

# Jose M. Ayuso, PhD.

Biomedical engineer & Biochemist

## **Education:**

- 2012- 2016: PhD in Biomedical Engineering. University of Zaragoza, Zaragoza, Spain, 2016.
- 2010 - 2011: MSc in Biophysics at the Universidad Autónoma de Madrid (UAM).
- 2005 - 2010: BSc Biochemistry awarded by UAM.

## **Research Positions:**

- May 2022 – Present: Assistant Professor at the Department of Dermatology, University of Wisconsin-Madison.
- August 2021 – March 2022: Scientist at the MMB lab, University of Wisconsin-Madison.
- October 2019 – July 2021: Postdoctoral fellow at the MMB lab, University of Wisconsin-Madison (PI: David J Beebe).
- August 2016 – September 2019: Morgridge postdoctoral fellow at the MMB lab, University of Wisconsin-Madison (PI: David J Beebe, Melissa Skala, and Kari B Wisinski).
- August 2014 – October 2014: Visiting scholar at the Institute for Cancer Therapeutics (PI: Kamyar Afarinkia and Roger Phillips), Bradford, UK.
- March 2012-July 2016: PhD student in the AMB group (PI: Ignacio Ochoa), University of Zaragoza, Spain.
- September 2010 – February 2012: Research student at the Physical-chemistry department (PI: Juan Salvador), UAM.
- September 2009 - June 2010: Research student at the Molecular Biology Centre - Severo Ochoa (PI: Francisco Javier Diez-Guerra), Madrid, Spain.

## **Prizes and awards (sorted by most recent):**

1. Best Paper Award. uTAS 2020. Amsterdam, The Netherlands, October, 2020.
2. Best poster and rapid fire presentation. Madison, Wisconsin, US, April 2019.
3. Spotlight presentation. EACR – Defense is the best attack. Barcelona, Spain, March, 2019.
4. EACR best poster finalist – Goodbye flat biology. Berlin, Germany, 2016.
5. EACR meeting bursary award. Amsterdam, The Netherlands, January 2016.
6. Iberus Campus PhD in 3 minutes competition. Winner. Zaragoza University, La-Rioja University, Navarra Public University and Lleida University. 2015, Navarra, Spain.
7. Best Poster prize at the EACR II International Symposium on Clinical and Basic Investigation in Glioblastoma. Toledo, Spain, September 2015. Poster.

## **Publications in peer review journals:**

Total publications = 39	First/last author = 18	Citations (05/02/2021) = 793	h-index = 19	i-index = 23
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1. **Jose M. Ayuso\***, Maria Virumbrales-Munoz\*, Joshua M. Lang, David J. Beebe. “A role for microfluidics in precision medicine”. **Nature Comms**, 2022. \* These authors equally contributed to this work.
2. **Jose M. Ayuso\***, Ignacio Ochoa Garrido\*. “The Importance of the Tumor Microenvironment to Understand Tumor Origin, Evolution, and Treatment Response”. **Cancers**, 2022. \*These authors contributed equally.
3. Maria Virumbrales-Munoz\*, **Jose M. Ayuso\***. “From microfluidics to microphysiological systems: past, present, and future”. **Organs-on-a-chip**, 2022. \* These authors equally contributed to this work.
4. María Virumbrales-Muñoz, **Jose M. Ayuso**, Jack Loken, Kathryn M. Denecke, Shujah Rehman, Melissa C. Skala, E. Jason Abel, David J. Beebe. “Cabozantinib partially restores

endothelial function in a co-culture organotypic model of the RCC microenvironment”. **Biomaterials**, 2022.

5. Arvinder Kapur, Pooja Mehta, Aaron D Simmons, Spencer S. Ericksen, Geeta Mehta, Sean Palecek, Mildred Felder, Zach Stenerson, Amruta Nayak, **Jose M. Ayuso**, Manish Patankar\*, Lisa M. Barroilhet\*. “Atovaquone: An Inhibitor of Oxidative Phosphorylation as Studied in Gynecologic Cancers”. **Cancers**, 2022. \* These authors contributed equally.

6. **Jose M. Ayuso**, Shujah Reman, Maria M Virumbrales, Patrick H. McMinn, Peter Geiger, Cate Fitzgerald, Tiffany Heaster, Melissa C Skala, David J Beebe. “Microfluidic tumor-on-a-chip model to evaluate the role of tumor environmental stress on NK cell exhaustion”. **Science Advances**, 2021. *Featured in “an outstanding selection of the most exciting, cutting-edge cancer research for our multidisciplinary readership”*, **Science**, 2022.

7. Kehinde Adebayo Babatunde, **Jose M Ayuso**, Sheena C Kerr, Anna Huttenlocher, and David J Beebe. “Microfluidic systems to study neutrophil forward and reverse migration”. **Frontiers in Immunology**, 2022.

8. Melissa C. Skala, **Jose M. Ayuso**, Mark E. Burkard, Dustin A. Deming. “Breast cancer immunotherapy: current biomarkers and the potential of in vitro assays”. **Current opinion in biomedical engineering**, 2021.

9. Chao Li, Amanda I. Hurley, Wei Hu, Jay W. Warrick, **Jose M. Ayuso**, Wenxiao Pan, Jo Handelsman, David J. Beebe. “Social motility of biofilm-like microcolonies in a gliding bacterium”. **Nature Communications**, 2021.

