CURRICULUM VITAE

Name:	Maria Pia Cosma
Laboratory Address:	CRG, Carrer Dr. Aiguader 88, E-08003 Barcelona, Spain
Telephone number:	+34 93 316 0370
e-mail:	pia.cosma@crg.es
webpage:	http://www.crg.eu/maria_pia_cosma
	http://piacosmalab.com/
	https://www.icrea.cat/Web/ScientificStaff/Maria-Pia-Cosma-524

Education

1991-1993	**Undergraduate student** at School of Medicine, University of Naples
December, 1993	**Master University degree** in Chemistry and Pharmaceutical Technology (110/110 summa cum laude) at the University of Naples.
January 1994 September 1995	**Postgraduate fellow** University of Naples,
August 1995	**Postgraduate fellow** NIH, Bethesda, USA.
October 1995 October 1999	**PhD** student in "Cellular and Molecular Genetics" at School of Medicine, Naples
March 2000	**PhD** in "Cellular and Molecular Genetics" at School of Medicine, Naples

Professional experience

November 1997 May 2000	**Post-doc fellow** at IMP Vienna, Austria
July 1999	**Visiting scientist** at the Whitehead Institute, MIT Cambridge, Massachusetts, USA
September 2000 June2003	**Research Associate** at TIGEM - Telethon Institute of Genetics and Medicine, Naples, Italy
June 2000 August 2000	**Visiting scientist** at the Oregon Health Science University (OHSU) Portland, USA
June 2002 August 2002	**Visiting scientist** at the MGH Massachusetts General Hospital Harvard Medical School, Charlestown, USA
September 2003	**Visiting scientist** at the University of Pennsylvania, Wistar Institute, Philadelphia, USA
October 2003	**EMBO Young Investigator**
July 2003 March 2010	**Group Leader (Associate Investigator)** at TIGEM Institute, Naples, Italy
January 2004	**Visiting scientist** at the St. Jude Children's Research Hospital, Memphis, USA
October 2004 March 2010	**Faculty** at SEMM European School of Molecular Medicine (http://www.semm.it/phd_mm.php)
July 2009-July 2015	**Honorary Associate Investigator**, Institute of Genetics and Biophysics (IGB), Naples, Italy
April 2010 up to now	**Senior Scientist** at Centre for Genomic Regulation, CRG, Barcelona, Spain
September 2010 up to now	**ICREA Research Professor**
October 2010	**EMBO Member**
February 2023	**Co-Coordinator** Systems and Synthetic Biology Program

January 2024 **Coordinator** Systems and Synthetic Biology Program

Awards

1994-95	Fellowship provided by CNR "Human Genome".
1995	Postgraduate short-term fellowship provided by NIH, Bethesda, USA.
1998-1999	Marie Curie Research Training Grant fellowship
2003	EMBO Young Investigator Award
2005	Marie Curie Excellence Award http://ec.europa.eu/research/fp6/mariecurie-actions/news/headline34_en.html
2006	"Principessa Sichelgaita" Award
2010	ICREA Professor
2010	EMBO Member
2012	Young Academy of Europe (YAE) Member
2013	AcademiaNet Member: Profiles of Leading Women Scientists
2014	"La Avanguardia ciencia" prize 2nd for the work on retinal regeneration (Sanges et al. Cell Reports 2013)
2015	City of Barcelona prize for the work on super-resolution of chromatin (Ricci et al. Cell 2015)
2016	"La Avanguardia ciencia" prize finalist for the work on super-resolution of chromatin (Ricci et al. Cell 2015)
2018	La Caixa Health award
2021	European Innovation Council (EIC) National Champion
2022	EIC Woman Leadership Programme
2023	Professor Joaquín Barraquer award for the best work in ophthalmology with title of Academician of Real Academia de Medicina de Cataluña

Honors

2007 Order of Merit of the Italian Republic; grade: knight

Special feature in ScienceCareers

Chris Berrie. The Road to Scientific Recognition. ScienceCareers.13-012006. http://sciencecareers.sciencemag.org/career_development/previous_issues/articles/2006_01_13/the_road_to_scientific_recognition/

Patents

1. Diagnosis and treatment of Multiple Sulfatase Deficiency and other sulfatase deficiencies (WO/2004/072275 and PCT Application PCT/US04/03632). Licensed to Shire international.
2. Method for reprogramming differentiated cells (WO/2009/101084; PCT/EP2009/051512). Licensed to Ferrer international.
3. Methods of treatment of retinal degeneration diseases (WO/2013/020945; PCT/EP2012/065327). Licensed to Ferrer international.
4. Method for detecting cells. US20170299610A1 (granted) PCT/EP2015/070734
5. Method of treatment of Parkinsonism. PCT/EP2017/058737
6. Therapy for degenerative disease and tissue damage. PCT/EP2021/078855 (filing date: 18/10/2021); Priority filing: Retinal Therapy EP 20382908.0 (filing date: 16/10/2020)

7. Method of generating multipotent stem cells. Patent application US 63/086,265; PCT/US21/53161

Reviewer

I served as a reviewer for journals including:

Cell Stem Cell, Science, Nature Genetics, Nature Communications, Cell Reports, Development, Stem Cell Reports, Plos Genetics, Current Opinion in Cell Biology, eBioMedicine, Journal of Clinical Investigation Insights, Plos Genetics (Associate Editor), Current Opinion in Genetics and Development, Plos Genetics, Review Commons, Scientific Reports' EMBO J, Advances in Regenerative Biology (Editorial Board Member), Cell, Molecular Cell, Journal of Biological Chemistry, Gene, Journal Cell Science, Journal of Biological Chemistry, Human Mutation, Molecular Genetics and Metabolism, Human Genetics, Faseb Journal.

