

# Diego LÓPEZ BARREIRO



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## EDUCATION

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**Ghent University** Ghent (Belgium)

Ph.D. in Applied Biological Sciences: Chemistry and Chemical Technology (Oct. 2011-Oct. 2015)

- Thesis: Hydrothermal liquefaction of algae
- Supervisor: Prof. Wolter Prins

**University of Santiago de Compostela** Santiago de Compostela (Spain)

Ms.C. in Chemical Engineering, with honours (Oct. 2005-Jul. 2011)

- Focus areas: 1) Bioprocess Engineering and 2) Process Control

## RESEARCH AND TEACHING EXPERIENCE

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**Department of Chemical Engineering**

**UCL, London, United Kingdom** (Sep. 2022-present)

Lecturer in Nature-Inspired Chemical Engineering

**DSM Biotechnology Center**

**DSM, Delft, The Netherlands** (May. 2020-Aug. 2022)

Marie Curie Postdoctoral Fellow

**Laboratory for Atomistic and Molecular Mechanics**

**Massachusetts Institute of Technology, Cambridge, USA** (Jan. 2017-Oct. 2019)

Postdoctoral Associate

**Laboratory for Thermochemical Conversion of Biomass**

**Ghent University, Ghent, Belgium** (Oct. 2011-Oct. 2016)

Ph.D. student (2011-2015) and Postdoctoral Researcher (2015-2016)

**Department of Chemical Engineering**

**University of Santiago de Compostela, Santiago de Compostela, Spain** (Jan. 2009-Jul. 2010)

Research Assistant

## FELLOWSHIPS & AWARDS

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- 2020 Marie Curie Individual Fellowship [European Commission](#)
- 2019 Review paper included in the Biopolymers 2019 Special Collection [Wiley](#)
- 2015 Grant for a stay abroad at MIT [Fund for Scientific Research FWO](#) (Belgium)
- 2012 IWT PhD Fellowship [Agency for Innovation through Science and Technology](#) (Belgium)
- 2012 Distinction in Chemical Engineering [Government of Galicia](#) (Spain)
- 2012 Distinction in Chemical Engineering [University of Santiago de Compostela](#) (Spain)
- 2011 PhD Fellowship [Fundación Pedro Barrié de la Maza](#) (Spain)
- 2009 Graduate researcher fellowship [Galician Ministry of Education](#) (Spain)

## PRE-PRINTS

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1. [López Barreiro D](#), Folch-Fortuny A, Muntz I, Thies JC, Sagt CMJ, Koenderink GH, Computer-aided design of elastin-like polypeptides with controlled viscoelastic and structural properties, [chemRxiv](#), doi.org/10.26434/chemrxiv-2022-9zjsk, 2022.