10. **Jose M Ayuso**, Shreyans Sadangi, Marcos Lares, David J Beebe, Vijayasaradhi Stealuri. “Microfluidic model reveals keratinocytes and dermal fibroblasts condition primary melanoma cells”. **Lab on a chip**, 2021.

11. Karina M. Lugo-Cintrón, María Virumbrales-Muñoz, **Jose M. Ayuso**, Max M. Gong, Mouhita Humayun, Suzanne Ponik, Paul M. Harari and David J. Beebe. “Primary Head and Neck Cancer-Associated Fibroblasts Promote Lymphangiogenesis in a Lymphatic Organotypic Co-culture Model”. **Ebiomedicine**, 2021.

12. Mouhita Humayun, **Jose M. Ayuso**, Suzanne Ponik, David J. Beebe. “A 3D organotypic lumen-based model to study breast cancer extravasation”. **Biomaterials**, 2021.

13. **Jose M Ayuso\***, Maria Virumbrales-Munoz\*, Keon-Young Park\*, David J Beebe. “Towards improved in vitro models of human cancer”. \* These authors equally contributed to this work. **APL Bioengineering**, 2021.

14. **Jose M Ayuso**, Shujah Rehman, Mehtab Farooqui, Kathryn M Denecke, Melissa C Skala, David J Beebe. “Microfluidic Tumor-on-a-Chip Model to Study Tumor Metabolic Vulnerability”. **International Journal of Molecular Sciences**, 2020.

15. Maria Virumbrales-Muñoz, Jiong Chen, **Jose M. Ayuso**, Moon Hee Lee, E. Jason Abel, David J. Beebe. “Organotypic primary lumen models of clear cell renal cell carcinoma for single-patient clinical trials”. **Lab on a chip**, 2020.

16. Maria Virumbrales-Munoz\*, **Jose M. Ayuso\***, Max M. Gong\*, Yasmin Alvarez-Garcia, Mouhita Humayun, Karina M. Lugo-Cintrón, Megan Livingston, Patrick McMinn, David J. Beebe. \* These authors equally contributed to this work. “Microfluidic organotypic lumen models”. **Chemical Society Reviews**, 2020.

17. Karina Lugo-Cintrón, Max Gong, **Jose M Ayuso**, Lucas Tomko, David Beebe, María Virumbrales-Muñoz, Suzanne Ponik. “Breast fibroblasts and ECM components modulate breast cancer cell migration through the secretion of MMPs in a 3D microfluidic co-culture model”. **Cancers**, 2020.

18. Karina M. Lugo-Cintrón, **Jose M. Ayuso**, Bridget R. White, Paul Harari, Suzanne Ponik, David Beebe, Max Gong, Maria Virumbrales-Munoz. “Matrix Density Drives 3D Organotypic Lymphatic Vessel Activation in a Microfluidic Model of the Breast Tumor Microenvironment”. **Lab on a chip**, 2020.

19. Maria Virumbrales\*, Megan Livingston\*, Melissa C Skala, David J Beebe, **Jose M. Ayuso**. “Development of a microfluidic array to study drug response in breast cancer”. \*These authors equally contributed to this work. **Molecules**, 2019.

20. **Jose M Ayuso\***, Max M Gong\*, Melissa C Skala, Paul Harari, David J Beebe. “A microfluidic lumen model reveals breast cancer cells educate lymphatic cells”. \* These authors equally contributed to this work. **Advanced Healthcare Materials**, 2019.

21. **Jose M. Ayuso**, Maria Virumbrales-Munoz, Patrick H. McMinn, Shujah Rehman, Mohammad R. Karim, Regan Trusttchel, Kari Wisinski, David J. Beebe, Melissa C. Skala. “Tumor on-a-chip: a microfluidic model to study cell response to nutrient starvation”. **Lab on a Chip**, 2019.

22. **Jose M. Ayuso\***, Ross Vitek\*, Adam D. Swick, Melissa, C. Skala, Kari B. Wisinski, Randall J. Kimple, Paul F. Lambert, David J. Beebe. “Effects of culture method on response to EGFR therapy in head and neck squamous cell carcinoma cells”. \* These authors equally contributed to this work. **Scientific Reports**, 2019.

23. María Virumbrales-Muñoz, **Jose M. Ayuso**, Alodia Lacueva, Teodora Randelovic, Sara Oliván, Inés Marmol, M. Jesús Rodríguez-Yoldi, Manuel Doblare, Luis Fernández, Ignacio

Ochoa. “Enabling cell recovery from 3D cell culture microfluidic devices for tumour microenvironment biomarker profiling”. **Scientific Reports**, 2018.

24. Sonja Stojković Burić, Ana Podolski-Renić, Jelena Dinić, Tijana Stanković, Mirna Jovanović, Stefan Hadžić, **Jose M. Ayuso**, María Virumbrales-Muñoz, Luis J. Fernández, Ignacio Ochoa, Victor M. Pérez-García, Milica Pešić. “Modulation of antioxidant potential with coenzyme Q10 suppressed invasion of temozolomide resistant rat glioma in vitro and in vivo”. **Oxidative Medicine and Cellular Longevity**, 2018.