I served as a reviewer for funding agencies including:

Human Frontier Science Programme (HFSP): committee member for long-term fellowships
European Molecular Biology Organization (EMBO): long-term fellowships and in the EMBO Member committee.
Association for international cancer research (AICR)
Greek Ministry for Education, Life Long Learning (Evaluator of Research Proposals)
Hong Kong Health and Medical Research Fund (HMRF) (Evaluator of Research Proposals)
Evaluation panel for FP7-HEALTH-2013-INNOVATION (EU projects)
ERC Synergy, ERC advanced, ERC consolidator and ERC starting Grants (remote and panel member)
FRM (La Fondation pour la Recherche Médicale) Research Grants
Swiss National Science Foundation Research Grants
Mardsen Foundation Research grants
Velux foundation Switzerland
Academy of Finland
Sir Henry Dale Fellowship,
Romanian Agency for Research Funding,
Medical Research Council, UK.
Coordination and Evaluation Subdivision of the State Research Agency (AEI), Spain
HORIZON-HLTH-2021
Mineco, Plan National Spain
Wellcome Trust, UK
Medical Research Council, UK.
Coordination and Evaluation Subdivision of the State Research Agency (AEI), Spain
HORIZON-HLTH-2021
Romanian Agency for Research Funding
Swiss National Science Foundation Research Grants
French National Research Agency

Affiliations to scientific societies

European Life Science Organization (ELSO)
European Molecular Biology Organization (EMBO)

American Association for the Advancement of Science (AAAS)
Young Academy of Europe (YAE)
American Society of Gene & Cell Therapy (ASGCT)
International Society for Stem Cell Research (ISSCR)

Teaching and Lectures

Lecturer for PhD courses: Stazione Zoologica Anton Dohrn, Naples; TIGEM Institute, Naples; Instituto Gulbenkian de Ciência, Oeiras, Portugal; EMBO practical course "Deciphering Chromosomes by Chromatin Immunoprecipitation"; SEMM, Naples; Open University (UK), Naples; Synthetic Biology, Universita' di Padova; International PhD program CRG, Barcelona

Invited Speaker in many Universities and Research Institutes, among others: MIT, Whitehead, Cambridge, USA 1999; University of Milan, Italy, 1999; Stazione Zoologica "Anton Dohrn", Naples,Italy, 2000; OHSU, Portland, USA, 2000; La Sapienza, University of Rome, Italy, 2003; St. Jude Children's Research Hospital, Memphis, USA, 2003; University of Pavia, Italy, 2004; Sanger Center, Cambridge, UK, 2006; Shire pharmaceutical, Boston, USA, 2007; Mario Negri Sud, Santa Maria in Baro, Chieti, Italy, 2007; Federico II, University of Naples, Italy, 2008; VIB, Lueven, Belgium 2008; IEO, Milan, Italy 2009; University of Siena, Italy 2009; IRB, Barcelona, Spain 2011; CNIO, Madrid, Spain 2011; CCBR, Cambridge, UK 2011; Cabimer, Seville, Spain, 2012; University of the Basque Country, Bilbao 2012; Friedrich Miescher Institute for Biomedical Research, Basilea, Switzerland 2013; Ebrew University, Jerusalem 2013; IOBA, Valladolid, Spain 2014; Bicocca University, Milan, Italy 2014; IBEC, Barcelona 22nd January 2015; TU Department of Bionanoscience/ Delft, the Netherland, 8th May 2015; Connect-EU, ACCIO y AGAUR, Barcelona, 27th October 2015; IRB, Barcelona, Spain 10th December 2015; Guangzhou Institutes of Biomedicine and Health, Guangzhou, China, November 1st 2016; Hong Kong University, November 3rd 2016 November 3rd 2016; CellViewer 22nd March 2017; Jerusalem, Israel; IMP, Vienna, Austria, April 28th 2017; Humanitas, Milan, Italy, 10th May 2017; University of Zurich, Switzerland, 22nd May 2017; Guangzhou Institutes of Biomedicine and Health, GIBH, China October 30th 2017; Q-Life Quantitative Biology Winter School: Transcribing the genome in 4D, Paris, 18th February 2019; University La Sapienza, Rome, Italy, 24th May 2019; Macau University, Macau, 9th of September 2019; Jinan University, Guangzhou, China, 18th of September 2019; Shanghai Institute of Biochemistry and Cell Biology (SIBCB), Shanghai, China, 16th of August 2021; Westlake University, Hangzhou, China 24th of August 2021; Tsinghua University, 30th of August 2021, Beijing, China; BGI, Shenzhen, China, 14th October 2021; SUSTech, Shenzhen, China, 20th October 2021; Reprogramming & Regeneration, University Pompeo Fabra, Barcelona, Spain, 28th January 2022; Center for Engineering Mechanobiology, University of Pennsylvania, USA, 10th March 2022; Department of Biology, University of Minho, Portugal, 4th April 2022; Centro de Investigaciones Margarita Salas, CSCIC, Madrid, Spain, 24th February 2023; IGBMC, Strasburg, Belgium, 28th April, 2023; LBI for Hematology and Oncology, Vienna, Austria, 12th May 2023; Shenzhen Bay Laboratory, Shenzhen, China, 18th October, 2023; Shenzhen University, Shenzhen, China, 20th October 2023; University of Basque Country, Bilbao, Spain, 4th December 2023

Invited Speaker for a selection of meetings, among others: European Society of Human Genetics 2004, Monaco, Germany; DGZ Annual Meeting of German Society for Cell

