Curriculum vitae

Marc A. Marti-Renom, ICREA Research Professor http://marciuslab.org
Group Leader Orcid:0000-0002-0151-4279
Structural Genomics Group.
National Center for Genomic Analysis -
Centre for Genomic Regulation (CNAG-CRG) tel +34 934 020 542
c/ Baldiri Reixac, 4. PCB - Tower I, 10th floor fax +34 934 037 279
08028 Barcelona, Spain martirenom@cnag.crg.eu

My Ph.D. work involved using Molecular Dynamics simulations to study protein folding and unfolding under the supervision of Profs. Karplus, Oliva and Avilés. This led to a postdoctoral fellowship at The Rockefeller University, where I later became a Research Assistant at the Sali Lab. Next, I moved to San Francisco where I was Assistant Adjunct Professor at the UCSF. There, my research focused on using statistics and evolution to study proteins and their complexes, and I contributed to the development of the MODELLER program and the Integrative Modeling Platform (IMP). My time at UCSF also included being a key member of three NIH research grants for the Structural Genomics Initiative and co-initiating the Tropical Disease Initiative, an open-source drug discovery project for tropical diseases. My experiences at the UCSF helped me develop leadership skills and a broader understanding of structural computational biology.

Since 2006, I have led my own research group starting at the CIPF in Valencia (Spain) and currently at the National Center for Genomic Analysis (CNAG) and the Centre for Genomic Regulation (CRG) in Barcelona. My group uses experimental and computational approaches to study the molecular regulation of cells, specifically focusing on the genome. Our research has resulted in over 135 peer-reviewed articles and 165 oral presentations. I have also been involved in several EU funded projects and currently serve as co-PI on the ChromDesign, PerMed, and 3D'Omics projects funded by the European Commission. In 2021, I became co-PI of the Center for Genome Imaging at the National Human Genome Research Institute of the NIH.

Additionally, I have been involved in promoting 4DNucleomics research in Europe as Chair and Vice-Chair of the INC COST Action, coordinator of the INC Spain, and co-coordinator of the EpiGene3Sys networks.

EDUCATION

1994 –1999	PhD, Molecular Biophysics	Universitat Autònoma de Barcelona, Spain.
1989 –1994	BSc, General Biology, Genetics	Universitat Autònoma de Barcelona, Spain.

PROFESSIONAL POSITIONS

2013 – to date	ICREA Research Professor. Barcelona, Spain.
2012 – to date	Structural Genomics Group Leader. National Center for Genomic Analysis - Centre for Genomic Regulation (CNAG-CRG). Barcelona, Spain.
2011 – 2012	Senior Head of the Structural Genomics Laboratory. Centro de Investigación Príncipe Felipe, Valencia. Spain.
2006 – 2011	Head of the Structural Genomics Unit at the Bioinformatics and Genomics Department. Centro de Investigación Príncipe Felipe, Valencia. Spain.
2003 – 2006	Assistant Adjunct Professor at the Department of Biopharmaceutical Sciences. University of California at San Francisco. San Francisco, California USA
2002 – 2003	Research Associate at the Laboratory of Biophysics, The Rockefeller University, New York, US. Mentor: Prof. Andrej Sali.

1999 – 2002 Research Postdoctoral Fellow at the Laboratory of Biophysics, The Rockefeller University, New York, USA. Mentor: Prof. Andrej Sali.

1994 – 1999 PhD student at the IBB, Universitat Autònoma de Barcelona, Spain. Mentors: Profs. Martin Karplus, Frances Xavier Avilés and Baldomero Oliva.