25. **Jose M. Ayuso**, Regan Truttschel, Max Gong, Mouhita Humayun, Maria Virumbrales-Munoz, Ross Vitek, Mildred Felder, Paul Sondel, Manish Patankar, David J. Beebe, Melissa C Skala. “Evaluating natural killer immunotherapy against solid tumors using a microfluidic model”. **Oncoimmunology**, 2018.

26. **Jose M. Ayuso**, Amani Guillete, Karina Lugo-Cintrón, Suehelay Acevedo-Acevedo, Ismael Gomez, Molly Morgan, Tiffany Heaster, Kari Wisinski, Sean P. Palecek, Melissa Skala, Dave J. Beebe. “Organotypic microfluidic breast cancer model reveals starvation-induced spatial-temporal metabolic adaptations”. **Ebiomedicine**, 2018.

27. Alan Viguera, Pilar M. Lanuza, Anne C. Prats, Santiago Costas, Guillermo Llamazares, Diego Sanchez-Martinez, **Jose M. Ayuso**, Luis Fernandez, Ignacio Ochoa, Julián Pardo. Asterisks denote equal authorship. "Activated allogeneic human primary NK cells efficiently kill colorectal cancer cells in 3D spheroid cultures". **Oncoimmunology**, 2017.

28. María Virumbrales-Muñoz, **Jose M. Ayuso**, Marta Olave, Rosa Monge, Diego de Miguel, Luis Martínez-Lostao, Séverine Le Gac, Ignacio Ochoa, Luis J. Fernandez. “Multiwell capillarity-based microfluidic device for the study of 3D tumour tissue-2D endothelium interactions and drug screening in co-culture models”. **Scientific Reports**, 2017.

29. Mohaned Ahmed, Haneen A. Basheer, **Jose M. Ayuso**, Djeddet Ahmet, Marco Mazzini, Roshan Patel, Steve D. Shnyder, Victoria Vinader, Kamyar Afarinkia. “Agarose Spot as a Comparative Method for in situ Analysis of Simultaneous Chemotactic Responses to Multiple Chemokines”. **Scientific Reports**, 2017.

30. Diego De Miguel, Ana Gallego-Lleyda, **Jose M. Ayuso**, Dolores Pejenaute-Ochoa, Vidal Jarauta, Isabel Marzo, Luis J. Fernandez, Ignacio Ochoa, Blanca Conde, Alberto Anel, Luis Martinez-Lostao. “High-order TRAIL oligomer formation in TRAIL-coated lipid nanoparticles enhances DR5 cross-linking and increases anti-tumor effect against colon cancer”. **Cancer Letters**, 2016.

31. **Jose M. Ayuso**, María Virumbrales-Muñoz, Alodia Lacueva, Pilar Lanuza, Julián Pardo, Manuel Doblare, Simon Allison, Roger Phillips, Luis Fernandez, Ignacio Ochoa. "Development and characterization of a microfluidic model of the tumour microenvironment". **Scientific Reports**, 2016.
32. **Jose M Ayuso**, Rosa Monge, Alicia Martínez-González, Guillermo A. Llamazares, Javier Berganzo, Aurelio Hernández-Laín, Jorge Santolaria, Manuel Doblare, Christopher Hubert, Jeremy Rich, Pilar Sánchez-Gómez, Víctor M. Pérez-García, Ignacio Ochoa, Luis J. Fernández. "Glioblastoma on a microfluidic chip: Generating pseudopalisades and enhancing aggressiveness through thrombotic events. **Neuro-Oncology**, 2016.
33. Sonja Stojković, Ana Podolski-Renić, JelenaDinić, **Jose M. Ayuso**, Luis J. Fernandez 2, Ignacio Ochoa, Victor M. Pérez-García, ŽeljkoPavković, VesnaPešić, MilicaPešić. "Resistance to DNA damaging agents produced invasive phenotype of rat glioma cells – characterization of a new in vivo model". **Molecules**, 2016.
34. Diego De Miguel, Ana Gallego Lleyda, **Jose M. Ayuso**, AleksandraPawlak, Ignacio Ochoa, Luis José Fernández, Alberto Anel, Luis Martinez-Lostao. "Combination of liposome-bound TRAIL with flavopiridol overcomes TRAIL resistance by shifting signalling through DR5 and enhancing DISC recruitment". **Recent Patents on Anti-Cancer Drug Discovery**, 2016.
35. Diego, De Miguel; Ana, Gallego-Lleyda; **Jose M. Ayuso**; Sandra, Erviti-Ardanaz; Roberto, Pazo-Cid; Celia, del Agua; Luis, Fernandez; Ignacio, Ochoa; Alberto, Anel; Luis, Martinez-Lostao. "TRAIL-coated lipid-nanoparticles overcome resistance to soluble recombinant TRAIL in non-small cell lung cancer cells." **Nanotechnology**, 2016.
36. **Jose M. Ayuso**, Haneen A. Basheer, Rosa Monge, Pablo Sánchez-Álvarez, Manuel Doblare, Steven D. Shnyder, Victoria Vinader, KamyarAfarinkia, Luis J. Fernández, Ignacio Ochoa. "Study of the chemotactic response of multicellular spheroids in a microfluidic device". **PLoS ONE**, 2015.
37. **Jose M. Ayuso**, Rosa Monge, Guillermo A. Llamazares, Marco Moreno, María Agirregabiria, Javier Berganzo, Manuel Doblare, Ignacio Ochoa and Luis J. Fernández. "SU-8 based microdevices to study self-induced chemotaxis in 3D microenvironments". **Front. Mater.** 2015.
38. Sergio Camero, María J. Benítez, Alejandro Barrantes, **Jose M. Ayuso**, Raquel Cuadros, Jesús Ávila, Juan S. Jiménez. "Tau Protein Provides DNA with Thermodynamic and Structural Features which are Similar to those Found in Histone-DNA Complex". **J Alzheimers Dis.** 2013.

