

SCIENTIFIC/TECHNICAL RECORD DURING THE LAST FIVE YEARS OF THE RESEARCH TEAM

1. LIST OF PEOPLE WITHIN THE RESEARCH TEAM.

Physico-Biological Interactions in the Ocean (INFIBIO) is a research group based at the Mediterranean Institute for Advanced Studies (IMEDEA UIB-CSIC). INFIBIO is an **official group** of both CSIC and UIB with the following membership (as of January 2024):

Name	DNI	Field	Employment	Expertise	email
Gotzon Basterretxea Oyarzabal (group)	30596404X	PhD Marine Sciences	Científico Titular CSIC	Physico-Biological interactions in the sea, marine plankton ecology	gotzon@imedea.uib-csic.es
Idan Tuval Gefen	76918072T	PhD Physics	Científico Titular CSIC	Biological fluid dynamics, biophysics, theory of dynamical systems	ituval@imedea.uib-csic.es
Oreste Piro Perusín	43164153F	PhD Physics	Titular de Universidad	Dynamical systems, Fluid dynamics, Chaos, Biophysics, Biophotonics	piro@imedea.uib-csic.es
Marco Polin	Y2647028H	PhD Physics	Investigador Científico CSIC	Experimental soft matter, Optics, Biophysics, Biofluids	mpolin@imedea.uib-csic.es
Alberto Alvarez Diaz	36091520N	PhD Physics, Robotic Engineering, Naval and Oceanic	Investigador Científico CSIC	Physical Oceanography and Acoustics	alberto.alvarez@imedea.uib-csic.es
Jorge Arrieta Sanagustín	18050295X	PhD Mathematical	Profesor Permanente Laboral	Computational Fluid Mechanics	jarrieta@imedea.uib-csic.es
Oscar Guadayol Roig	45487574Y	PhD Marine Sciences	“Maria Zambrano” PDRA Fellow	Physical Ecology at the microscale	oscar@guadayol.cat
Mary Kane	Y8508543Y	PhD Marine Sciences	“Vincenç Mut” PDRA Fellow	Marine Ecology	mkkane@imedea.uib-csic.es
Ana Laura Delgado	X9628205Z	PhD Geography	“Vincenç Mut” PDRA Fellow	Marine bio-optics, optical remote sensing, climate change	delgadoanala@gmail.com
Joan Font Muñoz	43104216P	PhD Marine Ecology	“Margalida Comas” PDRA Fellow	Optical methods in oceanography	jfont@imedea.uib-csic.es
Francisca Font Verdura	43188469N	PhD microbiology	PDRA	Extremophiles microbiology, Yeast	xfont@imedea.uib-csic.es
Olivier Armen Mesdjian	17DC21353	PhD Physics	PDRA	Experimental soft matter, cilia/flagella	olivier.armen.mesdjian@uib.cat



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Name	DNI	Field	Employment	Expertise	email
Medea Zanolí	Y8495392 B	Master in Physics	PhD student	Microbial biophysics	medea@imedea.uib-csic.es
Luc Zorrilla	Y73543871 B	Master in Physics	PhD student	Microbial motility	lucz@imedea.uib-csic.es
Sara Castillo Vila	53608087D	Master in Marine Sci.	PhD student	Microbial ecology	scastillo@imedea.uib-csic.es
Ana Massanet	32844690T	MSc Biology	Technician	Microbiology, biochemistry	ana.massanet@imedea.uib-csic.es
Alvaro Raya Marin	43231155X	BSc Biology	Technician	Microbiology	infibio@imedea.uib-csic.es