PERSONAL AWARDS & FELLOWSHIPS

2011 One of the 55 finalists to the 2011 HHMI International Early Career Competition. *This grant was awarded by the HHMI to 28 researchers worldwide.*

2011 Life Sciences IDEA Award by the City of Arts and Sciences Foundation. *This prize is considered the most important for young (under 40 years old) researchers in the Valencia region of Spain.*

2006 –2009 Positively evaluated by the Spanish I3 program. *The Spanish government provides financial support to the hiring institution of individuals with outstanding research trajectories.*

2002 –2003 The Rockefeller University Presidential Fellowship. *Awarded twice a year to postdoctoral applicants by a committee of professors at The Rockefeller University.*

1999 –2001 Burroughs Wellcome Fund fellowship. *The Burroughs Wellcome Fund encourages the interdisciplinary training of graduate and postdoctoral students from the physical, chemical, and computational.*

1994 –1998 Universitat Autònoma de Barcelona graduate fellowship. *The Universitat Autònoma de Barcelona awards a limited number of students with a fellowship to carry out their Doctoral studies. In 1994 the university awarded ~50 students.*

1994 –1998 Three-time recipient of Universitat Autònoma de Barcelona travel fellowship*. The Universitat Autònoma de Barcelona financially helps students on their expenses for traveling.*

RESEARCH AWARDS AND GRANTS.

Amounts are for entire consortium when applicable with specific funds for our group indicated in parenthesis.

Active:

2023-2025 InSituMicroSeq.
The VELUX Foundations (Denmark).
PI-Coordinator: A. Alberdi, Co-IP: M.A. Marti-Renom (1M DDK) ***1,999,548DDK***

2022-2026 Moving Epigenetics Towards Systems Biology – EpiGene3Sys.
International Research Network from the CNRS.
PI-Coordinator: G.Almouzni, Co-IP: M.A. Marti-Renom ***75,000€***

2021-2026 Center for Genome Imaging.
NIH. USA
PI-Coordinator: T. Wu, Co-PI: M.A. Marti-Renom (US$1.6M) ***US$14,210,230***

2021-2025 3D'Omics. Three-dimensional holo'omic landscapes to unveil host-microbiota interactions shaping animal production.
H2020 Program. European Commission.
PI-Coordinator: A. Alberdi, Co-PI: M.A. Marti-Renom (670K€) ***9,994,415€***

2021-2024 vPDX. Virtual patient derived xenografts for tumor treatment.
La Caixa Health Research 2020.
PI-Coordinator: L. Di Croce, Co-PI: M.A. Marti-Renom (330K€) ***980,000€***

2021-2024 Tissue Aware GWAS to study genetic cancer predisposition (TAGWAS).
Ministerio de Ciencia e Innovación. Spain.
PI: M.A. Marti-Renom. ***302,500€***

PROFESSIONAL ACTIVITIES

- President of the Catalan Society for Biology.