39. Sergio Camero, **Jose M. Ayuso**, Alejandro Barrantes, María J. Benítez, Juan S. Jiménez. “Specific binding of DNA to aggregated forms of Alzheimer's disease amyloid peptides”. **Int. J. Biol. Macromol.** 2013.

### **Publications accepted or in review in peer review journals:**

1. **Jose M Ayuso**, Mehtab Farooqui, Katheryn Denecke, Maria Virumbrales, Shujah Rehman, Jorge Guerrero, Matthew H Forsberg , Sheena Kerr, Nathan Sherer, Christian Capitini, Paul Harari, Melissa Skala, David J Beebe. Reverse-engineering the interaction between HIV, head and neck cancer, and CIML NK cell immunotherapy”. Article under review in **Nature Comms**.

2. **Jose M Ayuso**, Sara Abizanda, David J Beebe ,Sara Olivan, Ignacio Ochoa. “3D in vitro models to study Natural Killer cell anti-tumor response”. Article under review in **Science Advances**.

3. Yousef Alharbi, Arvinder Kapur, Mildred Felder, **Jose M Ayuso**, David J Beebe, David Marshall, Jim Prudent, Bikash Pattnaik, and Manish S. Patankar. “EDC-1, a extracellular drug conjugate that blocks ovarian cancer proliferation by targeting Na<sup>+</sup>/K<sup>+</sup>-ATPase”. Article under review in **Mol. Cancer research**.

4. Arvinder Kapur, **Jose M. Ayuso**, Mildred Felder, David J. Beebe, Cara King, Manish S. Patankar. “Repurposing atovaquone for the treatment of endometriosis”. Article under review in **Human Reproduction**.

### **Patents:**

1. Title: *METHOD OF ASSAYING FOR IMMUNE CELL EXHAUSTION USING A MICROFLUIDIC DEVICE WITH SPATIALLY-CONTROLLED CELL ISOLATION CAPACITY*. Jose M Ayuso, Maria Virumbrales-Munoz, Patrick H McMinn, David J Beebe. Filed in 2020.

2. Title: *DISEÑO DE ENTRADAS FLUIDICAS Y METODO DE USO*. Authors: Ignacio Ochoa Garrido, Luis José Fernández Ledesma, Rosa Monge Prieto, Guillermo Alejandro Llamazares, José María Ayuso Domínguez, María Virumbrales Muñoz, Clara Alcaine, Rebeca Guerrero, Alan Viguera, Jorge Santolaria Mazo. Filed in 2016.

3. Title: *DISPOSITIVO Y SISTEMA MICROFLUÍDICO PARA EL ESTUDIO DE CULTIVOS CELULARES*. Patent [P201230911-PCT/ES13/000141]. Authors: Ignacio Ochoa Garrido, Luis José Fernández Ledesma, Rosa Monge Prieto, Guillermo Alejandro Llamazares, José María Ayuso Domínguez, María Virumbrales Muñoz, Jorge Santolaria Mazo. *Filed in June 2015*.

### **Book chapters:**

1. “Hypoxia in Gliomas: Opening Therapeutical Opportunities Using a Mathematical-Based Approach”. Alicia Martínez-González, Gabriel F. Calvo, Jose M. Ayuso, Ignacio Ochoa, Luis J. Fernández, and Víctor M. Pérez-García. Springer International Publishing Switzerland 2016. K.A. Rejniak (ed.), *Systems Biology of Tumor Microenvironment*, *Advances in Experimental Medicine and Biology* 936, ISSN: 0065-2598 DOI 10.1007/978-3-319-42023-3\_2.

### **Current research funding:**

- UW SEED grant 07/01/2022-06/30/2023

Role: PI

- NIH/NCI 04/01/20-03/31/22 PI(s): Howard H Bailey.  
3P30CA014520-46S2  
CCSG Supplement  
ImmunoAIDS.

Role: I developed the concept and wrote the proposal

- UW SEED grant 05/01/20-04/30/21 PI(s): David J Beebe.

