

PERSONAL INFORMATION

Family name, First name: Güell, Marc
Researcher unique identifiers: 0000-0003-4000-7912 (ORCID); AAB-3054-2021 (ResearcherID)
Date of birth: 26 July 1982
URL for web site: <http://synbio.upf.edu>

EDUCATION

2010 – PhD Biomedicine, Center for Genomic Regulation (CRG), Pompeu Fabra University (UPF), Spain
Supervisor: Dr. Luis Serrano (CRG, Spain)
2007 – Master Biomedical Research (UPF, Spain)
Supervisor: Dr. Anne-Claude Gavin (EMBL, Germany)
2010 – BS Telecommunications Engineering (Universitat Oberta de Catalunya, Spain)
2006 – BS Chemistry (Universitat Ramon Llull, Spain)

CURRENT POSITIONS

2023 – ICREA Research Professor and head of the Translational Synthetic Laboratory, PRBB (Barcelona Biomedical Research Park), UPF, Barcelona, Spain

PREVIOUS POSITIONS

2017 – 2023 Ramon y Cajal / La Caixa Captació de talent, Translational Synthetic Laboratory, PRBB (Barcelona Biomedical Research Park), UPF, Barcelona, Spain
2015 – 2016 Wyss Technology Dev. Fellow, Wyss Institute, Harvard University, Boston, USA Supervisor: Dr. George Church (Harvard Medical School, USA)
2011 – 2015 Postdoc in the group "Harvard Molecular Technology Group & Lipper Center for Computational Genetics", Harvard Medical School, Boston, USA
Supervisor: Dr. George Church (Harvard Medical School, USA)

TECH TRANSFER

2019 – present Cofounder and scientific head of Integra Therapeutics (<http://integra-tx.com>). Spin-off from the Güell lab focussed on gene writing, Barcelona, Spain
2014 – 2022 Cofounder and scientific advisor of SBiomedic (<http://sbiomedic.com>). Startup company to based on the skin microbiome (Acquired by Beiersdorf in 2022), Beerse, Belgium
2015 – 2019 Founding scientist and consultant at eGenesis Biosciences. Startup company from Dr. Church's lab (Harvard University) oriented to make xenotransplantation a clinical reality applied advanced genome engineering to pigs (<http://egenesisbio.com>), Boston, USA

FELLOWSHIPS

2016 – Ramón y Cajal contract award (Host: UPF, Spain)
2015 – Wyss Technology Development Fellowship (Host: Harvard University, Boston, USA)
2014 – Awarded team of "Start-Up Chile 11th Generation" competition (Host: Sbiomedic, Santiago, Chile)
2014 – AWS Education Research grant (Host: Harvard University, Boston, USA)
2011 – HFSP Long Term Fellowship (Host: Harvard University, Boston, USA)
2010 – EMBO Long Term Fellowship (Host: Harvard University, Boston, USA)
2006 – FPU Pre-doctoral Fellowship (Host: CRG, Barcelona, Spain)
2005 – Spanish Science Ministry collaboration Fellowship (Host: Institut Químic de Sarrià, Spain)
2004 – Spanish Research Council (CSIC) Introduction to Research Fellowship (Host: CSIC, Spain)

SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

2017 – 2020 In my present lab, **I have supervised 5 postdocs**: Dr. Avencia Sánchez-Mejías is cofounder and CSO of Integra Tx; Dr. Daniela Azucena is postdoctoral scientist at Uppsala University; Dr. Amal Rahmeh, Dr. Javier Santos (Marie-Curie Fellow, now new ERC-Starting grantee and independent PI) and Dr. Mariajosé Fábrega (cofounder of Synflora, Juan de la Cierva fellow) are still in the lab;
6 PhD students: Nastassia Knödlseeder (cofounder of Synflora) and Maria Pallarès have recently defended, both have first author papers accepted (also in revision) and patents; Guillermo Nevot, Dimitri Ivancic, Marta Sanvicente and Núria Rafel (Industrial PhD) will graduate in 2023 and 2024
2011 – 2016 At Harvard University, Boston, USA, **I co-supervised 3 PhD students** (mentored with Prof. George Church): Dr. Óscar Castagnon is analyst at ArgoBIO studio; Dr. Dennis Grishin is cofounder and CSO of Nebula Genomics, Dr. Rida Mourtada is cofounder and CSO at Lytica therapeutics;
2 undergraduate students: Ellen Schrock is now a PhD candidate at the Elledge lab, Harvard; Stephany Foster is now a PhD candidate at Brown University