## PEER-REVIEWED PUBLICATIONS

1. López Barreiro D, Martin-Martinez FJ, Zhou S, Sagastagoia I, del Molino Pérez F, Arrieta Morales FJ, Buehler MJ, Biobased additives for asphalt applications produced from the hydrothermal liquefaction of sewage sludge, *J Env Chem Eng*, 10:108974, 2022.
2. López Barreiro D\*, Martín-Moldes Z\*, Blanco Fernández A, Fitzpatrick V, Kaplan DL, Buehler MJ, Molecular simulations of the interfacial properties in silk-hydroxyapatite composites, *Nanoscale*, 14:10929-10939, 2022.
3. López Barreiro D, Minten IJ, Thies JC, Sagt CMJ, Structure-property relationships of elastin-like polypeptides – a review on experimental and computational studies, *ACS Biomater Sci Eng*, accepted, 2021.
4. Martín-Moldes Z\*, López Barreiro D\*, Buehler MJ, Kaplan DL, Effect of the silica nanoparticle size on the osteoinduction of biomineralized silk-silica nanocomposites (\*equal contribution), *Acta Biomater*, 120:203-212, 2021.
5. Wan CTC\*, López Barreiro D\*, Forner-Cuenca A, Barotta JW, Hawker MJ, Han G, Loh HC, Han G, Masic A, Kaplan DL, Chiang YM, Brushett FR, Martin-Martinez FJ, Buehler MJ, Exploration of biomass-derived activated carbons for use in vanadium redox flow batteries (\*equal contribution), *ACS Sust Chem Eng*, 8:9472–9482, 2020.
6. López Barreiro D, Martín Moldes Z, Yeo J, Shen S, Hawker MJ, Martin-Martinez FJ, Kaplan DL, Buehler MJ, Conductive silk-based composites using biobased carbon materials, *Adv Mater*, 31:1904720, 2019.
7. López Barreiro D, Jin K, Martin-Martinez FJ, Qin Z, Hamm M, Paul CW, Buehler MJ, Molecular dynamics study of the mechanical properties of polydisperse pressure-sensitive adhesives, *J Int Adh Adhes*, 92:58-64, 2019.
8. López Barreiro D, Yeo J, Tarakanova A, Martin-Martinez FJ, Buehler MJ, Multiscale modeling of silk and silk-based biomaterials - a review, *Macromol Biosci*, 1800253, 2018.
9. Jin K, López Barreiro D, Martin-Martinez FJ, Qin Z, Hamm M, Paul CW, Buehler MJ, Improving performance of pressure sensitive adhesives by tuning the cross-linking density and locations, *Polymer*, 154:164-171, 2018.
10. López Barreiro D, Martin-Martinez FJ, Torri C, Prins W, Buehler MJ, Molecular characterization and atomistic model of biocrude oils from hydrothermal liquefaction of microalgae, *Algal Res*, 35:262-273, 2018.
11. Martin-Martinez FJ, Jin K, López Barreiro D, Buehler MJ, The rise of hierarchical nanostructured materials from renewable sources: learning from nature, *ACS Nano*, 12:7425-7433, 2018.
12. Zhang D, Clauwaert P, Luther A, López Barreiro D, Prins W, Brilman W, Ronsse F, Sub- and supercritical water oxidation of anaerobic fermentation sludge for carbon and nitrogen recovery in a regenerative life support system, *Waste Manage*, 77:268-275, 2018.
13. López Barreiro D, Ríos Gómez B, Ronsse F, Hornung U, Kruse A, Prins W, Heterogeneous catalytic upgrading of biocrude oil produced by hydrothermal liquefaction of microalgae: State of the art and own experiments, *Fuel Process Technol*, 148:117-127, 2016.
14. Torri C, López Barreiro D, Conti R, Fabbri D, Brilman W, Fast procedure for the analysis of hydrothermal liquefaction biocrude with stepwise Py-GC-MS and data interpretation assisted by means of non-negative matrix factorization, *Energy Fuel*, 30:1135-1144, 2016.
15. López Barreiro D, Ríos Gómez B, Hornung U, Kruse A, Prins W, Hydrothermal liquefaction of microalgae in a continuous stirred-tank reactor, *Energy Fuel*, 29:6422–6432, 2015.
16. López Barreiro D, Riede S, Hornung U, Kruse A, Prins W, Hydrothermal liquefaction of microalgae: Effect on the product yields of the addition of an organic solvent to separate the aqueous phase and the biocrude oil, *Algal Res*, 12:206-212, 2015.
17. López Barreiro D, Beck M, Hornung U, Ronsse F, Kruse A, Prins W, Suitability of hydrothermal liquefaction as a conversion route to produce biofuels from macroalgae, *Algal Res*, 11:234-214, 2015.

18. López Barreiro D, Bauer M, Hornung U, Posten C, Kruse A, Prins W, Cultivation of microalgae with recovered nutrients after hydrothermal liquefaction, *Algal Res*, 9:99-106, 2015.
19. López Barreiro D, Samorì C, Terranella G, Hornung U, Kruse A, Prins W, Assessing microalgae biorefinery routes for the production of biofuels via hydrothermal liquefaction, *Bioresource Technol*, 174:256-265, 2014.
20. Samorì C, Pezzolesi L, López Barreiro D, Galletti P, Pasteris A, Tagliavini E, Synthesis of new polyethoxylated tertiary amines and their use as switchable hydrophilicity solvents, *RSC Adv*, 4:5999-6008, 2014.
21. López Barreiro D, Zamalloa C, Boon N, Vyverman W, Ronsse F, Brilman W, Prins W, Influence of strain-specific parameters on hydrothermal liquefaction of microalgae, *Bioresource Technol*, 146:463-471, 2013.
22. López Barreiro D, Prins W, Ronsse F, Brilman W, Hydrothermal liquefaction (HTL) of microalgae for biofuel production: state of the art review and future prospects, *Biomass Bioenerg*, 53:113-127, 2013.
23. Samorì C, López Barreiro D, Vet R, Pezzolesi L, Brilman W, Galletti P, Tagliavini E, Effective lipid extraction from algae cultures using switchable solvents, *Green Chem*, 15:353-356, 2013.
24. Chaves Padín R, López Barreiro D, Macías Vázquez F, Casares Long JJ, Monterroso Martínez C, Application of system dynamics technique to simulate the fate of persistent organic pollutants in soils, *Chemosphere*, 90:2428-2434, 2013.

