# *Curriculum vitae*

## PERSONAL INFORMATION

**Family name, First name:** Diz-Muñoz, Alba
**Researcher unique identifier(s):** ORCID iD 0000-0001-6864-8901
**Date and place of birth:** 08.12.1984 in Barcelona

## EDUCATION

| | | |
|---|---|---|
| 2008 – 2011 | *Doctor rerum naturalium*<br>Mark: *summa cum laude* | Biophysics, *MPI-CBG* and *TU Dresden,* Dresden. |
| 2002 – 2007 | Licenciatura (Bachelor/Master's equivalent).<br>Rank: 2nd. | Human Biology, *Universitat Pompeu Fabra,* Barcelona. |
| 2002 – 2007 | Medical school (Years 1-3) | *Universitat Autònoma de Barcelona,* Barcelona. |

## CURRENT POSITION

| | |
|---|---|
| Since Apr. 2024 | **European Molecular Biology Laboratory and the University Hospital Heidelberg, Heidelberg, Germany.**<br>*Group leader at the Molecular Medicine Partnership Unit* |
| Since Apr. 2016 | **European Molecular Biology Laboratory, Heidelberg, Germany.**<br>*Group leader at the Cell Biology and Biophysics Unit* |

## PREVIOUS POSITIONS

| | |
|---|---|
| Sept. 2024 – July 2026 | **European Molecular Biology Laboratory, Heidelberg, Germany.**<br>*Interim leadership of the Cell Biology and Biophysics Unit* |
| Sept. 2021 – Aug. 2024 | **European Molecular Biology Laboratory, Heidelberg, Germany.**<br>*Deputy head of the Cell Biology and Biophysics Unit* |
| May 2012 – Mar. 2016 | **University of California San Francisco (UCSF) and UC Berkeley, San Francisco, USA.**<br>*Damon Runyon postdoctoral fellow with Prof. Weiner and Prof. Fletcher* |
| Sept. 2011 – Apr. 2012 | **Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany.**<br>*Bridging postdoctoral fellow with Prof. Paluch* |
| Jan. 2008 – Sept. 2011 | **Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany.**<br>*PhD thesis with Prof. Paluch and Prof. Heisenberg*<br>Thesis title: Role of cell protrusions during cell migration *in vivo* |

## CAREER BREAKS

| | |
|---|---|
| Dec. 2018 – May 2019 | Maternity leave |
| March 2020 – March 2021 | The EMBL day-care was closed for 81 working days due to the COVID pandemic, leading to 3.7 months of full-time care of our oldest daughter, who was 1-2 years old at the time |
| Apr. 2021 – Sept. 2021 | Maternity leave |

## FELLOWSHIPS AND AWARDS

1. 2024 Binder Innovation Prize from the German Society for Cell Biology (DZG).
2. Allen Distinguished Investigator Award. $0.9 Mio (out of 1.5 Mio).
3. Invited to write a leading Voice piece on Mechanobiology for Cell's 50th anniversary. Mar. 2024.
4. ERC CoG MitoMeChanics. Apr. 2024 – Mar. 2029. €2.2 Mio.
5. Ben Barres Acceleration Award from CZI. Dec. 2023 – Nov. 2027. $1.2 Mio.
6. 2023 Early Career Award in Mechanobiology from the American Biophysical Society (BPS).
7. Interviewed for the "Cell Scientist to Watch" series from the Journal of Cell Science. Apr. 2020.
8. Damon Runyon Fellowship Award. Jan. 2013 – Mar. 2016.
9. EMBO Long-Term Fellowship (declined).
10. American Heart Association Postdoctoral Fellowship (declined).
11. PhD-thesis: *summa cum laude*, Sept 2011.

## THIRD PARTY FUNDING

**Ongoing Research Support**

2024–2029 European Research Council (ERC), Consolidator Grant "MitoMeChAnics – Deciphering the role of surface mechanics during cell division". €2.2 Mio.

2024–2028 Deutsche Forschungsgemeinschaft (DFG), CRC/SFB 1638 "Mechanical regulation of membrane curvature during endocytosis". €266,800.

2024–2027 Allen Family Philanthropies, Allen Distinguished Investigator Award "David and Goliath at the cell surface: Photo-crosslinkable lipid derivatives to control membrane mechanics". $879,205 (out of 1.48 Mio).