Biology 2005, Heidelberg, Germany; ELSO 2005 Heidelberg, Germany; CRUI 2006, ERC meeting Bologna; Festival della Scienza 2006, Genova; Scientificamente 2007, Cattolica, Glycobiology meeting, Boston 2007; University of Basilicata, Potenza 2008; Golgi meeting 2008, Pavia, Italy; SIBBM 2009, Naples, Italy; Unistem 2010, Milan; EMBO meeting 2010, Barcelona; CSLH Systems Biology 2010, Hinxton, UK; Yeast Model Convention 2010, La Sapienza, Roma, Italy; DTI meeting, Taormina 2010; Annual SCB Meeting 2010. Catalan Society of Biology, Barcelona, Spain 2010; Fundación Duques de Soria, Madrid, Spain 2010; AIMPS 2011, Senago (MI), Italy; ABCD 2011, Ravenna, Italy; EMBO Members 2011, Heidelberg; Crossroads in Biology 2012, Cologne, Germany; Spring School 2012, Cambridge, UK; ABCD meeting, Torino 2012; SIBBM meeting, Palermo 2012; Stem Cell in Cancer, Cambridge 2012; EMBL Stem Cell Conference, Heidelberg 2012; Perspectives in Translational Medicine, Barcelona 2012; International PhD Student Symposium, 9th Horizons in Molecular Biology, Gottingen 2012; Enhancing the Attractiveness of European Universities as a Destination for World-Class Researchers. ERC day; Barcelona 2012; SIGU, Sorrento (Napoli) 2012; RIKEN-CRG meeting, Barcelona 2013; HFSP Awardees Meeting, Strasburg 2013; Symposium on Stem Cells and Regenerative Medicine, Hannover 2013; Cell fusion EMBO meeting, Israel 2013; Retinal diseases and stem cells meeting, Valencia 2014; EMBO-EMBL conference Tumor microenvironment and signaling, Heidelberg 2014; EMBO meeting 2014, Paris, France; Nuclear function meeting 2014, Patras, Greece 2014; Spanish Society of developmental biology, Madrid, Spain 2014; Cancer stem cell symposium, DISCUSS, Hannover, Germany, 2014; Gene Regulation, Genomics and Stem Cell in disease meeting, Tel Aviv 2015; INGENIUM meeting, Naples, Italy. 9th November 2015; NIH workshop and ARVO meeting, Seattle (USA) 2016.; EMBL conference "Perspectives in Translational Medicine: Personalized Medicine", Heidelberg 6-8 May 2016; "Jornades de Biologia molecular institut catalans de Barcelona", June the 14th Barcelona; "Macula Foundation B-Debate meeting, 6-7 September 2016, Barcelona; Blueprint Meeting, 8-9 September 2016, Brussels, Belgium; Epigenetics and Epigenomics, 22nd September 2016, Salerno; Summit on stem cell therapy for eye diseases, 28-29 October 2016, Chongquing, China; Enviromental Epigenetics, 12-15 February 2017, KAUST, Saudi Arabia; SIBBM conference, 14-16 June 2017, Milan, Italy; ECA meeting, Florence, 1-4 July 2017; 3rd International Summit of Stem Cell Therapy for Eye diseases, 28-29 October 2017, Chongqing, China; Multidimensional Genomics: The 3D/4D organization of chromatin, 13-15 November, Barcelona, Spain; EMBO conference, Dresda, Germany, 1-3 March 2018; Cell Viewer meeting, Cyprus, 10-11 April 2018; 11th International Conference on Stem Cells and Regenerative Medicine in Guangzhou, China, 26-28 November 2018; Multiscale Modeling of Chromatin: Bridging Experiment with Theory, Les Houches, France, 31st March- 4ht of April 2019;Gordon Research Conference (GRC) on Genome Architecture/ Hong Kong 4 August 2019; 25yearTigem, Alumni conference, Naples, Italy 8 November 2019; CRG-GDL symposium Guangzhou Regenerative Medicine and Health Guangdong Laboratory, China, 13-14 January 2020; Chromatin Modeling: Integrating Mathematics, Physics, and Computation for Advances in Biology and Medicine, University of Vienna, 16th – 19th of March 2020; 12th FENS FORUM in Neuroscience, Glasgow, UK, 12-15 July 2020; 21-22 November 2020; ICG Cellomics, Qindao, China; 20 May 2021, FEBS Danube Epigenetics, Budapest; 8th International Symposium on 3D Genomics, Tsinghua University, 19th-21st of November 2021, Beijing, China; SEMM, Technological Roundtable, Naples, Italy, 7th February 2022; EcaBox Annual meeting, Bar Ilan University, Tel Aviv, Israel 19th-20th July 2022; Wnt Signaling Gordon Conference GRC, Barcelona, Spain 30th July to 3rd August 2023; EcaBox Annual

meeting, University of Minho, Porto, Portugal 6th-7th June 2023; EMBO Workshop on DNA topology Villars-sur-Ollon, Switzerland, 3rd – 7th ; September 2023; Louis-Jeantet Symposium, Geneva, Switzerland, 10th October 2023; Keystone Symposia on Emerging Cellular Therapies / Stem Cells and Regeneration, Sante Fe, USA, 22-25 January 2024

Conference/workshops organization

ITN INGENIUM European network minisyposium. CRG, Barcelona, 3-4th February 2014
1st Somatic Cell Reprogramming course. CRG, Barcelona, November 7-12th- 2014
2nd Somatic Cell Reprogramming course. CRG, Barcelona, October 23rd-28th- 2015
ICREA International Symposium "BioNano vision of cellular architecture: from the nucleus to the cell membrane. ICFO, Barcelona, May 25-27th 2016
BIST founding conference 31st March 2017
BIST annual conference 27th June 2018
CellViewer conference "Seeing and decoding nuclear function and structure" 27th -28th January 2020

Public Outreach

Scientific achievements have been reported in several Italian and Spanish newspapers from 2003 up to now.

