Lluís Ribas de Pouplana

ICREA Research Professor
Gene Translation Laboratory
Barcelona Institute for Research in Biomedicine (IRB Barcelona)
ORCID code: 0000-0002-2087-0359

Contact:
Gene Translation Laboratory, IRB
Barcelona Science Park
C/ Baldiri Reixac 10
Barcelona 08028
Catalonia

Tel: +34 934 034 868
Fax: +34 934 034 870
Email: lluis.ribas@irbbarcelona.org
URL: www.irbbarcelona.org

Education

Ph.D. Biochemistry	University of Edinburgh, UK	1992
B.Sc. Biology	University of Barcelona	1988

Continuing Education

M.Sc on Omics Data analysis	University of Vic (Barcelona)	2015 -

Research positions:

2003-	**Research Professor.**	ICREA and IRB Barcelona.
2000 - 03	**Assistant Professor.**	Dept. of Molecular Biology, TSRI, USA.
1997 - 99	**Senior Research Scientist.**	The Scripps Research Institute, USA.
1993 - 97	**Post-Doctoral fellow.**	Dept. of Biology, M.I.T., USA.

Data from Google Scholar:
H index: 38
Citations: 5314
Number of papers: 135
Papers cited over 100 times: 14

Theses directed:
Current number of Ph.D. students: 3
Completed Ph.D. theses: 12
Completed M.Sc. theses: 10

Fellowships and honours:

2020	**1st Award.** Ribo-Omics Grant Challenge. Immagina Corporation.
2018	**"Editor's pick"** by the JBC editorial board, for Ribas de Pouplana (2018).
2012	**SEBBM prize** to the best published paper in 2012, for Novoa et al. (2012).
2010	**"Paper of the week"** by the JBC editorial board, for Guitart et al. (2010).
2001	**Recipient.** TOYPS prize for young researchers in biomedicine.
1995	**Postdoctoral fellow.** Generalitat de Catalunya postdoctoral fellowships.
1991	**Fellow.** Faculty of Medicine, University of Edinburgh.
1991	**Fellow.** Short term fellowships of the International Union of Biochemistry.
1989	**Fellow.** Postgraduate fellowships 'La Caixa/British council'.
1986	**Recipient.** 'Prince of Asturias' prize for Young Researchers.

Selected published research articles:

1 Torres AG, Rodríguez-Escribà M, Marcet-Houben M, Santos Vieira HG, Camacho N, Catena H, Murillo Recio M, Rafels-Ybern À, Reina O, Torres FM, Pardo-Saganta A, Gabaldón T, Novoa EM, **Ribas de Pouplana L**. (2021) "Human tRNAs with inosine 34 are essential to efficiently translate eukarya-specific low-complexity proteins. " *Nucleic Acids Res.* 49(12):7011-7034.

2 Torres AG, Reina O, Stephan-Otto Attolini C, **Ribas de Pouplana L.** "Differential expression of human tRNA genes drives the abundance of tRNA-derived fragments." *Proc Natl Acad Sci USA.* 116(17):8451-8456.

3 Picchioni D, Antolin-Fontes A, Camacho N, Schmitz C, Pons-Pons A, Rodríguez-Escribà M, Machallekidou A, Güler MN, Siatra P, Carretero-Junquera M, Serrano A, Hovde SL, Knobel PA, Novoa EM, Solà-Vilarrubias M, Kaguni LS, Stracker TH, **Ribas de Pouplana L.** (2019) "Mitochondrial Protein Synthesis and mtDNA Levels Coordinated through an Aminoacyl-tRNA Synthetase Subunit. " *Cell Reports* 27(1):40-47

4 Rafels-Ybern À, Torres AG, Camacho N, Herencia-Ropero A, Roura Frigolé H, Wulff TF, Raboteg M, Bordons A, Grau-Bove X, Ruiz-Trillo I, **Ribas de Pouplana L.** (2019) "The expansion of Inosine at the wobble position of tRNAs, and its role in the evolution of proteomes." *Mol. Biol. Evol.* 36(4):650-662.

5 Rafels-Ybern À, Torres AG, Grau-Bove X, Ruiz-Trillo I, **Ribas de Pouplana L**. (2017) "Codon adaptation to tRNAs with Inosine modification at position 34 is widespread among Eukaryotes and present in two Bacterial phyla." *RNA Biol*. 7:1-8.

