



JÚLIA CHAUMEL

Ph.D.

Postdoctoral Fellow

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Dept. Organismic and
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George Lauder's Lab



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CONTACT



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LANGUAGES

Spanish (mother language)

Catalan (mother language)

English (fluent - C1 level)

German (A1 level)

RESEARCH EXPERIENCE

- 2022 | **Postdoctoral Fellow** / Organismic and Evolutionary Biology dept.
Current | Harvard University (Cambridge, USA)
- 2021 | **Postdoctoral Fellow** / Biomaterials dept.
2022 | Max Planck Institute of Colloids and Interfaces (Berlin, Germany)

EDUCATION

- 2021 | **Ph.D. in Biology, sp. in Zoology** / Biomaterials dept.
2018 | Max Planck Institute of Colloids and Interfaces (Berlin, Germany)
Dissertation: Characterization of cartilage cells and matrix in elasmobranch skeletons | Dr. Mason Dean
- 2017 | **M.S. in Biodiversity and Evolution** / Marine Zoology dept.
2016 | University of Valencia, Instituto Cavanilles (Valencia, Spain)
Dissertation: Bycatch impact analysis of trammel nets on the Mediterranean batoid population | Dr. Ohiana Revuelta
- 2017 | **B.S. in Marine Sciences** / Marine Sciences dept.
2016 | University of Alicante, (Alicante, Spain)
Dissertation: Color adaptations to light competition in coral species in Colima (Mexico) | Dr. Marco Liñan

INTERESTS

Elasmobranchs · 3D Imaging · Biomaterials · Biomechanics ·
Functional morphology · Sensory biology

PUBLICATIONS

Published Articles

- Chaumel**, J., Clark, B., Johanson, Z., Underwood, C., Smith, M. M., & Dean, M. N. (2022). Bricks, trusses and superstructures: Strategies for skeletal reinforcement in batoid fishes (rays and skates). *Frontiers in Cell and Developmental Biology*, 10, 932341.
- Chaumel***, J., Marsal, M., Gómez-Sánchez, A., Blumer, M., Gualda, E.J., de Juan, A., Loza-Alvarez, P. and Dean, M.N., 2021. Autofluorescence of stingray skeletal cartilage: hyperspectral imaging as a tool for histological characterization. *Discover Materials*, 1(1), p.16.

Chaumel*, J., Schotte, M., Bizzarro, J.J., Zaslansky, P., Fratzl, P., Baum, D. and Dean, M.N., 2020. Co-aligned chondrocytes: zonal morphological variation and structured arrangement of cell lacunae in tessellated cartilage. *Bone*, 134, p.115264.

Schotte, M., **Chaumel**, J., Dean, M.N. and Baum, D., 2020. Image analysis pipeline for segmentation of a biological porosity network, the lacuno-canalicular system in stingray tesseræ. *MethodsX*, 7, p.100905.

Seidel, R., Blumer, M., **Chaumel**, J., Amini, S. and Dean, M.N., 2020. Endoskeletal mineralization in chimaera and a comparative guide to tessellated cartilage in chondrichthyan fishes (sharks, rays and chimaera). *Journal of the Royal Society Interface*, 17(171), p.20200474.

Book chapters

Dean, M.N., **Chaumel**, J. and Seidel, R., 2022. To build a fish. Structuring space and material in skeletons. In *Design, Gestaltung, Formativtà: Philosophies of making* (pp. 315-328). Birkhäuser.

Published abstracts

Chaumel, J., Schotte, M., Bizzarro, J.J., Zaslansky, P., Fratzl, P., Baum, D. and Dean, M.N., 2021, March. Do the cells in stingray mineralized cartilage perform the roles of bone cells? Quantitative analysis of the lacuno-canalicular network in stingray tesseræ. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 61, pp. E132-E133). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.

Dean, M.N., Blumer, M., Gualda, E., **Chaumel**, J., Seidel, R., Marsal, M. and Omelon, S., 2020, March. Cartilage canals in ray skeletons: Morphology, homology and putative role in mineralization. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 60, pp. E54-E54). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.