Publications

González-Almela E, Castells-Garcia A, Le Dily F, Carnevali D, Cusco P, Di Croce L, **Cosma MP**. Herpes simplex virus type 1 reshapes the host chromatin architecture via transcription machinery hijacking. *Nature Communication, under revision*

Carnevali D, Zhong L, González-Almela E, Viana C, Wang A, Neguembor MV, Castells-Garcia A, Arganda-Carreras I and **Cosma MP.** AINU: a deep learning method that identifies cellular heterogeneity using nanoscale nuclear features. *Nature Machine Intelligence, under final revision after reviewer's comments*

Garate X, Gómez-García PA, Zhu C, Castells-García A, Ed-daoui AI, Fernández Merino M, Martin L, Ochiai H, Neguembor MV, **Cosma MP.** Nanoscale genome organization of pluripotency genes regulates gene expression in mouse embryonic stem cells undergoing pluripotency transition. *Nucleic Acids Research*, *under revision after reviewer's comments*

Nakagawa S, Tu X, Carnevali D, … Califano A, **Cosma MP** The Wnt-dependent master regulator NKX1-2 controls mouse pre-implantation development. *Stem Cell Reports, under revision after reviewer's comments*

Kant, A.; Guo, Z.; Vinayak, V.; Neguembor, M.V.; …. **Cosma MP** and Shenoy V. Active Transcription and epigenetic reactions synergistically regulate meso-scale genomic organization. *Nat Comm*, *under revision after reviewer's comments*

Martinez-Sarmiento, J.A., **Cosma, MP** # and Lakadamyali, M. #. Super-Resolution Imaging Uncovers Key Temporal Changes in Chromatin Structure and Pluripotent Gene Reactivation in Single Cells Undergoing Reprogramming.

Cell Reports, *under revision after reviewer's comments* #corresponding author and co-last authors

Lv. Y, Guo, X ….. **Cosma, MP**, ……Miguel Esteban. coRIC map: a framework for the exploration of multifaceted subcellular RNA-binding proteins. *Nat Comm*, *under revision after reviewer's comments*

Pardo-Lorente, N, Gkanogiannis, A….. **Cosma, MP**, ….. Sara Sdelci. Nuclear localization of MTHFD2 is required for correct mitosis progression. *Nat Comm*, *under revision after reviewer's comments*

Sebastian-Perez R, Aranda S, Nakagawa S, Pesaresi M, Gomez-Garcia PA, Alcoverro-Bertran M, Gomez-Vazquez JL, Carnevali D, Borràs E, Sabidó E, Nissim-Rafinia M, Meshorer E, Di Croce L, **Cosma, MP (**2023**)**. SMARCAD1 contributes to heterochromatin establishment at the 5transition from the 2C-like to the pluripotent state. *eLife,* 6 June

Martin, L.; Neguembor, M.V.[#]; **Cosma, M.P.** [#] (2023). Women's contribution in understanding how topoisomerases and supercoiling control genome organization *Frontiers in Molecular Bioscience* 10:1155825.

Cosma, M.P.[#]; Neguembor, M.V.[#] (2023). The magic of unraveling genome architecture and function. *Cell Reports,* Apr 25;42(4):112361 [#]corresponding author

Martin, L.; Castells-García, A.; **Cosma M.P**.#; Neguembor, M.V.# (2023) STORM microscopy and cluster analysis for PcG studies. Book: Polycomb Group Proteins – *Methods and Protocols*, Springer ISBN 978-1-4939-6380-5, *in press in second edition*. #corresponding author

Porter, H.*; Li. Y.*; Neguembor, M.V.; et al; **Cosma M. P.** Hadjur S. (2023) Cohesin-independent STAG proteins interact with RNA and R-loops and promote complex loading. *eLife* 12, e79386.

Athanasouli P, Balli M, De Jaime-Soguero A, Boel A, Papanikolaou S, van der Veer BK, Janiszewski A, Vanhessche T, Francis A, El Laithy Y, Lo Nigro A, Aulicino F, Peng Koh K, Pasque V, **Cosma MP**, Verfaillie C, Zwijsen A, Heindryckx B, Nikolaou C, Lluis F (2023). The Wnt/TCF7L1 transcriptional repressor axis drives primitive endoderm formation by antagonizing naive and formative pluripotency. *Nature Comm* 14(1):1210.

Generoso, S.F, Neuguemor, M.V……..**Cosma, M.P.**, Lee, J.T. and Payer B (2023). Cohesin controls X chromosome structure remodeling and X-reactivation during mouse iPSC-reprogramming. *PNAS* 120(4), e2213810120.

Neguembor MV, Buitrago D, Lema R, Arcon JP, JWalther J, Garate X, Martin L, Romero P, Gut Blanc MJ, AlHaj Abed J, Lakadamyali M, Wu CT, Brun Heath I, Orozco M, Dans P and **Cosma MP** (2022). MiOS, an integrated imaging and modeling strategy to resolve gene folding at nucleosome resolution. *Nat Struct Mol Biol* 29(10):1011-1023.

Bonilla-Pons SA, Nakagawa S, Garreta Bahima E, Fernandez-Blanco A, Pesaresi M, D'Antin JC, Sebastian-Perez R, Greco D, Dominiguez-Sala E, Gomez-Riera R, Barraquer Compte RI, Dierssen M, Monsterrat Pulido N, **Cosma MP** (2022). Müller glia fused with adult stem cells undergo neural differentiation in human retinal models. *EBioMedicine* 77:103914.

Castells-Garcia A, Ed-daoui I, González-Almela E, Vicario C, Ottestrom J, Lakadamyali M, Neguembor MV, **Cosma MP** (2021). Super resolution microscopy reveals how elongating RNA polymerase II and nascent RNA interact with nucleosome clutches. *Nucleic Acids Res* 50(1):175-190.

Martin L, Vicario C, Castells-García A, Lakadamyali M, Neguembor MV, **Cosma MP** (2021) A protocol to quantify chromatin compaction with confocal and super-resolution microscopy in culture cells. *Star Protocols* 2(4):100865.

