the Quality Management (ISO 9001) for the teaching process at the ENSCR (2012- )  
Member of the board of directors of the ENSCR (2014- )  
Member of the Laboratory board (UMR CNRS 6226) (2011- )  
Responsibility of teaching lab of organic chemistry/biochemistry (2008- )  
Member of *Conseil National des Universités* (CNU Section 32) (2011-2015)  
Responsibility of the *Olympiades de la Chimie en Bretagne* (2011-2015)  
Member of the scientific committee of the ENSCR (2011-2014)  
Member of the evaluation committee of *Bretagne Valorisation* (2008-2011)

#### Symposium organization :

- Member of the organizing committee of the "Liquid Cristal French Colloquium"  
(CFCL-Rennes) Septembre 2011  
- Member of the organizing committee of the SIGMA-ALDRICH Symposium for Young Chemists  
2001 (SAJEC-Val de Reuil) October 16-18<sup>th</sup> 2001

### RESEARCH EXPERIENCES

- 2010 **Habilitation à Diriger des Recherches**  
*Research topics:* Synthesis and supramolecular self-assembly
- 2005-current **Associate Professor at the Ecole Nationale Supérieure de Chimie de Rennes (ENSCR)**  
*Research topics:* Synthesis of glycolipids and supramolecular assembly  
Carbohydrate chemistry  
Scientific leader of the **ANR JCJC StereoArchaea** (2009-2012)
- 2004-2005 Post-doctoral position in the **Jonathan Clayden's group** (The University of Manchester)  
*16 months* Subject: Stereochemical relay through oligoureas
- 2002-2004 JSPS - Post-doctoral fellow in the **Eiichi Nakamura's group** (The University of Tokyo)  
*16 months* Subject: Synthesis of amino-fullerene derivatives for gene delivery
- 1999-2002 Ph.D. in organic chemistry (University of Rouen) at the Institute of Research in Fine Organic  
*3 years* Chemistry (IRCOF-Rouen)  
Synthesis of carbasugars by diastereo and enantioselective intramolecular Diels-Alder reaction  
Supervisors: **Jacques Maddaluno** and Jean-Claude Combret

### OTHER QUALIFICATIONS

*Languages:* French: Mother language; English: Fluent; Japanese: Basic

## **ARTICLES, PATENTS, BOOK CHAPTERS**

### **Book Chapters**

2. Benvegny, T.; Lemiègre, L.; Ballet, C.; Portier, Y.; Plusquellec, D. **Glycolipid-based nanosystems for the delivery of drugs, genes and vaccine adjuvant applications**. In *Carbohydrate Chemistry: Volume 40*; The Royal Society of Chemistry: 2014; Vol. 40, p 341.

1. Benvegny, T.; Plusquellec, D.; Lemiègre, L. **Surfactants from Renewable Sources: Synthesis and Applications**. In *Monomers, Polymers and Composites from Renewable Resources*, Belgacem, M. N.; Gandini, A., Eds. Elsevier Limited: Amsterdam, 2008; ISBN-13: 978-0-08-045316-3.

### **Patents**

#### **4. Nouvelle composition émulsionnante à caractère cationique**

Benvegny, T.; Pérusse, D.; Lemiègre, L.; Guilbot, J.; Rolland, H. FR201361770

#### **3. C-Glycoside compounds, and method for preparing C-glycoside compounds**

Ranoux, A.; Lemiègre, L.; Benvegny, T. WO2010052314

#### **2. Thinners for aqueous suspensions of mineral particles and hydraulic binder pastes**

Maitrasse, P.; Pellerin, B.; Leising, F.; Olivi, N.; Noiret, N.; Lemiègre, L. WO2010112775

#### **1. Method for producing aminated fullerene**

Nakamura, E.; Isobe, H.; Lemiègre, L. JP2006199674

### **Articles**

#### **2015**

35. **Synthesis and characterisation of bio-based polyester materials from vegetable oil and short to long chain dicarboxylic acids**

Gobin, M.; Loulergue, P.; Audic, J.-L.; Lemiègre, L. *Industrial Crops and Products* 2015, 70, 213-220.

#### **2014**

34. **Modification of bipolar lipid conformation at the air/water interface by a single stereochemical variation**

Terme, N.; Jacquemet, A.; Benvegny, T.; Vié, V.; Lemiègre, L. *Chemistry and Physics of Lipids* 2014, 183, 9-17.

33. **Thermal and Mechanical Properties of a Polyhydroxyalkanoate Plasticized with Biobased Epoxidized Broccoli Oil**

Audic, J.-L.; Lemiègre, L.; Corre, Y.-M. *J. Appl. Polym. Sci.* 2014, 131, 10.1002/app.39983.

32. **Effects of a Novel Archaeal Tetraether-Based Colipid on the In Vivo Gene Transfer Activity of Two Cationic Amphiphiles**

Le Gall, T.; Barbeau, J.; Barrier, S.; Berchel, M.; Lemiègre, L.; Jeftić, J.; Meriadec, C.; Artzner, F.; Gill, D. R.; Hyde, S. C.; Férec, C.; Lehn, P.; Jaffrès, P.-A.; Benvegny, T.; Montier, T. *Molecular Pharmaceutics* 2014, 11, 2973-2988.

