

Amandine Flourat

Chemical engineer

Chaire ABI - AgroParisTech

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Present & previous positions

Dec. 2012 - Present - **Chemical engineer** at Chaire AgroBiotechnologies Industrielles (ABI) – AgroParisTech, Pomacle, France

- Development of bio catalyzed reaction
- Organic multi-step synthesis
- Polymers syntheses
- Laboratory management

Oct. 2011 – Jun. 2012 - **Chemical engineer**, at INRA, Versailles, France

Project : Design and synthesis of proteins bearing dimers of ferulic acid

Sept. 2010 – Oct. 2011 - **Apprentice** at INRA, Versailles, France

Project : Synthesis of hybrid materials polysaccharides / polystyrene for DHPs supported training and study of interactions polysaccharides/lignins in the cell wall of plants

Apr. 2010 – Jul. 2010 - **Trainee** at INRA, Versailles, France

Project : Biocatalyst of lignin

Education

2009 - 2011 **Master of Sciences in molecular chemistry** (with honors), U. Paris VI, France

2007 - 2009 **Bachelor of Sciences in Physic and Chemistry**, U. Paris VI, France

2006 - 2007 **Ist year of medicine**, U. Paris VI, France

Research topics

- Chemistry of phenolic compounds
- Syntheses of natural products
- Enzyme-catalyzed reactions
- Innovative structures for renewable materials

Summary :

- 3 patents
- 1 book chapter
- 11 publications in peer-reviewed journals
- 8 oral communications and 11 posters

Patents :

[1] **Method for transforming levoglucosenone into 4-hydroxymethyl butyrolactone or 4-hydroxymethyl butenolide** Allais, F. ; Flourat, A. L. ; Peru, A. A. M. ; Teixeira, A. R. S. ; Brunissen, F. ; Spinnler, H. E. , Dépôt Avril 2014

[2] **Procédé de synthèse d'un précurseur d'un unique isomère de dairy-lactone** Allais, F. ; Flourat, A. L.; Peru, A. A. M.; Duncan, A. ; Greatrex, B., Dépôt Avril 2015

[3] **Procédé de transformation de la lévoglucosénone en 4-hydroxyméthylbutyrolactone et 4-hydroxyméthylbuténolide en absence de solvant et de catalyseur** Allais, F.; Bonneau, G.; Flourat, A. L.; Peru, A. A. M. Dépôt Juillet 2016

Book Chapter :

[1] **Chemo-enzymatic Synthesis, Derivatizations, and Polymerizations of Renewable Phenolic Monomers Derived from Ferulic Acid and Biobased Polyols : An access to Sustainable Copolyesters, Poly(ester-urethane)s, and Poly(ester-alkenamer)s** F. Pion, A. F. Reano, M. Z. Oulame, I. Barbara, A. L. Flourat, P.-H. Ducrot, F. Allais ACS Symposium Series 2015, 1192(Green Polymer Chemistry: Biobased Materials and Biocatalysis), 41-68

Publications in peer-reviewed journals :

[1] **Investigating isomer specific photoprotection in a model plant sunscreen** M. D. Horbury, A. L. Flourat, S. E. Greenough, F. Allais and V. G. Stavros Chemical Communications 2018 accepted

[2] **Elucidating nuclear motions in a plant sunscreen during photoisomerization through solvent viscosity effects** M. D. Horbury, W.-D. Quan, A. L. Flourat, F. Allais, V. G. Stavros Physical Chemistry Chemical Physics 2017 19(31), 21127-21131

[3] **From bench scale to kilolab production of renewable ferulic acid-based bisphenols: optimisation and evaluation of different purification approaches towards technical feasibility and process environmental sustainability** A.R.S. Teixeira, G. Willig, J. Couvreur, A.L. Flourat, A. A.M. Peru, P. Ferchaud, H. Ducatel, F. Allais Reaction Chemistry & Engineering 2017, 2(3), 406-419

[4] **Ultrafast Barrierless Photoisomerization and Strong Ultraviolet Absorption of Photoproducts in Plant Sunscreens** J. Luo, Y. Liu, S. Yang, A.L. Flourat, F. Allais, K. Han Journal of Physical Chemistry Letters 2017, 8(5), 1025-1030

[5] **Chemo-enzymatic synthesis of chiral epoxides ethyl and methyl (S)-3-(oxiran-2-yl)propanoates from renewable levoglucosenone: an access to enantiopure (S)-dairy lactone** A. A. M. Peru, A. L. Flourat, C. Gunawan, W. Raverty, M. Jevric, B. W. Greatrex, F. Allais Molecules 2016 21(8), 988/1-988/10

[6] **Lipase- Catalyzed Baeyer-Villiger Oxidation of Cellulose-Derived Levoglucosenone into (S)- γ -Hydroxymethyl- α,β -Butenolide: Optimization by Response Surface Methodology** A. R. S. Teixeira, A. L. Flourat, A. A. M. Peru, F. Brunissen, F. Allais Frontiers in Chemistry 2016 4, 16/1-16/11

[7] **Diversity of Lactobacillus reuteri Strains in Converting Glycerol into 3-Hydroxypropionic Acid** G. Burgé, C. Saulou-Bérion, M. Moussa, B. Pollet, A. L. Flourat, F. Allais, V. Athès, H.E. Spinnler Applied biochemistry and biotechnology 2015 177 (4)

[8] **3-Hydroxypropionaldehyde (3-HPA) quantification by HPLC using a synthetic acrolein-free 3-hydroxypropionaldehyde system as analytical standard** G. Burgé, A. L. Flourat, B. Pollet, H. E. Spinnler and F. Allais RSC Advances 2015, 5, 92619

[9] **Renewable polymers derived from ferulic acid and biobased diols via ADMET** I. Barbara, A. L. Flourat and Allais,* F. Eur. Polym. J. 2015, 62, 236