Neguembor, MV, Martin L, Castells-García A, Gómez-García, PA, Vicario, C, Carnevali, D, AlHaj Abed, J, Granados, A, Sebastian-Perez, R, Sottile, F, Solon, J, Wu, CT, Lakadamyali, L, **Cosma MP** (2021). Transcription-mediated supercoling regulates genome folding and loop formation. *Mol Cell* 81(15):3065-3081.e12. Epub 2021 Jul 22. Article Cover

Gomez-Garcia PA, Portillo-Ledesma S, Neguembor MV, Pesaresi M, Oweis W, Rohrlich T, Wieser S, Meshorer E, Schlick T, ***Cosma MP**, *Lakadamyali M. (2021) Mesoscale modeling and single nucleosome tracking reveal remodeling of clutch folding and dynamics in stem cell differentiation. *Cell Reports*, 34(2):108614.*co-last and co-corresponding authors

Pesaresi M, Bonilla-Pons SA, Sebastian-Perez R, Di Vicino U, Alcoverro-Bertran M, Michael R, **Cosma MP** (2021). The chemokine receptors, Ccr5 and Cxcr6, enhance the integration of mesenchymal stem cells into the degenerating retina. *Molecular Therapy*, 29(2):804-821

Arumugam K, Shin W, Schiavone V, Tu T, Romo R, Paull E, Subramaniam P, Worley J, Califano C, **Cosma MP** (2020). The Master Regulator protein BAZ2B can reprogram human hematopoietic lineage-committed progenitors into a multipotent state. *Cell Reports*, 33(10):108474. doi: 10.1016/j.celrep.2020.108474.

Portillo-Ledesma S, Tsao LH, Wagley M, Lakadamyali M, **Cosma MP**, Schlick T (2021). Nucleosome clutches are regulated by chromatin internal parameters. J. Mol. Biol. S0022-2836(20)30619-7

Aulicino F, Sottile F, Pedone E, Lluis F, Marucci M, **Cosma MP** (2020). Canonical Wnt pathway controls mESCs self-renewal through inhibition of spontaneous differentiation via β-catenin/TCF/LEF functions (2020). *Stem Cell Reports*, 3:646-661

Zhang M, Lai Y, Krupalnik V, Guo P, … **Cosma MP**, … Esteban MA (2020). β-Catenin safeguards the ground state of mouse pluripotency by strengthening the robustness of the transcriptional apparatus. *Science Advances* 6:17-07

Ritschka B, Knauer-Meyer TK, Sampaio Goncalves D, Mas A, Plassat JL, Durik M, Jacobs H, Pedone E, Di Vicino U, **Cosma MP,** Keyes WM (2020) The senotherapeutic drug ABT-737 disrupts aberrant p21 expression to restore liver regeneration in adult mice. *Genes Dev,* 34(7-8):489-494

Lakadamyali, M and **Cosma, M.P** (2020). Visualizing the genome in high resolution challenges our textbook understanding. *Nat Methods,* 17:371–379

Frade J, Nakagawa S, Cortes P, di Vicino U, Romo N, Lluis F and **Cosma MP** (2019). Controlled ploidy reduction of pluripotent 4n cells generates 2n cells during mouse embryo development. *Science Advances,* 5(10), eaax4199.

Otterstrom J, Castells Garcia A, Vicario C, ***Cosma MP**, *Melike Lakadamyali M (2019) Super-resolution microscopy reveals nucleosomal level decompaction of chromatin upon hyperacetylation. *Nucleic Acids Res* 5(10): 8470-8484. *co-last and co-corresponding authors

Pedone E, Rocca D, Postiglione L, Aulicino F, Montes-Olivas S, di Bernardo D, **Cosma MP,** Marucci L (2019). A tunable dual input system for 'on-demand' dynamic gene expression regulation. *Nat Comm,* 10(1):4481

Sottile F, Pesaresi M, Simonte G and **Cosma MP** (2019) Cell therapy for degenerative retinal disease: Special focus on cell fusion mediated regeneration. *Stem*

Cell Biology and Regenerative Medicine, book series (STEMCELL), Springer, 02 March 2019

Theka I, Sottile F, Cammisa M, Bonnin S, Sanchez Delgado M, Di Vicino U, Aulicino F, Arumugam K, Monk D, Riccio A, **Cosma MP** (2019). Wnt/β-catenin signaling pathway safeguards epigenetic stability and homeostasis of mouse embryonic stem cells. *Scientific Reports, 9:948*

Pesaresi M, Sebastian-Perez R, **Cosma MP** (2018). Dedifferentiation, transdifferentiation and cell fusion: in vivo reprogramming strategies for regenerative medicine. *FEBS Journal.* Mar;286(6):1074-1093

Pesaresi, M, Bonilla S, Simonte G, Sanges D, Di Vicino U, **Cosma MP** (2018). Endogenous mobilization of bone-marrow cells into murine retina induces fusion mediated reprogramming of Müller glia cells. *eBioMedicine.* 30 (2018) 38–51

Pesaresi M, Bonilla-Pons S, **Cosma MP** (2018). In vivo somatic cell reprogramming for tissue regeneration: the emerging role of the local microenvironment. *Current Opin Cell Biol*. 55:119–128

Neguembor MV, Sebastian-Perez R, Aulicino F, Gomez-Garcia PA, ***Cosma MP**, *Lakadamyali M (2018). PoSTAC (Polycistronic SunTAg modified CRISPR) enables live-cell and super resolution visualization of multiple genes. *Nucleic Acids Res.* 46(5):e30.*co-corresponding authors.

Kieffer-Kwon KR, Nimura, K Rao, SSP, Xu J, Jung S, Pekowska A, Dose M,……**Cosma MP**, Batchelor E, Levens D, Phair RD,…… Casellas R (2017) Myc Regulates Chromatin Decompaction and Nuclear Architecture during B Cell Activation. *Molecular Cell*, 67(4):566-578.e10.

Theka I, Sottile F, Aulicino F, Castells Garcia A and **Cosma MP** (2017). Reduced expression of Paternally Expressed Gene-3 enhances somatic cell reprogramming through mitochondrial activity perturbation, *Scientific Reports.* Aug 29;7(1):9705.

De Jaime-Soguero A, Aulicino F, Ertaylan G, Grieco A, Cerrato A, Tallam A, del Sol A, ***Cosma MP,** *Lluis F (2017). Wnt/Tcf1 pathway restricts embryonic stem cell cycle through activation of the Ink4/Arf locus. *Plos Genetics.* 27;13(3). *co-last and co-corresponding authors

Ricci MA, ***Cosma MP**, Lakadamyali M (2017) Super resolution imaging of chromatin in pluripotency, differentiation, and reprogramming. *Current Opinion in Genetics and Developmen*t 46:186–193 *co-last and co-corresponding author.