2. SCIENTIFIC-TECHNICAL ACHIEVEMENTS AND CONTRIBUTIONS TO SOCIETY.

List of publications in the last 5 years

- 1) Sourisseau M., Font-Muñoz J., *et al.*, *J. Phycol.* (in press 2024).
- 2) Arena, M., Pratolongo, P., Loisel, H., Manh Duy, T., Scheffer, D., Delgado, A.L. *Frontiers of Remote Sensing: Multi- and Hyper-Spectral Imaging Section* Accepted for pub. (2023).
- 3) Mosby L., Straube A., Polin M., *J. Royal Soc. Interface*, 20, 20230510 (2023).
- 4) Araújo N.A.M., *et al. Soft Matter*, 19, 1695-1704 (2023).
- 5) Font-Verdera F, Liébana F, Rossello-Mora R., Viver T., *FEMS Microbiol. Ecol.*, 99, 1-12 (2023).
- 6) Cizak M., Balle S., Piro O., Marino F. *Chaos Solitons & Fractals* 167, 0960 (2023).
- 7) Regaudie-de-Gioux A, Latorre L. Basterretxea G. *J. Plankton Res.* 00, 1-9 (2023).
- 8) Delgado, A.L., *et al. J. Geophys. Res.-Oceans*, 128, e2023JC019865 (2023).
- 9) G. Basterretxea, *et al. Ocean Science* 19, 973-990 (2023).
- 10) Williams S., Jeanneret R., Tuval I., Polin M., *Nat. Commun.* 13, 4776 (2022).
- 11) Salgado-Hernanz. P.M. *et al. Biogeosciences* 19, 47 (2022).
- 12) Latva, M. *et al. Mar. Pollut. Bull.* 179, 113701 (2022).
- 13) Souzy, M. *et al. Phys. Rev. Res.* 4, 022029 (2022).
- 14) Arena, M. *et al. International Journal of Remote Sensing*, 43, 3714 (2022).
- 15) Buzzi, N.C., *et al. Mar. Pollut. Bull.* 174, 113275 (2022).
- 16) Font-Muñoz, J.S. *et al. Sci. Adv.* 7, 5230 (2021).
- 17) Álvarez I., Font-Muñoz J. *et al. Estuar. Coast. Shelf S.*, 258, 107410 (2021).
- 18) Aguiló-Ferretjans, M. del Mar *et al. Nat. Commun.* 12, 1857 (2021).
- 19) Lopez-Grobas I., Polin M., Asally M. *eLife* 10, e62632 (2021).
- 20) Delgado A.L. *et al. Ocean and Coastal Research*, 69, e21007 (2021).
- 21) Arena M. *et al. XIX Workshop on Information Processing and Control (RPIC), IEEXPLORE 2021*, 1-6, DOI: 10.1109/RPIC53795.2021.9648456.
- 22) Javadi A., Arrieta J., Tuval I., Polin M. *Phil. Trans. Roy. Soc. A* 378, 20190523 (2020).
- 23) Mosby L., Polin M., Koester D.V. *J. Phys. D Appl. Phys.* 53, 304002 (2020).



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- 24) Mosby L. *et al. Biophys. J.* 118, 1-12 (2020).
- 25) Arrieta, J and Sevilla, A. *J. Fluid Mech.* 897, A4 (2020).
- 26) Héctor V. *et al. eLife* 9, e50532 (2020).
- 27) Arrieta J, *et al. Phil. Trans. R. Soc. A.* 378, 20200168 (2020).
- 28) Basterretxea G., Font J., Tuval I. *Front. Mar. Sci.* 25, 185 (2020).
- 29) Arrieta J., Jeanneret R., Roig P., Tuval I., *Phil. Trans. Roy. Soc. A* 378, 20190529 (2020).
- 30) Font-Muñoz J. *et al. Optics Express* 28, 14085 (2020).
- 31) Hernández-Pereira Y., *et al. Mathematics* 8, 1 (2019).
- 32) Cartwright J., Piro O., Tuval I., *Phil. Trans. Roy. Soc. B* 375, 20190566 (2019).
- 33) Jeanneret R., Pushkin M., Polin M., *Phys. Rev. Lett.* 123, 248102 (2019).
- 34) Borgnino M. *et al. J. Roy. Soc. Interface* 16, 1742 (2019).
- 35) Font-Muñoz J. *et al. Proc. Natl. Acad. Sci. (USA)* 116, 15997 (2019).
- 36) Arrieta J., Polin, M., Saleta R., Tuval I. *Phys. Rev. Lett.* 123, 158101 (2019).
- 37) Alvarez A. *J. Theor. Biol.* 473, 28 (2019).
- 38) Campos-Candela A. *et al. Ecol. Lett.* 22, 213 (2019).
- 39) Ramirez-Gomez H., Tuval I., Guerrero A., Darszon A. *Method. Cell Biol.* 151, 473 (2019).
- 40) Salgado-Hernanz P.M. *et al. Remote Sens. Environ.* 221, 50 (2019).
- 41) Fernandez Severini M., *Regional Studies in Marine Science* 29, 100646 (2019).
- 42) Delgado A.L., *Continental Shelf Research*, 173: 73-86 (2019).
- 43) Arena M., Delgado A.L., Pratalongo P., Celleri C. *Regional Studies in Marine Science*, 29, 100639 (2019).