#### **2013**

31. **Collapsed Bipolar Glycolipids at the Air/Water Interface: Effect of the Stereochemistry on the Stretched/Bent Conformations**

Jacquemet, A.; Terme, N.; Benvegny, T.; Vié, V.; Lemiègre, L. *Journal of Colloid and Interface Science* 2013, 412, 72-81.

30. **Applications of Extremophilic Archaeal Lipids in the Field of Nanocarriers for Oral/Topical Drug Delivery (review)**

Benvegny, T.; Lemiègre, L.; Dalençon, S.; Jeftić J., *Current Biotechnology* 2013, in press.

29. **Folate-equipped nanolipoplexes mediated efficient gene transfer into human epithelial cells**

Mornet, E.; Carmoy, N.; Lainé, C.; Lemiègre, L.; Le Gall, T.; Laurent, I.; Marianowski, R.; Férec, C.; Lehn, P.; Benvegny, T.; Montier, T., *International Journal of Molecular Sciences* 2013, 14, 1477-1501.

#### **2012**

28. **Stereochemical effect revealed in self-assemblies based on archaeal lipid analogues bearing a central five-membered carbocycles: A SAXS study**

Jacquemet, A.; Mériadec, C.; Lemiègre, L.; Artzner, F.; Benvegny, T., *Langmuir* 2012, 28, 7591-7597.

## 2011

### 27. *How the Stereochemistry of a Central Cyclopentyl Ring Influences the Self-Assembling Properties of Archaeal Lipid Analogues: Synthesis and CryoTEM Observations*

Jacquemet, A.; Lemiègre, L.; Lambert, O.; Benvegno, T., *Journal of Organic Chemistry* **2011**, 76, 9738-9747.

## 2010

### 26. *Air/water interface study of cyclopentane-containing archaeal bipolar lipid analogues*

Jacquemet, A.; Vié, V.; Lemiègre, L.; Barbeau, J.; Benvegno, T., *Chemistry and Physics of Lipids* **2010**, 163, 794-799.

### 25. *Synthesis and evaluation of C-glycosides as hydrotropes and solubilizing agents*

Ranoux, A.; Lemiègre, L.; Benvegno, T., *Science in China Serie B: Chemistry* **2010**, 53, 1957-1962.

### 24. *Horner-Wadsworth-Emmons reaction from unprotected sugars in water or without any solvent: One step access to C-glycoside amphiphiles*

Ranoux, A.; Lemiègre, L.; Benoit, M.; Guégan, J.-P.; Benvegno, T., *European Journal of Organic Chemistry* **2010**, 1314-1323.

## 2009

### 23. *Supramolecular structures based on new bolaamphiphile molecules investigated by Small and Wide Angle X-ray Scattering and Polarised Optical Microscopy*

Berchel, M.; Mériadec, C.; Lemiègre, L.; Artzner, F.; Jeftić, J.; Benvegno, T., *The Journal of Physical Chemistry B* **2009**, 113, 15433-15444.

### 22. *New Generation of Liposomes Called Archaeosomes Based on Natural or Synthetic Archaeal Lipids as Innovative Formulations for Drug Delivery. (review)*

Benvegno, T.; Lemiègre, L.; Cammas-Marion, S. *Recent Patents on Drug Delivery & Formulation* **2009**, 3, 206-220.

### 21. *Archaeal tetraether bipolar lipids: structures, functions and applications. (review)*

Jacquemet, A.; Barbeau, J.; Lemiègre, L.; Benvegno, T., *Biochimie* **2009**, 91, 711-717.

### 20. *Regioselective synthesis of folic acid conjugates from diether-type archaeal lipid analogues*

Lainé, C.; Mocquet, C.; Lemiègre, L.; Benvegno, T., *Tetrahedron* **2009**, 65, 1455-1460.

## 2008

### 19. *Desymmetrization of a meso allylic acetal by enantioselective conjugate elimination.*

Xu, L.; Regnier, T.; Lemiègre, L.; Cardinael, P.; Combret, J.-C.; Bouillon, J.-P.; Blanchet, J.; Rouden, J.; Harrison-Marchand, A.; Maddaluno, J., *Organic Letters* **2008**, 10, 729-732.

### 18. *Folate-equipped Pegylated Archaeal Lipid Derivatives: Synthesis and Transfection Properties.*

Lainé, C.; Mornet, E.; Lemiègre, L.; Montier, T.; Cammas-Marion, S.; Neveu, C.; Carmoy, N.; Lehn, P.; Benvegno, T., *Chemistry-a European Journal* **2008**, 14, 8330-8340.

### 17. *Glycine betaine as a renewable raw material to "greener" new cationic surfactants.*

Goursaud, F.; Berchel, M.; Guilbot, J.; Legros, N.; Lemiègre, L.; Marcilloux, J.; Plusquellec, D.; Benvegno, T., *Green Chemistry* **2008**, 10, 310-320.