- Grant review panels:
  - 2023 ERC panel member.
  - 2022 DGF German Funding Agency Expert for 4DNucleome program.
  - 2021 AGAUR Expert for FI program.
  - 2019 DGF German Funding Agency Expert for 4DNucleome program.
  - 2016 MINECO Expert for the BFU-BMC panel program.
  - 2015 ANEP panel member of the Ramon y Cajal program.
  - 2015 Member of the Scientific Advisory Board for the SysMo ERA-NET.
- Editorial membership
  - 2014-2018 Editorial Member. BMC Structural Biology.
  - 2012-2018 Associate Editor. PLOS Computational Biology.
- Other memberships
  - 2004 Funding member of the TDI.
  - 2005 Member and SA of The Synaptic Leap.
- Meeting organizer:
  - Sep. 2023 INC-COST Conference, Corfu, Greece.
  - Mar. 2023 BIZVI. Heidelberg, Germany.
  - Oct 2022 EPiC meeting. Granada, Spain.
  - July 2019 LifeTime UnConference. Barcelona, Spain.
  - May 2018 3DGenomics. Barcelona, Spain.
  - Nov. 2017 3D/4D Genome. Barcelona, Spain.
  - Sept. 2016 The dynamics of the genome. Barcelona, Spain.
  - Dec. 2014 II Jornades de Bioinformàtica of the SCB-BiB. Barcelona, Spain.
  - Sept. 2012 Modeling 3D-Structure of Chromosomes. Barcelona, Spain.
  - Sept. 2012 Chromosomes, Stem Cells and Disease. Barcelona, Spain.
  - Jul 2012 Special Session. 3D Genomics. ISMB12. Long Beach, USA.
  - Jan. 2012 XI Jornadas de Bioinformática. Barcelona, Spain.
- Reviewer for Amino Acids, BioEssays, Bioinformatics, Biophysics Journal, BMC bioinformatics, BMC Genomics, BMC MCF, BMC Structural Biology, **Cell**, Current Bioinformatics, FEBS Journal, FEBS Letters, Gene, **Genome Biology**, **Genome Research**, Human Mutation, In Silicon Biology, Journal of Functional and Structural Genetics, Journal of Molecular Biology, **Nature**, Nature Communications, **Nature Genetics, Nature Methods, Nature Neurobiology, Nature NSMB, Nucleic Acids Research**, PLOS Computational Biology, **PLOS Genetics**, PLOS ONE, **PNAS**, Protein Science, Proteins, **Science**, and Structure.
- *Ad hoc* reviewer for NIH (USA), DoE (USA), EC (Europe), ANEP (Spain), ANR (France), German, Danish, Norway, Holland and Argentinean agencies.
- 2022-2023 Consulting for Acuity Spatial Genomics Inc (USA).
- Active scientific collaborations:
  - 2023-to date Prof. Bru Cormand (UB). 3D Genome and drug addiction.
  - 2022-to date Dr. Dario Lupiañez (MDC). Sex determination and 3D Genome.
  - 2021-to date Dr. Eduard Batlle (IRB). Colorectal cancer.
  - 2021-to date Dr. Antton Alberdi (U. Copenhagen). Gut bacterial organization.
  - 2020-to date Dr. Ralph Stadhouders (MC Utrech). Asthma and 3D genome.
  - 2019-to date Dr. Jaume Mora (HSJD). DIGP paediatric cancer.
  - 2019-to date Dr. Pere Roca-Causach, (IBEC). Nuclear forces and 3D genome.
  - 2019-to date Prof. Tom Gilbert, (U Copenhagen). 3D genome of ancient DNA.
  - 2018-to date Dr. Paco Real & Dr. Núria Malats, (CNIO). 3D genome of cancer.
  - 2017-to date Prof. Ting Wu, (Harvard). 3D genome and imaging.
  - 2015-to date Prof. Luciano di Croce (CRG). Genome organization.

PUBLICATIONS

Total publications 127. Current H-index of 60 with ~18K total citations (Google Scholar). A star "" indicates MAM-R was corresponding/senior author of the article. Next, I list of only those peer-reviewed publications over the last 5 years (2019-2023)*