Patents

M. Martínez Ledesma; A. Álvarez, G; Vizoso; J. Tintoré. Method for transferring data between at least one Lagrangian buoy for measuring currents for ocean and coastal environment and a base station, and Lagrangian buoy for measuring currents for ocean and coastal environments. EU EP2781447A1, 3090 - CSIC / 0032 – UIB

Igor Mezic, Frederic Bottausci, Idan Tuval. Dynamic equilibrium separation, concentration, and mixing apparatus and methods. Gates & Cooper LLP Howard Hughes Center - Los Angeles, CA, US. Issued US Patent #: 8182669B2

David G. Grier, Marco Polin, Sang-Hyuk Lee, Yael Roichman, Kosta Ladavac. Manipulation of objects in potential energy landscapes. U.S. Patent 20090101807, New York University (2009).

Organisation of conferences/seminars/workshops/schools

- *Microscale Ocean Biophysics Seminar Series*: we started this monthly seminar series in January 2021 (Polin, together with Shilpa Khatri, UC Merced, and Roi Holzman, U. Tel Aviv) and led it until mid 2022. The series has been ongoing ever since. From January 2024 it is again co-organised by INFIBIO (Polin, together with Jonasz Słomka, ETH Zürich).
- *Conferences organised*: 2019 Biologically Active Fluids Annual Meeting (UK, National); 2022 6th Microscale Ocean Biophysics (Esp, International); 2022 ETN PHYMOT 1st



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Annual Meeting (Esp, International); 2022 Focus Session T05 (USA, International); 2022 European Physical Society CMD 29 Meeting, 2-days Minicolloquium (UK, International).

Outreach activities

Public engagement plays a vital contribution to the future of science, for example by attracting talented people to science and promoting political support for scientific funding. By contributing to scientific literacy and encouraging rational thinking, scientific outreach contributes also to social progress. INFIBIO members therefore strive to contribute to this endeavour by being involved in and organising regular outreach and dissemination activities. We regularly participate in events including: European Researchers' Night (September), the Semana de la Ciencia (November), the local local celebrations for the Patron Saint (San Pere, June). We have hosted primary school visits, with activities like "Mystery Boxes", on the scientific method; "Microplantas en movimiento", on swimming phytoplankton; "Wonderful Diatoms", on the beautiful structures of marine diatoms. We regularly participate also in other events co-organised by IMEDEA, e.g. the "late night science show: La resistència científica" (2022, with CSIC Balear); "Pint of Science" (2023, with IFISC UIB-CSIC); "Ciència a tot tren" (2022 & 2023, with UIB and IFISC).

At the same time, Polin is currently the coordinator of the MSCA CITIZENS project Ocean Night (Horizon Europe), which brings together five CSIC institutes (IMEDEA, CEAB, ICM, ICMAN, IIM) with the aim of promoting the societal importance of the marine environment and the associated science. The project (<https://oceannight.eu/>), running from May 2022 to April 2024, has generated educational material and organised a large number of activities along several locations in Spain with the overarching organisation being responsibility of our group.

Collaborations with public and private sector

- 2018-2020. Saint-Gobain Research Paris. Collaboration between Emmanuelle Guillard (Saint Gobain) and Tuval on geometric mixing.
- 2024-2025. Govern Balear. Basterretxea is the scientific coordinator of the project EBAMAR-PortoC, a collaboration with the Government of the Balearic Islands and SOCIB to monitor and predict the effects of global warming in the Mediterranean.

