DIRENA ALONSO-CURBELO, PhD
Group Leader - Inflammation, Tissue Plasticity & Cancer Lab, IRB Barcelona

PERSONAL DETAILS

- Family name, First name: **ALONSO CURBELO, DIRENA**
- Email: direna.alonso-curbelo@irbbarcelona.org
- Research identifiers: ORCID: 0000-0001-6674-3059; Google Scholar
- Website: https://www.irbbarcelona.org/es/research/direna-alonso

EDUCATION

21/06/2013 **PhD in Biochemistry & Molecular Biology**, Spanish National Cancer Research Center (CNIO) and Autonomous University of Madrid (UAM), Madrid, Spain.
Supervisor: María S. Soengas (CNIO)
Title: Specific roles of endolysosomal trafficking in melanoma progression and drug response. *Cum Laude & Extraordinary Doctorate Award.*

2007 **BS in Pharmacy,** Complutense University of Madrid (UCM), Spain.
GPA: 3.57/4. *Valedictorian & National Prize Award*.

CURRENT POSITION

2022 – **Group leader (Tenure-track)**, *Inflammation, Tissue Plasticity and Cancer* group, Cancer Science Programme, IRB Barcelona, Spain.

PREVIOUS POSITIONS

2019 – 2021 **Research Associate.** Memorial Sloan-Kettering Cancer Center (MSKCC), New York, USA.
Supervisor: Dr. Scott W. Lowe (Cancer Biology & Genetics Program, Head).

2013 – 2019 **Postdoctoral Researcher,** MSKCC, New York, USA. *Supervisor*: Dr. Scott W. Lowe.

2012 **Visiting Graduate Student**, MSKCC, New York, USA. *Supervisor*: Dr. Johanna Joyce.

2010 **Visiting Graduate Student**, Netherlands Cancer Institute (NKI), The Netherlands.
Supervisor: Dr. Reuven Agami.

2008 - 2013 **PhD Student**, CNIO, Spain. *Supervisor*: Dr. Maria S Soengas.

SHORT CV SUMMARY

I am a tenure-track **Group Leader** at the Institute for Research in Biomedicine (IRB Barcelona), where I lead the *Inflammation, Tissue Plasticity & Cancer* laboratory. My research program defines how **non-genetic mechanisms** govern **cancer initiation and immune evasion**. By bridging cancer biology, immunology, and epigenetics, I aim to uncover **tumor-specific driving mechanisms** that cannot be explained by genetics alone and that may inform rational strategies for cancer interception and treatment.

During my PhD at CNIO, I uncovered lineage-specific mechanisms of cancer cell plasticity, establishing **RAB7** as a tumor-supportive regulator of vesicular trafficking co-opted during malignant progression (***Cancer Cell*** 2014). My graduate research also defined the mechanism of action of a new therapy exploiting cancer-specific vesicle trafficking features (***Autophagy*** 2010) that is currently under clinical evaluation (NCT02828098), shaping my long-standing interest in how cell identity programs are rewired in cancer in therapeutically exploitable ways. I was also recipient of EMBO and national scholarships to perform short-stays at the Netherlands Cancer Institute and Memorial Sloan Kettering Cancer Center (MSKCC).

After graduating with Cum Laude and an Extraordinary PhD Award, I undertook postdoctoral training at MSKCC in the laboratory of Dr. Scott W. Lowe. My postdoctoral work helped define **chromatin-based mechanisms** mediating the immune surveillance of senescent cells (*Cancer Discovery*, 2016) and uncovered how oncogenic KRAS cooperates with tissue damage to induce early, tumor-permissive epigenetic states underlying pancreatic cancer initiation (*Nature*, 2021). This research also led to a **patent filing** targeting epigenetically dysregulated cytokine signaling in pancreatic cancer (PCT/US2019/041670).

Since starting my laboratory in January 2022, I have built a **multidisciplinary research program** integrating mouse models, functional perturbations, single-cell (epi)genomics, and human samples to define non-genetic determinants of cancer initiation and immune escape across cell-intrinsic, tissue-level and organismal scales. As I initiated my group, I co-led and completed a comprehensive single-cell study of epithelial plasticity during pancreatic tumorigenesis (***Science***, 2023; co-first author), and have since published as **corresponding author** research defining tissue-sensing mechanisms governing anti-tumor immune interactions (***Cancer Discovery***, 2023), alongside invited reviews and perspectives (***Cancer Cell*** 2024; ***Nature*** *(N&V)* 2024; ***Trends in Cancer*** 2025). In the past 4 years, I have secured as PI **>€4M in competitive funding** for my laboratory, including an **ERC Consolidator Grant (ERC-CoG)** and **US DoD awards**, alongside **>€1M** in competitive fellowships for my trainees. I also co-lead international collaborations (TRANSCAN-3, EP PerMed) addressing intra-tumor heterogeneity and early disease challenges.

My international visibility is reflected in **>40 invited talks** since 2020 at **major conferences** (e.g., Annual EACR, CRUK/AACR Cancer Prevention, Crick International Cancer Conference), the **organization of high-profile international meetings** (including the BioMed Conference *Cancer in Context*), and service as **evaluator** for national and international agencies (e.g., ERC, AACR) and reviewer for leading journals (e.g., *Nature*, *Cancer Discovery*). I have also acted as **expert advisor** in international initiatives to define research priorities in cancer (i.e. European UNCAN.eu initiative, 'Early Diagnosis' Working Group; Cancer Grand Challenges 2023 Consultation Workshop); and have served in committee roles in AACR and ESMO. My trajectory has been recognized with >10 national and international awards, including the **AACR Cancer Discovery Early Career Award (2024)** and the **Blavatnik Regional Award for Young Scientists (2021)**.

I am deeply committed to **mentoring and training** the next generation of scientists. I currently supervise five PhD students and two postdoctoral fellows supported by competitive fellowships (EMBO, AECC, MSCA-COFUND), in addition to a computational postdoctoral fellow and master's trainees. I actively contribute to graduate training, thesis advisory committees, and international teaching, and engage in **outreach initiatives** promoting **diversity** and strengthening the connection between scientific discovery and society.

Overall, my trajectory reflects sustained scientific independence, international competitiveness, and a clear commitment to advancing fundamental questions in cancer biology while fostering a collaborative research environment that supports the training and independence of the next generation of cancer scientists.

HONORS & DISTINCTIONS

2024 **Cancer Discovery *Early Career Award***, American Association for Cancer Research (USA).
2023 **Ramón y Cajal Fellowship** - Ranked ***1st*** in *Biomedicine* category.
2022 **Award for the Promotion of Scientific Vocations, Merck Salud-ASEICA** (Spain).
2022 **´CAN de las Ciencias´ Award**, Council of Gran Canaria (Spain).
2021 **Blavatnik Regional Award for Young Scientists. Winner** in Life Sciences (USA).
2020 **"*La Caixa*" Junior Leader Award**, La Caixa Foundation (Spain).
2018 **Benjamin F. Trump Award for Scientific Research Excellence** (USA).
2016 **AACR Scholar-in-Training Award.** American Association for Cancer Research (USA).
2014 **Ramón Areces Foundation Postdoctoral Fellowship**, Ramón Areces Foundation (Spain).
2014 **Extraordinary Doctorate Award**, Autonomous University of Madrid (Spain).
2010 **EMBO Short-Term Fellowship**, European Molecular Biology Organization (EMBO).
2010 **Society for Melanoma Research Travel Award** (USA).
2009 **Biomedical Sciences Schools Valedictorian**, Complutense University of Madrid (Spain).
2008 **National Award in Pharmaceutical Sciences** (3rd pos), Ministry of Education (Spain).
2007 **National Undergraduate Research Fellowship,** Spanish Ministry of Education (Spain).
2007 **Pharmacy School Valedictorian Award**, UCM University (Spain).

PUBLICATIONS

h-index: 22, **i10-index**: 25; **Citations**: 4,185 (total), 3,453 (since 2021) (source: *Google Scholar, 2026/03/03*)

As LEADING or CORRESPONDING AUTHOR

1. Carra D*, Maas S*, Seoane JA†, **Alonso-Curbelo D**†. *Exposomal determinants of non-genetic plasticity in tumor initiation. Trends in Cancer* (2025). PMID: 40023688 - Invited Review for Special 10th-anniversary issue. (†***corresponding authors***).