TEACHING ACTIVITIES

- 2017 – present Advanced Synthetic Biology – Degree in Biomedical Engineering, UPF, Barcelona, Spain
2018 iGEM competition supervisor of UPFBarcelona team, UPF, Barcelona, Spain
2010 – 2020 Teaching Gene Editing and Synthetic Biology in multiple International Workshops (2012-EMBO workshop: Introduction to Synthetic Biology, Buenos Aires, Argentina; 2015-Systems Biology of E. coli, Awaji Island, Japan; 2015-Genome editing workshop, CRG, Barcelona; 2016-Genome editing workshop, CRG, Barcelona; 2018 - The Transplantation Society Workshops, Madrid)

ORGANIZATION OF SCIENTIFIC MEETINGS

- 2019 Scientific co-organizer of “Synthetic Biology: Engineering life for the medicine of the future”. International meeting with 300 participants, Barcelona, Spain

INSTITUTIONAL RESPONSIBILITIES

- 2021 – present Director, Board of Directors, Integra Therapeutics, Barcelona, Spain
2015 – 2018 Director, Board of Directors, Sbiomedic, Beerse, Belgium
2023 – now Member, The Science, Technology and Innovation Advisory Council (CACTI), Ministry of Science, Madrid, Spain
2023 – now Global Forum in Technology, Organisation for Economic Co-operation and Development (OECD), Paris, France

REVIEWING ACTIVITIES

- 2023 – present Member of the Spanish Science Ministry Advisory Committee (CACTI)
2020 – present Scientific advisory board member, Integra Tx, Spain
2018 – present Chair of the scientific advisory board, Sbiomedic, Belgium
2016 – present Reviewer for numerous journals, including: *Microbiome*, *Bioinformatics*, *BMC Bioinformatics*, *ACS Synthetic Biology*, *BMC Systems Biology*, *Science Advances*, *MSB*
2016– present Reviewer for multiple funding agencies, including: Catalan Research Agency (AGAUR), Spanish Agency for Research (AEI), French National Research Agency (ANR), European Innovation Council (EIC), multiple private foundations
2016 – 2018 Selection committee in StartUp Chile (world’s largest startup competition)
2016 – 2018 Consulting about Gene Editing technologies: McKinsey, Qiha, eGenesis, Rome therapeutics

MEMBERSHIPS OF SCIENTIFIC SOCIETIES

- 2017 – present European Society of Gene and Cell Therapy
2021 – present EMBO Young Investigator
2022 – Academia Joven de España

Current grants:

<i>Project Title</i>	<i>Funding source</i>	<i>Amount</i>	<i>Period</i>	<i>Role of the PI</i>
SCRIBE – RNA-based gene writing	ERC Consolidator – Horizon Europe	2,000,000 EUR	2023-2027	PI
FiCAT, development of a new genetic engineering technology applied in a CAR-T therapy(CPP2021-008676)	Spanish Agency for Research (AEI)	313,738 EUR	2022-2024	PI
Advanced technologies for the precise and efficient insertion of genes (PID2020-118597RB-I00)	Spanish Agency for Research (AEI)	278,300 EUR	2020-2022	PI
Validation of FiCAT as precise and safe gene editing technology (PDC2021-121730-I00)	Spanish Agency for Research (AEI)	138,000 EUR	2022-2023	PI
ECO-COATING - Engineering Control of Organic Coatings on Autonomous Navy Gliders	DARPA- US Government	\$464,378	2022-2025	PI
SKINDEV	European Innovation Council	600,000 EUR	2023-2026	PI
REMODEL - PREcise gene delivery for advanced disease MODElling	Acció - Agency for Business Competitiveness	80,000 EUR	2022-2023	PI

Early achievements track-record

The natural biosphere offers the most advanced engineering space. Animals made with the same essential components as us (DNA, proteins...) are able to resist cosmic radiation, be cancer free or live perpetually. Nature's molecular architecture is a continuous source of inspiration from which we can learn new scientific and engineering principles. Despite amazing progress in Synthetic Biology, we are very far from nature's capacity to create advanced molecular systems. My passion is to continue to create new basic biological tools that catalyze advancement of the biology of the future. Specifically, SCRIBE pursues the development of a new gene writing technology which could put Europe at the forefront of gene editing technologies.