Pedone E, Oltenau VA, Marucci L, Muñoz-Martin MI, Youssef SA, de Bruin A, **Cosma MP** (2017). Modeling Dynamics and Function of Bone Marrow Cells in Mouse Liver Regeneration. *Cell Reports,* 18, 107–121

Sottile F, Aulicino F, Theka I, **Cosma MP** (2016) Mesenchymal stem cells generate distinct functional hybrids in vitro via cell fusion or entosis. *Scientific Reports*. 6:36863

Sanges D, Simonte G DiVicino U, Romo N, Pinilla I, Nicolás Farrés M, **Cosma MP** (2016). Reprogramming Müller glia via in vivo cell fusion regenerates murine photoreceptors *Journal of Clinical Investigation*, Aug 1;126(8):3104-3116

Altarche-Xifro W, di Vicino U, Muñoz-Martin MI, Bové J, Vila M, **Cosma MP** (2016). Functional rescue of dopaminergic neuron loss in Parkinson's disease mice after transplantation of hematopoietic stem and progenitor cells, *eBioMedicine,* Jun;8:83-95

Ricci MA, Manzo C, García-Parajo M, *Lakadamyali M, ***Cosma MP** (2015). Chromatin fibers are formed by heterogeneous groups of nucleosomes in vivo. *Cell*, Mar 12;160(6):1145-58. *co-last authors. Nominated F1000Prime 2015 https://www.youtube.com/watch?v=5KSr-giy8qo

Lakadamyali M, **Cosma MP** (2015). Advanced microscopy methods for visualizing chromatin structure". *FEBS Letters*. 589(20 Pt A):3023-30

Marucci L, Pedone E, Di Vicino U, Sanuy-Escribano B, Isalan M, **Cosma MP** (2014) Beta-Catenin fluctuates in mouse ESCs and Is essential for Nanog-mediated reprogramming of somatic cells to pluripotency. *Cell Reports* 8(6):1686-96.

Aulicino F, Theka I, Ombrato L, Lluis F, **Cosma MP** (2014) Temporal perturbation of the Wnt signalling pathway controls cell reprogramming via Tcf1 activity. *Stem Cell Reports*, 2(5):707-20.

Sanges D, Romo N, Simonte G, Di Vicino U, Tahoces AD, Fernández E, **Cosma MP** (2013) Wnt/β-Catenin Signaling Triggers Neuron Reprogramming and Regeneration in the Mouse Retina. *Cell Reports* Jul 25;4(2):271-86.

Lluis F, **Cosma MP**. (2013) Resetting Epigenetic Signatures to induce Somatic Cell Reprogramming. *Cell Mol Life Sci*. Apr;70(8):1413-24

Ombrato L, Lluis F, **Cosma MP**. Regulation of self-renewal and reprogramming by TCF factors. (2012) *Cell Cycle* Jan 1;11(1):39-47. Epub 2012 Jan 1.

Lluis F, Ombrato L, Pedone E, Pepe S, Merrill BJ, **Cosma MP** (2011) T-cell factor 3 (Tcf3) deletion increases somatic cell reprogramming by inducing epigenome modifications. *PNAS* Jul 19;108(29):11912-7.

Sanges D., Lluis F. and **Cosma MP** (2011) Cell fusion mediated reprogramming: pluripotency or transdifferentiation? Implication in regenerative medicine. *Adv Exp Med Biol*. 713:137-59.

Sanges D. and **Cosma MP** (2010) Reprogramming cell fate to pluripotency: the decision-making signalling pathways. *International Journal of Developmental Biol*ogy; 54(11-12):1575-87.

Lluis F, Pedone E, Pepe S, **Cosma MP** (2010) The Wnt/β-Catenin Signaling Pathway Tips the Balance Apoptosis and Reprogramming of Cell-Fusion Hybrids. *Stem Cells*. 28(11):1940-9

Buono M, Visigalli I, Bergamasco R, Biffi A, and **Cosma MP** (2010). SUMF1-mediated FGF signaling primes multilineage development Hematopoietic Stem and Progenitor Cells. *Journal of Experimental Medicine.* Aug 2;207(8):1647-60.

Buono M, and **Cosma MP** (2010). Sulfatase activities towards the regulation of cell metabolism and signaling in mammals. *Cell Mol Life Sci*. 2010 Mar;67(5):769-80.

Lluis F, **Cosma MP**. (2010). Cell-fusion-mediated somatic-cell reprogramming: a mechanism for tissue regeneration. *J Cell Physiol*. 2010 Apr;223(1):6-13.

Marucci L, Barton DA, Cantone I, Ricci MA, **Cosma MP**, Santini S, di Bernardo D, di Bernardo M. (2009). How to turn a genetic circuit into a synthetic tunable oscillator, or a bistable switch. *PLoS One*. 2009 Dec 7;4(12):e8083.

Polito V and **Cosma MP** (2009). IDS crossing of the blood-brain barrier corrects CNS defects in MPSII mice. *American Journal of Human Genetics* Aug;85(2):296-301.

Plati T, Visigalli I, Capotondo A, Buono M, Naldini L, **Cosma MP**, Biffi A. (2009). Development and maturation of invariant NKT cells in the presence of lysosomal engulfment. *Eur J Immunol.* Oct;39(10):2748-54.

Cantone I, Marucci L, Iorio F, Ricci MA, Belcastro V, Bansal M, di Bernardo M, Santini D, di Bernardo D and **Cosma MP** (2009). A yeast synthetic network for In-vivo assessment of reverse-engineering and modelling approaches. *Cell* 137(1):172-81

Lluis F & **Cosma MP** (2009). Somatic cell reprogramming control: signalling pathway modulation versus transcription factor activities. *Cell Cycle* 8(8):1138-44.