2. Blériot C, Dunsmore G, **Alonso-Curbelo D**†, Ginhoux F†. *A temporal framework for tumor-associated macrophage identities and functions. Cancer Cell* (2024). PMID: 38670090 - Review. (†***corresponding authors).***

3. Alcolea MP†, **Alonso-Curbelo D**†, Ambrogio C†, Bullman S†, Correia AL†, Ernst A†, Halbrook CJ†, Kelly GL†, Lund AW†, Quail DF†, Ruscetti M†, Shema E†, Stromnes IM†, Tam WL†. *Cancer Hallmarks: Piecing the Puzzle Together. Cancer Discovery* (2024). PMID: 38571410 - Invited Perspective. (†equal contribution; ***corresponding authors***).

4. Woess K, **Alonso-Curbelo D**†. *Cancer spread in the liver is unlocked from within. Nature* (2024). PMID: 39048866 - *News & Views*. (†***corresponding author***).

5. Burdziak C*, **Alonso-Curbelo D***, Walle T, et al; (AC) Lowe SW†, Pe'er P† (position: 1/25). *Epigenetic plasticity cooperates with cell-cell interactions to direct pancreatic tumorigenesis. Science* (2023). PMID: 37167403 (*equal contribution: ***first author***).
   - *Highlighted in Nature Reviews Gastroenterology & Hepatology PMID: 37286640.*
   - *Highlighted in Trends Cancer PMID: 37495432.*
   - *Selected among the top 10 EACR Highlights in Cancer Research*

6. Chen HA, Ho YJ, Mezzadra R, Adrover JM, Smolkin R, Zhu C, Woess K#, Bernstein N, Schmitt G, Fong L, Luan W, Wuest A, Tian S, Li X, Broderick C, Hendrickson RC, Egeblad M, Chen Z, **Alonso-Curbelo D**†, Lowe SW†. *Senescence rewires microenvironment sensing to facilitate anti-tumor immunity*. *Cancer Discovery* (2023) 13:432-453 PMID: 36302222. (†***corresponding authors***). (#Alonso-Curbelo lab member)
   - *Highlighted in Oncoimmunology PMID: 36531690.*
   - *Highlighted in Nat. Rev. Cancer PMID: 36456754.*

7. **Alonso-Curbelo D**, Ho YJ, Burdziak C, Maag JLV, Morris JP 4th, Chandwani R, Chen HA, Tsanov KM, Barriga FM, Luan L, Tasdemir N, Livshits G, Azizi E, Chun J, Wilkinson JE, Mazutis L, Leach SD, Koche R, Pe'er D, Lowe SW†. *A gene–environment-induced epigenetic program initiates tumorigenesis*. *Nature* (2021) PMID: 33536616. (***first author***)
   - *Highlighted in Nature PMID: 33536597*
   - *Highlighted within the 10 Noteworthy Science Breakthroughs of 2021 at MSKCC.*
   - *Highlighted in Signal Transduct. Target. Ther. PMID: 34023857*

8. Tasdemir N*, Banito B*, Roe JS*, **Alonso-Curbelo D***, Camiolo M, Tschaharganeh DF, Huang CH, Aksoy O, Bolden JE, Chen CC, Fennell M, Thapar V, Chicas A, Vakoc CV†, Lowe SW†. *BRD4 connects super enhancer remodeling to senescence immune surveillance. Cancer Discovery* (2016) PMID: 27099234 (*equal contribution; ***first author***).
   - *Highlighted in Cancer Discovery PMID: 27261480*

9. **Alonso-Curbelo D**, Osterloh L, Cañón E, Calvo TG, Martínez-Herranz R, Karras P, Martínez S, et al, [C/A] Soengas MS†. RAB7 counteracts PI3K-driven macropinocytosis activated at early stages of melanoma development. *Oncotarget* (2015) PMID: 26008978. (***first author***)

10. **Alonso-Curbelo D**, Soengas MS†. *Hyperactivated endolysosomal trafficking in melanoma. Oncotarget* (2015) PMID: 25682879. Review article. (***first author***)

11. **Alonso-Curbelo D,** Riveiro-Falkenbach E, Pérez-Guijarro E, Cifdaloz M, Karras P, Osterloh L, Megías D, Cañón E, et al, [C/A] Soengas MS†. *RAB7 controls melanoma progression by exploiting a lineage-specific wiring of the endolysosomal pathway*. ***Cancer Cell*** (2014) PMID: 24981740. (***first author***)
    - *Highlighted in Research Watch, Cancer Discovery PMID: 25185197*
    - *Highlighted in Pigment Cell Melanoma Res PMID: 25141997*

12. **Alonso-Curbelo D**, Soengas MS†. *Self-killing of melanoma cells by cytosolic delivery of dsRNA: Wiring immunity for a coordinated mobilization of endosomes, autophagosomes and the apoptotic machinery in tumor cells.* ***Autophagy*** (2010) PMID: 19923903. Review article. (***first author***)

As CONTRIBUTING AUTHOR

13. Reyes J, Del Priore I, Chaikovsky AC, et al, [C/A] Di Magliano MP, **Alonso-Curbelo D**, Pe'er P†, Lowe SW†. *Dynamic assembly and collapse of cancer-like niches at the benign-to-malignant transition.* ***Cell*** (2026). *In Press.*

14. Tsanov KM, Barriga FM, Ho Y-J, **Alonso-Curbelo D**, et al, [C/A] Lowe SW†. *SMAD4 induces opposite effects on metastatic growth from pancreatic tumors depending on the organ of residence.* ***Nature Cancer*** (2025). PMID: 40999053.

15. Burdziak C, Zhao CJ, Haviv D, **Alonso-Curbelo D**, Lowe SW, Pe'er†. *scKINETICS: inference of regulatory velocity with single-cell transcriptomics data.* ***Bioinformatics*** (2023). PMID: 37387147.

16. Barriga FM*, Tsanov KM*, Ho YJ, Sohail N, Zhang A, Baslan T, Wuest AN, Del Priore I, Meškauskaitė B, Livshits G, **Alonso-Curbelo D**, Simon J, et al. [C/A] Lowe SW†. *MACHETE identifies interferon-encompassing chromosome 9p21.3 deletions as mediators of immune evasion and metastasis*. ***Nature Cancer*** (2022) PMID: 36344707.

17. Kozuka C, Efthymiou V, Sales VM, Zhou L, Osataphan S, Yuchi Y, Chimene-Weiss J, Mulla C, Isganaitis E, Desmond J, Sanechika S, Kuusuyama J, Goodyear L et al**,** Sandoval D, **Alonso-Curbelo D**, Wu L, Qi J, Patti ME†. *Bromodomain Inhibition Reveals FGF15/19 as a Target of Epigenetic Regulation and Metabolic Control.* ***Diabetes*** (2022) PMID: 35100352.

18. Olmeda D†, Cerezo-Wallis D, Mucientes C, Calvo TG, Cañón E, **Alonso-Curbelo D**, Ibarz N, Muñoz J, Rodriguez-Peralto JL, Ortiz-Romero P, Ortega S, Soengas MS†. *Live imaging of pathogenic neolymphangiogenesis identifies acute antimetastatic roles of dsRNA mimics.* ***EMBO Molecular Medicine*** (2021) PMID: 34762341. (†co-corresponding).