6 Silva J, Aivio S, Knobel PA, Bailey LJ, Casali A, Vinaixa M, Garcia-Cao I, Coyaud E, Jourdain AA, Perez-Ferreros P, Rojas AM, Antolin-Fontes A, Samino-Gené S, Raught B, González-Reyes A, **Ribas de Pouplana L**, Doherty AJ, Yanes O, Stracker TH (2017) "EXD2 governs germ stem cell homeostasis and lifespan by regulating mitochondrial ribosome assembly, translation and cellular respiration" *Nature Cell Biology*, 20:162-174.

7 Saint-Léger A, Bello-Cabrera C, Dans PD, Torres AG, Novoa EM, Camacho N, Orozco M, Kondrashov FA, **Ribas de Pouplana L.** (2016) "Saturation of recognition elements blocks evolution of new tRNA identities" *Science Advances* 29;2(4):e1501860.

8 Torres AG, Piñeyro D, Rodríguez-Escribà M, Camacho N, Reina O, Saint-Léger A, Filonava L, Batlle E, **Ribas de Pouplana L.** (2015) "Inosine modifications in human tRNAs are incorporated at the precursor tRNA level." *Nucleic Acids Res.* 43(10):5145-5157.

9 Novoa EM, Camacho N, Tor A, Wilkinson B, Moss S, Marín-García P, Azcárate IG, Bautista JM, Mirando AC, Francklyn CS, Varon S, Royo M, Cortés A, **Ribas de Pouplana L**. (2014) "Analogs of natural aminoacyl-tRNA synthetase inhibitors clear malaria in vivo." *Proc Natl Acad Sci U S A.* 111(51)E5508-E5517.

10 Guitart T, Picchioni D, Piñeyro D, **Ribas de Pouplana L.** (2013) "Human mitocondrial disease-like symptoms caused by a reduced tRNA aminoacylation activity in flies." *Nucleic Acids Res.*41(13):6595-6608.

11 Novoa EM, Pavon-Eternod M, Pan T, **Ribas de Pouplana L.** (2012) "A role for tRNA modifications in genome structure and codon usage." *Cell* 149(1):202-213.

12 Castro de Moura M, Miro F, Han JM, Kim S, Celada A, **Ribas de Pouplana L.** (2011) "Entamoeba lysyl-tRNA synthetase contains a cytokine-like domain with chemokine activity towards human endothelial cells." *PLoS Negl Trop Dis.* 5(11):e1398.

13 Jones, T.E.; Brown, C.L.; Geslain, R.; Alexander, R.W.; and **Ribas de Pouplana, L.** (2008) "An operational RNA code for faithful assignment of AUG triplets to methionine" *Mol. Cell* 15:401-7

14 Beebe, K, **Ribas de Pouplana**, L, and Schimmel, P (2003) "Elucidation of tRNA-dependent editing by a class II tRNA synthetase and significance for cell viability" *EMBO J.*, 22:668-675.

15 **Ribas de Pouplana, L.** & Schimmel, P. (2001) "Two classes of tRNA synthetases suggested by sterically compatible dockings on tRNA acceptor stem". *Cell* 104, 191-3.

Selected published reviews and commentaries:

1 Srinivasan S, Torres AG, **Ribas de Pouplana L.** (2021) “Inosine in Biology and Disease. “ *Genes* (Basel). 12(4):600.

2 Ros E, Torres AG, **Ribas de Pouplana L.** (2020) “Learning from Nature to Expand the Genetic Code“ *Trends Biotechnol*. S0167-7799(20)30211-0.

3 **Ribas de Pouplana L.** “The mitochondrial tRNA conundrum.” (2020) *Nat. Rev. Mol. Cell Biol*. 21(7):361.

4 **Ribas de Pouplana L.** (2018) “Genetic code and metabolism: The perpetual waltz.” *J. Biol. Chem*. 293(49):19157-19158.

5 Saint-Léger A, Sinadinos C, **Ribas de Pouplana L.** (2016) “The growing pipeline of natural aminoacyl-tRNA synthetase inhibitors for malaria treatment.” *Bioengineered* 7(2):60-4.

6 Filonava L, Torres AG, **Ribas de Pouplana L.** (2015) “A novel cause for primordial dwarfism revealed: defective tRNA modification.” *Genome Biol*. Vol. 16, pp 216.

7 Novoa EM, **Ribas de Pouplana L.** (2015) “Cooperation for Better Inhibiting.” *Chem Biol*.22:685-6.

8 **Ribas de Pouplana L.** (2014) “Not an inside job: non-coded amino acids compromise the genetic code.” *EMBO J.* 33(15):1619-1620.

9 Torres AG, Batlle E, **Ribas de Pouplana L.** (2014) “Role of tRNA modifications in human diseases.” *Trends Mol Med.* 20(6):306-14.

10 Novoa EM, **Ribas de Pouplana L.** (2012) “Speeding with control: codon usage, tRNAs, and ribosomes.” *Trends Genet.* 28(11):574-581.