1. Kocanova, S., Raynal, F., Goiffon, I., Oksuz, B.A., Baù, D., Kamgoué, A., Cantaloube, S., Zhan, Y., Lajoie, B., **Marti-Renom, M.A.*,** Dekker, J. and Bystricky, K. "Enhancer-driven local 3D chromatin domain folding modulates transcription in human mammary tumor cells" Life Science Alliance (2023) **7(2)** e202302154
2. Yeh, SH., Strilets, T., Tan, W-L., Castillo, D., Medkour, H., Rey-Cadilhac, F., Serrato-Pomar, I.M., Rachenne, F., Chowdhury, A., Chuo, V., Azar, S.R., Singh, M.K., Hamel, M., Missé, D., Kini, R.M., Kenney, L.J., Vasilakis, N., **Marti-Renom, M.A.,** Nir, G., Pompon, J. and Garcia-Blanco, M.A. "The anti-immune dengue subgenomic flaviviral RNA is present in vesicles in mosquito saliva and is associated with increased infectivity" PLOS Pathogens (2023) **19(3)** e1011224
3. Álvarez-González, L., Arias-Sardá, C., Montes-Espuña, L., Marín-Gual, L., Vara, C., Lister, N.C., Cuartero, Y., Garcia, F., Deakin, J., Renfree, M., Robinson, T.J., **Marti-Renom, M.A.,** Waters, P.D., Farré, M. and Ruiz-Herrera, A. "Principles of 3D chromosome folding and evolutionary genome reshuffling in mammals" Cell Reports (2022) **41(12)** 111839
4. Mas, G., Santoro, F., Blanco, E., Gamarra Figueroa, G., Le Dily, F., Frigè, G, Vidal, E., Mugianesi, F., Ballaré, C., Gutierrez, A., Sparavier, A., **Marti-Renom, M.A.,** Minucci, S. and Di Croce, L. "In vivo temporal resolution of acute promyelocytic leukemia progression reveals a role of Klf4 in suppressing early leukemic transformation" Genes & Development (2022) **36** 451-467
5. Galan, S., Serra, F. and **Marti-Renom, M.A.*** "Identification of chromatin loops from Hi-C interaction matrices by CTCF-CTCF topology classification" NAR Genomics and Bioinformatics (2022) **4(1)** lqac021.
6. Serna-Pujol, N., Salinas-Pena, M.S., Mugianesi, F., Le Dily, F., **Marti-Renom, M.A.** and Jordan, A. "Coordinated changes in gene expression, H1 variant distribution and genome 3D conformation in response to H1 depletion" Nucleic Acids Research (2022) **50 (7)** 3892–3910
7. Vilarrasa-Blasi, R., Verdaguer-Dot, N., Belver, L., Soler-Vila, P., Beekman, R., Chapaprieta, V., Kulis, M., Queirós, A.C., Parra, M., Calasanz, M.J., Agirre, X., Prosper, F., Beà, S., Colomer, D., **Marti-Renom, M.A.**, Ferrando, A., Campo, E. and Martin-Subero, J.I. "Insights into the mechanisms underlying aberrant SOX11 oncogene expression in mantle cell lymphoma" Leukemia (2022) **36(2)** 583-587
8. Farabella, I., Di Stefano, M., Soler-Vila, P., Marti-Marimon, M. and **Marti-Renom, M.A.*** "Three-dimensional genome organization via triplex forming RNAs " Nature Structural and Molecular Biology (2021) **28(11)** 945-954
9. Gines, L.R., Lapi, E., Pancaldi, V., Cuenca, M., Castillo de Santa Pau, E., Madrid, M., Neyret-Kahn, H., Radvanyi, F., Rodriguez, J.A., Cuartero, Y., Serra, F., Le Dily, F., Valencia, A., **Marti-Renom, M.A.*** and Real, F.X. "STAG2 loss-of-function affects short-range genomic contacts and modulates urothelial differentiation in bladder cancer cells" Nucleic Acids Research (2021) **49(19)** 11005–11021
10. Di Stefano, M., Paulsen, J., Jost, D. and **Marti-Renom, M.A.*** "4D nucleome modeling" Current Opinion in Genetics & Development (2021) **67** 25-32

11. Mendieta-Esteban, J., Di Stefano, M., Castillo, D., Farabella, I. and **Marti-Renom, M.A.*** "3D reconstruction of genomic regions from sparse interaction data" NAR Genomics and Bioinformatics (2021) **3(1)** lqab017

12. Di Stefano, M., Nuetzmann, H-W., **Marti-Renom, M.A.** and Jost, D. "Polymer modelling unveils the roles of heterochromatin and nucleolar organizing regions in shaping 3D genome organization in Arabidopsis thaliana" Nucleic Acids Research (2021) **4** 1840–1858

13. Di Stefano, M., Castillo, D., Serra, F., Farabella, I., Goodstadt, M. and **Marti-Renom, M.A.*** "Analysis, Modeling, and Visualization of Chromosome Conformation Capture Experiments." Methods Mol Biol (2021) **2157** 35-63

14. **Marti-Renom, M.A.*** "Benchmarking experiments with polymer modeling." Nature Methods (2021) **18** 456-457

15. Lopez de Maturana, E., Rodriguez, J.A., .../..., **Marti-Renom, M.A.,** Real, F.X. and Malats, N. "A multilayered post-GWAS assessment on genetic susceptibility to pancreatic cancer" Genome Medicine (2021) **13(1)** 15