19. Paz Zafra M, Parsons MJ, Kim J, **Alonso-Curbelo D**, Goswami S, Schatoff EM, Han T, Katti A, Calvo Fernandez MT, Wilkinson JE, Piskounova E, Dow LE†. *An in vivo KRAS allelic series reveals distinct phenotypes of common oncogenic variants.* ***Cancer Discovery*** (2020) PMID: 32792368.
    - *Highlighted in Cancer Discovery PMID: 33139339.*

20. Amor C*, Feucht J*, Leibold J*, Ho Y-J, Zhu C, **Alonso-Curbelo D**, Mansilla-Soto J, Boyer JA, Li X, Giavridis T, Kulick A, Houlihan S, et al, [C/A] Sadelain M, Lowe SW†. *Senolytic CAR T cells reverse senescence-associated pathologies.* ***Nature*** (2020) PMID: 32555459 (*co-first).
    - *Highlighted in 7 editorial comments, including Nature PMID: 32601490 and Nat Drug Discov PMID: 32581354.*

21. Escobar-Hoyos LF, Penson A, Kannan R, Cho H, Pan C-H, Singh RK, Apken LH, Hobbs GA, Luo R, Lecomte N, Babu S, Pan FC, **Alonso-Curbelo D**, et al, [C/A] Leach SD†. *Altered RNA splicing by mutant p53 activates oncogenic RAS signaling in pancreatic cancer.* ***Cancer Cell*** (2020) PMID: 32559497.

22. Ruscetti M*, Morris JP 4th*, Mezzadra R*, Russell J, Leibold J, Romesser PB, Simon J, Kulick A, Ho YJ, Fennell M, Li J, Norgard RJ, Wilkinson JE, **Alonso-Curbelo D**, et al, [C/A] Lowe SW†. *Senescence-Induced Vascular Remodeling Creates Therapeutic Vulnerabilities in Pancreas Cancer*. ***Cell*** (2020) PMID: 32234521 (*equal contribution).

23. Osmanbeyoglu HU, Shimizu F*, Rynne-Vidal A*, **Alonso-Curbelo D***, Chen HA, Wen HY, Yeung TL, Jelinic P, Razavi P, Lowe SW, Mok SC, Chiosis G, Levine DA, Leslie CS†. *Chromatin-informed inference of transcriptional programs in gynecologic and basal breast cancer.* ***Nature Communications*** (2019) PMID: 31554806 (*equal contribution).

24. Karras P, Riveiro-Falkenbach E, Cañon E, Tejedo C, Calvo TG, Martínez-Herranz R, **Alonso-Curbelo D**, et al, [C/A] Soengas MS†. *p62/SQSTM1 fuels melanoma progression by opposing mRNA decay of a selective set of pro-metastatic factors.* ***Cancer Cell*** (2018) PMID: 30581152.

25. Livshits D, **Alonso-Curbelo D**, Morris JP4th, Koche R, Saborowski M, Wilkinson JE, Lowe SW†. *Arid1a restrains Kras-dependent changes in acinar cell identity.* ***eLife*** (2018) PMID: 30014851.
    - *Highlighted in eLife PMID: 30014853.*

26. Finley LWS*, Vardhana SA*, Carey BW*, **Alonso-Curbelo D**, Koche R, Chen Y, Wen D, King B, Radler MR, Rafii S, et al, [C/A] Thompson CB†. *Pluripotency transcription factors and Tet1/2 maintain Brd4-independent stem cell identity.* ***Nature Cell Biology*** (2018) PMID: 29662175 *(*equal contribution*).
    - *Highlighted in Nat. Cell Biol. PMID: 29662177.*

27. Olmeda D, Cerezo-Wallis D, Riveiro-Falkenbach E, Pennacchi PC, Contreras-Alcalde M, Ibarz N, Cifdaloz M, Catena X, Calvo TG, Cañón E, **Alonso-Curbelo D**, Suarez J, Osterloh L, Graña O, et al, [C/A] Soengas MS†. *Whole body imaging of lymphovascular niches identifies premetastatic roles of MIDKINE.* ***Nature*** (2017) PMID: 28658220.

28. Perez-Guijarro E, Karras K, Cifdaloz M, Martínez-Herranz R, Cañón E, Grana O, Horcajada C, **Alonso-Curbelo D**, et al, [C/A] Soengas MS†. *Lineage-specific roles of the cytoplasmic polyadenylation factor CPEB4 in the regulation of melanoma drivers*. ***Nature Communications*** (2016) PMID: 27857118.

29. Tormo D, Checińska A, **Alonso-Curbelo D**, Pérez-Guijarro E, Cañón E, Riveiro-Falkenbach E, Calvo TG, Larribere L, et al, [C/A] Soengas MS†.*Targeted activation of innate immunity for therapeutic induction of autophagy and apoptosis in melanoma cell*s. ***Cancer Cell*** (2009) PMID: 19647221.

Under review or *In preparation*

30. Matar SM, Blázquez-Araguás S, Diéguez-Docampo A, Liu X, Katanga A, Magurk JE, Gallien NF, Dong MJ, Lao M, Tezcan N, Tarcan Z, Tseng R, Escobor-Hoyos L, **Alonso-Curbelo D**†, Goodale BC†, Leach SD† ***(†corresponding authors)***. *Evolutionarily conserved epigenetic regulation of transcriptional cell states during vertebrate pancreatic tumorigenesis.* Under review

31. López-Gil JC, Diéguez-Docampo A#, Giráldez-Trujillo A. et al, **Alonso-Curbelo D**, García-Silva S†, Sainz, BJ†. *PGLYRP1-expressing cancer stem cells shape pancreatic ductal adenocarcinoma 1 subtypes via heterotypic paracrine signaling. Submitted.* Under review (contributing author; #Alonso-Curbelo lab member).

32. Gavriil ES, Xiao Z, Andrei S, Coupland CE, Carrique L, Woess K#, Hayes A, Wood F, Kumar P, Panea S#, O'Neil S, et al., **Alonso-Curbelo**, Lanyon-Hogg, Siebold C, Tate EW. Discovery of the First Orally Bioavailable Hedgehog Acyltransferase Inhibitor for Treatment of Cancer and Fibrotic Diseases. Submitted. (contributing author; #Alonso-Curbelo lab member)

33. Galvan J*, Dieguez-Docampo A*, Woess K et al. [C/A] **Alonso-Curbelo D**. *Epigenetic divergence of macrophage plasticity uncouples regeneration and inflammation-driven tumorigenesis.* In preparation

PATENTS AND LEADERSHIP IN INNOVATION

Patent of invention. International Application No: PCT/US2019/041670. *Methods of using pharmacologic inhibitors of Type 2 cytokine signaling to treat or prevent pancreatic cancer*. WO/2020/014650. Filing date: 13/07/2018. United States of America. Authors: **Direna Alonso Curbelo**; Scott W. Lowe.

Collaboration agreement. Ongoing 3-way collaboration between IRB Barcelona, industry partner CALICO (USA), and MSKCC (USA); Single-cell senescence surveillance project. 2022-present.

RESEARCH SUPPORT & PROJECTS

As an independent principal investigator (PI) since the fall of 2021, I have secured **> €5M competitive funding**, among which:

- **Grants as PI**: **~€4.17M**, including international ERC-CoG, TRANSCAN, EP PerMed & US DoD awards.
- **Fellowships** for **current lab trainees**: **~€1.33M**, including international EMBO, IBSA Foundation, and AECC Talent Postdoctoral Fellowships.

COMPETITIVE PROJECTS GRANTED AS PI (2021-current) - **International** highlighted with an (*)