2023–2027 Marie Skłodowska-Curie Actions, Doctoral Network "Training Alliance for Computational Systems Chemistry (TACsy)". €230,299 (out of €3.87 Mio).

2023–2027 Chan Zuckerberg Initiative, Ben Barres Acceleration Award "Harnessing mechanics to immunomodulate microglia and fight neurodegeneration". $1.2 Mio.

**Completed Research Support**

2018–2021 Deutsche Forschungsgemeinschaft (DFG), Sachbeihilfe "Deciphering the role of intra and extracellular elasticity for protrusion growth, stability and switching during cell motility in vivo". €206,667.

2018–2021 Human Frontier Science Program (HFSP), Young Investigator Grant "Molecular Control of Cell Polarization". $350,000 (out of $1.05 Mio).

2019–2023 Deutsche Forschungsgemeinschaft (DFG), Priority Programme SPP 1782 "Deciphering the role of mechanics for epithelia trans-differentiation". €189,850.

2023–2024 Health and Life Science Alliance Heidelberg Mannheim (two consumables' grants). €35,000.

2022–2025 Fritz Thyssen Stiftung "Targeting tissue stiffness to improve cancer therapy". €270,000.

I have also coached all eligible trainees to apply for independent funding, resulting in 10 competitive Postdoctoral fellowships (EIPOD and EMBO), a PhD fellowship (MERCK) and 7 top-up fellowships (Joachim Herz Stiftung, EMBO Research Exchange, Biologist Traveling Fellowship)

## TEACHING ACTIVITIES

2026 Engagement Event for children: Kleine Wunder, Türen auf mit der Maus, Heidelberg, Germany

2026 Academic job market workshop, EMBL, Heidelberg, Germany

2024–2026 Lectures and keynotes at Heidelberg University (COS), the Lautenschläger Summer School and EMBL Brillouin Microscopy course.

2025 SPARK@COS lecture for approx. 400 high school students, Heidelberg, Germany

Since 2017 Lecturer and instructor, EMBO Practical Course "Current Methods in Cell Biology", Heidelberg.

Since 2016 Main organizer, lecturer and instructor, Cell Biology and Biophysics module of the EMBL PhD course, Heidelberg

2016–2017 Lecturer, EMBO Course "Non-neuronal Optogenetics", Heidelberg

2014–2015 Teaching Assistant, Physiology Course, Marine Biological Laboratory, Woods Hole, USA

## SUPERVISION OF GRADUATE STUDENTS AND POSTDOCTORAL FELLOWS

Current 6 postdocs, 4 PhD students, 1 clinician scientist, 4 Staff Scientists, 1 Scientific Officer and 2 Master students

Alumni 9 postdocs, 4 PhD students, 9 Master students, 2 Bachelor students, 8 Interns and 2 Image Processing and Software Specialists. Alumni have moved on to positions including group leader (KIT), postdocs (Harvard, IST Austria, University of Sydney, and others), PhD programmes (EMBL, Institute Gustave Roussy, Amsterdam UMC, and others), and industry (BioNTech, AstraZeneca, AbbVie, Leica, and others)

## ORGANIZATION OF SCIENTIFIC MEETINGS

2021–2026 Main organizer of four EMBL-EMBO Symposia on Mechanobiology (2021, 2022, 2023, 2026), Heidelberg

2025 Co-organizer of Mechanobiology III Vietnam: From Fundamental Research to Applications, Quy Nhon, Vietnam

Feb. 2018 Co-chair of the Cell Morphology session in the DGZ Young Scientists' Forum, Berlin, Germany

2017–2019 Main organizer/co-organizer of 3 EMBO Practical Courses (Current Methods in Cell Biology; Brillouin Microscopy), Heidelberg
2017 Main organizer, Physical Biology Circle Meeting, EMBL, Heidelberg