3. NATIONAL RESEARCH PROJECTS.

The *national* research projects active within the group in the last 5 years are as follows (for the international ones see Sec.5):

- 2024-2025: *EBAMAR-PortoC. Planes Complementarios en Ciencias Marinas*. MICIN + CAIB. **EUR 1.640.411**. (Scientific Coordinator: G. Basterretxea, CSIC).
- 2023-2027: *Light-mediated communication in marine diatoms*, MICINN, **EUR 191.250** (PIs: G. Basterretxea (CSIC), J. Arrieta Sanagustin (UIB)).
- 2023-2024: *Consortium for Biomechanics of viscoelastic flagella*. ILINK22008 **EUR 12.000** (PI: I. Tuval, CSIC)
- 2023-2025: *Stochastic dynamics of elongation and length maintenance in eukaryotic flagella*. MICINN, **EUR 199.577** (PI: M. Polin, CSIC).
- 2023-2025: *Desarrollo de un método de control de proliferaciones de algas nocivas basado en sistemas dinámicos*. MICINN, **EUR 190.747** (PIs: I. Tuval, G. Basterretxea, CSIC).



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- 2022-2023: *Estudio satelital de la fenología de grupos funcionales dominantes del fitoplancton en la Plataforma continental Norpatagónica (Océano Atlántico SO) y su tendencia de variación climática*. ICOOP-CSIC, **EUR 23.800** (PI: G. Basterretxea, CSIC).
- 2022-2023: *Sistema analítico para metabolómica marina (SAMM)*. MICINN, **EUR 873.392** (PI: G. Basterretxea, CSIC).
- 2020-2021: *Canal de experimentación para investigación en ecología marina (EcoCanal)*. Ministerio de Ciencia, Innovación y Universidades, **EUR 193.048** (PI: I. Tuval, CSIC)
- 2020-2022: *The rheological properties of eukaryotic cilia and flagella*. Ministerio de Ciencia, Innovación y Universidades, **EUR 188.760** (PIs: M. Polin; I. Tuval; CSIC)
- 2018-2021: *Circulación inducida por el sifón térmico y salino y su influencia sobre la dinámica de las proliferaciones de algas nocivas en el Mediterráneo*. Plan Nacional I+D+I, **EUR 151.250** (PI: G. Basterretxea; A. Álvarez; CSIC).
- 2017-2019: *Dinámica de la gestión de la luz en microalgas móviles*. Beca Leonardo BBVA a investigadores y creadores culturales, **EUR 40.000** (PI: I. Tuval, CSIC).
- 2017-2019: *Iniciativa interdisciplinaria sobre las bases dinámicas de los fenómenos biológicos y pre-biológicos*. Ministerio de Economía y Competitividad, **EUR 130.000** (PI: I. Tuval, CSIC).

4. DOCTORAL AND POST-DOCTORAL TRAINING CAPACITY OF THE RESEARCH GROUP.

DOCTORAL: Theses completed or in progress within the research team (last 5y)

Name	Thesis title	Start date	End date	Publications (DOI)
Richard Henshaw	The dynamics of phototaxis in photosynthetic microorganisms (<i>M. pusilla</i>)	01/09/2015	03/06/2019	10.1101/740605 10.1101/740571
Paula María Salgado Hernanz	Patterns of phytoplankton and primary production variability in the Mediterranean, based on remote sensing data	01/11/2015	10/05/2019	ISBN:978-84-16724-16-1 10.3389/fmars.2018.00078 10.1016/j.rse.2018.05.027 10.1016/j.rse.2018.10.036 10.1016/j.rse.2018.10.036
Joan Font-Muñoz	Characterisation of the structure of marine phytoplankton by laser diffractometry	01/10/2015	15/04/2019	10.1093/plankt/fbv041 10.1098/rsif.2017.0046 10.3389/fmars.2018.00078 10.1016/j.rse.2018.05.027
Yunay Hernández Pereira	Estudio de las soluciones del Flujo de Stokes inducido por un rotlet en una esfera rígida: dirigido a obtener un modelo mínimo del flujo en la Vesícula de Kupffer	01/01/2017	28/05/2020	10.3390/math8010001
Lewis Mosby	How microtubule +TIP trackers couple polymer assembly to cargo transport	01/09/2017	18/06/2021	10.1016/j.bpj.2020.02.025 10.1088/1361-6463/ab87bf 10.1098/rsif.2023.0510