16. Vilarrasa-Blasi, R., Soler-Vila, P., Verdaguer-Dot, N., Russinol, N., Di Stefano, M., Chapaprieta, V., Clot, G., Farabella, I., Cusco, P., Agirre, X., Prosper, F., Beekman, R., Bea, S., Colomer, D., Gut, I., Stunnenberg, H., Campo, E., **Marti-Renom, M.A.*** and Martin-Subero, J.I. "Dynamics of genome architecture and chromatin function during human B cell differentiation and neoplastic transformation" Nature Communications (2021) **12(1)** 651-667

17. Vara,C., Paytuví-Gallart, A., Cuartero, Y,, Álvarez-González, A., Garcia, F., Florit-Sabater, B., Marín-Gual, L., Capilla, L., Albert-Lizandra, A., Sanchéz-Guillén, R.A., Sarrate, Z., Cigliano, R.A., Sanseverino, W., Ventura, J., **Marti-Renom, M.A.,** Le Dily, F. and Ruiz-Herrera, A. "The Impact of Chromosomal Fusions on 3D Genome Folding and Recombination in the Germ Line" Nature Communications (2021) **12** 2981

18. Zhang, N., Mendieta-Esteban, J., Magli, A., Lilja, K.C., Perlingeiro, R.C.R., **Marti-Renom, M.A.**, Tsirigos, A. and Dynlacht, B.D. " Muscle progenitor specification and myogenic differentiation are associated with changes in chromatin topology" Nature Communications (2020) **11** 6222

19. Galan, S., Machnik, N., Kruse, K., Díaz, N., **Marti-Renom, M.A.** and Vaquerizas, J.M. "Quantitative comparison and feature extraction for chromatin contact data using structural similarity" Nature Genetics (2020) doi:10.1038/s41588-020-00712-y

20. Nguyen, H.Q., Chattoraj, S., Castillo, D., Nguyen, S.C., Nir, G., Martins, N.M.C., Reginato, P.R., Hannan, M., Church, G.M., Daugharthy, E.R., **Marti-Renom, M.A.*** and Wu, C.T. "3D mapping and accelerated super-resolution imaging of the human genome using in situ sequencing" Nature Methods (2020) **17** 822–832

21. Rajewsky, N., Almouzni, G., Gorski, S., .../..., **Marti-Renom, M.A.,** .../... and LifeTime Community "LifeTime and improving European healthcare through cell-based interceptive medicine" Nature (2020) doi:/10.1038/s41586

22. Farabella, I. and **Marti-Renom, M.A.*** "TADs without borders" Nature Genetics (2020) 52 752–753

23. Sandoval-Velasco, M., Rodriguez, J.A., Perez-Estrada, C., Zhang, G., Lieberman-Aiden, E., **Marti-Renom, M.A.,** Gilbert, M.T.P and Smith, O "Hi-C chromosome conformation capture sequencing of avian genomes using the BGISEQ-500 platform" GigaScience (2020) 9(8) giaa087

24. Di Stefano, M., Stadhouders, R., Farabella, I., Castillo, D., Serra, F., Graf, T. and **Marti-Renom, M.A.*** "Dynamic simulations of transcriptional control during cell reprogramming reveal spatial chromatin caging." Nature Communications (2020) **11** 2564

25. Serna-Pujol, N., Salinas-Pena, M., Mugianesi, F., Lopez-Anguita, N., Torrent-Llagostera, F., Izquierdo-Bouldstridge, A., **Marti-Renom, M.A.** and Jordan, A. "TADs enriched in histone H1.2 strongly overlap with the B compartment, inaccessible chromatin and AT-rich Giemsa bands" FEBS Journal (2020) 10.1111/febs.15549