## SERVICE AND COMMISSIONS OF TRUST

- Co-head of the 2025 EMBL Cell Biology and Biophysics Unit review
- Member of 30 thesis advisory and 22 PhD defence committees (EMBL, Institut Curie, University of Geneva, University of Toulouse, Heidelberg University, IMBA)
- Selection panels for 13 group leader positions at EMBL and for positions at UNSW Sydney, NCMBM (Norway) and CNRS
- Grant reviewer and panel member: ERC, DFG (incl. CRC review panels), Wellcome Trust, FWF, SNSF, ANR, FNRS, ESA
- Tenure and institutional evaluations: UNSW Sydney, TU Dresden, MRC Laboratory of Molecular Biology
- Reviewer for 20 journals including Cell, Science, Nature, Nature Cell Biology, Nature Methods, PNAS, JCB.
- EMBO-Helmholtz science policy workshop "Biomedical Engineering – Science Translation for Future Health" (2026). White papers: https://doi.org/10.1038/d41586-026-02389-5; https://www.embo.org/wp-content/uploads/2026/09/Whitepaper_English_final.pdf

## SELECTED INVITED LECTURES (20 most significant)

Life-inspired Engineering Molecular Systems Conference, Heidelberg University, September 30th, 2026.
International Symposium on Mechanobiology, Glasgow, UK, July 15th, 2026.
Intersection of Mechanics and Metabolism Across Biological Scales, Janelia Research Campus, VA, June 2nd, 2026.
The rise of complex multicellularity: uncovering core principles through deep lineage comparisons, Fondation des Treilles, Treilles, April 9th, 2026.
2026 BIST Symposium on Microscopy, Nanoscopy and Imaging Sciences, Barcelona, March 20th, 2026.
Franco-German Symposium (Gastlandsymposium) at the DPG Spring Meeting 2026 on "Soft, active and alive: emergent properties in living matter", Dresden, March 11th, 2026.
DGZ meeting 50th anniversary, DKFZ, Heidelberg, October 27th, 2025.
EMBO workshop "Cell polarity and membrane dynamics", Sant Feliu de Guíxols, May 19th, 2025.
Biologists@100 conference. BSCB and BSDB annual meeting, Liverpool, March 25th, 2025.
EMBO workshop "From molecules to organisms: An integrative view of cell biology", Radstadt, March 20th, 2025.
SYStem meeting, IMBA-IMP, Vienna, March 13th, 2025.
GRC on Directed cell migration, Il Ciocco, January 15th, 2025.
Oswalt Symposium, MPI for Biophysics, September 25th, 2024.
BIOENG24 meeting, Helmholtz Pioneer Campus, May 7th, 2024.
Cytomeet meeting, Bern, Jan 16th, 2024. **Keynote talk**
Workshop on Synthetic Biology, Freiburg, Dec 12th, 2023.
ASCB, Perception and Sensation, Boston, Dec 6th, 2023. **Symposia (plenary) speaker**
International meeting of Finnish matrix and cell biology societies, Helsinki, March 31st, 2023. **Keynote talk**
2023 Biophysical Society Meeting, San Diego, February 18th, 2023. **Career award talk**
Cell and developmental systems EMBO meeting, Arolla, Aug 23rd, 2022.

## PUBLICATION LIST

42 peer-reviewed publications. 18 (+ 3 in bioRxiv) as corresponding author. * denotes corresponding author. ** denotes first co-author. # denotes 10 most important publications

### Preprints

# 1. Nunes Vicente F*, …, Diz-Muñoz A* (2026). Optogenetic control of actin crosslinker length reveals a mechanical basis for cortical symmetry breaking. **bioRxiv.**
# 2. Decker L, …, Diz-Muñoz A* (2026). MechanoMaST – a multimodal pipeline for spatially registering mechanical and transcriptomic tissue data. **bioRxiv.**
    i. Selected as preprint highlight by preLights.