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Name	Thesis title	Start date	End date	Publications (DOI)
Iago Grobas	Biophysical mechanisms of antimicrobial resistance in swarming <i>B. subtilis</i>	01/09/2017	29/06/2021	10.7554/eLife.62632 10.3389/frsfm.2022.936779
Steve Williams	Mixed active-passive systems in confinement	01/09/2018	16/06/2022	10.1038/s41467-022-32520-9
Medea Zanoli	Collective dynamics of microbial parasites	01/08/2021	31/07/2024	First publication under review and currently working on a second publication
Luc Zorrilla	Rheological properties of eukaryotic flagella	01/08/2021	31/07/2024	Currently working on a first publication
Sara Castillo Vila	Movement ecology of the cosmopolitan picoalga <i>Micromonas</i>	01/01/2024	31/12/2027	N/A yet

DOCTORAL: Scientific or professional development of graduate doctors

- *Richard Henshaw* moved to a PDRA with Prof. Jeff Guasto at Tufts University (USA) and then to a PDRA in the group of Prof. Roman Stocker at ETH Zürich (Switzerland).
- *Paula María Salgado Hernanz* moved to a PDRA position at the Spanish Oceanographic Institute (IEO).
- *Joan Font-Muñoz* moved to a PDRA position at the French Institute for Ocean Science (IFREMER), Brest (FRA).
- *Yunay Hernández-Pereira* moved in 2021 to the Departamento de Matemáticas, Instituto Tecnológico y de Estudios Superiores de Monterrey (Mexico), where she is currently Profesora Titular.
- *Lewis Mosby* moved to PDRA with Dr. Zena Hadjivasiliou at The Crick Institute, London.
- *Iago Grobas* moved to PDRA with Prof. Dirk Aarts (U. Oxford, UK); now Marie Curie Fellow with Dr. Buceta at UPV (Spain).
- *Steve Williams* moved to PDRA with Prof. Shilpa Khatri at University of California Merced (USA).

POST-DOCTORAL: Scientific or professional development of earlier postdocs (last 5y)

- *Raphaël Jeanneret* moved in 2019 to the Laboratoire de Physique of ENS Paris (FRA) first as an independent fellow and then with a permanent position as a CNRS researcher.
- *Antoine Allard* moved in 2022 to a position as University Lecturer at U. Bordeaux (FRA).
- *Anusuya Pal* moved in 2022 to a JSPS Postdoctoral Fellowship at the U. of Tokyo (JPN).

Scientific-Technical context of the group

INFIBIO.— The research group on Physico-Biological Interaction in the Ocean (INFIBIO <http://imedea.uib-csic.es/infibio/>) integrates researchers from various disciplines, who share a common interest in the study of the functioning and dynamics of marine ecosystems. The core of the group is formed by 5 researchers, specialised respectively in the study of fluid mechanics, physical and biological oceanography, marine plankton, acoustics, dynamical systems theory and the biophysics of microorganisms. The members of the group belong to UIB (Physics) and CSIC and, within IMEDEA, are affiliated to the Department of Marine



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Ecology (MARE). In addition, INFIBIO components lead the Coastal Oceanography, Environmental Microfluidics and Marine Acoustics Laboratories, and coordinate some common IMEDEA infrastructures, such as the ECOCANAL singular facility (a dedicated flume to study interactions between marine organisms and currents) and the Microscopy and Flow Cytometry Services.

IMEDEA.— IMEDEA (UIB-CSIC) is a mixed research centre between the University of the Balearic Islands and the Spanish Research Council with a recognised international prestige in the field of marine research. It has recently been awarded a distinction as a *María de Maeztu* (MdM) unit of excellence for the period 2023-2027. This award is a unique seal received by research institutions with highly competitive strategic programmes at the frontiers of knowledge, which are considered by the AEI leaders in their respective scientific areas.