### 16. *Conformation and Stereodynamics of 2,2'-Disubstituted N,N'-Diaryl Ureas.*

Clayden, J.; Lemiègre, L.; Pickworth, M.; Jones, L., *Organic & Biomolecular Chemistry* **2008**, 6, 2908-2913.

### 15. *Synthesis of enantiomerically enriched isotopically-labelled anilines by (-)-sparteine directed lithiation.*

Clayden, J.; Lemiègre, L.; Pickworth, M., *Tetrahedron Asymmetry* **2008**, 19, 2218-2221.

### 14. *Helix persistence and breakdown in oligoureas of metaphenylenediamine: apparent diastereotopicity as a spectroscopic marker of helix length in solution.*

Clayden, J.; Lemiègre, L.; Morris, G. A.; Pickworth, M.; Snape, T. J.; Jones, L. H., *Journal of the American Chemical Society* **2008**, 130, 15193-15202.

### 13. *Synthesis of unsymmetrical saturated or diacetylenic cationic bolaamphiphiles.*

Berchel, M.; Lemiègre, L.; Tréput, S.; Lambert, O.; Jeftić, J.; Benvegno, T., *Tetrahedron Letters* **2008**, 49, 7419-7422.

### 12. *Synthesis of unsymmetrical spin-labelled bolaamphiphiles.*

Berchel, M.; Lemiègre, L.; Jeftić, J.; Benvegno, T., *Tetrahedron Letters* **2008**, 49, 4690-4692.

**11. Nouveaux émulsifiants "verts" sur base végétale pour les industries routière et cosmétique.**

Benvegno, T.; Plusquellec, D.; Lemiègre, L.; Marcilloux, J., *Annales des falsifications, de l'expertise chimique & toxicologique* **2008**, 969, 32-35.

**10. Archaeal Lipids: Innovative Materials for Biotechnological Applications. (review, cover art)**

Benvegno, T.; Lemiègre, L.; Cammas-Marion, S., *European Journal of Organic Chemistry* **2008**, 4725-4744.

**2007**

**9. Archaeosomes based on synthetic tetraether-like lipids as novel versatile gene delivery systems.**

Réthoré, G.; Montier, T.; Le Gall, T.; Delépine, P.; Cammas-Marion, S.; Lemiègre, L.; Lehn, P.; Benvegno, T., *Chemical Communications* **2007**, 2054-2056.

**8. Synthesis of oxy aminated [60] and [70]fullerenes with cumene hydroperoxide as oxidant.**

Lemiègre, L.; Tanaka, T.; Nanao, T.; Isobe, H.; Nakamura, E., *Chemistry Letters* **2007**, 36, 20-21.

**7. Synthesis and stacked conformations of symmetrical and unsymmetrical oligo-ureas of metaphenylenediamine.**

Clayden, J.; Lemiègre, L.; Helliwell, M., *Journal of Organic Chemistry* **2007**, 72, 2302-2308.

**6. Synthesis of archaeal bipolar lipid analogues: A way to versatile Drug/Gene delivery systems.**

Brard, M.; Lainé, C.; Réthoré, G.; Laurent, I.; Neveu, C.; Lemiègre, L.; Benvegno, T., *Journal of Organic Chemistry* **2007**, 72, 8267-8279.

**2005-2002**

**5. Ring fission of chiral cyclic acetals plus intramolecular [4+2] cycloaddition: a sequential access to medium-size lactones. Application to the synthesis of carbasugars.**

Lemiègre, L.; Stevens, R. L.; Combret, J. C.; Maddaluno, J., *Organic & Biomolecular Chemistry* **2005**, 3, 1308-1318.

**4. Regioselective oxygenative tetraamination of [60]fullerene. Fullerene-mediated reduction of molecular oxygen by amine via ground state single electron transfer in dimethyl sulfoxide.**

Isobe, H.; Tanaka, T.; Nakanishi, W.; Lemiègre, L.; Nakamura, E., *Journal of Organic Chemistry* **2005**, 70, 4826-4832.

**3. Synthesis of alpha,beta-unsaturated dioxanes, dioxolanes and dioxepanes by trans-acetalisation of dimethylacetals with meso or C-2-symmetrical 1,2-, 1,3- and 1,4-diols.**

Lemiègre, L.; Lesetre, F.; Combret, J. C.; Maddaluno, J., *Tetrahedron* **2004**, 60, 415-427.

**2. Conjugated elimination versus [1,2]-Wittig rearrangement of unsaturated diox(ol)anes.**

Lemiègre, L.; Regnier, T.; Combret, J. C.; Maddaluno, J., *Tetrahedron Letters* **2003**, 44, 373-377.

**1. Thermal/hyperbaric heterocycloaddition of 1,4-dialkoxy-1,3-dienes: The de novo (E,Z) way to sugars.**

Bataille, C.; Begin, G.; Guillam, A.; Lemiègre, L.; Lys, C.; Maddaluno, J.; Toupet, L., *Journal of Organic Chemistry* **2002**, 67, 8054-8062.