**Peer-reviewed original papers**

# 1. Dar S, Tesoro Moreno R, Palaia I, …, Diz-Muñoz A* (2026). Caging of membrane-to-cortex attachment proteins can trigger cellular symmetry breaking. **Cell (In press).**
2. Mortazavi N, …, Diz-Muñoz A, …, Gunawan F (2026). Laminin network regulates valve morphogenesis. **Sci Adv (In press).**
# 3. Strauss L, Lembo S, …, Diz-Muñoz A* (2026). The membrane-to-cortex distance regulates mDia1 activity to control cortical mechanics. **Nat Commun.**
4. Bailleu R, …, Diz-Muñoz A, …, Ikmi A (2026). Deciphering mechanical determinants of morphological evolution. **Cell.**
5. Dufrancais O, …, Diz-Muñoz A, …, Vérollet C (2024). Moesin controls cell-cell fusion and osteoclast function. **J Cell Biol.**
6. Bijonowski BM, …, Diz-Muñoz A, …, Wegner SV (2025). Intercellular adhesion boosts collective cell migration through elevated membrane tension. **Nat Commun.**
# 7. Baghdadi MB, …, Diz-Muñoz A, …, Kim TH (2024). PIEZO-dependent mechanosensing is essential for intestinal stem cell fate decision and maintenance. **Science.**
8. Mihlan M, …, Diz-Muñoz A, …, Lämmermann T (2024). Neutrophil trapping and nexocytosis, mast cell-mediated processes for inflammatory signal relay. **Cell.**
9. Verdys P, …, Diz-Muñoz A, …, Poincloux R (2024). Ezrin, radixin, and moesin are dispensable for macrophage migration and cellular cortex mechanics. **EMBO J.**
10. Conti S, …, Diz-Muñoz A, …, Trepat X (2024). Membrane to cortex attachment determines different mechanical phenotypes in LGR5+ and LGR5- colorectal cancer cells. **Nat Commun.**
11. Gopalan AB, …, Diz-Muñoz A*, Ejsing C* (2024). Lipotype acquisition during neural development is not recapitulated in stem cell-derived neurons. **Life Sci Alliance.**
    i. Selected for a special collection on neuroscience research by LSA.
# 12. Sitarska E, …, Diz-Muñoz A* (2023). Sensing their plasma membrane curvature allows migrating cells to circumvent obstacles. **Nat Commun.**
    i. Featured in "The Scientist" journal: "How Migrating Cells Navigate Biological Mazes" by Laura Mac-Daniel.
13. Bergert M*, Diz-Muñoz A* (2023). Quantification of Apparent Membrane Tension and Membrane-to-Cortex Attachment in Animal Cells Using Atomic Force Microscopy-Based Force Spectroscopy. **Methods Mol Biol.**
14. Yang F, …, Diz-Muñoz A, …, Prevedel R (2023). Pulsed stimulated Brillouin microscopy enables high-sensitivity mechanical imaging of live and fragile biological specimens. **Nat Methods.**
15. Bevilacqua C, …, Diz-Muñoz A, …, Prevedel R (2023). High-resolution line-scan Brillouin microscopy for live imaging of mechanical properties during embryo development. **Nat Methods.**
16. de Teresa-Trueba I, …, Diz-Muñoz A, …, Zaugg JB (2023). Convolutional networks for supervised mining of molecular patterns within cellular context. **Nat Methods.**
# 17. Sánchez-Iranzo H*, Halavatyi A, Diz-Muñoz A* (2022). Strength of interactions in the Notch gene regulatory network determines patterning and fate in the notochord. **eLife.**
    i. Selected as preprint highlight by preLights.
18. Kaplan C, …, Diz-Muñoz A, …, Drubin DG (2022). Load adaptation by endocytic actin networks. **Mol Biol Cell.**
19. Clark AG, …, Diz-Muñoz A, …, Vignjevic DM (2022). Self-generated gradients steer collective migration on viscoelastic collagen networks. **Nat Mater.**
20. Venkova L, …, Diz-Muñoz A, …, Piel M (2022). A mechano-osmotic feedback couples cell volume to the rate of cell deformation. **eLife.**
21. Leithner A, …, Diz-Muñoz A, …, Sixt M (2021). Dendritic cell actin dynamics control contact duration and priming efficiency at the immunological synapse. **J Cell Biol.**
# 22. Bergert M, …, Diz-Muñoz A* (2021). Cell surface mechanics gate embryonic stem cell differentiation. **Cell Stem Cell.**
    i. Preview in the same issue of Cell Stem Cell; Recommended by FacultyOpinions as being of special significance in its field; Selected as preprint highlight by preLights.