1. EU-funded **ERC Consolidator Grant*** - IGNITE (101171929), 2025–2030. *Unmasking non-genetic determinants instructing tumor initiation* (~€1.99M). PI.
2. **Coordinated Project AECC 2025** - EOPC-ACMI, 2026-2029. *Early-onset pancreatic ductal adenocarcinoma: a comprehensive multimodal investigation* (€200k to my group). PI.
3. **Ministry of Science, Innovation and Universities' Knowledge Generation Project -2024** – ECHO (PID2024-159806OB-I00), 2025–2028. *Elucidating cell–cell interactions underlying homeostatic and pro-oncogenic niches in pancreatic cancer* (€225k + PhD fellowship). PI.
4. **IRB–VHIO Collaborative Project** - SCAPE (CEX2023-001260-S), 2025–2028. *Multi-Omics Spatial Cartography of Pancreatic Tumor Ecosystems* (€140k, personnel support). PI.
5. EU-funded **EP PerMed JTC2024*** - COMBAT-PDAC (101137129), 2025–2027. *Combinatorial personalized approaches for subtyping and targeting functional heterogeneity in PDAC* (€200k to my group).
6. **AgeMMetTech Project** Agencia Estatal de Investigación, Centros de Excelencia Severo Ochoa: CEX2023-001260-S /MICIU/AEI/10.13039/501100011033. *Systematic Discovery of Immune and Epithelial Checkpoints and Senolytic Therapy in Liver Cancer*, 2025-2026. €15,000 **PI.**
7. **Ramón y Cajal National Programme** (RYC2023-045857-I), 2025-2029 (€251.8k). PI. Ranked 1st in Biomedicine category
8. EU-funded **TRANSCAN-3 JTC-2022*** - SIMMBAP, 2023–2026. *Systemic immunological determinants of tumor evolution and therapy response in BRCA-mutated PDAC* (€325k to my group). PI.
9. US-funded **DoD Pancreatic Cancer Research Program Idea Development Award*** (W81XWH-22-1-0814), 2022–2025. *Epigenetic licensing of pancreatic cancer metastasis* (€287k to my group). PI.
10. **SGR-Cat 2021** (AGAUR; 01586) – INFLAM-MATES, 2022-2025. Inflammation in Aged Tissue Ecosystems (€13.3k) PI (coordinator)
11. **Ministry of Science and Innovation's Knowledge Generation' Project -2021** – PRE-CAN (PID2021-128102OA-I00), 2022–2025. *Dissecting and targeting early epigenetic programs in pancreatic cancer* (€211k + PhD fellowship). PI.
12. **National Research Network 2022 -** RAS-CURE Network (PID2020-116824RB-100), 2022-2024. *RAS oncoproteins: from basic science to therapeutic applications*. (€149K to whole network). co-PI.
13. **II Ayuda FERO-ASEICA** (Spanish Association for Cancer Research) BFERO2021, 2022-2023. *Intercepting onco-inflammatory networks in pancreatic cancer.* (€80k). PI.
14. ***la Caixa* Junior Leader Incoming** (LCF/BQ/PI20/11760006), 2021–2024. *Dissecting and targeting cell and tissue fate dysregulation in PDAC* (€305k). PI.

INNOVATION TECHNOLOGIES AWARDS

15. **10x Genomics Xenium In Situ Grant Program**. 2026. 10x Genomics/Bonsai Lab/IRB Barcelona Functional Genomics Core Facility. Discounted Spatial Transcriptomics Reagent costs. PI.
16. **ACD Bio-Techne RNAscope Spatial Multiomics Grant Program**. 2025. On-site technology set-up at IRB's Histopathology Core + Reagents. PI.
17. EU-funded **INFRAFRONTIER Precision Disease Models Program**. 2025. Genetic validation of novel genetically-engineered "dual reporter" mouse models was generated together with the IRB's Mouse

Mutant Core. PI.

18. **10x Genomics Single Cell Grant Program**. 2022. 10x Genomics/Bonsai Lab/IRB Barcelona Functional Genomics Core Facility. Discounted single-cell RNA-seq reagent costs. PI.

PARTICIPATING PROJECTS

19. **Institutional AECC Excellence Program: *EPAEC222649IRB*** *Understanding and targeting metastatic disease.* IRB Barcelona (Barcelona, Spain). 01/01/2023-31/12/2026. €2M (Institutional). **Participating Principal investigator** (Working Package Leader).
20. **MSK - Calico Single Cell Collaboration.** Scott W. Lowe, Charles Rudin, Charles Sawyers, Travis Hollman, MSKCC; Bob Cohen; Calico PI; 01/01/2020-01/30/2023. *Role/contribution:* **Team member:** Conceptualization and grant, performed experiments, and published one paper as part of this funding (*Cancer Discovery* 2023). (*)
21. **The Alan and Sandra Gerry Metastasis and Tumor Ecosystems Center - Classic Individual Grant**. *The epigenetic control of tumor ecosystem dynamics during PDAC progression*. Scott W. Lowe & Dana Pe'er. 01/01/2017-01/01/2019. €337,699.52 MSKCC. *Role/contribution:* **Team member:** Conceptualization and grant, performed experiments, and published two papers as part of this funding (*Science* 2023; *Bioinformatics* 2023). (*)
22. **Lustgarten Foundation Grant.** *Target identification and validation in pancreatic ductal adenocarcinoma.* Scott W. Lowe. 01/01/2014-01/01/2017. €422,352 MSKCC. *Role/contribution:* **Team member:** Grant writing, performed experiments, and contributed to a paper as part of this funding (*eLife* 2018). (*)
23. **David Rubenstein Center for Pancreatic Care Research Pilot Project.** *Cell-autonomous and paracrine roles of BRD4 during pancreatic cancer progression and maintenance*. Scott W Lowe. 01/01/2014-01/01/2016. €337,699.52 MSKCC. *Role/contribution:* **Team member:** Performed experiments, and published a paper as part of this funding (*Nature* 2021). (*)
24. **MSKCC Metastasis Research Center Grant**. *Dissecting the interactions between Smad4 and p53 inactivation in pancreatic cancer metastasis.* Scott W Lowe. 01/2014-01/2015. €168,941 MSKCC. *Role/contribution:* **Team member:** Grant writing, performed experiments, and contributed to a paper that is currently under revision partially supported by this funding (*Metastatic site influences driver gene function in pancreatic cancer*. (Tsanov KM et al. *Nature Cancer*, 2025). (*)

FELLOWSHIPS (PhD & Postdoctoral): My training has been supported by the following awards:

25. **Ramón Areces fellowship for international studies**. *Investigating cellular senescence and immunomodulation in pancreatic cancer*. Fundación Ramón Areces. Direna Alonso Curbelo. 2014-2016. (salary support for post-doc stay). **Principal investigator.**
26. **National Graduate Short-Term Research Fellowship**, Spanish Ministry of Science and Innovation**.** Direna Alonso Curbelo. 2008-2012 (short-term fellowship for short-stay at MSKCC, New York, USA). **Principal investigator.**
27. **EMBO Short-Term fellowship.** *Genome-wide RNA interference to define and improve the therapeutic efficacy of dsRNA-based nanocomplexes in human melanoma.* European Molecular Biology Organization (EMBO). Direna Alonso Curbelo. 2010 (short-term fellowship for short-stay at NKI, Amsterdam, The Netherlands). **Principal investigator.** (*)
28. **National Graduate Research Fellowship (FPU)**, Spanish Ministry of Education. Direna Alonso Curbelo. 2008-2012 (salary support for PhD studies). **Principal investigator.**
29. **Undergraduate Research Fellowship (Beca-Colaboración)**, Spanish Ministry of Education. **Direna Alonso Curbelo**. 2007 (Biochemistry Department, Pharmacy School, UCM).

INVITED PRESENTATIONS (last 5 years). **International** congresses/events are highlighted with an (*)

2026 Invited speaker. **CRUK Pancreatic Cancer Conference** (London, UK). Q3 (*)
2026 Invited speaker. **Les Treilles: Stem cells & Cancer Plasticity** (Provence, France). Q2 (*)
2026 Invited speaker. **Forbeck Forum: Causes and Consequences of Cellular Plasticity in Cancer** (Princeton - New Jersey, USA). Q2 (*)
2026 Invited speaker. **EACR Conference: The Tumour Ecosystem: From Mechanisms to Novel Therapeutics** (Bergamo, Italy). Q2 (*)