## SELECTED CONFERENCE PRESENTATIONS

1. López Barreiro D, Folch-Fortuny A, Koenderink GH, Thies JC, Sagt CMJ, Computationally-aided design and synthesis of elastin-like polypeptide (ELP) block copolymers, *18<sup>th</sup> European Mechanics of Materials Conference*, Oxford (UK), 2022.
2. Forner Cuenca A, López Barreiro D, Wan CTC, Barotta JW, Martin-Martinez FJ, Brushett F, Buehler MJ, Biomass-derived electrodes for vanadium redox flow batteries, *Materials Research Society Fall Meeting*, Boston (USA), 2018.
3. López Barreiro D, Yeo J, Martin-Martinez FJ, Buehler MJ, Multi-scale modeling of carbon materials derived from hydrothermal processing of biomass, *Engineering Mechanics Institute Conference*, Boston, (USA), 2018.
4. Zhang D, Ronsse F, Luther A, Clauwert P, López Barreiro D, Prins W, Brilman W, Hydrothermal oxidation of fermentation sludge for use in a bioregenerative life support system, *7<sup>th</sup> International Conference on Engineering for Waste and Biomass Valorisation*, Prague (Czech Republic), 2018.
5. López Barreiro D, Hornung U, Kruse A, Ronsse F, Prins W, Biorefinery of microalgae via HTL – a technoeconomic assessment, *15<sup>th</sup> European Meeting on Supercritical Fluids*, Essen (Germany), 2016.
6. López Barreiro D, Bauer M, Hornung U, Kruse A, Posten C, Prins W, Nutrient recycling in a hydrothermal liquefaction (HTL) based algae biorefinery, *Algal Biomass, Biofuels and Bioproducts*, San Diego (USA), 2015.
7. López Barreiro D, Hornung U, Kruse A, Ronsse F, Prins W, Process developments for a continuous HTL-based algae biorefinery, *Algal Biomass, Biofuels and Bioproducts*, San Diego (USA), 2015.
8. López Barreiro D, Hornung U, Kruse A, Prins W, Development of continuous HTL processing for algae-based biorefineries, *23<sup>rd</sup> European Biomass Conference and Exhibition*, Vienna (Austria), 2015.
9. López Barreiro D, García Cuadra F, Hornung U, Kruse A, Acien Fernández FG, Prins W, Hydrothermal liquefaction of protein-extracted algae: a promising biorefinery route, *23<sup>rd</sup> European Biomass Conference and Exhibition*, Vienna (Austria), 2015.

10. **López Barreiro D**, Torri C, Ronsse F, Prins W, Fabbri D, Brilman W, Biofuels from microalgae: suitability of strains for hydrothermal liquefaction, **21<sup>st</sup> European Biomass Conference and Exhibition**, Copenhagen (Denmark), 2013.

## LEADERSHIP & SERVICE

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| 2018-2019 | Postdoctoral liaison, Postdoctoral Committee of the Department of Civil and Environmental Engineering, MIT, Cambridge, USA           |
| 2018-2019 | Launching of the mentoring program Fostering Grads for Spanish PhD students to carry out a research stay at a laboratory in the USA. |
| 2018-2019 | Member of the Board of the Boston Chapter of the Association of Spanish Scientists in USA (ECUSA).                                   |
| 2017      | Member of the scientific advisory committee of the II Joint Meeting of Spanish Scientists in USA (Boston, USA).                      |