BRIEF CURRICULUM VITAE

Education

1987	B.Sc. Biology, University of Barcelona, Catalonia, Spain
1993	PhD Human Molecular Genetics, University of Barcelona, Catalonia, Spain
1994-1998	Postdoctoral fellow, Howard Hughes Medical Institute, Department of Molecular and Human Genetics, Baylor College of Medicine, Houston, TX
1998	Research Associate, Carl C. Icahn Center for Gene Therapy and Molecular Medicine, Mount Sinai School of Medicine, New York, NY

Academic positions

1999 - 2001	Instructor, Mount Sinai School of Medicine, New York, NY
2001 - 2003	Research Assistant Professor, Mount Sinai School of Medicine, New York, NY
2003 - 2009	Assistant Professor, Indiana University School of Medicine, Indianapolis, IN
2005 - 2009	Assistant Professor, Indiana University School of Medicine, Indianapolis, IN
2009 -	Associate Professor (tenured), Indiana University School of Medicine, Indianapolis, IN
2010 - 2011	Visiting Professor (sabbatical leave), Swiss Federal Institute of Technology (ETH), Zurich

Other Experience

2009 - 2010	Ad hoc reviewer, NIDDK Special Emphasis Panel; ZDK1-GRB-W Diabetes, Endocrinology, and Metabolic Disease Fellowships (F30/F32) study section
2009 - 2012	Member, American Society of Gene and Cell Therapy, Genetic and Metabolic Diseases Committee
2009 - 2012	Permanent member, American Diabetes Association Research Grant Review Committee
2011 - 2011	Co-Chair, Genetic and Metabolic Diseases Gene & Cell Therapy II oral abstract session, American Society of Gene and Cell Therapy 14th Annual meeting,
2011 - 2017	Permanent member, NIH, Gene and Drug Delivery Systems (GDD) study section
2012 - 2018	Member, American Society of Gene and Cell Therapy, Oligonucleotide and RNAi Therapeutics Committee
2017 - 2018	Chair, American Society of Gene and Cell Therapy, Oligonucleotide and RNAi Therapeutics Committee

Publications

Peer-reviewed articles

1. Estivill, X., Chillón, M., Casals, T., Bosch, A., **Morral, N**., *et al*. DF508 gene deletion in cystic fibrosis in Southern Europe. *Lancet* 2: 1404 (1989).
2. Gasparini, P., Nunes, V., Savoia, A., Dognini, M., **Morral, N**., Gaona, A., Bonizzato, A., Chillón, M., Sangiuolo, F., Novelli, G., Dallapiccola, B., Pignatti, P.F., Estivill, X. Search for south european cystic fibrosis mutations: identification of two new mutations, four variants, and intronic sequences. *Genomics* 10:193-200 (1991).
3. Gasparini, P., Dognini, M., Bonizzato, A., Pignatti, P.F., **Morral, N**., Estivill, X. A tetranucleotide repeat polymorphism in the cystic fibrosis gene. *Human Genetics* 86:625 (1991).