11 **Ribas de Pouplana L**, Dedon PC. (2014) “More than an adaptor molecule: the emerging role of tRNA in cell signaling and disease.” *FEBS Lett.* 588(23):4267.

12 **Ribas de Pouplana L,** Santos MA, Zhu JH, Farabaugh PJ, Javid B. (2014) “Protein mistranslation: friend or foe?” *Trends Biochem Sci.*Vol. 39(8):355-362.

13 **Ribas de Pouplana L.** (2014) “Not an inside job: non-coded amino acids compromise the genetic code.” *EMBO J.* 33(15):1619-1620.

14 Torres AG, Batlle E, **Ribas de Pouplana L.** (2014) “Role of tRNA modifications in human diseases.” *Trends Mol Med.* 20(6):306-14.

15 Novoa EM, **Ribas de Pouplana L.** (2012) “Speeding with control: codon usage, tRNAs, and ribosomes.” *Trends Genet.* 28(11):574-581.

16 Jackson KE, Habib S, Frugier M, Hoen R, Khan S, Pham JS, **Ribas de Pouplana L,** Royo M, Santos MA, Sharma A, Ralph SA. (2011) “Protein translation in Plasmodium parasites.” *Trends Parasitol.* 27(10):467-476.

17 **Ribas de Pouplana L,** Geslain, R “Not just because it is there: aminoacyl-tRNA synthetases gain control of the cell.” (2008) *Molecular Cell* 30:3-4.

18 **Ribas de Pouplana, L.** & Schimmel, P. (2004) “Aminoacylations of tRNAs: Record-keepers for the Genetic Code” In “Protein Synthesis & Ribosome Structure - Translating the Genome” (Nierhaus & Wilson Eds.) Wiley Press, Hoboken, USA. pp. 145 -184.

19 **Ribas de Pouplana, L.** & Schimmel, P. (2001) “Operational RNA code for amino acids in relation to genetic code in evolution”. *J. Biol. Chem.* 276:6881-6884.

20 Schimmel, P. & **Ribas de Pouplana, L.** (1999) “Genetic code origins: Experiments confirm phylogenetic predictions and may explain a puzzle”. *Proc. Natl. Acad. Sci. U.S.A.,* 96:327-328.

21 Schimmel, P. & **Ribas de Pouplana, L.** (1995) “Transfer RNA: From minihelix to genetic code”. *Cell,* 81:983-986.

Selected books and book chapters:

1 Editor. "The Enzymes Vol XLVII. Biology of Aminoacyl-tRNA synthetases" (2020) Elsevier, Amsterdam, the Netherlands.

2 **Ribas de Pouplana L** (2020) "The evolution of Aminoacyl-tRNA Synthetases, from dawn to LUCA" In "The Enzymes Vol XLVII. Biology of Aminoacyl-tRNA synthetases" (Ribas de Pouplana L. & Kaguni L. Eds.) Elsevier, Amsterdam, the Netherlands. pp 15-32.

3 Editor. "The genetic code and the origin of life" (2005) Plenum Press, New York, USA.

4 **Ribas de Pouplana L** & Schimmel P (2005) "Aminoacyl-tRNA Synthetases as Clues To Establishment of the Genetic Code" In "The genetic code and the origin of life" (Ribas de Pouplana L. Ed.) Plenum Press, New York, USA, pp 119-133.

Main research projects and grants (in €):

1. 2021 Seed Grant of the Spanish Cancer Association (20.000)
2. 2020 Grant of the Spanish Ministry of Sci. and Tech. PID2019-108037RB-100 (326.000)
3. 2018 M.I.T.- La Caixa (MISTI-Spain) for collaborative projects with M.I.T groups (6.000)
4. 2016 Grant of the Spanish Ministry of Science and Technology BIO2015-64572. (346.060)
5. 2015 Grant of the Spanish Ministry of Science and Technology BIO2014-61411-EXP. (66.550)
6. 2014 Consolidated Research Group Grant of the Catalan Government 2014-SGR-771. (22.000)
7. 2013 Grant of the Spanish Ministry of Science and Technology SAF2012-32200. (175.000)
8. 2010 Grant of the Spanish Ministry of Science and Technology BIO2009-09776. (180.000)
9. 2009 Consolidated Research Group Grant of the Catalan Government. (42.000)
10. 2009 Coordinator of MEPHITIS, an EU-funded research consortium. (2.145.151)
11. 2007 Grant of the Spanish Ministry of Science and Technology BIO2006-01558. (211.266)
12. 2006 Emerging Research Group Grant of the Catalan Government. 2005–SGR-350. (36.600)
13. 2004 Grant of the Spanish Ministry of Science and Technology BIO2003-02611. (82.300)
14. 2005 Marie Curie International Reintegration Award, European Union. (80.000)