UW State Economic  
Engagement & Development  
(SEED) Research Program  
grants



## **Conference contributions:**

1. Sara Abizanda, Clara Bayona, Teodora Randelović, Marta Claramonte de la Viuda, Julio Alberto Andrés Sanz, Isabel Marquina, Delia Recalde, María del Mar Encabo, José M Ayuso\*, Ignacio Ochoa\*. Patient-derived 3D microfluidic models to assess glioblastoma tumor microenvironment immunomodulation. **EACR annual conference**, Seville, Spain, June, 2022.
2. **Jose M. Ayuso**, Mehtab Farooqui, Kathryn Denecke, Maria Virumbrales-Munoz, Sheena Kerr, Jorge Guerrero, Nathan Sherer, Melissa C. Skala, and David J. Beebe. “Reverse-engineering the intersection between cancer, immunotherapy, and HIV”. **Micro-TAS**, 2021. **Oral Presentation**.
3. María Virumbrales-Muñoz, **Jose M. Ayuso**, Jack Loken, Kathryn Denecke, E. Jason Abel, David J. Beebe. “Effects of cabozantinib in a renal tumor microenvironment on-a-chip model”. **Micro-TAS**, 2021.
4. Mouhita Humayun, Keon Young Park, **Jose M. Ayuso**, Laura J. Knoll, Sheena Kerr, and David J. Beebe “An organotypic intestinal tissue-on-a-chip system for modelling innate immune response to parasite infection”. **Micro-TAS**, 2021. **Oral Presentation**.
5. **Jose M Ayuso**\*, Shreyans Sadangi\*, Marcos Lares, Shujah Rehman, Mouhita Humayun, Kathryn M Denecke, Melissa C Skala1, David J Beebe1, Vijayasaradhi Setaluri. \*These authors contributed equally to the work. A Microfluidic Platform To Investigate the Effects of Skin Microenvironment on Primary Melanoma Evolution. UW Carbone Cancer Center Virtual Retreat 2021, online. March, 2021.
6. **Jose M. Ayuso**, Mehtab Farooqui, Maria Virumbrales-Munoz, Shujah Rehman, Melissa C. Skala, David J. Beebe. “Reverse-engineering the tumor microenvironment through microfluidics and bioengineered in vitro models”. **AACR The Evolving Tumor Microenvironment**, online. January, 2021.
7. **Jose M Ayuso**\*, Shreyans Sadangi\*, Marcos Lares, Shujah Rehman, Mouhita Humayun1, Kathryn M Denecke, Melissa C Skala, David J Beebe, Vijayasaradhi Setaluri. “A Novel Microfluidic Model To Investigate Crosstalk Between Melanoma and Stromal Cells.” \*These authors equally contributed to this work. Virtual congress, **Society for Melanoma Research congress**. October, 2020.

8. Maria Virumbrales-Munoz, Jiong Chen, **Jose M Ayuso**, Erwin J. Abel, and David J. Beebe. “Patient-derived kidney cancer models on-a-chip to inform precision oncology”. **Micro-TAS**. The Netherlands-Online, October, 2020.
9. **Jose M. Ayuso**, Maria Virumbrales-Munoz, Patrick H. McMinn, Shujah Rehman, Cate M. Fitzgerald, David J. Beebe, Melissa C. Skala. “Microfluidics and oncoimmunology: new in vitro models to study solid tumor immunotherapy”. **Micro-TAS**. The Netherlands-Online, October, 2020.
10. Shujah Rehman, **Jose M. Ayuso**, Maria Virumbrales-Munoz, Patrick H. McMinn, David J. Beebe, Melissa C. Skala. “Optical Metabolic Imaging and Molecular Profiling of Immune-tumor Cell interactions in 3D microfluidic models”. **AACR Annual meeting**. San Diego, US, 2020.
11. **Jose M. Ayuso**, Maria Virumbrales-Munoz, Patrick H. McMinn, Shujah Rehman, Cate M. Fitzgerald, David J. Beebe, Melissa C. Skala. “Microfluidics and oncoimmunology: new in vitro models to study solid tumor immunotherapy”. **AACR - Tumor Immunology and Immunotherapy**. Boston, US, November, 2019.
12. Karina M. Lugo-Cintrón, María Virumbrales, **Jose M. Ayuso**, Bridget White, Suzanne Ponik, Paul Harari, David J. Beebe and Max M. Gong. “Influence of ECM Density on Lymphatic Vessel-Breast Tumor Interactions in a 3D Organotypic Model”. **BMES Annual meeting**, Philadelphia, Pennsylvania, US, October, 2019.
13. **Jose M. Ayuso**, Maria Virumbrales-Munoz, Patrick H. McMinn, Shujah Rehman, Mohammad R. Karim, Regan Truttchel, Kari Wisinski, David J. Beebe, Melissa C. Skala. “Microfluidic models to study tumor and immune metabolism in solid tumors”. **Midwest Tumor Microenvironment**, Notre Dame University, South Bend, Indiana, US, May, 2019.
14. **Jose M. Ayuso**, Regan Truttchel, Maria Virumbrales-Munoz, Max Gong, Mouhita Humayun, Manish Patankar, Paul Sondel, Kari B. Wisinski, David J. Beebe, Melissa C. Skala. “Microfluidics and oncoimmunology: new in vitro tools to study solid tumor immunotherapy”. **Wisconsin Stem cell symposium**. Madison, WI, USA, April 2019.
15. **Jose M. Ayuso**, Regan Truttchel, Maria Virumbrales-Munoz, Max Gong, Mouhita Humayun, Manish Patankar, Paul Sondel, Kari B. Wisinski, David J. Beebe, Melissa C. Skala. “Microfluidics and oncoimmunology: new in vitro tools to study solid tumor immunotherapy”. **EACR conference: Defence is the Best Attack: Immuno-Oncology Breakthroughs**. Barcelona, Spain, March 2019. **Presentation selected for a flash talk**.