4. **Morral, N**., Nunes, V., Casals, T., Estivill, X. CA/GT microsatellite alleles within the cystic fibrosis gene are not generated by unequal crossingover. *Genomics* 10:692-698 (1991).
5. Estivill, X., **Morral, N**., Casals, T., Nunes, V. Prenatal diagnosis of cystic fibrosis by multiplex PCR of mutation and microsatellite alleles. *Lancet* 338:458 (1991).
6. **Morral, N**., Girbau, E., Zielenski, J., Nunes, V., Casals, T., Tsui, L.-C., Estivill, X. Dinucleotide (CA/GT) repeat polymorphism in intron 17b of the *CFTR* gene. *Human Genetics* 88:356 (1992).
7. Posas, F., Casamayor, A., **Morral, N**., Ariño, J. Molecular cloning and analysis of a yeast protein phosphatase with an unusual amino-terminal region. *Journal of Biological Chemistry* 267:11734-11740 (1992).
8. **Morral, N**., and Estivill, X. Multiplex PCR amplification of three microsatellites within the *CFTR* gene. *Genomics* 13:1362-1364 (1992).
9. Casals, T., Nunes, V., Palacio, A., Giménez, J., Gaona, A., Ibáñez, N., **Morral, N**., Estivill, X. Geographical distribution of cystic fibrosis mutations DF508 and G542X: high frequency of G542X in the South-East of Spain. *Human Genetics* 91:66-70 (1993).
10. **Morral, N**., Nunes, V., Casals, T., Chillón, M., Giménez, J., Bertranpetit, J., Estivill, X. Microsatellite haplotypes for cystic fibrosis: mutation frameworks and evolutionary tracers. *Human Molecular Genetics* 2:1015-1022 (1993).
11. **Morral, N**., Nunes, V., Casals, T., Cobos, N., Asensio, O., Dapena, J., Estivill, X. Uniparental inheritance of microsatellites alleles of the cystic fibrosis (*CFTR*) gene: identification of a 50 kb deletion. *Human Molecular Genetics* 2:677-681 (1993).
12. Chillón, M., Casals, T., Giménez, J., Ramos, D., Palacio, A., **Morral, N**., Estivill, X., Nunes, V. Analysis of the CFTR gene confirms the high genetic heterogeneity of the Spanish population: 43 mutations account for only 78% of CF chromosomes. *Human Genetics* 4:447-451 (1994).
13. Kere, J., Estivill, X., Chillón, M., **Morral, N**., Nunes, V., Norio, R., Savilahti, E., De la Chapelle, A. Cystic fibrosis in a low-incidence population: two major mutations in Finland. *Human Genet*ics 93:162-166 (1994).
14. **Morral, N**., Bertranpetit, J., Estivill, X., Nunes, V., Casals, T., Giménez, J., *et al.* Tracing the origin of the major cystic fibrosis mutation (DF508) in European populations. *Nature Genetics* 7:169-175 (1994).
15. Mercier, B., Raguenes, O., Estivill, X., **Morral, N**., Kaplan, G.C., Mc Clure, M., Grebe, T.A., Kessler, D., Pignatti, P.F., Marigo, C., Bombieri, C., Audrezet, M.P., Verlingue, C., Ferec, C. Detection of CFTR mutations in patients of native American Indian origin using denaturing gradient gel electrophoresis and DNA sequencing. *Human Genetics* 94:629-632 (1994).
16. **Morral, N**., Llevadot, R., Casals, T., Gasparini, P., Macek, M., Dörk, T., Estivill, X. Independent origins of cystic fibrosis mutations R334W, R347P, R1162X and 3849+10kbC->T provide evidence of mutation recurrence in the CFTR gene. *American Journal of Human Genetics* 55:890-898 (1994).
17. Cashman, S.M., Patino, A., Martinez, A., García-Delgado, M., Miedzybrodzka, Z., Schwarz, M., Shrimpton, A., Ferec, C., Raguenes, O., Macek, M., **Morral, N**., De Arce, M. Identical intragenic microsatellite haplotype found in cystic fibrosis chromosomes bearing mutation G551D in Irish, English, Scottish, Breton and Czech patients. *Human Heredity* 45:6-12 (1995).
18. Meukus, F., Dörk, T., Deufel, T., **Morral, N**., Tümmler, B. Analysis of microsatellites by direct blotting electrophoresis and chemiluminescence detection. *Electrophoresis* 16:1886-1888 (1995).
19. **Morral, N**., Dörk, T., Llevadot, R., Dziadek, V., Mercier, B., Férec, C., Costes, B., Girodon, E., Zielenski, J., Tsui, L.-C., Tümmler, B., Estivill, X. Haplotype analysis of 94 cystic fibrosis mutations with seven polymorphic *CFTR* DNA markers. *Human Mutation* 8:149-159 (1996).
20. Claustres, M., Desgeorges, M., Moine, P., **Morral, N**., Estivill, X. CFTR haplotypic variability

