

Dr. Martha B Lopez Yrigoyen

Macomics/University of Edinburgh
The Queen's Medical Research Council Centre for Reproductive Health
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PROFILE:

Enthusiastic and motivated Postdoctoral Research Fellow with extensive knowledge of genetic manipulation, culture and differentiation of human induced pluripotent stem cells to study macrophage biology in health and disease. Particular strengths in the design and execution of genome editing strategies, including CRISPR-Cas9; maintenance and differentiation of embryonic and induced pluripotent stem cells, culture and assay development for macrophage and erythroid cell function, gene-expression analyses, multicolour flow cytometry, genome wide studies. Strong record of collaborations, patent application and publishing in peer reviewed journals at an early career stage. Background and experience in Higher Education Teaching.

EDUCATION

- **Ph.D. Regenerative Medicine**
Centre for Regenerative Medicine; The University of Edinburgh, October 2015-October 2019
Funded by CONACYT (Mexico) and BECA SEP Complemento (Mexico)
Title of Thesis: *Genetic programming of human iPSC-derived macrophages provides a tool to study the Erythroblastic Island niche in vitro.* Supervised by Prof. Lesley Forrester
- **M.Ed Academic Practice in Higher Education**
The University of Edinburgh, January 2018-2020
Funded by the University of Edinburgh
Awarded a Fellowship of the Higher Education Academy
- **MSc.Regenerative Medicine: Clinical and Industrial Delivery; with distinction**
Centre for Regenerative Medicine, The University of Edinburgh, UK, 2014-2015
Funded by CONACYT (Mexico) and The Edinburgh Global Latin-American Masters Scholarship (University of Edinburgh)
Title of Dissertation: *Constructing an MMP-12 overexpression system in murine ESCs to derive macrophages capable of promoting the regression of liver fibrosis*
- **BSc. Biotechnology Engineering with a Molecular Biology concentration; Highest GPA of class 2013; Summa cum laude**
Instituto Tecnológico y de Estudios Superiores Monterrey, Mexico, 2009-2013
Academic Excellence Full Tuition Fees Scholarship (Instituto Tecnológico y de Estudios Superiores Monterrey, Mexico)

RESEARCH OUTPUT

Published Articles in Peer Review Journals:

- Fidanza, A, Strunpf, P, Ramachandran, P, Tamagno, S, Babbie, A, **Lopez-Yrigoyen, M** ..., Forrester, L. M, (2020). 'Single cell analyses and machine learning define hematopoietic progenitor and HSC-like cells derived from human PSCs. *Blood* <https://doi.org/10.1182/blood.2020006229>
- **Lopez-Yrigoyen, M.** et al (2020). Production and Characterization of Human Macrophages from Pluripotent Stem Cells. *Journal of Visualized Experiments*, <http://dx.doi.org/10.3791/61038>
- **Lopez-Yrigoyen, M.**, Yang, T., Fidanza, A., Cassetta, L., Taylor, H., McCahill, A., Sellink, E., von Lindern, M., van den Akker, E., Mountford, J.C., Pollard, J.W., Forrester, L.M (2019). Genetic programming of macrophages generates an *in vitro* model for the human erythroid island niche. *Nature Communications*. <http://doi.org/10.1038/s41467-019-08705-0>.

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- Cassetta, L., Fragkogianni, S., Sims, A. H., Swierczak, A., Forrester, L. M., Zhang, H., Soong, D., Cotechini, T., Anur, P., Lin, E., **Lopez-Yrigoyen, M.**, Fidanza, A., Millar, M.R., Urman, A., Swierczak, A., Ai, Z., Spellman, E., Shelley Hwang, J., Dixon, M., Wiechman, L., Coussens, L., Smith, H., Pollard, J.W (2019) Human tumor-associated macrophage and monocyte transcriptional landscapes reveal cancer-specific reprogramming and identify novel biomarkers and therapeutic targets. *Cancer Cell*, 1–15. <https://doi.org/10.1016/j.ccell.2019.02.009>
- **Lopez-Yrigoyen, M.**, Fidanza, A., Cassetta, L., Axton, R.A., Taylor, A.H., Meseguer-Rippolles, J., Tsakiridis, A., Wilson, V., Hay, D., Pollard, J., Forrester, L.M. (2018). A human iPSC line capable of differentiating into functional macrophages 1 expressing ZsGreen: a tool for the study and in vivo tracking of therapeutic cells. *Philosophical Transactions B*. <http://doi.org/10.1098/rstb.2017.0219>
- Fidanza, A., **Lopez-Yrigoyen, M.**, Romanò, N., Jones, R., Taylor, A. H., & Forrester, L. M. (2017). An all-in-one UniSam vector system for efficient gene activation. *Scientific Reports*, 7(1), 6394. <http://doi.org/10.1038/s41598-017-06468-6>
- Axton, R. A., Haideri, S. S., **Lopez-Yrigoyen, M.**, Taylor, H. A., & Forrester, L. M. (2017). SplitAx: A novel method to assess the function of engineered nucleases. *PLOS ONE*, 12(2), e0171698. <http://doi.org/10.1371/journal.pone.0171698>

Review Articles:

- **Lopez-Yrigoyen, Martha**; Cassetta, Luca; Pollard, Jeffrey (in Press) 'Macrophage targeting in Cancer', ANN NY ACAD SCI.