16. **Jose M. Ayuso**, Karina Lugo-Cintrón, Suehelay Acevedo-Acevedo, Amani Gillette, Patrick N. Ingram, Tiffany Heaster, Kari B. Wisinski, Sean P. Palecek, Dave J. Beebe, Melissa C. Skala. “Microfluidic models and optical imaging to monitor microenvironmental stimuli for breast cancer invasion”. **SPIE Photonics West**. San Francisco, USA. January, 2018. **Oral presentation**.

17. **Jose M. Ayuso**, Regan Truttschel, Max M. Gong, Mouhita Humayun, Amani Gillette, Manish Patankar, David J. Beebe\*, Melissa C. Skala\*. “Microfluidics to study solid tumor-NK cell interactions: from migration and cytotoxicity to therapeutic antibodies”. \*These authors equally coordinated this project. **AACR conference: Tumor Immunology and Immunotherapy**. Boston, USA. October, 2017.

18. Alicia Martínez-González, **Jose M. Ayuso**, Rosa Monge, María Virumbrales-Muñoz, Guillermo A. Llamazares, Javier Berganzo, Aurelio Hernández-Laín, Jorge Santolaria, Manuel Doblare, Christopher Hubert, Jeremy N. Rich, Pilar Sánchez-Gómez, Ignacio Ochoa, and Luis J. Fernández, Víctor M. Pérez-García. “Glioblastoma on a microfluidic chip: Mathematical and experimental validation of the pseudopalisades formation hypothesis”. **WFNOS**. Zurich, Switzerland, May 2017.

19. María Virumbrales-Muñoz, **Jose M. Ayuso**, Alodia Lacueva, Teodora Randjelovic, Sara Olivá, Manuel Doblare, Ignacio Ochoa, Luis Fernández. “Enabling gene profiling in microfluidic models for precision medicine”. **EACR conference series: Making it Personal**. Amsterdam, The Netherlands. March, 2017. Poster.

20. María Virumbrales-Muñoz; Adithya Sridhar; Rosa Monge; **Jose M. Ayuso**; Guillermo Llamazares; Ignacio Ochoa; Albert Ruggi; Luis Fernandez; Séverine Le Gac. “Oxygen sensitive hydrogel matrix for 3D cell culture and 3D oxygen concentration mapping”. **Nanobiotech**. Montreux (Switzerland), November 2016. Poster.

21. María Virumbrales-Muñoz, Adithya Sridhar, Rosa Monge, **José M. Ayuso**, Guillermo A. Llamazares, Ignacio Ochoa, Albert Ruggi, Luis Fernández and Séverine Le Gac. “Oxygen sensitive hydrogel matrix for cell culture and 3D oxygen concentration mapping”. **Micro-TAS**. Dublin, Ireland, September 2016. Poster.

22. **Jose M. Ayuso**, María Virumbrales-Muñoz, Alodia Lacueva, Marta Olave, Alan Viguera, Guillermo A. Llamazares, Rosa Monge, Clara Alcaine, Rebeca Guerrero, Manuel Doblare, Ignacio Ochoa, Luis J. Fernández. “Advanced lab-on-a-chip microdevices to mimic tumor microenvironment in high density cell cultures”. **EACR Conference series 2016: Goodbye flat biology**, Berlin, Germany, November 2016. Poster.

23. María Virumbrales-Munoz, **Jose M. Ayuso**, Rosa Monge, Guillermo A. Llamazares, Marte Olave, Manuel Doblare, Luis J. Fernández, Ignacio. Ochoa. “Tubeless microfluidic

device to study tumour-endothelium crosstalk”. **EACR Conference series 2016: Goodbye flat biology**, Berlin, Germany, November 2016. Poster.

24. **Jose M. Ayuso**, Rosa Monge, Guillermo A. Llamazares, María Virumbrales-Munoz, Alodia Lacueva, Marta Olave, Manuel Doblaré, Ignacio Ochoa , Luis J. Fernández . “Engineering glioblastoma microenvironment in a chip to study cell response”. **24th Biennial Congress of the European Association for Cancer Research**. Manchester, United Kingdom. July 2016. Poster.

25. María Virumbrales-Munoz, **Jose M. Ayuso**, Rosa Monge, Guillermo A. Llamazares, Alodia Lacueva, MartaOlave, Manuel Doblaré, Luis J. Fernández, Ignacio Ochoa. “Biomimetic microfluidic platform for 2D3D co-culture models”. **24th Biennial Congress of the European Association for Cancer Research**. Manchester, United Kingdom. July 2016. Poster.

26. María Virumbrales-Muñoz\*, AdithyaSridhar\*, Rosa Monge, **Jose M. Ayuso**, Guillermo Llamazares, Ignacio Ochoa, Albert Ruggi, Luis Fernández, Séverine Le Gac. “Oxygen sensitive hydrogel matrix for 3D cell culture and 3D oxygen concentration mapping”. **Analytical and Nanoanalytical Methods for Biomedical and Environmental Sciences**, Brasov, Romania. June 2016. Poster.