Infrastructure and equipment.— INFIBIO group facilities currently occupy two 30m² rooms at IMEDEA. We have a large wetlab, for cell culturing and sample preparation. This includes extensive facilities for cell growth (diurnal growth chambers, incubators with orbital shakers) and biochemical preparation (purified water, autoclave, laminar flow hood and standard laboratory appliances). Our microscopy room includes: a suite of cameras (high-sensitivity sCMOS; NIR CMOS; high-speed CCD); 3 inverted microscopes (Zeiss) equipped with a range of objectives (incl. 100x oil, 63x water, 60x, 40x, 20x, 10x, 4x); a Leica Sp5 confocal; a motorised stereomicroscope (Zeiss AxioZoom V16). We have a dual view system for simultaneous NIR and fluorescence imaging (TwinCam, CAIRN UK) and a continuously focusable, wide field standalone objective (Infinivar, Infinity USA). Most of the microscopes are hosted onto optical tables (Thorlabs). A Spatial Light Modulator (HoloEye PLUTO) can be used to create holographic optical tweezers. The lab includes a range of non-coherent light sources: high-power mounted LEDs (blue, red, green and NIR); fibre-mounted solid state blue laser with driver (all from Thorlabs); a far red LED ring (Falcon, Germany). Our experimental projects commonly include cell micromanipulation and the use of microfluidic circuits. For the former we have a micropipette puller and microforge system required for pipette shaping, as well as a Scientifica PatchStar micromanipulator. For microfluidics we host a soft photo-lithography prep station within a fully functional clean-room for the design, creation and characterisation of microfluidic devices, as well as two syringe-pumps and one pressure pump to drive microfluidic devices.

Through IMEDEA, INFIBIO enjoys also access to two 3D printers, and to a range of facilities within the Scientific-Technical services of the University of the Balearic Islands (mechanical workshop, chemical characterisation laboratory, etc.). These include also the newly formed Balearic Centre for Biodiversity, providing sequencing services (for a fee).

Social context and professional growth opportunities.— Besides daily exchanges of ideas with informal training opportunities in the lab, and 1-to-1 meetings of early-stage researchers with their supervisors, INFIBIO organises fortnightly group meetings. These meetings are a more structured opportunity for individuals to discuss scientific and technical problems and receive feedback from all members of the group. INFIBIO includes researchers from a wide range of backgrounds (e.g. marine biology, microbiology, coastal studies) which provides exciting opportunities for stimulating discussions across competences. The internal weekly seminar series at IMEDEA and the monthly online Microscale Ocean Biophysics Seminar Series (co-organised by INFIBIO), are further periodic contributions to the professional growth of our members. INFIBIO enjoys a constant stream of international scientists who come for multi-weeks visits (e.g. *Dr. Eleonora Secchi*, ETH Zürich, Sept '21 for 4 weeks; *Dr. Shilpa Khatri*, UC Merced, April-May '22, 8 weeks; *Dr. Hermes Gadelha*, U. Bristol, Sept '22, 4 weeks; *Dr. Henry Fu*, U. Utah, Jan-June '23, 6 months; *Prof. Ashis Mukhopadhyay*, Wayne U., 2 months). This gives further opportunities for day-to-day networking and exchange of ideas, contributing to the international dimension and the wider



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professional profile of team members.

Being part of a mixed centre like IMEDEA, INFIBIO members benefit from support and training opportunities offered by both CSIC and UIB (e.g. introduction to Python programming, intro to confocal microscopy, scientific writing). This includes training opportunities linked to the strategic activities of the *Maria de Maeztu* program (e.g. artificial intelligence, programming and usage of microcontrollers).

We recognise that participation to conferences and international schools is also of fundamental importance for professional development. We therefore actively support it with internal funds whenever possible. This is helped by the MdM program, which includes support for members of IMEDEA in the form of: travel awards to PhDs and PDRAs; “Primary caregiver award” travel grant to help researchers with young children attend meetings; “Extra hands” for a temporary technician support in case of pregnancy during the postdoc. In addition, the INFIBIO team is currently involved in a EU funded Innovative Training Network (ITN) on the Physics of Microbial Motility (<https://etn-phymot.eu>), acting as the only Spanish national node, supervising 2 early stage researchers, hosting others for secondments and mini-projects, and organising specialised training on a range of topics. Synergy with the PHYMOT Network enhances the training opportunities within the group.