Book Chapters:

- Heideveld, Esther, Horcas-Lopez, Marta, **Lopez-Yrigoyen, Martha**, Forrester, Lesley M, Cassetta, Luca and Pollard, Jeffrey W, (2019) 'Methods for Macrophage Differentiation and in Vitro Generation of Human Tumor Associated-like Macrophages' <https://doi.org/10.1016/bs.mie.2019.10.005>

Patents:

- UK priority patent application (1806118.4) entitled "Macrophage use", filed on 13th April 2018 by the University of Edinburgh (Co-inventors: Lesley Forrester and **Martha Lopez-Yrigoyen**)
- International Patent Application (PCT/GB2019/051060) entitled 'Macrophage Use' filed by the University of Edinburgh (Co-inventors: Lesley Forrester and **Martha Lopez-Yrigoyen**)

Research Grants, Travel Grants and Project Funding awards:

- British Federation of Women Graduates-Winifred Cullis Prize (£2,000), 2018; given to outstanding 3rd year PhD students from UK Universities, who have an exceptional Academic Trajectory. <https://bfwg.org.uk/bfwg2/awards/>
- Centre for Regenerative Medicine 2018 Wilmut Prize Award, Runner Up (£1000); given to the second best 3rd year-PhD Project Presentation from the Centre for Regenerative Medicine, The University of Edinburgh
- The University of Edinburgh Deanery of Clinical Sciences Funding Challenge award winner, (£2,500) 2016. Applicant: **Lopez-Yrigoyen, M.** "Gene expression profiling of human genetically modified iPSC derived macrophages to compare them at a genome wide level". <https://www.ed.ac.uk/clinical-sciences/progression>
- 7th Summer Research Program at the University of Tsukuba, (Programme, travel and accommodation expenses covered by Tsukuba University and the MRC Centre for Regenerative Medicine, The University of Edinburgh). 2016. <http://www.md.tsukuba.ac.jp/G30/ss2016>. Award for Best Scientific Presentation at the end of the Summer School
- Scottish Institute for Enterprise Young Innovators Challenge Winner (£6,000) 2015. Applicants: **Lopez-Yrigoyen, M.**, Lopez-Bravo, E., Tam, T. "Curing Vitiligo with an autologous Stem Cell Therapy". <http://www.sie.ac.uk/wp-content/uploads/2016/07/scotlands-brightest-young-innovators-announced.pdf>, https://youtu.be/s4bIR_nnZ6s

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WORK EXPERIENCE

| Position | Place of Work | Time |
|---|---|---------------------|
| Lecturer, Demonstrator and Marker for the Biology Teaching Organisation | College of Science and Engineering School of Biological Sciences The University of Edinburgh. UK <i>Courses: Quantitative Life Sciences, Molecules Genes and Cells 1, The Dynamic Cell 2 and Molecular Genetics 3, Stem Cells and Regenerative Medicine, Basic Techniques in Regenerative Medicine</i> | 09/2015- 12/2020 |
| Full time Lecturer and Course Organiser in the Biotechnology Engineering Department | Biotechnology Engineering Department Instituto Tecnológico y de Estudios Superiores Monterrey, Campus Puebla. Mexico <i>Courses: Biotechnological Processes laboratory, Tissue Culture theory and laboratory; and Genetic Engineering theory and laboratory.</i> | 01/2014- 08/2014 |

OTHER PROFESSIONAL QUALIFICATIONS

- **Associate Fellowship of the Higher Education Academy** (Awarded: 23/01/2018)
In recognition of attainment against the UK Professional Standards Framework for teaching and learning support in Higher Education.
United Kingdom
Recognition Reference: PR140784

CONFERENCE ORAL AND POSTER PRESENTATIONS

- ISEH Los Angeles 2018: 'Genetic programming of human induced pluripotent stem cell-derived macrophages as a tool to study the Erythroid Island niche' Poster Presentation
- The 2nd Edinburgh/Glasgow Meeting on Immune Cells and Cancer Metastasis (November 2017; The University of Edinburgh QMRI). 'Genetically-manipulated macrophages from human pluripotent stem cells. Oral Presentation
- Centre for Regenerative Medicine Poster Event 2017 (October 2017; The University of Edinburgh, Centre for Regenerative Medicine) Recapitulating the Erythroblastic Island Niche in a dish'. Poster Presentation. School of Clinical Sciences 'First place award' for best Poster Presentation and Defence.
- The XV Symposium of Mexican Students and Studies (July 2017; Durham University) 'Generating blood in the lab by recreating the Erythroblastic Island niche in a dish'. Oral Presentation
- Scientific Symposium, Coming of Age: The Legacy of Dolly at 20 (September 2016; The University of Edinburgh, The Roslin Institute) 'Modifying the phenotype of human induced Pluripotent Stem Cell (iPSC) derived macrophages through the enforced expression of KLF1 to study the erythropoiesis niche'. Poster Presentation
- Centre for Regenerative Medicine PhD Day 2016. (July 2016; The University of Edinburgh, Centre for Regenerative Medicine). 'Enhancing the proliferation and maturation of iPSC-derived erythroid cells by manipulating the macrophage niche. Oral Presentation. 1st place award for best Oral Presentation