27. Ignacio Ochoa, María Virumbrales-Muñoz, **Jose M. Ayuso**, Alan Vigueras, Alodia Lacueva, MartaOlave, Guillermo A. Llamazares, Diego De Miguel, Clara Alcaine, Rosa Monge, Rebeca Guerrero, Manuel Doblaré, Luis Martinez-Lostao, Luis J. Fernández. “Advanced lab-on-a-chip microdevices to mimic tumor microenvironment in high density cell co-cultures”. **EMBL - Tumor Microenvironment and Signaling**. Heidelberg, Germany, March 2016. Poster.

28. **Jose M. Ayuso**, María Virumbrales-Muñoz, Alodia Lacueva, Clara Alcaine, Rosa Monge, Guillermo A. Llamazares, Rebeca Guerrero, Alan Vigueras, Marta Olave, Manuel Doblaré, Luis J. Fernández, Ignacio Ochoa. “Microdevices as models to study the tumor behavior in high density cell cultures”. **EACR conference series 2016: A matter of life or death**. Amsterdam, The Netherlands, January, 2016. Poster.

29. María Virumbrales-Muñoz, Adithya Sridhar, Rosa Monge, **Jose M. Ayuso**, Guillermo A. Llamazares, Ignacio Ochoa, Albert Ruggi, Luis Fernández, Séverine Le Gac. “Oxygen-sensitive hydrogel for 3D cell culture and monitoring of biological samples” **NanoBioTech**. Montreaux, Suiza. November 2015. Poster.

30. **Jose M. Ayuso**, María Virumbrales-Muñoz, Guillermo A. Llamazares, Rosa Monge, Alan Vigueras, Pablo Sánchez, Marta Olave, Manuel Doblaré, Luis J. Fernández, Ignacio Ochoa. "GBM-on-a-chip: Engineering glioblastoma microenvironment in a chip to study

cell response". **II International Symposium on Clinical and Basic Investigation in Glioblastoma**. Toledo, Spain, September 2015. Poster.

**31. Jose M. Ayuso**; Rosa Monge, Alicia Martínez-González, Guillermo A. Llamazares, Javier Berganzo, Aurelio Hernández-Laín, Jorge Santolaria, Manuel Doblaré, Pilar Sánchez-Gómez, Víctor M. Pérez-García, Ignacio Ochoa, Luis J. Fernández. "Novel in-vitro biomimetic microfluidic device to resemble the glioblastoma microenvironment". **II International Symposium on Clinical and Basic Investigation in Glioblastoma**. Toledo, Spain, September 2015. Oral, presenting author Dr Fernández.

**32. Jose M. Ayuso**, Rosa Monge, Alicia Martínez-González, Guillermo A. Llamazares, Javier Berganzo, Aurelio Hernández-Laín, Jorge Santolaria, Manuel Doblaré, Pilar Sánchez-Gómez, Víctor M. Pérez-García, Ignacio Ochoa, Luis J. Fernández. "An in-vitro model for Glioblastoma using microfluidics: Generating pseudopalisades on a chip". **AACR- Advances in Brain Cancer Research**. Washington, USA, May, 2015. Poster.

**33. Jose M. Ayuso**, Rosa Monge, Guillermo A. Llamazares, Pablo Sánchez, MaríaAgirregabiria, Javier Berganzo, Jorge Santolaria, Manuel Doblaré, Ignacio Ochoa, Luis J. Fernández. "Novel in vitro biomimetic microfluidic device to resemble the pseudopalisade formation and glioblastoma progression". **EACR Conference series 2014: Goodbye flat biology**, Berlin, Germany, November 2014. Poster.

**34.** Ignacio Ochoa, Rosa Monge, Guillermo A. Llamazares, **Jose M. Ayuso**, María Virumbrales, Alan Viguera, Jorge Santolaria, KamyarAfarinkia, Victoria Vinader, Haneen A. Basheer, Luis J. Fernandez. "Biomimetic tumour microenvironment based on non-gas permeable polymericmicrofluidicmicrodevices". **EACR Conference series 2014: Goodbye flat biology**. Berlin, Germany, November 2014. Poster.

**35. Jose M. Ayuso**, Rosa Monge, Marco Moreno, MaríaAgirregabiria, Javier Berganzo, Jorge Santolaria, Manuel Doblaré, Ignacio. Ochoa, Luis J. Fernandez. "SU-8 based microfluidic device for oxygen/nutrients three dimensional cell culture gradients". **Annual Meeting of the American Society of Cell Biology**. New Orleans, U.S.A., December 2013. Poster.

## **Workshops:**

1. Introduction to CRISPR-Cas9 Genome Editing. Carlsbad, USA. 2018.
2. AACR-Translational Cancer Research for Basic Scientists Workshop. Boston, USA. 2017.

3. Postdoctoral Training Course in Scientific Leadership. Madison, USA. 2017.
4. Design, fabrication, and operation of microfluidic systems for cell culture applications: Theoretical and practical aspects. Zaragoza, Spain. 2014.
5. The third dimension bridges the gap between cell culture and live tissue. Bordeaux, France. 2014.
6. Nanofabrication: concepts, techniques and Nanotechnology applications. Jaca, Spain. 2013.
7. Cells on Chips: From Single Cell Studies Towards Tissue Engineering. Bordeaux, France. 2012.
8. Cells in focus - new ways in cell microscopy. Zaragoza, Spain, 2012.