Further training opportunities for doctoral and postdoctoral researchers comes from supervision of researchers in training (predoctoral or master students coming for “Prácticas externas”, TFGs or TFMs) and laboratory technicians. Finally, the group has a well-established network of national and international collaborations (see Sec.5 for the international ones) directly including several of our early-stage researches.

Overall, the training capacity of the group is very high. This is reflected in the professional trajectory of its previous members (see above), their significant previous mentoring and supervision experience, and from the multidisciplinary training available in-house.

5. INTERNATIONAL ACTIVITIES.

International projects:

- 2024-2028: *Illuminating Microbial Communication Networks: The Phycosphere lab*, **USD 1.400.000** (Spanish node: I. Tuval, CSIC).
- 2022-2024: *CO2BAHIA. Variabilidad estacional, inter-anual y a largo plazo (25 años) de pCO₂ y flujo de CO₂ en un estuario impactado por las actividades humanas en Argentina*. ECOS2020. Travel award. (PI: A.L. Delgado).
- 2022-2024: *Ocean Night: helping society understand the importance of the marine ecosystem*. Horizon Europe, **EUR 299.602** (Coordinator and local PI: M. Polin).
- 2021-2025: *The aphrodisiac gut: defining the factors promoting yeast mating within insect intestines*. HFSPO Research Grant, **USD 1.395.000** (Spanish node PI: M. Polin).
- 2021-2023: *Towards HAB-Controlling Technology: Studying Parasitoid-Dinoflagellate Interactions on Individual- and Population-Scales*. Horizon 2020 - MSCA-IF, **EUR160.932** (PI: I.Tuval; MCSA-fellow: M. Kane)
- 2020-2024: *Physics of Microbial Motility (PHYMOT)*. H2020-MSCA-ITN-2020- Innovative Training Networks, **EUR 4.106.256** (Coord: Gerhard Gommer; Spanish nodes PIs: I. Tuval and M. Polin).
- 2019-2023: *Unravelling phototaxis-photosynthesis connections in a model microalga*. Leverhulme Trust, **EUR 328.000** (PI: M. Polin; co-PI: I. Tuval).
- 2018-2023: *Chemobrionics*. COST Action CA17120. **EUR 624.234** (Scientific Representative: I. Tuval)



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Ongoing International collaborations:

1. *Henry Fu*, U. Utah (**USA**). Modelling phytoplankton motile response to infection. INFIBIO Member: Polin.
2. *Corina Brusaard*, U. of Amsterdam (**NLD**). Impact of motility in viral infection of *Micromonas*. INFIBIO Members: Castillo, Polin.
3. *Philippe Bastin*, Inst. Pasteur (Paris, **FRA**). Assembly and structure of *Micromonas* flagella. INFIBIO Members: Castillo, Polin.
4. *Irene Stefanini*, U. Torino (**ITA**); *D. Segre*, U. Boston (**USA**); *Elizabeth New*, U. Sydney (**AUS**). Biophysical mechanism of natural yeast outbreeding. INFIBIO Members: X. Font, Polin.
5. *Barbara Capone*, U. Roma Tre (**ITA**). Motility of *P. aeruginosa* through porous materials. PhD co-supervision. INFIBIO Member: Polin.
6. *Orkun Soyer*, U. Warwick (**UK**); *Emanuele Locatelli*, U. Padova (**ITA**). Individual and group motility of filamentous cyanobacteria. INFIBIO Member: Polin.
7. *Hermes Gadelha*, U. Bristol (**UK**). Modelling flexural dynamics of externally loaded flagella. INFIBIO Members: Zorrilla, Tuval, Polin.
8. *Matthew Juniper* and *Alexandros Kontogiannis*, U. Cambridge (**UK**). A Bayesian-inference approach to measure mechanical properties of eukaryotic flagella. INFIBIO Members: Zorrilla, Polin.
9. *Raphael Jeanneret*, ENS Paris (**FRA**). Buoyancy regulation in diatoms. PhD co-supervision. INFIBIO Member: Tuval.
10. *Stuart Humphries*, U. Lincoln (**UK**); *Rudi Schuech*, Tulane U. (**USA**). Effects of cell elongation on chemotaxis performance in planktonic bacteria. INFIBIO Member: Guadayol
11. *Daniele Faccio*, *Ashley Lyons* and *Manlio Tassieri*, U. Glasgow (**UK**); *Stuart Humphries*, U. Lincoln (UK). Development of a quantum-enabled nano-scale rheology system to characterise planktonic microenvironments. INFIBIO Member: Guadayol.
12. *Bryce Inman*, Scripps Institution of Oceanography (**USA**). Effects of viscous gradients around microalgae on the diffusion of molecules and the interaction with bacteria. INFIBIO Member: Guadayol.
13. *Ashis Mukhopadhyay*, Wayne State University (**USA**). Differential dynamic microscopy to characterize microgradients of viscosity. INFIBIO Member: Guadayol.
14. *Marc Sourisseau*, IFREMER (**FRA**). Collective behaviour and environmental response of pennate diatoms. INFIBIO Members: J. Font, Basterretxea.
15. *Angela Falciatore*, IBPC-CNRS (**FRA**). The role of phytochromes as sensors in marine diatoms. INFIBIO Members: J. Font, Tuval, Basterretxea.
16. *Johann Lavaud*, LEMAR-CNRS (**FRA**). Optical properties of diatom microalgae; Collective migration of raphid pennate diatoms in porous media. INFIBIO Member: J. Font.
17. *Aditya Nayak*, Florida Atlantic U. (**USA**). Digital holography for *in situ* microscopic studies of marine microorganisms (AUTO-HOLO). INFIBIO Members: J. Font, Tuval,