Lluis F, Pedone E, Pepe S, **Cosma MP** (2008). Periodic activation of Wnt/□-catenin signalling enhances somatic cell reprogramming mediated by cell fusion. *Cell Stem Cell*. 3(5):493-507

Yiş U, Pepe S, Kurul SH, Ballabio A, **Cosma MP** and Dirik E. (2008). Multiple sulfatase deficiency in a Turkish family resulting from a novel mutation. *Brain Dev*. 30(5):374-7

Fraldi A, Zito E, Annunziata F, Lombardi A, Cozzolino M, Monti M, Spampanato C, Ballabio A, Pucci P, Sitia R and **Cosma MP (2008).** Multistep, sequential control of the trafficking and function of the Multiple Sulfatase Deficiency gene product, SUMF1 by PDI, ERGIC-53 and ERp44. *Hum Mol Genet.* 17(17):2610-21.

Capotondo A, Cesani M, Pepe S, Fasano S, Gregori S, Tononi L, Venneri MA, Brambilla R, Quattrini A, Ballabio A, **Cosma MP**, Naldini L, Biffi A. (2007). Safety of arylsulfatase A overexpression for gene therapy of metachromatic leukodystrophy (2007). *Hum Gene Ther*. 18(9):821-36.

Zito E, Fraldi A, Buono M, Pepe S, Settembre C, Annunziata I, Surace EM, Dierks T, Monti M, Cozzolino, M, Pucci P, Ballabio A and **Cosma MP** (2007) Sulfatase modifying factor 1 trafficking through the cells: from endoplasmic reticulum to the endoplasmic reticulum. *EMBO Journal* 26(10):2443-53.

Fedele AO, Filocamo M, Di Rocco M, Sersale G, Lubke T, di Natale P, **Cosma MP**, Ballabio A (2007) Mutational analysis of the HGSNAT gene in Italian patients with mucopolysaccharidosis IIIC (Sanfilippo C syndrome). *Hum Mutat*. 28(5):523.

Settembre C, Annunziata I, Spampanato C, Zarcone D, Cobellis G, Nusco E, Zito E, Tacchetti C, **Cosma MP**, Ballabio A. (2007) Systemic inflammation and neurodegeneration in a mouse model of multiple sulfatase deficiency. *PNAS*. 104(11):4506-11.

Fraldi A, Biffi A, Lombardi A, Visigalli I, Pepe S, Settembre C, Nusco E, Auricchio A, Naldini L, Ballabio A and **Cosma MP**. (2007) SUMF1 enhances sulfatase activities in vivo in five sulfatase deficiencies. *Biochem J.* 403(2):305-12.

Cardone M, Polito VA, Pepe S, Mann L, D'Azzo A, Auricchio A, Ballabio A, and **Cosma MP**. (2006). Correction of Hunter syndrome in the MPSII mouse model by AAV2/8-mediated gene delivery. *Human Molecular Genetics* 15(7):1225-36.

Zito E, Fraldi A, Pepe S, Annunziata I, Kobinger G, Di Natale P, Ballabio A and **Cosma MP** (2005) Sulfatase activities are regulated by the interaction of the sulfatase modifying factor 1 with SUMF2. *EMBO Reports* 6, 655-60

Cosma MP (2004) Daughter-specific repression of *Saccharomyces cerevisiae HO*: Ash1 is the commander. *EMBO reports*, 5(10):953-7

Cosma MP, Pepe S, Parenti G, Settembre C, Annunziata I, ….and Ballabio A. (2004) Molecular and functional analysis of *SUMF1* mutations in Multiple Sulfatase Deficiency. *Human Mutation*, 23(6):576-81

Cosma MP, Pepe S, Annunziata A, Newbold RF, Grompe M, Parenti G, and Ballabio A. (2003). The Multiple Sulfatase Deficiency Gene Encodes an Essential and Limiting Factor for the Activity of Sulfatases. *Cell*, 113:445-456

Cosma MP (2002) Ordered recruitment: gene-specific mechanism of transcription activation. *Molecular Cell*, 10, 227-236

Cosma MP, Panizza S and Nasmyth K (2001) Cdk1 triggers association of RNA polymerase to cell cycle promoters only after recruitment of the mediator by SBF. *Molecular Cell*, 7(6): 1213-1220

Quadro L, Fattoruso O, **Cosma MP**, Verga U, Porcellini A, Libroia A, Colantuoni V (2001) Loss of heterozygosity at the RET Protooncogene locus in a casa of multiple endocrine neoplasia type 2A J. *Clinical Endocrinology & Metabolism* 86;239-244

Quadro L, Blaner WS, Salchow DJ, Vogel S, Piantedosi R, Gouras P, Freeman S, **Cosma MP**, Colantuoni V, and Gottesman ME (1999) Impaired retinal function and vitamin a availability in mice lacking retinol-binding protein. *EMBO Journal*,18(17):4633-4644

Tanaka T, **Cosma MP**, Wirth K and Nasmyth K (1999) Identification of Cohesin Association Sites at Centromeres and along Chromosome Arms. *Cell*, 98(6):847-58

Cosma MP, Tanaka T and Nasmyth K (1999) Ordered recruitment of transcription and chromatin remodeling factors to a cell cycle- and developmentally regulated promoter. *Cell*, 97(3):299-311

Cosma MP, Cardone M, Carlomagno F, and Colantuoni V. (1998). Mutations in the extracellular domain cause RET loss of function by a dominant negative mechanism. *Mol Cell Biol*, 18(6):3321-9

Cosma MP, Panariello L, Quadro L, Dathan NA, Fattoruso O, and Colantuoni V. (1996) A mutation in the RET proto-oncogene I Hirschsprung's disease affects the tyrosine kinase activity associated with multiple endocrine neoplasia type 2A and 2B. *Biochemical Journal* 314, 397-400.

Pedone PV, **Cosma MP**, Ungaro P, Colantuoni V, Bruni CB, Zarrilli R, and Riccio A (1994) Parental Imprinting of Rat Insulin-like Growth Factor II Gene Promoters Is Coordinately Regulated. *The Journal of Biological Chemistry* 269, 23970-23975.