Academic committees and boards (since 2012):

2019 - **Editor-in-Chief.** "Genetics and Genomics Research" section, *Life* (ISSN 2075-1729).
2016 - 18 **Member.** Editorial Board – *Life* (ISSN 2075 -1729)
2015 - 16 **Guest editor.** Special Issue "Evolution of tRNA" – *Life* (ISSN 2075 -1729)
2015 - 17 **Coordinator.** Gordon Research Seminar: "Protein translation and beyond".
2015 - **Member.** Scientific Advisory Board, Institute for Biomedicine of U. of Aveiro, Portugal.
2009 - 14 **Patron.** Catalan Foundation for the Advancement of Research.

Selected public presentations and conference organizations (since 2015):

2021 **Invited speaker.** Colloquium series, Dept. of Biochemistry, University of Leipzig, Germany.
2020 **Invited Speaker.** The Maud Menten Lectures. University of Western Ontario, Canada.
2019 **Speaker.** 12 International Symposium on aminoacyl-tRNA synthetases. Hangzhou, China.
2019 **Keynote Speaker.** RNA Regulatory Networks ISFMS2019. Lisbon, Portugal.
2018 **Keynote Speaker.** 27th tRNA Conference. Strasbourg.
2018 **Invited Speaker.** Centro de Investigación del Cancer de Salamanca.
2017 **Speaker.** 11th International Symposium on aminoacyl-tRNA synthetases. Tampa.
2017 **Invited Speaker.** The evolution of RNA. Colegio Mayor, Mexico DF.
2017 **Keynote Speaker.** METU Evolutionary Biology Conference. Ankara.
2016 **Speaker.** Banbury conference on the Genetic Code, CSHL, New York.
2016 **Speaker.** 26th tRNA Conference. Jeju, South Korea.
2016 **Invited Speaker.** MRC Mitochondrial Biology Unit, Cambridge.
2015 **Organizer.** 10th International Symposium on aminoacyl-tRNA synthetases. Barcelona
2015 **Invited Speaker.** MITOcross Symposium. Strasbourg, France.
2015 **Speaker.** Gordon Research Conference. California, USA.

Technology transfer activities:

2005 -15 **Founder, CEO, and CSO.** Omnia Molecular S.L., Barcelona.
1997 **Founder.** Agrobiosys S.L., Barcelona.
1994-97 **Scientific consultant.** Cubist Pharmaceuticals Corporation, USA.

Patents:

1 **Ribas de Pouplana, L.,** Bori Sanz, T., Castro de Moura, M., Geslain, R. "A screening method for identifying new aminoacyl-tRNA syntehtase inhibitors" (2007) PCT/EP2007/059063, WO/2008/028862, PUB. DATE: 13/03/2008.

2 **Ribas de Pouplana, L.,** Bori Sanz, T. "A screening method for identifying new drugs" (2007) APPLICATION NO.: PCT/EP2007/056458, WO/2008/000785, PUB. DATE: 03/01/2008.

3 Ezkerra Fernandez, A., Berganzo Ruiz, J., **Ribas de Pouplana, L.,** Cortés i Closas, A. "Impulsion core for a fluid micropump", (2011) PCT/EP2012/056742, WO/2012/140180, PUB. DATE: 18/10/2012.

4 Jirgensons A., Loža E., Finn P.W., Charlton M, **Ribas de Pouplana L**., Saint-Léger A. "Novel N-Acyl-Diarylsulfonamide Derivatives as Aminoacyl t-RNA Synthetase Inhibitors" (2015) Patent application (not yet published), APPLICATION NO.: P-15-14, FILING DATE: 01/06/2015.

Teaching experience:

2016 **Invited Professor.** M.Sc. on Biomedical Sciences, U. Pompeu Fabra.
2013 **Invited Professor.** M.Sc. on Advanced Catalysis and Molecular Modelling. U. Girona.
2010-11 **Invited Professor.** M.Sc. in the Economics of Science and Innovation. Barcelona Graduate School of Economics.
2000-02 **Assistant Professor** of Molecular Biology. TSRI.
1999 **Invited Professor,** Bioinformatics. Graduate program, U. Pompeu Fabra.
1999-00 **Invited Professor,** Bioinformatics. Graduate program, U. Barcelona.
1997-03 **Teaching assistant,** Protein Modelling. Department of Biology, MIT.
1989-92 **Teaching assistant,** Biochemistry. University of Edinburgh.