2026 Invited speaker. **CRUK Cambridge Cancer Seminars** (Cambridge, UK). (*)
2025 Invited speaker. **VIB Conference: Tumor Heterogeneity, Plasticity and Therapy** (Leuven, Belgium). (*)
2025 Invited speaker. **EACR's Cancer Cell Plasticity: Cracking the Code of Adaptation and Survival** (virtual). (*)
2025 Invited speaker. **II International Conference of the Spanish Society of Cellular Senescence (SENESCEL)**. (Barcelona, Spain)
2025 Invited speaker. **Botton-Champalimaud International Pancreatic Cancer Conference** (Lisbon, Portugal). (*)
2025 Invited speaker. **Targeting RAS Symposium** (Salamanca, Spain) (*)
2025 Invited speaker. **5th Crick International Cancer Conference**. The Francis Crick Institute (London, UK). (*)
2025 Scientific Committee member, Chair & Speaker. **European Society for Medical Oncology (ESMO): ESMO MAP 2025 - Molecular Analysis for Precision Oncology Congress** (Paris, France). (*)
2025 Invited speaker. **The Cancer Prevention Research Conference 2025**, **Cancer Research UK & American Association for Cancer Research** (London, UK) (*)
2025 Roundtable panelist. **BIST Forum 2025: From Discovery to Impact**, CaixaForum Barcelona (Barcelona, Spain)
2025 Invited speaker & Power Hour Session Chair. **Gordon Research Conference: Decoding the Cancer Genome and Epigenome** (Lucca, Italy). Power Hour Session Chair. (*)
2025 Invited speaker. **EACR Conference: Persister Cells: from Bacteria to Cancer** (Lyon, France). (*)
2024 Invited speaker. **West China International Symposium on Cancer Research** (Chengdu, China)
2024 Invited speaker. **Medicine at the Crick Symposium: Inflammation and Cancer Promotion** (London, UK). (*)
2024 Invited speaker (virtual). **Universitäres Cancer Center Schleswig-Holstein Oncology Seminar** (Kiel, Germany). (*)
2024 Invited speaker and Panel Chair. **Genome Regulation and Cellular Fates in Homeostasis and Disease Conference**. (Madrid, Spain). (*)
2024 Invited speaker. **SUNRiSE meeting "Tumor Heterogeneity & Plasticity"** (Corsica, France). (*)
2024 Invited speaker. **National Biotechnology Center – Spanish National Research Council (CSIC).** Immunology & Oncology Dept Research Seminars. (Madrid, Spain).
2023 Invited speaker. **Oncode Annual Scientific Conference**, Royal Tropical Institute (Amsterdam, The Netherlands). (*)
2023 Invited speaker. **III School of Cellular and Molecular Biology of Cancer.** Zaragoza University. (Zaragoza, Spain).
2023 Invited speaker**. European Association for Cancer Research (EACR) Annual** Congress "Innovative Cancer Science" (Torino, Italy). (*)
2023 Invited speaker**. European Molecular Biology Laboratory (EMBL) Barcelona** - Science by the Beach Seminar (Barcelona, Spain).
2023 Invited speaker. **Pancreatic Diseases Gordon Research Seminar** (Lucca, Italy). (*)
2023 Invited speaker. **Stem Cell Biology, Cancer Plasticity and Therapeutic Potential Conference, European Association for Cancer Research (EACR)** (virtual). (*)
2023 Invited speaker. **FIT-Cancer9**: **IX Foro de Inmunología Traslacional e Immunoterapia del Cánce*r*** (Madrid, Spain)
2022 Invited speaker. **Symposium on Cancer genomics and Epitranscriptomics: from the Bench to the Clinic** (Salamanca, Spain). (*)
2022 Invited speaker. **Cancer Grand Challenge Program Workshop**, Spanish Association for Cancer Research (Madrid, Spain). (*)
2022 Invited speaker. **Vienna BioCenter PhD Symposium "Pushing Boundaries".** Research Institute of Molecular Pathology (IMP) (Vienna, Austria). (*)
2022 Invited speaker. **18th ASEICA International Conference** (Santiago de Compostela, Spain). (*)
2022 Invited speaker. **Biomed Conference in Premalignacy & Aging** (Barcelona, Spain). (*)
2022 Invited speaker. **MELIS-UPF Biomedical Research Symposium** (Barcelona, Spain). (*)
2022 Selected talk. **Selected Talk.** Barcelona Single Cell Genomics Symposium (Barcelona, Spain). (*)
2022 Invited speaker. **CNIC Inflammation and Immunity Day** (Madrid, Spain). (*)

2022 Invited speaker. **Vall d'Hebron Institute of Oncology (VHIO)** CaixaResearch Scientific Seminar Series (Barcelona, Spain).
2022 Invited speaker. **Institut Hospital del Mar d'Investigacions Mèdiques (IMIM)** Seminar Series. (Barcelona, Spain).
2022 Selected talk. **EMBO Workshop "The many faces of cancer evolution"**. (Rimini, Italy).
2022 Invited Speaker. **XII Chromatin & Epigenetics Meeting**, Societat Catalana de Biologia (Barcelona, Spain).
2022 Invited Speaker. **IV Cancer Research Meeting 'Ciutat d'alcoi'** (Alcoi, Spain).
2022 Invited speaker. **Centro de Investigación del Cáncer (CIC) Seminar Series**. (Salamanca, Spain)
2021 Invited speaker **(Round Table Discussion)**. **IV Young Researchers Meeting CIBERONC-CIBERBBN** (Barcelona, Spain).
2021 Distinguished lecture. **Josep Carreras Leukemia Research Institute Retreat** (Barcelona, Spain).
2021 Invited speaker. **Marie Curie ITN Doctoral Network** Annual Meeting (Evomet), IRB Barcelona. Barcelona, Spain. (*)
2021 Invited speaker (virtual). **New York University (NYU)** Langone Health, Perlmutter Cancer Center Seminar Series (New York, USA). (*)
2021 Invited speaker (virtual). **McGill University**, Frontiers in Cancer Research Lecture Series, (Montreal, Canada). (*)
2020 Selected talk (virtual). **Cold Spring Harbor Laboratory (CSHL) Mechanisms & Models of Cancer Meeting** (New York, USA). (*)
2019 Selected talk. **CSHL Microenvironment & Metastasis Meeting** (New York, USA). (*)
2019 Invited speaker. **Tumor Microenvironments: Mechanisms & Therapeutic Implications - 6th Symposium.** MSKCC (New York, USA). (*)

***Posters** (during **PhD & post-doc**):* >15 presentations, with 7 Best Poster Awards and 2 Travel Awards (*)

ORGANIZATION OF INTERNATIONAL SCIENTIFIC EVENTS

2027 Co-organizer / Chair. Upcoming **AACR Special Conference in Cancer Research**. *'Micro- & Macro-environmental Determinants of Tumorigenesis'* (USA)
2026 Scientific Committee Chair. Tumor Microenvironment Subcommittee of the **2026 AACR Annual Meeting**'s Program Committee.
2025 Scientific Committee member. **European Society for Medical Oncology (ESMO) MAP 2025 - Molecular Analysis for Precision Oncology Congress.**
2024 Organizer. **Gustave Roussy Institute (IGR) – IRB Barcelona *Inflammation & Cancer Summit*** Co-organizer: Dr. Florent Ginhoux (IGR, France). IRB Barcelona (Barcelona, Spain).
2023 Organizer. **40th Barcelona BioMed Conference** *Cancer in context: cellular, tissue, and organismal determinants of malignant fates.* Co-organizer: Dr. Tuomas Tammela (MSKCC, USA). Casa Convalescència - Barcelona (Barcelona, Spain).

INSTITUTIONAL RESPONSIBILITIES & SERVICE

- Member of the **Functional Genomics** and **Histopathology** Steering (2023-present).
- Member of **Group Leader Evaluation** (2023) and **PhD Selection Committees** (2023, 2025).
- Contributor to the **Diversity Working Group** (2023) and initiator of a bottom-up initiative to advance the IRB Barcelona's **Pre-clinical Modeling Strategy** (2025).
- **Participating work package co-coordinator** in the institutional **AECC Excellence grant**; and contributor to **institutional grant proposals** (2024, 2025).
- IRB Barcelona representative in the **BIST Precision Health Initiative** Task Force (2024-present), a multidisciplinary programme across the seven BIST centres focused on healthy ageing, early detection, and precision therapies for age-associated disorders.
- IRB Barcelona and speaker at the **Secretary of State for Health visit** to discuss cross-disciplinary research initiatives bridging Catalan research.