Awarded Research Grants

1. H2020 FET-OPEN; Role Coordinator; Period 2021-2024. Total Budget 3.552.000€. Cosma's Budget 836.546€. ECaBox "Eyes in a Care Box": Regenerating human retina from resuscitated cadaveric eyes.

2. La Marato'. Role Coordinator Period 2021-2024. Total budget 199.993€. "Boosting integration of transplanted cells to regenerate Retinitis Pigmentosa retina".

3. SGR; Role PI; Period 2022-2024 Budget 60.000€. Reprogramming and Regeneration

4. Plan National; Role PI; Period 2021-2024. Budget 230.000€. Investigating mechanisms to regenerate the retina in mammals.

5. Velux Stiftung; Role PI; Period 2019-2022. Budget CHF 282,000. Cell fusion-mediated therapy to regenerate human retinae

6. La Caixa Health; Role Coordinator; Period 2019-2021. Budget 500.000€. Cosma's budget 35%. Regenerating photoreceptors in human retinal organoids to establish a treatment for Retinitis Pigmentosa

7. H2020 FET-OPEN; Role Coordinator; 2016-2020. Total Budget 3.988.000€. Cosma's Budget 957.000€. CellViewer: super-resolution systems microscopy to assess pluripotency and differentiation of stem cells at single cell level.

8. H2020-FET Launchpad; Role Coordinator; Period 2018-2019. Budget 100.000€ Hermes Super Resolution

9. Plan National; Role PI; Period 2018-2020. Budget 234.740€. Studying fusion-mediated somatic cell reprogramming: from basic mechanisms to tissue regeneration.
10. SGR; Role PI; Period 2017-2020 Budget 42.000€. Reprogramming and Regeneration
11. Velux Stiftung; Role PI; Period 2016-2019. Budget CHF 353,000.00. Regenerating photoreceptors in Retinitis Pigmentosa.
12. Health Ministry "Bando Giovani Ricercatori 2008"; Role PI; Period 2013-2018. Total Budget 517.000 €. Cosma's Budget 50% SUMF1 (Sulfatase Modifying Factor 1) controls self-renewal and differentiation of the HSCs (hematopoietic stem cells).
13. Plan National; Role PI; Period 2015-2018. Budget 320.000€. Studying Wnt/beta-catenin signaling in the regulation of reprogramming and tissue regeneration
14. ERC-StGrant (European Research Council); Role PI; Period 2010-2015. Budget 1.570.000 € (RERE). Wnt/β-Catenin signalling pathway controls reprogramming: the basis of regeneration in higher Vertebrates.
15. AXA; Role PI Period 2012-2015. Total Budget $700,000. Cosma's Budget 33%. Identification and manipulation of molecular pathways relevant for age-dependent tissue regeneration
16. Plan National; Role PI; Period 2012-2015. Budget 563.000 €. Identification and manipulation of molecular pathways relevant for age-dependent tissue regeneration
17. European Commission ITN (Initial Training Networks**.** Ten Partners are involved); INGENIUM; Period 2012-2016. Cosma's Budget 238.000 €. Studying Physiology and Pathology of Imprinted Genes to understand the role of Epigenetic Mutations in Human Disease
18. La Marato'. Period 2012-2016. Total budget 300.000€. Cosma's Budget 60%. Regeneration of dopaminergic neurons in Parkinson's disease through cell-fusion mediated reprogramming
19. Spanish Ministry of Education – Explora Ingenio (for radically new ideas). Period 2014-2016**.** Total budget 45.000€. Cosma's Budget 50%. Visualizing nucleosome movements and DNA unfolding in living cells during transcriptional activation and reprogramming at high resesolution.
20. Human Frontier Science Programme (HFSP); Role Coordinator; Period 2010-2014. Total Budget 750.000 $; Cosma's Budget 60%. Dissecting the molecular mechanisms regulating somatic cell reprogramming.
21. MPS Society; Role: PI; Period: 2009-2011; Budget 80.000 $. AAV2/5CMV-IDS therapy in MPSII mice: correction of CNS defects through IDS delivery across the blood-brain barrier.
22. AIRC; Role PI; Period 2009-2011; 100.000 €. Characterization of SUMF1 (SUlfatase Modifying Factor1) as a tool to expand HSCs (Hematopoietic Stem Cells)
23. TELETHON Foundation P32; Role: PI; Period 2006-2011; Budget 350.000 €
Characterization of the mammalian sulfatase modification system.
24. TELETHON Foundation P34; Role: PI; Period 2006-2011; Budget 350.000 €
AAV-mediated gene therapy of the MPSII mouse model.
25. European Commission STREP; Role PI; Period 2007-2010; Budget 350.000 €
Engineering and control of biological systems COBIOS
26. Shire Biotech Company; Role PI; Period 2009-2010; Budget 150.000 €
Correction of the CNS defects in an MPSII mouse model via systemic ERT
27. Shire Company; Role PI; Period 2006-2008; Budget 250.000 €
Correction of the CNS defects in an MPSII mouse model via systemic ERT
28. MPS Society; Role: PI; Period: 2006-2008; Budget 80.000$
AAV Mediated Gene Therapy of the Hunter Syndrome in the MPS II Mouse Model.
29. MPS Society; Role: PI; Period: 2004-2006; Budget 60.000$

Gene therapy for MPS II: strengthening Iduronate sulfatase enzymatic activity through the action of the Sulfatase Modifying Factor 1.
30. EMBO YIP; Role:PI; Period: 2003-2006; Budget 60.000 €
Yeast transcriptional network: identification of target genes by coupling chromatin immuno-precipitation and microarray.
31. Italian Ministry of University and Research; Role: PI; Period: 2004-2007; Budget 45.000 €
Novel, integrated approaches for target gene identification in genomes.
32. TELETHON Foundation (starting grant); Role: PI; Period 2003-2006; Budget 350.000 € Iduronate Sulfatase (Ids) knock-out mouse: a model to develop gene therapy approaches for diseases due to sulfatase deficiencies