Seidel, R., **Chaumel**, J., Blumer, M., Herbert, A., Moreno-Jimenez, I., Summers, A., Debais-Thibaud, M. and Dean, M.N., 2019, March. Mineralization in Chimaera Cartilage: tessellated but not Tesseræ?. In *INTEGRATIVE AND COMPARATIVE BIOLOGY* (Vol. 59, pp. E405-E405). JOURNALS DEPT, 2001 EVANS RD, CARY, NC 27513 USA: OXFORD UNIV PRESS INC.

Submitted articles

Chaumel*, J., Lauder V.G. A hydrodynamic antenna: novel lateral line design in the tail of myliobatid stingrays. *Under review*

Chaumel*, J., White, C., Lauder V.G. The hydrodynamic function of the myliobatids tail during swimming. *Under review*

GRANTS

- 2023
2025 | **Walter Benjamin Postdoctoral Fellowship (Deutsches Academy of Sciences, DFG)** funding a 2-years postdoc at Harvard University to develop a project focused on understanding the biological function of the whip-tail of Myliobatiforms (eagle, cownose and manta rays) (140,000 \$)
- 2018
2021 | **CORBEL (European Union's Horizon 2020)** grant to develop 3D imaging techniques for biological tissues using super-resolution and confocal microscopy at Institute of Photonic Sciences (ICFO, Spain) (14,837.8 €)
- 2018
2021 | **ASSEMBLE + (European Union's Horizon 2020)** grant to access to aquarium and microscope facilities for the study of the skeletal growth in living skates (elasmobranchs) (Banyuls-sur-mer, France) (~15,000 €)

SCHOLARSHIPS

- 2017 | **Erasmus Intership (European commission)** awarded to support training in histological techniques applied to elasmobranch's skeletal tissues at Paulo Gavaia's lab (University of Algarve, Portugal) (1,000 €)
- 2016
2017 | **Spanish Government Scholarship** funding master degree fees and living support (Valencia, Spain) (3,000 €)
- 2014
2013 | **Iberoamericana Banco Santander (Santander bank)** to pursue a bachelor's thesis research project at University of Colima (Colima, Mexico) (3,500 €)
- 2013
2012 | **SENECA (Spanish government)** to pursue a one-year stay at University of Gran Canaria (Canary Islands, Spain) during the Marine Sciences bachelor degree (3,000 €)
- 2014
2010 | **Spanish Government Scholarship** funding Marine Sciences degree fees and living support, awarded for all years (3,000 € / year)

AWARDS

- 2020 | **Best Student Presentation** – Society for Integrative and Comparative Biology (SICB) conference (USA)
- 2020 | **Best Lightning Talk** – Tomography for Scientific Advancement (ToSca) symposium (UK)
- 2019 | **Best Graphical Abstract** – Sustainable continuous flow valorization of γ -valerolactone with trioxane to α -methylene- γ -valerolactone over basic beta zeolite. ChemSusChem, 2628-2636 (Germany)
- 2018 | **Poster Award** – Interdisciplinary Approaches in Fish Skeletal Biology Conference (Portugal)

SKILLS

Biomaterials Imaging

Sample processing

- Specimen identification and anatomical dissection
- Live fish experimental and husbandry experience
- Tissue preparation for histology / immunofluorescence / electron microscopy
- Sample preparation for visualization and imaging in several microscopies

Sample imaging

- Stainings: histology, immunofluorescence, immunohistochemistry, electron microscopy
- Microscopies: Keyence, polarized light, confocal, fluorescence, second harmonic generation, SEM
- Computed tomography: μ CT, nanoCT and synchrotron-based μ CT
- Tissue clarification and staining

Imaging processing softwares

- Amira Avizo software for 3D imaging analysis and rendering
- Meshlab for processing and editing 3D triangular meshes
- Fiji (ImageJ) image processing software
- Adobe Photoshop and Illustrator