[10] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer-Villiger oxidation of levoglucosenone** Flourat, A. L.; Peru, A. A. M.; Teixeira, A. R. S.; Brunissen, F. and Allais,* F. Green Chem. 2014, 17, 404

[11] **Chemoenzymatic total synthesis of the naturally occurring (5-5)/(8-O-4) dehydrotrimer of ferulic acid** Mouterde, L. M. M.; Flourat, A. L.; Cannet, M. M. M.; Ducrot, P.-H. and Allais,* F. Eur. J. Org. Chem. 2013, 1, 173-179

Oral communications :

[1] **Design and synthesis of proteins bearing dimers.trimer of ferulic acid: creation of antibodies and immunohistochemistry in plant cells** Mouterde, Louis L. L.; Flourat, Amandine L.; Ducrot, Paul-Henri; Allais,* Florent 244th ACS National Meeting, Philadelphia, PA (USA), 18-23 août 2012

[2] **Chaire ABI presentation** Amandine Flourat, GDR Symbiose, Nantes (FR), 8-10 avril 2015

[3] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer-Villiger oxidation of lévoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais ISGC2015, La Rochelle, 4-7 mai 2015

[4] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer-Villiger oxidation of lévoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais Renewable chemicals from waste, London (U-K), 20 Novembre 2015

[5] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer-Villiger oxidation of lévoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais CABiomass, Compiègne (FR), 9-11 Mars 2016

[6] **New route for the synthesis of enantiopure (S)-dairy lactone** Amandine L. Flourat, Aurélien A. M. Peru, Ben W. Greatrex, F. Allais Renewable Resources and Biorefineries, Gent (Be), 30-31 mai et 1 juin 2016

[7] **Synthesis and characterization of new degradable polymers with antiradical & antimicrobial activities** Amandine L. Flourat, Abderrahim Rekla, Bastien Kauffmann, Tiphaine Clément, Andreia R. S. Teixeira, Florent Allais, ISGC2017, La Rochelle (FR), 16-19 mai 2017

[8] **Synthesis and characterization of new degradable polymers with antiradical & antimicrobial activities** Amandine L. Flourat, Abderrahim Rekla, Bastien Kauffmann, Tiphaine Clément, Andreia R. S. Teixeira, Florent Allais, Biopolymer Congress, Paris (FR), 7-9 sept 2017

Posters :

[1] **Synthèse de dimères d'acide férulique et leur couplage sur protéine, production d'anticorps correspondants pour l'immunohistochemie des parois végétales** Mouterde, Louis; Flourat, Amandine; Ducrot, Paul-Henri; Allais, Florent Journées jeunes chercheurs de la Société de Chimie Thérapeutiques, Romainville, 2-3 février 2012

[2] **Synthesis, characterization, biological properties and polymerizations of new biobased macrobisphenols derived from ferulic acid** A. F. Reano, F. Pion, M. Z. Oulame, J. Chérubin, Q. Wang, T. Clément, M.-N. Maillard, S. Domenek, P.-H. Ducrot, F. Allais ICP 2014 & 8th Tannin Conference, Nagoya (Japan), 2-6 septembre 2014

[3] **Renewable polymers derived from ferulic acid and biobased diols via ADMET** Imane Barbara, Amandine L. Flourat, Florent Allais ISGC 2015, La Rochelle (FR), 4-7 mai 2015

[4] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer–Villiger oxidation of lévoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais Renewable Resources and Biorefineries 2015, York (U-K), 3-5 juin 2015

[5] **Synthesis and polymerizations of new biobased macrobisphenols derived from ferulic acid** A. F. Reano, F. Pion, M. Z. Oulame, I. Barbara, A. L. Flourat, S. Domenek, P.-H. Ducrot, F. Allais Renewable Resources and Biorefineries 2015, York (U-K), 3-5 juin 2015

[6] **Synthèses chemo-enzymatique de deux intermédiaires clés, (S)- γ -hydroxymethyl- α,β -butenolide et (S)- γ -hydroxymethyl- γ -butyrolactone, par oxydation de Baeyer-Villiger de la Levoglucosenone à l'aide d'une lipase** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais Journées Condorcet, Compiègne (FR), 8-9 juillet 2015

[7] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer–Villiger oxidation of lévoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais Renewable chemicals from waste, London (U-K), 20 Novembre 2015

[8] **Chemo-enzymatic synthesis of key intermediates (S)- γ -hydroxymethyl- α,β -butenolide and (S)- γ -hydroxymethyl- γ -butyrolactone via lipase-mediated Baeyer–Villiger oxidation of levoglucosenone** Amandine L. Flourat, Aurélien A. M. Peru, Andreia R. S. Teixeira, Fanny Brunissen, Florent Allais Les lipides du future - les lipases au cœur des développements scientifiques et industrielles, Romainville, 23-24 novembre 2015

[9] **Synthesis and polymerizations of new biobased macrobisphenols derived from ferulic acid** A. F. Reano, F. Pion, M. Z. Oulame, I. Barbara, A. L. Flourat, S. Domenek, P.-H. Ducrot, F. Allais Biopolymers 2015, Nantes, December 14-16, 2015

[10] **Renewable polymers derived from ferulic acid and biobased diols via ADMET** Imane Barbara, Amandine L. Flourat, Florent Allais CABiomass 9-11 mars 2016

[11] **Molécules modèles et standards pour la compréhension des mécanismes de la paroi secondaire des végétaux.** Amandine L. Flourat, Louis Mouterde, Josiane Beauhaire, Maxime Carrié et Florent Allais Journées Condorcet 2017, Lille (FR), 8-9 juin 2017.

Languages

French : Native language

English : Professional