I am currently a 'tenure-track' professor and PI at Pompeu Fabra University. I have a strong record of original, solid, ambitious, and scientifically and socially relevant research. My work includes several synthetic biology breakthroughs (novel technologies for gene writing, first *in vivo* skin microbiome modulation, highest number of simultaneous CRISPR edits, most recoded genome, PERVs-free pigs) that have produced a tremendous impact: **>16,000 citations, 3 companies developing therapies** ([Sbiomedic](#) in skin microbiome (recently acquired by Beiersdorf); [eGenesis](#) in xenotransplantation; [Integra Therapeutics \(Tx\)](#) in gene therapy (FiCAT technology) - this latter was just launched as spin off from my lab with a 6M EUR seed fund in December'21), **and patents licensed to leading companies**. We are currently developing new principles and tools that could revolutionize therapeutic approaches to several medical conditions.

TEN SELECTED PUBLICATIONS

Total number of citations (since 2018): **9120 (total 16805)**, h-index: **24**, i10-index: **29**

- 1) Pallarès-Masmitjà M, Ivančić D, ... **Güell M**, Find and cut-and-transfer (FiCAT) mammalian genome engineering, *Nature Communications* 2021; 12:7071 (**Top 25 Most Downloaded Papers in 2021**)
- 2) Ivančić D, ... **Güell M**, INSERT-seq enables high-resolution mapping of genomically integrated DNA using Nanopore sequencing, *Genome Biology* 2022; 23:227
- 3) Pätzold B, **Güell M**, Skin microbiome modulation induced by probiotic solutions, *Microbiome* 2019; 7:95
- 4) Niu D, ... **Güell M***, Church G*, Yang L* (*equally contributing as senior authors), Eradication of porcine endogenous retrovirus activity in pigs using CRISPR-Cas9 *Science* 2017; 357(6357):1303-1307
- 5) Knödseder N, ... **Güell M**, Engineering selectivity of *Cutibacterium acnes* phages by epigenetic imprinting, *Plos Pathogens* 2022; 18(3):e1010420
- 6) Ostrov N*, Landon M*, **Güell M*** et al. (*equally contributing), Design, test of a 57-codon genome, *Science* 2016; 353(6301):819-22
- 7) Yang L*, **Güell M*** et al. (*equally contributing), Genome-wide inactivation of porcine endogenous retroviruses (PERVs), *Science* 2015; 350(6264):1101-1104
- 8) Mali P, Yang L, Esvelt KM, Aach J, **Güell M**, et al. RNA-guided human genome engineering via Cas9, *Science* 2013; 15:339(6121):823-6
- 9) Vivancos AP*, **Güell M***, et al. (*equally contributing), Strand-specific deep sequencing of the transcriptome, *Genome Research* 2010; 20(7):989-99
- 10) **Güell M**, et al., Transcriptome Complexity in a Genome-Reduced Bacterium, *Science* 2009; 326(5957):1268-1271

TEN SELECTED PATENTS

- 1) Sánchez-Mejías A, **Güell M**, ... Targeted gene editing constructs and methods of using the same, **WO2020250181A1** (Licensed to Integra Tx)
- 2) Sánchez-Mejías A, **Güell M**, Programmable transposases and uses thereof, **EP20214696.5** (Licensed to Integra Tx)
- 3) Sánchez-Mejías A, **Güell M**, Therapeutic LAMA2 payload for treatment of congenital muscular dystrophy, **EP20214691.6** (Licensed to Integra Tx)
- 4) **Güell M**, Knödseder N. A method for screening for modifications in the infectivity range of bacteriophages due to epigenetic imprinting, **EP21382796.7** (Licensing under negotiation to Synflora)
- 5) **Güell M**, Knödseder N. Human neutrophil gelatinase-associated lipocalin derived from recombinant bacteria and uses thereof, **EP22382050.7** (Licensing under negotiation to Synflora)
- 6) Yang L, Church G, **Güell M**, Joyce Yang. Genome engineering, **WO2015013583A2** (Licensed to several companies including Editas, Genentech, ...)
- 7) Yang L, Church G, **Güell M**, Multiplex genome editing, **WO2017062723A1** (Licensed to several companies including Editas, Genentech, ...)
- 8) Church G, Yang L, **Güell M**, Genome-wide inactivation of PERVs, **US Patent App. 62/239,239** (Licensed to eGenesis Biosciences)

- 9) Paetzold B, ..., **Güell M.** Methods and compositions for changing the composition of the skin microbiome using complex mixtures of bacterial strains, **EP3528825B1** (Transferred to Sbiomedic)
- 10) Yang L, **Güell M.** Cells, tissues, organs, and/or animals having one or more modified genes for enhanced xenograft survival and/or tolerance, **WO2020228039A1** (Owned by Qihan bio)