INTERNATIONAL ADVISORY & COMMITTEE ROLES

2026 Award Evaluation Committee member. AACR Award for Outstanding Achievement in Basic Cancer Research (USA)
2025 Scientific Advisory Board member. **Research Training Group (RTG) Pancreatic Cancer Metastasis** (PanCMet) (Germany, Europe).
2024- Steering Committee member. **AACR Tumor Microenvironment Working Group** (USA)

EXTERNAL EVALUATION & REVIEWING

2025 Abstract Evaluator. TME track abstracts, **AACR Annual Meeting** 2026, USA. (*)
2025 External Grant Reviewer (ERC-CoG). (ERC-CoG). **European Research Council** (Europe). (*)
2025 ESMO MAP Abstract Evaluator. **European Research Council** (Europe). (*)
2024 Grant Reviewer. **DKFZ-MOST Cooperation in Cancer Research** (Germany-Israel). (*)
2024 Grant Evaluator. **AECC** Projects ("Proyectos Generales")
2024 Fellowship Evaluator. **AECC** PhD Fellowships
2023-24 Grant Evaluator. **ERA-NET-Cofund TRANSCAN-3** Call (2023) (Riga, Latvia). (*)
2023 Expert Advisor. **European UNCAN.eu** initiative, 'Early Diagnosis' Expert Working Group. (*)
2023 Expert Advisor. **Cancer Grand Challenges** Consultation Workshop. (*)
2023 Grant Evaluator. **National State Research Agency** (AEI) (Spain).
2023 External Grant Reviewer (ERC-CoG). **European Research Council** (Europe). (*)
2023 Group Leader Call Evaluator. **IRB Barcelona** (Barcelona, Spain).
2023 Grant Evaluator. **AECC** Projects in Translational Cancer Research (Spain).
2023 PhD Call Evaluator. **Vall d'Hebron Institute of Oncology** (VHIO) (Barcelona, Spain).
2022-23 Abstract Evaluator. Metastasis track abstracts, **AACR Annual Meeting** 2023, USA. (*)
2022 Guest Editor. "Heterogeneity in Pancreatic Cancer" Special issue; **Frontiers in Oncology**.
2022 Grant Evaluator. **FERO-ASEICA** Grants (Spanish Association for Cancer Research).
2022 Grant Evaluator. **FERO** Grants for Translational Oncology Research (Barcelona, Spain).
2022 Fellowship Evaluator. "**La Caixa Foundation**" Postgraduate Abroad Fellowships (Spain).
2019- Peer-reviewer. *Nature, Cancer Discovery, Nat Comms, Cancer Research, Gut, etc* (*)
2018 External Grant Evaluator.**"Koppie Au" Foundation. The Netherlands**. (*)
2015 External Grant Evaluator. **The Icelandic Research Fund**. Iceland. (*)

TEACHING & MENTORING

PHD THESES

- Hsuan-An Chen (PhD Thesis co-director, with Scott W. Lowe). "*Senescence rewires microenvironment sensing programs to facilitate immune surveillance*". Louis V. Gerstner Jr. Graduate School of Biomedical Sciences- MSKCC, USA (2015-2021; thesis deposited in 2022). Received *NCI F99/K00 Award* to pursue a postdoc at Rockefeller University (USA).
- Samantha Panea (PhD Thesis director). "*Dissecting non-genetic determinants of senescence immunosurveillance and anti-tumor immunity*". Barcelona University (UB) – IRB Barcelona, Spain (2022-current). Supported by an *IRB Dream Marie Skłodowska-Curie COFUND PhD fellowship*.
- Sandra Blázquez (PhD Thesis director). "*Characterization of epigenetic determinants of neoplastic plasticity in pancreatic cancer*". Barcelona University (UB) – IRB Barcelona, Spain (2022-current). Supported by a *FPI fellowship* (Ministry of Science, Innovation and Universities).
- Josefina Galván (PhD Thesis director). "*Understanding and targeting early immune co-option in pancreatic cancer*". Barcelona University (UB) – IRB Barcelona, Spain (2023-current). Supported by a *Spanish Association Against Cancer (AECC) PhD fellowship*.
- Melani Jurić (PhD Thesis director). "*Dissecting cell-cell crosstalk networks dictating tumor immunogenicity and immune escape".* Barcelona University (UB) – IRB Barcelona, Spain (2023-current) *IRB-TARGET Marie Skłodowska-Curie COFUND PhD fellowship*.
- Perrine Simon (PhD Thesis director; computational). "*Understanding spatial and epigenetic determinants of (pre)malignant ecosystems in pancreatic cancer*" (2026-current). Supported by an *FPI fellowship* (Ministry of Science, Innovation and Universities).

MASTER THESES MENTORSHIP

- Stephanie Sanjines (Ms Thesis director) "*Identification of aging-modulated senescence niches underlying systemic inflammation*" (receiving score 8.7/10 in the oral and 9.6/10 in the written section respectively). Barcelona Institute of Science and Technology (BIST). Master of Multidisciplinary Research in Experimental Sciences, Barcelona (2024-2025). *Institutional tuition fellowship*.
- Philipp Putze (Ms Thesis director). "*Characterisation of early-induced microenvironment remodelling factors in pancreatic cancer"* (receiving the *highest score 10/10* in both oral and written sections). Barcelona Institute of Technology (BIST). Master of Multidisciplinary Research in Experimental Sciences, Barcelona (2023-2024). *Institutional tuition fellowship*.
- Josefina Galván (Ms Thesis director). "*Mapeando el ecosistema inmunitario de los estadios tempranos del cáncer de páncreas*". Universidad Internacional de Valencia. Master's degree in Bioinformatics. Barcelona (2022-2023).
- Pere Pericot (Ms Thesis co-director, minor project). Barcelona Institute of Technology (BIST). Master of Multidisciplinary Research in Experimental Sciences. Barcelona (2022-2023).

EXTERNAL VISITING STUDENT MENTORSHIP

- Stephanie Sanjines. Fulbright visiting scholar. *Fulbright USA Student Program* (2023-2024).
- Daniel De La Torre. *High school research project (Trabajo de Recerca)* (Summer 2025).

PHD THESIS ADVISORY COMMITTEE MEMBER - International are highlighted with an (*)

- María Martelo (Eduard Batlle Lab), IRB Barcelona (2025-current)
- Alex Cebria (Alexandra Avgustoniva Lab), IRB Barcelona (2024-current)
- Stephan Forisch (Stefanie Wculek Lab), IRB Barcelona (2024-current)
- Mathilde Bied (Florent Ginhoux Lab), External: **Gustave Roussy** (2024-current) (*)
- Emanuele Pitino (Holger Heyn Lab), External: **CNAG** (2024-current)
- Francesca Cogo (Mate Maus Lab), External: **VHIO** (2024-current)
- Davide Franchi (Gioacchino Natoli Lab), External: **SEMM Milan** (2023-current) (*)
- Cayetano Galera Martinez (Joan Seoane lab), External: **VHIO** (2023-current)
- Emily Middendorp (Eduard Batlle lab), IRB Barcelona (2023-current)
- Raquel Blanco (Nuria Lopez-Bigas lab), IRB Barcelona (2023-current)
- Elvira González (Alejo Rodriguez Fraticelia lab), IRB Barcelona (2023-current)
- Patricia Ferrer (Fran Supek lab), IRB Barcelona (2022-current)
- María Guarini (Alejo Rodriguez Fraticelia lab), IRB Barcelona (2021-current)
- Elena Pareja (Patrick Aloy lab), IRB Barcelona (2022-current)
- Marion Martinez (María Abad lab), External: **VHIO** (2022-current)
- Luis C. Rodríguez (Alejo Rodriguez Fraticelia lab), IRB Barcelona (2021-current)

EXTRAMURAL TEACHING ACTIVITIES (selected, past 3 years)

2023 Lecturer. **III Escuela de Biología Celular y Molecular del Cáncer**. University of Zaragoza (Zaragoza, Spain).

2022 Guest Lecturer. **Master of Multidisciplinary Research in Experimental Sciences**, Barcelona Institute of Technology (BIST) (Barcelona, Spain)

2022 Mentor. **1st edition of BIST Mentoring Program** (Barcelona, Spain).

2021 Lecturer. **Mouse Engineering Course**. Cold Spring Harbor Laboratory (New York, USA).

2021 Guest Lecturer. **Cancer Biology Course**. The City College of New York (New York, USA).

SCIENTIFIC CONTRIBUTIONS & IMPACT

My main scientific contributions span *three major conceptual areas* of cancer biology that explain the origins and mechanistic underpinnings of **non-genetic cellular plasticity in tumor initiation and progression**, and which I am currently expanding to new tissue- and organismal dimensions.