3D Modeling and Biomechanics

Design and creationg

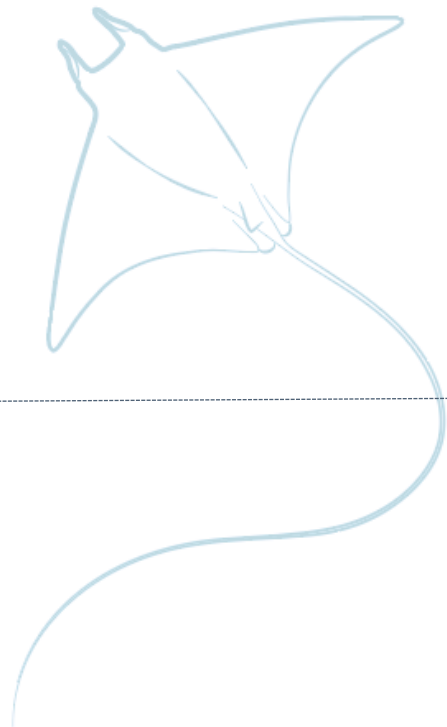
- Autodesk Maya for 3D model design
- FDM and SLA 3D printing

Biomechanics experiments

- 3D model testing in circulatory flow tanks
- Movement tracking with accelerometers
- High-speed camera imaging

Data Analysis

- R for statistics and data visualization
- Igor Pro for data analysis and visualization
- Photron PFV for High-speed camera analysis



SUPERVISION, MENTORING & TEACHING

- **Undergraduate Thesis Supervision** – Characterization of skin denticles in giant manta *Mobula birostris* (Harvard University) – Current
- **Undergraduate Thesis Supervision** – Hydrodynamic role of the whip-tail in stingrays when swimming in turbulent waters (Harvard University) – Current
- **Teaching assistant** – Evolutionary human anatomy and physiology (Harvard University) - Current
- **Training instructor in Amira Avizo Workshop** (Harvard University) - 2022
- **Teaching experience in highschool courses on Evolution** – 2021
- **Teaching experience on Deep Sea fishes Biology and Evolution courses** – 2021
- **Undergraduate Thesis Supervision** – Morphological characterization of skeletal joints in *Raja asterias* (Humboldt University) – 2019

RESEARCH ACTIVITIES & EXPEDITIONS

- **Seminar organizer** for the Museum of Comparative Zoology at Harvard University (current)
- **Elasmobranch specialist** at MEDITS Oceanographic Expedition (1 month) in the Mediterranean sea (2023)
- **Reviewer** in: PLOS ONE (x1), Front. of Zoology (x2), Cells (x1), Journal of Anatomy (x2), Tissue and Cell (x1)
- **Co-organizer** of “Comparative Cartilage Biology” Conference in France (2019)

CONFERENCES, TALKS & PRESENTATIONS

- Society of Integrative and Comparative Biology (SICB) – **Talk** (Seattle, USA)
- Society of Experimental Biology (SEB) – **Talk** (Montpellier, France)
- Society of Integrative and Comparative Biology (SICB) – **Talk** (Austin, USA)
- Tomography for Scientific Advancement (ToSca) symposium – **Talk** (Bristol, UK)
- 112th Annual Meeting of the German Zoological Society – **Talk** (Jena, Germany)
- Comparative Cartilage Biology – **Talk** (Banyuls-sur-mer, France)
- Imaging & Technology Symposium – **Poster** (Berlin, Germany)
- II International Fisheries Symposium – **Talk** (Cyprus, Turkey)
- 111th Annual Meeting of the German Zoological Society – **Poster** (Greiswald, Germany)
- Interdisciplinary Approaches in Fish Skeletal Biology – **Poster** (Faro, Portugal)

WORKSHOPS

- Segmentation of 3D images using AMIRA 3D life sciences software (Max Planck Institute / Germany)
- Advanced tools in AMIRA 3D for life sciences software (Federal Institute for Materials Research and Testing / Germany)
- Imaging Technology Symposium (Naturkundemuseum Berlin / Germany)
- Storytelling in Science (Max Planck Society / Germany)
- Developing dynamic presentations (Max Planck Society / Germany)

REFERENCES

Dr. George V. Lauder / Postdoc Advisor

Harvard University / Dept. of Organismic and Evolutionary Biology (Cambridge, USA)
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Dr. Mason N. Dean / Ph.D. Supervisor

City University of Hong Kong / Infectious Diseases and Public Health Dept. (Hong Kong, China)
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Dr. Peter Fratzl / Head of Biomaterials Dept. at Max Planck Institute

Max Planck Institute / Biomaterials Dept. (Berlin, Germany)
Peter.fratzl@mpikg.mpg.de

Dr. Melanie Debiais-Thibaud / Ph.D. committee member

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