Diego **LÓPEZ BARREIRO**

Department of Chemical Engineering
University College London
Torrington Place
London WC1E 7JE (UK)

d.lopezbarreiro@ucl.ac.uk

theLBgroup.github.io

EDUCATION

Ghent University Ghent (Belgium)
PhD 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)
MsC in Chemical Engineering, with honours (Oct. 2005-Jul. 2011)

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

RESEARCH AND TEACHING EXPERIENCE

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

2023 New Investigator Award EPSRC (UK)
2023 Research Grant Royal Society (UK)
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)

TEACHING

CENG0083 2023-present Dynamics of Natural Systems UCL
CENG0085 2023-present Nature-inspired Bioengineering UCL

PEER-REVIEWED PUBLICATIONS

1. López Barreiro D, Houben K, Schouten O, Koenderink GH, Thies JC, Sagt CMJ, Order-disorder balance in silk-elastin-like polypeptides determines their self-assembly into hydrogel networks, ACS Appl Mater Interfaces, 2025.
2. Shire E, Coimbra AAB, Barba-Ostria C, Rios-Solis L, López Barreiro D, Molecular design of protein-based materials – state of the art, opportunities and challenges at the interface between materials engineering and synthetic biology, Mol Syst Des Eng, 9:1187-1209, 2024.
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, 9: 3796–3809, 2023.
4. López Barreiro D, Folch-Fortuny A, Muntz I, Thies JC, Sagt CMJ, Koenderink GH, Sequence control of the self-assembly of elastin-like polypeptides into hydrogels with bespoke viscoelastic and structural properties, Biomacromolecules, 24:489-501, 2023.
5. 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.
6. 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.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. 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.
14. 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.
15. 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.
16. 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.

17. 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.
18. 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.
19. 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.
20. 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.
21. 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.
22. 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.
23. 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.
24. 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.
25. 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.
26. 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.
27. 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, Experimental-computational design of protein-based materials, Materials Research Society Spring Meeting, Seattle (USA), 2024.
2. López Barreiro D, Folch-Fortuny A, Koenderink GH, Thies JC, Sagt CMJ, Computationally-aided design and synthesis of elastin-like polypeptide (ELP) block copolymers, 18th European Mechanics of Materials Conference, Oxford (UK), 2022.
3. 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.
4. 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.
5. 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, 7th International Conference on Engineering for Waste and Biomass Valorisation, Prague (Czech Republic), 2018.
6. López Barreiro D, Hornung U, Kruse A, Ronsse F, Prins W, Biorefinery of microalgae via HTL – a technoeconomic assessment, 15th European Meeting on Supercritical Fluids, Essen (Germany), 2016.
7. 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.

8. 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.
9. López Barreiro D, Hornung U, Kruse A, Prins W, Development of continuous HTL processing for algae-based biorefineries, 23rd European Biomass Conference and Exhibition, Vienna (Austria), 2015.
10. López Barreiro D, García Cuadra F, Hornung U, Kruse A, Acién Fernández FG, Prins W, Hydrothermal liquefaction of protein-extracted algae: a promising biorefinery route, 23rd European Biomass Conference and Exhibition, Vienna (Austria), 2015.
11. López Barreiro D, Torri C, Ronsse F, Prins W, Fabbri D, Brilman W, Biofuels from microalgae: suitability of strains for hydrothermal liquefaction, 21st European Biomass Conference and Exhibition, Copenhagen (Denmark), 2013.

SERVICE

2023-present	Deputy Departmental Tutor UCL, UK
2018-2019	Postdoctoral liaison, Postdoctoral Committee of the Department of Civil and Environmental Engineering MIT, 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).

PROFESSIONAL AFFILIATIONS

2025	Chartered Engineer (CEng)
2025	Member of the Institution of Chemical Engineers UK (MIChemE)
2024	Fellow of the Higher Education Academy (FHEA)