1. ***Lineage-specific mechanisms and vulnerabilities in cancer*.** As a PhD student, I established the relevance of non-genetic, **lineage-specific mechanisms** in rewiring **endolysosomal trafficking** to drive metastasis (*Cancer Cell* 2014; first author). These findings established that tumor cells can exploit developmental wiring to support metastasis, highlighting non-genetic cellular dependencies as therapeutic opportunities,

and opened a new area of research in my PhD lab that led to the discovery of other lineage-specific drivers (*Nat Comms* 2016) and metastasis (*Nature* 2017; *Cancer Cell* 2019). I was also a key contributor in work uncovering such hyper-activated endolysosomal trafficking of tumor cells as a therapeutic vulnerability to induce immunogenic cell death via a new dsRNA-based strategy currently under clinical development (NCT02828098). Together, these studies reinforced the concept that malignant cells retain lineage-imprinted features that can be selectively targeted.

2. ***Epigenetic determinants of anti-tumor immunity***. Beyond dissecting cell-intrinsic mechanisms in cancer, my post-doc work combined flexible in vivo and co-culture systems to reveal non-genetic mechanisms regulating **senescence and tumor immunosurveillance**. Specifically, my work implicated enhancer remodeling in the regulation of the characteristic **proinflammatory phenotypes** of senescent cells (*Cancer Discovery* 2016; co-first author), prompting new questions about the functional relevance of chromatin-directed secretory phenotypes in shaping the tumor microenvironment. These findings paved the way for additional translational studies that I collaborated on, in which we exploited senescence-specific epigenetic programs to enhance drug delivery in the tumor microenvironment (*Cell* 2020) and as target for chimeric antigen receptor (CAR) T cell-based senolytic therapy (*Nature* 2021). More recently, as co-corresponding author, I demonstrated that senescence-associated chromatin changes enhance **tumor immunogenicity** (*Cancer Discovery*, 2023), revealing that epigenetic states can modulate how tumor cells are sensed by the immune system. Collectively, these studies provided novel insights into the role of epigenetic plasticity in anti-tumour immunity and contributed to shifting the view of senescence from a tissue-remodeling state to a dynamically regulated, bidirectional interface between tumor cells and their surroundings, with translational implications for enhancing anti-tumor immunity.

3. ***A molecular basis for gene-environment cooperation in pancreatic cancer***. A major contribution of my research has been defining how oncogenic mutations cooperate with tissue damage to initiate cancer. By combining state-of-the-art mouse modeling approaches and epigenomics methods, I demonstrated that mutant KRAS and injury converge to generate tumor-associated **chromatin alterations that precede overt malignancy** (*Nature*, 2021; leading author), providing molecular resolution to the long-recognized link between regeneration and tumorigenesis. Reflecting my capacity to creatively integrate sophisticated methodologies to address challenging questions in cancer biology, I was the first in the Lowe lab to combine **single-cell multi-omics** with spatiotemporally-controlled functional in vivo perturbations, and rigorously optimized protocols that allowed me to capture rare and transitioning states *in vivo*. Leveraging these capacities, I subsequently co-led the development of a **single-cell atlas of epithelial regeneration, pre-malignancy, and pancreatic cancer** (*Science*, 2023; co-first author), integrating *in vivo* perturbations with multi-omic profiling to resolve early transitional states. This work established experimental and analytical platforms that are now widely used to interrogate early tumor evolution. Beyond my primary research, my expertise in pancreatic cancer models and RNAi/CRISPR tools contributed to collaborative work on tumorigenesis-associated cell identity dysregulation (*eLife* 2018; *Cell* In Press), allele-specific outputs of oncogenic KRAS (*Cancer Discovery* 2020), and metastasis (*Nature Cancer* 2023; *Nature Cancer* 2025). These studies collectively revealed how early cell-state alterations and tissue context collaborate to set and direct tumor trajectories.

Taken together, my work has contributed to reframing tumorigenesis as a process shaped not only by genetic lesions, but also by lineage history, chromatin configuration, and microenvironmental cues. By identifying tumor-selective cellular states and context-dependent vulnerabilities, these studies have expanded the conceptual and mechanistic basis for studying cancer beyond genetics and have opened new avenues for selective cancer interception and immune modulation.

KEY COLLABORATORS

National

- Dr. T. Macarulla, Vall d'Hebron Institute of Oncology (VHIO); now at Hospital Clínic de Barcelona -Head of the Medical Oncology service- (TRANSCAN-3, EP PerMed, AECC Project co-PI partner)
- Dr. B. Sainz, Instituto de Investigaciones Biomédicas "Alberto Sols" CSIC-UAM
- Dr. A. Rodriguez-Fraticelli, IRB Barcelona – Lineage tracing (SGR-Cat 2021/2025 grant co-PI)
- Dr. H. Heyn – Spatial transcriptomics
- Dr. P. Real, CNIO (Madrid) – GATA4/6 in pancreas plasticity

International

- Dr. EW. Tate, Imperial College London & Francis Crick Institute
- Dr. SD. Leach, Director of Dartmouth University (USA) – Pancreatic cancer (DoD grant, co-PI)
- Dr. F. Ginhoux, Gustave Roussy (France) – Immunology
- Dr. H. Zuber, Research Institute of Molecular Pathology (IMP) – Advanced CRISPR-based editing.
- Dr. G. Natoli, European Institute of Oncology (Italy) – European Partnership for Personalized Medicine (EP PerMed) grant co-PI
- Dr. M. Solimena, Director of Paul Langerhans Institute Dresden of Helmholtz Munich (Germany) – EP PerMed grant co-PI
- Dr. A. Feldmann, Helmholtz-Zentrum Dresden-Rossendorf (Germany) – EP PerMed grant co-PI
- Dr. N. Dusetti, Cancer Research Center of Marseille – EP PerMed grant co-PI

RESEARCH NETWORKS & MEMBERSHIPS

International networks are highlighted with an (*).

2023-Present **RAS-CURE Research Network.** Spain.
2023-Present **Alianza de Investigación en Cáncer de Páncreas** (ALIPANC). Spain.
2023-Present **Grupo Español de Terapias Inmuno-Biológicas en Cáncer** (GÉTICA). Spain.
2023-Present **Spanish Research Group for Hyper-early Diagnosis and Treatment of Diseases** (GETIDPHE). Spain.
2022-Present **VHIO Pancreas Task Force.** Spain.
2019-Present **Spanish Association for Cancer Research** (ASEICA). Spain.
2016-Present **American Association of Cancer Research** (AACR). USA. (*)
2017-2021 **New York Academy of Sciences** (NYAS). USA. (*)
2016-2021 **American Association for the Advancement of Science** (AAAS). USA. (*)
2014-2021 **David M. Rubenstein Center for Pancreatic Cancer Research**. USA. (*)

OUTREACH & PUBLIC ENGAGEMENT

2026 Invited institutional representative. **"Condis Solidarity" ceremony** at Sagrada Familia, moderated by Josep Corbella
2025 Round Table panelist in General Audience Discussion on "**The Challenge of Growing Older: Current and future strategies for healthy aging**", with co-panelists Drs. Salvador Macip (UOC / University of Leicester, UK) and Arcadi Navarro (BBRC / UPF, Spain)
2025 Participant lab & speaker. **"IRB Open Day"** (IRB Barcelona, Spain)
2025 Participant lab. "**Crazy about Biomedicine" program** (IRB Barcelona) bringing science closer to high school students (Spain).
2023 Speech on the value of research at ***Gala Benéfica Llavaneres Contra el Cáncer*** (Barcelona).
2021-23 Coordinator and participant of ***"CONOCELAS"* women in science initiative**, organized by the Spanish Association for Cancer Research (**ASEICA**), which connected >300 women cancer researchers with >20,000 students across Spain (2023) to promote STEM values.
2021 Researcher featured in the **campaign "Cosa de Mujeres" against stereotypes in science** & beyond, by Las Palmas de Gran Canaria City Hall (Spain).
2021 Invited speaker at **Commemorative Act of International Women´s Day**. Institute for Women's Studies (IUEM), University of La Laguna (Spain).
2019 Invited young investigator to "High School" Day, in Aspen High School (USA).
2018 Organizer and moderator. ***"Today's Paths to Leadership: A Different Perspective"* Faculty Panel**, Women in Science & Medicine Series, MSKCC (New York, USA). Featured in *Scientific American* blog article.
2017 Co-leader of **Pancreatic cancer awareness & fundraising team** "Scientists –*Re*Searching for a Cure" Team. Pancreatic Cancer Action Network (PanCAN Foundation). (USA).