23. Shen Y, Schmidt T*, Diz-Muñoz A* (2020). Protocol on tissue preparation and measurement of tumor stiffness in primary and metastatic colorectal cancer samples with an atomic force microscope. **STAR Protoc.**

# 24. Shen Y, …, Diz-Muñoz A*, Schmidt T* (2020). Reduction of liver metastasis stiffness improves response to bevacizumab in metastatic colorectal cancer. **Cancer Cell.**
    i. Preview in the same issue of Cancer Cell.

25. Sánchez-Iranzo H, Bevilacqua C, Diz-Muñoz A*, Prevedel R* (2020). A 3D Brillouin microscopy dataset of the in-vivo zebrafish eye. **Data Brief.**
26. Gross-Thebing S, …, Diz-Muñoz A, …, Raz E (2020). Using migrating cells as probes to illuminate features in live embryonic tissues. **Sci Adv.**

# 27. Bevilacqua C, Sánchez-Iranzo H, Richter D, Diz-Muñoz A*, Prevedel R* (2019). Imaging mechanical properties of sub-micron ECM in live zebrafish using Brillouin microscopy. **Biomed Opt Express.**
    i. Selected as preprint highlight by preLights.

28. Graziano BR, …, Diz-Muñoz A, Weiner OD (2019). Cell confinement reveals a branched-actin independent circuit for neutrophil polarity. **PLoS Biol.**
29. Chan CJ, …, Diz-Muñoz A, …, Hiiragi T (2019). Hydraulic control of mammalian embryo size and cell fate. **Nature.**
30. Ficht X, …, Diz-Muñoz A, …, Stein JV (2019). In vivo function of the lipid raft protein flotillin-1 during CD8+ T cell-mediated host surveillance. **J Immunol.**
31. Moalli F, …, Diz-Muñoz A, Stein JV (2018). The Rho regulator Myosin IXb enables nonlymphoid tissue seeding of protective CD8+ T cells. **J Exp Med.**
32. Crest J, Diz-Muñoz A, Chen DY, Fletcher DA, Bilder D (2017). Organ sculpting by patterned extracellular matrix stiffness. **eLife.**
33. Diz-Muñoz A, …, Weiner OD (2016). Membrane Tension Acts Through PLD2 and mTORC2 to Limit Actin Network Assembly During Neutrophil Migration. **PLoS Biol.**
34. Diz-Muñoz A*, Romanczuk P*, …, Paluch EK (2016). Steering cell migration by alternating blebs and actin-rich protrusions. **BMC Biol.**
    i. Recommended by F1000Prime as being of special significance in its field.
35. Lou SS, Diz-Muñoz A, Weiner OD, Fletcher DA, Theriot JA (2015). Myosin light chain kinase regulates cell polarization independently of membrane tension or Rho kinase. **J Cell Biol.**
36. Diz-Muñoz A**, Krieg M**, …, Heisenberg CP (2010). Control of directed cell migration in vivo by membrane-to-cortex attachment. **PLoS Biol.**

**Review and opinion articles**

37. Diz-Muñoz A (2024). Voice piece on “Mechanobiology: shaping the future of cellular form and function”: Greater than the sum of their parts. **Cell 50th anniversary issue.**
38. Nunes Vicente F, Diz-Muñoz A* (2023). Order from chaos: how mechanics shape epithelia and promote self-organization. **Curr Opin Syst Biol.**
39. Li JH, Trivedi V, Diz-Muñoz A* (2023). Understanding the interplay of membrane trafficking, cell surface mechanics, and stem cell differentiation. **Semin Cell Dev Biol.**
40. Sitarska E, Diz-Muñoz A* (2020). Pay attention to membrane tension: mechanobiology of the cell surface. **Curr Opin Cell Biol.**
41. Prevedel R*, Diz-Muñoz A*, Ruocco G, Antonacci G (2019). Brillouin microscopy: an emerging tool for mechanobiology. **Nat Methods.**
42. Diz-Muñoz A*, Weiner OD, Fletcher DA* (2018). In pursuit of the mechanics that shape cell surfaces. **Nat Phys.**
43. Diz-Muñoz A, Fletcher DA, Weiner OD (2013). Use the force: membrane tension as an organizer of cell shape and motility. **Trends Cell Biol.**
    i. Selected for the "Top Ten Editorial Board Favorite Articles of 2013 in Trends in Cell Biology"; Selected as a chapter for the book "Core Topics in Cell Biology" from Cell Press.