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21. Zhou, H., O'Neal, W., **Morral, N.,** Beaudet, A.L. Development of a complementing cell line and a system for construction of adenovirus vectors with E1 and E2a deleted. *Journal of Virology* 70:7030-7038 (1996).
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24. O'Neal, W.K., Zhou, H., **Morral, N**., Aguilar-Cordova, E., Pestaner, J., Langston, C., Mull, B., Wang, Y., Beaudet, A.L., Lee, B. Toxicological comparison of E2a-deleted and first-generation adenoviral vectors expressing a_1-antitrypsin after systemic delivery. *Human Gene Therapy* 9:1587-1598 (1998).
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36. **Morral, N.** Gene therapy for type 1 diabetes. New approaches. *Minerva Med.* 95:93-104 (2004). Review.
37. **Morral, N.,** Edenberg, HJ., Witting, SR., Altomonte, J., Chu, T., Brown, M. Effects of glucose metabolism on regulation of genes of fatty acid synthesis and triglyceride secretion in the liver. *Journal of Lipid Research* 48:1499-1510 (2007).
38. Chen, J., **Morral, N.**, Engel, DA. Transcription releases protein VII from adenovirus chromatin. Virology 369:411-422 (2007).
39. Witting, SR., Brown, M., Saxena, R., Nabinger, S., **Morral,** N. Helper-dependent adenovirus-mediated shRNA expression in the liver activates the interferon response. *Journal of Biological Chemistry* 283:2120-2128 (2008).
40. Ruiz, R., Witting, S.R., Saxena, R., **Morral, N.** Robust hepatic gene silencing for functional studies using helper-dependent adenovirus vectors. Human Gene Therapy 20:87-94 (2009).
41. Walkiewicz, MP., **Morral, N**., Engel, DA. Accurate single-day titration of adenovirus vectors based on equivalence of protein VII nuclear dots and infectious particles. *J Virol Methods*. 159:251-258 (2009).
42. Park, JS., Surendran, S., Kamendulis, LM., **Morral, N**. Comparative nucleic acid transfection efficacy in primary hepatocytes for gene silencing and functional studies. *BMC Research Notes* 4:8 (2011).
43. Ahn, M., Witting, S.R., Ruiz, R., Saxena, R., **Morral, N**. Constitutive expression of shRNA *in vivo* triggers build up of mature hairpin molecules. Human Gene Therapy 22:1483-1497 (2011).
44. **N. Morral,** S. Witting**.** shRNA-induced interferon-stimulated gene analysis. *Methods in Molecular Biology* 820:163-77 (2012).
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47. Mansouri A, Pacheco-López G, Ramachandran D, Arnold M, Leitner C, Prip-Buus C, Langhans W, and **Morral N.** Enhancing hepatic mitochondrial fatty acid oxidation stimulates eating in food-deprived mice. *The American Journal of Physiology - Regulatory, Integrative and Comparative Physiology* 308:R131-R137 (2015).
48. Surendran S, Jideonwo VN, Merchun C, Ahn M, Murray J, Ryan J, Dunn K, Kota J, **Morral N.** Gene targets of mouse miR-709: regulation of distinct pools. *Scientific Reports* 6:18958 (2016).
49. Irimia, J. M., Meyer, C.M., Segvich, D.M., Surendran, S., DePaoli-Roach, A., **Morral, N.**, Roach, P.J. Lack of liver glycogen causes hepatic insulin resistance and steatosis in mice. *Journal of Biological Chemistry* 292:10455-10464 (2017).
50. Moore NA, Bracha P, Hussain RM, **Morral N**, Ciulla TA. Gene Therapy for Age-Related Macular Degeneration. *Expert Opinion on Biological Therapy* Jul 20:1-10 (2017).
51. Moore NA, **Morral N**, Ciulla TA, Bracha P. Gene Therapy for Inherited Retinal and Optic Nerve Degenerations. *Expert Opinion on Biological Therapy* 18:37-49 (2018).
52. Jideonwo VN, Hou, Y., Ahn M, Surendran S, **Morral N.** Impact of silencing hepatic SREBP-1 on insulin signaling. PLoS ONE 13(5): e0196704 (2018).
53. **Morral N*,** Liu S, Conteh AM, Chu X, Wang Y, Dong XC, Liu Y, Linnemann A, Wan J. Aberrant gene expression induced by a high fat diet is linked to H3K9 acetylation in the

promoter-proximal region. *BBA-Gene Regulatory Mechanisms* 1864:194691 (2021). *Corresponding author.

54. Qian G, **Morral N.** Role of non-coding RNAs on liver metabolism and NAFLD pathogenesis. *Human Molecular Genetics* 31 (R1): R4-R21 (2022).
55. Saxena R, Nassiri M, Yin X-M, **Morral N.** Insights from a high-fat diet fed mouse model with a humanized liver. *PLoS One* 17(5):e0268260 (2022).
56. Yadav AK, MacNeill JJ, Krylov A, Ashrafi N, Ashrafi Mimi R, Saxena R, Liu S, Graham SF, Wan J, **Morral N.** Sex and age-associated factors drive the pathophysiology of MASLD. *Hepatology Communications* 2024;8:e0523.

Book chapters

1. Estivill, X., Casals, T., **Morral, N**., Chillón, M., *et al*. Utilización de la genética molecular en el estudio de enfermedades hereditarias: patología de la FQ. *In* Aspectos moleculares en las patologías metabólico-genéticas, Fundación Areces, Madrid (1990).
2. Estivill, X., Casals, T., **Morral, N**., Chillón, M., Bosch, A., Nunes, V. La genética molecular en la investigación y el diagnóstico: patología molecular de la Fibrosis Quística, Fundación Dr. Esteve, Barcelona (1991).
3. Estivill, X., **Morral, N**. Principios del análisis genético. *In* Medicina Interna, 13ª edición, P. Farreras y C. Rozman (Eds), Doyma, Madrid (1995).
4. Estivill, X., **Morral, N**. Evolution of cystic fibrosis alleles. *In* Cystic Fibrosis-Current Topics, Vol. 3, J.A. Dodge, D.J.H. Brock and J.H. Widdicombe (Eds), John Wiley & Sons Ltd (1996).
5. **N. Morral**. La manipulación de los genes, o terapia génica, como tratamiento alternativo. Anuario de la diabetes (2003). Fundación para la diabetes (Eds). Madrid, Spain.
6. **N. Morral,** S. Witting. RNAi-mediated therapeutics. *In* Development of Therapeutic Agents Handbook, S. Gad (Ed.), John Wiley & Sons Inc. pp425-444 (2012)**.**