PRIZES AND AWARDS

- 2022 – National Research Award Ángela Ruiz Robles received from the King of Spain, Alicante**
2021 – August Pi i Sunyer Award, Institute of Catalan Studies
2020 – Elected EMBO Young Investigator, European Molecular Biology Organization
2019 – Highly cited researcher of the Web of Science (top 1%)
2019 – National Research Award to young talent received from President of the Generalitat, Barcelona
 2018 – Premi Consell Social UPF to Tech Transfer, Barcelona
 2016 – OneStart competition finalists (S-Biomedic). London, United Kingdom
 2015 – Received from the King of Spain Felipe VI an award as South Summit 2015 winning team (S-Biomedic) in the Healthcare & Biotech category. Madrid, Spain
 2013 – Awarded with the distinction of Garrotxa's Embassador by the Olot Mayor Dr. Corominas, Olot City Council, Olot, Girona
 2010 – P. Salvador Gil Award to the best final degree project, Institut Químic de Sarrià, Barcelona
 2001 – Received special award from the Catalan Universities Minister Dr. Mas-Colell for obtaining a top 10 grade (nation-wide) in the university admission exam, Generalitat de Catalunya, Barcelona
 Team awards: Mentor of iGEM team Hormonic (gold medal, Best New Basic Part, Best Wiki)

STARTUPS, PATENTS AND TRANSLATIONAL SCIENCE

An important part of my career has focused on bringing back to society the new progresses we have made in the laboratory. I am the cofounder and founding scientist of four biotech companies developing therapies:

- 1) [Sbiomedic](#) (Series A + EIC grant – 7.5M EUR raised; Acquired by Beiersdorf in 2022) is focused on skin microbiome-based therapeutics.
- 2) [eGenesis](#) (Series A – \$38M, Series B – \$100M, Series C – \$125M) was founded in 2016 with the aim to making xenotransplantation a reality.
- 3) [Integra Tx](#) was founded in 2020 based on a gene therapy technology (FiCAT) developed in my laboratory. We obtained ~500,000 EUR in non-diluting funding from government and foundations and we closed a round of an additional 6M EUR from an international investment syndicate (Invivo capital and Columbus Ventures - Spain, Adbio - France, Takeda ventures - USA). Integra Tx is raising very much interest from the pharmaceutical industry and venture capital community.
- 4) Synflora was founded in early 2022. This company is licensing technology from my laboratory to use synthetic biology to generate advanced therapeutics for the skin. We were finalists in the last EIT Jumpstarter edition, and we are in conversations with investors to close a financing round.
- 5) Patents I generated beside being the bases of new companies have also been actively licensed to leading established companies (Editas Medicine, Juno, Genentech, ...).

SELECTED INVITED PRESENTATIONS

- 2023 – 33rd IFSCC Congress, Barcelona, (Keynote speaker)
 2023 – COST action - CA21113 Genome Editing to Treat Human diseases, Granada, Spain (Invited speaker)
 2023 – European Joint Programme on Rare Diseases (EJP RD), Barcelona, Spain (Invited speaker)
 2022 – Gene editing: From research to industry, Vilnius, Lithuania (Invited speaker)
 2022 – Synthetic Biology-Based Therapies Summit, Boston, USA (Invited speaker)
 2021 – CRISPR-Cas: From Microbiology to Biomedicine, Baeza, Spain (Invited speaker)
 2020 – Nature Symposium on biosensors and their medical potential, Madrid, Spain (Invited speaker)
 2018 – Transplantation Society International Congress, Madrid, Spain (Invited speaker)
 2017 – CRISPR: From Biology to Technology and Novel Tx, Sitges, Spain (Oral presentation)
 2017 – SEED conference: Synthetic Biology, Engineering, Evolution & Design, Vancouver, Canada (Invited speaker)
 2016 – Microbiome R&D and Business collaboration forum, San Diego, USA (Invited panelist)
 2016 – Genome Editing Tools Course, CRG, Barcelona, Spain (Invited speaker)
 2015 – Systems Biology of *E. coli*, Awaji Island, Japan (Invited speaker)
 2012 – 10th Anniversary Symposium, CRG, Barcelona, Spain (Invited speaker)
 2010 – The EMBO meeting 2010, Barcelona (Invited speaker)
 2010 – Systems Biology of Microorganisms, Paris, France (Oral presentation)