MEDIA COVERAGE

Different specialized and mainstream media outlets, including national TV channels, radio stations, and newspapers, have been interested in the discoveries and activities of the lab:

Impact of Scientific Work

2026 News interview in *ABC* news, highlighting the lab's work and trainees and the societal value of research https://h1.nu/1kViE (in Spanish)

2024 Podcast interview and collaborator in the episode "*Los detectives del Cáncer*" (Season 2, Episode 8) of the scientific dissemination podcast "90 gramos" (in Spanish) – available in Spotify.

2024 Video interview for *Cancer Discovery*, as recipient of the inaugural Early Career Award bit.ly/3XkwlEy

2023 TV interview in *TV3 - Televisió de Catalunya* (in Spanish & Catalan) ln.run/6dh_4

2023 News article in *BioWorld,* highlighting the Biomed Conference "Cancer In Context" (co-organizer) (in English) ln.run/zQDSl

2023 News article in *El Mundo* sharing discoveries in *Science* 2023 publication (in Spanish) ln.run/ZzcJC

2023 News article in *IRB website* sharing discoveries in *Science* 2023 publication (in Spanish, Catalan and English). ln.run/z6WOG

2023 News article in *IRB website* sharing discoveries in 2023 publication in *Cancer Discovery* (in Spanish, Catalan and English). n.run/2LEBz

2023 Radio interview in *Catalunya Radio* (in Spanish & Catalán) sharing discoveries in *Science* 2023 publication.

2023 News article in *La Vanguardia* highlighting 2023 publication in *Cancer Discovery* (in Spanish) ln.run/fY1gg

2023 Radio interview in *Cope Radio* on senescent cells and Cancer Discovery 2023 study. ln.run/NRm9j

2022 News interview in *La Provincia* newspaper covering the research themes of our lab at IRB Barcelona (in Spanish) ln.run/yvThD

2022 TV Interview in *Informe Trópico for Radiotelevision Canaria* (RTVC) TV channel on the relevance of scientific research to fight disease (in Spanish) https://rtvc.es/la-desigual-batalla-contra-dos-virus-vih-y-covid-19-en-informe-tropico (min 41:06)

2022 Featured in *Barcelona Science Park* blog highlighting publication in *Cancer Discovery* (in English) https://www.pcb.ub.edu/en/scientists-at-irb-barcelona-pave-the-way-to-considering-senescent-cells-as-vaccines-against-cancer/

2021 Featured in *MSKCC In the News* blog highlighting the publication in *Nature* (in English) https://www.mskcc.org/news/msk-scientists-learn-how-genes-and-environment-conspire-pancreatic-cancer-development

2021 Featured in *Genetic Engineering & Biotechnology News* outlet highlighting the publication in *Nature* (in English) https://www.genengnews.com/news/zeroing-in-on-earliest-stages-of-pancreatic-cancer-development/

2021 News interview in *La Provincia* general newspaper highlighting the publication in *Nature* (in Spanish) https://www.laprovincia.es/sociedad/2021/02/07/genes-dano-tisular-conspiran-iniciar-34187122.html

2021 News interview in *El Confidencial* general newspaper highlighting the publication in *Nature* (in Spanish) https://www.alimente.elconfidencial.com/bienestar/2021-02-19/pancreatitis-vuelco-pronostico-cancer-de-pancreas_2956919/

2021 News interview in *eldiario.es* general newspaper highlighting the publication in *Nature* (in Spanish) https://www.eldiario.es/canariasahora/ciencia_y_medio_ambiente/direna-alonso-cientifica-canaria-abierto-puerta-tratamiento-temprano-cancer-pancreas_1_7210243.html

2021 News interview in *El Independiente* general newspaper highlighting the publication in *Nature* (in Spanish) https://www.elindependiente.com/vida-sana/salud/2021/02/18/una-joven-cientifica-canaria-publica-en-nature-como-se-inicia-el-cancer-de-pancreas/

The Value of Science & Diversity in Academia

2024 Participant and Featured Scientist in the Initiative "Yo, jefa" (https://www.yojefa.com/censo-jefas/direna-alonso).

2022 Radio interview in *Onda Cero Las Palmas* on the occasion of 2022 *International Day of Women and Girls in Science* (in Spanish) https://www.youtube.com/watch?v=NoCo0eUqX9c

2021 TV Interview in *El mundo que viene* for RTVC TV channel on the occasion of 2021 *Women´s Day* (min 7-13 and 21-26, in Spanish) https://www.youtube.com/watch?v=y6QRYe2u0kU

2021 Radio interview in *Julia en la Onda* for Onda Cero national Spanish radio describing Spanish Association for Cancer Research (ASEICA)´s initiative "Conócelas" for the *International Day of Women and Girls in Science* (in Spanish) ln.run/eZCQd

2021 Featured woman in science by the *Las Palmas de Gran Canaria City Hall* in the campaign "*Cosa de Mujeres*" on the occasion of 2021 Women´s Day (in Spanish): ln.run/M8dbN

2021 TV Interview in *Atlántico Noticias* for RTVC TV channel highlighting the role of women in science and the importance of basic and translational research (min 23-28, in Spanish) https://www.youtube.com/watch?v=mwAiEeyYW-E&t=8s

Research Trajectory

2023 Featured scientist in *"Meet the Next Generation of Scientists: Meet 3 Remarkable MSK Alumni*" (in English), describing the trajectories of three investigators trained at Memorial Sloan Kettering Cancer Center (New York, USA): https://www.mskcc.org/news/training-next-generation-of-scientists-meet-3-remarkable-msk-alumni

2022 Video covering "CAN Ciencias" Award, from *Gran Canaria TV.com* (in Spanish, English subtitles): https://www.facebook.com/watch/?v=367105155340771

2022 Interview in *La Provincia* newspaper covering *"CAN de las Ciencias" Award* from the Council of Gran Canaria (in Spanish) https://www.laprovincia.es/gran-canaria/2022/03/17/direna-alonso-gran-objetivo-desentranar-63812779.html

2021 Feature article by the *Barcelona Scientific Park IRB* media platform describing opening of our new lab at the IRB Barcelona https://www.pcb.ub.edu/en/irb-barcelona-opens-a-new-laboratory-to-study-the-link-between-inflammation-and-cancer/?_gl=1*rik5c4*_ga*MTk1MzcxNTk4MC4xNjc2MTE1OTg2*_up*MQ..

2021 Feature video by *The New York Academy of Sciences* on the *2021 Blavatnik Regional Awards* (in English) https://www.youtube.com/watch?v=1UDzJmbFwpk

2021 Featured scientist by *Agencia SINC* national science media platform describing my education, career trajectory and research interests (in Spanish) https://www.agenciasinc.es/Entrevistas/Un-tumor-es-la-celula-y-sus-circunstancias

2021 Featured scientist by the *Spanish Foundation for Science and Technology (FECYT)* on 2021 World Cancer Day, as one of current Spanish leaders in oncology (in Spanish) https://www.fecyt.es/es/noticia/fecyt-se-une-la-conmemoracion-del-dia-mundial-contra-el-cancer

2021 Interview in *La Provincia* newspaper covering my education and research trajectory (in Spanish) https://www.laprovincia.es/sociedad/2021/02/07/alumna-escuela-publica-34187129.html This article was selected by *eldiario.es* editorial team as one of the most influential articles from 2021 https://www.eldiario.es/canariasahora/sociedad/2021-canarias-ahora-historias-marcaron-redaccion_1_8624108.html