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Basterretxea.

18. *Hubert Loisel*, U. du Littoral (**FRA**). Methods to improve the estimation of surface ocean chemistry from satellite data. INFIBIO Member: Delgado.
19. *Paula Pratolongo*, CERZOS-CONICET-UNS (**ARG**). Tools for the environmental management of coastal waters in the Buenos Aires area, from satellite and *in situ* data. INFIBIO Member: Delgado.
20. *Pietro Cicuta*, U. Cambridge (**UK**). Motion of bacteria near slip surfaces. INFIBIO Member: Arrieta.
21. *Alejandro Martínez Calvo*, U. Princenton (**USA**). Mechanisms of biofilm delamination. INFIBIO Member: Arrieta.
22. *Jean-Baptiste Raina*, U. Technology Sydney (**AUS**), *Glen Wheeler*, Plymouth Marine Laboratory (**UK**), *Christophe Coudret*, U. Paul Sabatier Toulouse (**FRA**). Light interactions between marine microorganisms. INFIBIO Members: Polin.

International visitors (long visits only; last 5y):

- *Eleonora Secchi*, ETH Zürich (**Switzerland**), Sept '21, 4 weeks.
- *Shilpa Khatri*, UC Merced (**USA**), April-May '22, 8 weeks.
- *Hermes Gadelha*, U. Bristol (**UK**), Sept '22, 4 weeks.
- *Henry Fu*, U. Utah (**USA**), Jan-June '23, 6 months.
- *Ashis Mukhopahdyay*, Wayne U. (**USA**), 2 months.

Capacity to attract talent:

As reflected also in the number of ongoing international grants and collaborations, INFIBIO has an excellent international exposure. This is evident also in the ability of the group to attract international talented scientists at different levels of seniority. These include:

- *Marco Polin*, from U. Warwick (**UK**). Joined in 2020 as a Ramón y Cajal; currently Investigador Científico of CSIC.
- *Oscar Guadayol*, from U. Lincoln (**UK**). Joined in 2022 as Maria Zambrano Fellow.
- *Mary Kane*, from U. Rhode Island (**USA**). Joined in 2021 as a Marie-Curie Fellow; currently Vincenç Mut Postdoctoral Fellow (CAIB).
- *Ana Laura Delgado*, coming from CONICET (**ARG**). Joined in 2023 as a "Vincenç Mut" Postdoctoral Fellow (CAIB).
- *Olivier Mesdjian*, coming from the Technion (**ISR**). Joined as a PDRA in 2023.
- *Medea Zanoli*, coming from U. Bremen (**GER**). Joined in 2021 as a ETN-PHYMOT PhD student.
- *Luc Zorrilla*, coming from U. Stockholm (**SWE**). Joined in 2021 as a ETN-PHYMOT PhD student.