26. Stik, G., Vidal, V., Barrero, M., Cuartero, S., Vila-Casadesús, M., Mendieta-Esteban, J., Tian, T.V., Choi, J., Berenguer, C., le Dily, F., Cramer, P., **Marti-Renom, M.A.**, Stadhouders, R. and Graf, R. "CTCF is dispensable for cell fate conversion but facilitates acute cellular responses" Nature Genetics (2020) **52** 655-661

27. Soler-Vila, P., Cusco Pons, P., Farabella, I., Di Stefano, M. and **Marti-Renom, M.A.*** "Hierarchical chromatin organization detected by TADpole." Nucleic Acids Research (2020) **48 (7)** e39

28. Sati, S., Bonev, B., Szabo, Q., Jost, D., Bensadoun, P., Serra, F., Loubiere, V., Papadopoulos, G.L., Rivera-Mulia, J.C., Fritsch, L., Bouret, P., Castillo, D., Gelpi, J.LL., Orozco, M., Vaillant, C., Pellestor, F., Bantignies, F., **Marti-Renom, M.A.,** Gilbert, D., Lemaitre, J.L. and Cavalli, G. "4D genome rewiring during oncogene induced and replicative senescence" Molecular Cell (2020) **78** 1–17

29. Di Stefano, M., Di Giovanni, F., Pozharskaia, V., Gomar-Alba, M., Baù, D., Carey, L.B., **Marti-Renom, M.A.*** and Mendoza, M. "Impact of chromosome fusions on 3D genome organization and gene expression in budding yeast." Genetics (2020) **214 (3)** 651-667

30. Vara, C., Paytuví-Gallart, A., Cuartero, Y., Le Dily, F., Garcia, F., Salvà-Castro, J., Gómez-H, L., Julià, E., Moutinho, C., Aiese-Cigliano, R., Sanseverino, W., Fornas, O., Pendàs, A.M., Heyn, H., Waters, P.D., **Marti-Renom, M.A.*** and Ruiz-Herrera, A. "Three-dimensional genomic structure and cohesin occupancy correlates with transcriptional activity during spermatogenesis." Cell Reports (2019) **28(2)**:352-367

31. Miguel-Escalada, I., Bonàs-Guarch, S., Cebola, I., Ponsa-Cobas, J., Mendieta-Esteban, J. , Rolando, D., Javierre, B.M., Atla, G., Farabella, I., Morgan, C.C., García-Hurtado, J., Beucher, A., Morán, I., Pasquali, L., Ramos, M., Appel, E.V.R., Linneberg, L., Gjesing, A.P., Witte, D.R., Pedersen, O., Grarup, N., Ravassard, P., Mercader, J.M., Torrents, D., Piemonti, L., Berney, T., de Koning E., Kerr-Conte, J., Pattou, F., Hansen, T., **Marti-Renom, M.A.,** Fraser, P. and Ferrer, J. "Human pancreatic islet 3D chromatin architecture provides insights into the genetics of type 2 diabetes" Nature Genetics (2019) **51** 1137–1148

32. Morf, J., Wingett, S.W., Farabella, I., Cairns, J., Furlan-Magaril, M., Jiménez-García, L.F., Liu, X., Craig, F.F., Walker, S., Segons-Pichon, A., Andrews, S., **Marti-Renom, M.A.** and Fraser, P. "RNA proximity sequencing reveals properties of spatial transcriptome organization in the nucleus." Nature Biotechnology (2019) **37** 793–802

This article has been highlighted in Nature Methods (https://doi.org/10.1038/s41592-019-0555-z).

33. Cuadrado, A., Giménez-Llorente, D., Kojic, A., Rodríguez-Corsino, M., Cuartero, Y., Martín-Serrano, G., Gómez-López, G., **Marti-Renom, M.A.** and Losada, A. "Specific contributions of cohesin-SA1 and cohesin-SA2 to TADs and Polycomb domains in embryonic stem cells." Cell Reports (2019) **27** 3500–3510

34. Spill, Y.G., Castillo, D., Vidal, E. and **Marti-Renom, M.A.*** "Binless normalization of Hi-C data provides significant interaction and difference detection independently of resolution." Nature Communications (2019) **10(1)** 1938