### **Mentoring and Teaching:**

1. Biomedical Engineering 550. Madison, WI, USA, 2017.
2. Teaching assistant in “Advanced therapies and biotechnology innovation”. Francisco Vitoria University, Madrid, Spain, 2016.
3. Teaching assistant in “Biology 101”. University of Zaragoza, Zaragoza, Spain, 2015.
4. Pablo Sánchez, graduate student, Biochemistry. Project title: Validation of PS based microdevices for GBM microenvironment studies. Zaragoza, Spain, 2015.
5. Albert Espona, graduate student, Biochemistry. Project title: 3D cell culture under mechanical stimulation in the tissue engineering context. Zaragoza, Spain, 2014.
6. Marco, Moreno, graduate student, Chemical engineering. Project title: Hydrogel confinement protocol development for 3D cell culture in microfluidic systems. Zaragoza, Spain, 2014.
7. Teaching assistant in “Instrumental techniques”. UAM, Madrid, 2011.

### **Fellowships:**

1. September 2016 – September – 2019: Morgridge postdoctoral fellowship under the supervision of Dr Melissa Skala, Prof David Beebe and Dr Kari Wisinski.
2. August - October 2016: Boehringer-Ingelheim Foundation short stage grant at the Wisconsin Institutes for Medical Research under the supervision of Professor David Beebe.
3. December 2015: EACR conference meeting bursary.
4. July 2015: CIBER-BBN visiting scholar grant at the Institute for Cancer Therapeutics (Bradford, UK) under the supervision of Dr Kamyar Afarinkia.
5. August 2014 - October 2014: CIBER-BBN visiting scholar grant at the Institute for Cancer Therapeutics (Bradford, UK) under the supervision of Dr Roger Phillips.
6. March 2012 – February 2016: PhD grant at the Aragon Institute for Engineering Research under the supervision of Dr Ignacio Ochoa.
7. October 2010 - September 2011: Post-graduate initiation grant at applied physical chemistry department in the Universidad Autónoma de Madrid (U.A.M.), under the teaching of the Prof Juan Salvador Jiménez Martínez.
8. October 2009 - July 2010: Collaboration grant at Molecular Biology Centre “Severo Ochoa” (CBMSO) in the project “Characterization of Neurogranin-enriched complex in the rat brain” under the supervision of the Dr Francisco-Javier Díez Guerra.

### **Editorial responsibilities**

- Guest editor Jose M Ayuso for the Special Issue "Understanding the Role of the Microenvironment in the Progression of Tumors", **Cancers**, 2021.
- Ad hoc reviewer: Lab on a chip, Analyst, Scientific reports, Cancers, IJMS, Biology, Processes, PLoS ONE, Oncoimmunology, JCM, Micromachines, Frontiers in Bioengineering, ACS Biomaterials Science, Biomedical Microdevices, Advanced Healthcare Materials.

### **Outreach:**

1. Participation in the “Cookies and milk” Science podcast. 2021.

2. Wisconsin Science Festival. 2019.
3. Morgridge Institute for Research, Saturday Science. Participation in multiple events from 2016 to 2019.
4. European Association for Cancer Research (EACR) yearbook - "meet EACR Ambassadors" section, page 31. January 2017:
5. Press release at the Morgridge Institute for Research. Link: <https://morgridge.org/story/jose-maria-ayuso-dominguez-a-man-of-many-names-and-talents/>. January 2017:
6. "Advanced Biomicrofluidic Systems". Jose M. Ayuso and María Virumbrales-Muñoz. **Scientific American**, vol 472, Spanish edition. January 2016.
7. Article in the Aragon Newspaper. Link: [http://www.elperiodicodearagon.com/noticias/aragon/tesis-tres-minutos\\_1070622.html](http://www.elperiodicodearagon.com/noticias/aragon/tesis-tres-minutos_1070622.html). November 2015.
8. Article in the Aragon Herald. Link: [http://www.heraldo.es/noticias/aragon/2015/11/11/cientificos\\_aragoneses\\_abren\\_un\\_a\\_nueva\\_via\\_para\\_tratar\\_tumor\\_cerebral\\_mas\\_agresivo\\_621719\\_300.html#](http://www.heraldo.es/noticias/aragon/2015/11/11/cientificos_aragoneses_abren_un_a_nueva_via_para_tratar_tumor_cerebral_mas_agresivo_621719_300.html#). November 2015.
9. Participation in the Science and innovation pavilion at the Zaragoza's fair. October 2015.
10. Participation in the European Researchers' night. "Organ-on-a-chip" demonstration. September 2015.
11. Press release in the Aragon Herald. Link: [http://www.heraldo.es/noticias/suplementos/2015/06/22/ingenieria\\_realidad\\_368769\\_314.html](http://www.heraldo.es/noticias/suplementos/2015/06/22/ingenieria_realidad_368769_314.html). June 2015.
12. Interview in Zaragoza Radio station. Podcast available in: <http://www.ivoox.com/4568255>. May 2015.
13. Participation in the "I3A IV Young Researchers Day" with the oral presentation "Engineering Microenvironment to Study Tumour Behaviour". May 2015.