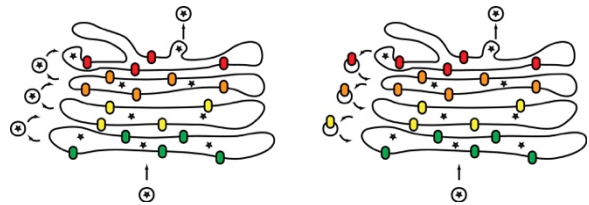


The **Single Molecule Biophotonics (SMB)** research group led by Prof. **Maria Garcia-Parajo at ICFO** is offering several positions at the **Master's, PhD, and post-doctoral level** to work in Cell Biology and Biophysics-related projects under the supervision of Dr. **Felix Campelo**.

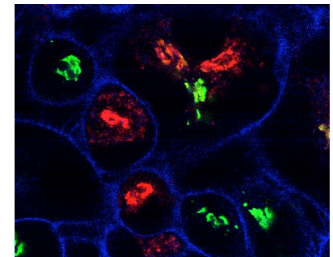
The SMB group is a multidisciplinary group focusing on both the development of advanced optical techniques and their application to the study of a wide range of cellular processes at the nanoscale. The successful candidates will be involved in an **interdisciplinary project**, with research being conducted at the interface between biology and physics.

PROJECT 1. MULTI-GOLGI: New multidisciplinary approaches to investigate intra-Golgi membrane traffic and the functional role of Golgi-membrane lateral compartmentalization.

The goal of the research project is to bring understanding on **how proteins are transported between the different membranes of the Golgi complex** and the impact of **Golgi membrane organization** to its function. In spite of its fundamental importance, it has been challenging to study Golgi membranes using conventional microscopy tools, due to their highly dynamic nature and reduced dimensions. As a result, after so many years of research in the field, a clear understanding of the how proteins are transported between the different membranes of the Golgi complex is still lacking.



The successful candidate will investigate the mechanisms by which secretory cargoes are processed and transported along the Golgi complex. To reach this goal, we will use a unique multidisciplinary approach combining state-of-the-art **molecular and cell biological tools** with biophysical modeling. Moreover, the candidate will be exposed to advanced imaging techniques, including **super-resolution microscopy** and single molecule approaches. The project will be carried out in **collaboration with worldwide leading groups** in cell biology and biophysics, offering the successful candidate the opportunity to benefit by a multidisciplinary and international environment.

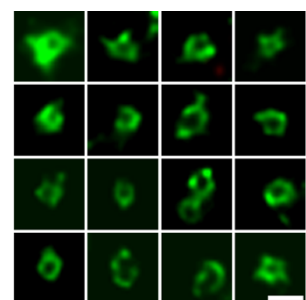


Key publications:

1. Duran J.M., Campelo F., van Galen J., Sachsenheimer T., Sot J., Egorov M.V., Rentero C., Enrich C., Polishchuk R.S., Goñi F.M., Brügger B., Wieland F. & Malhotra V. Sphingomyelin organization is required for vesicle biogenesis at the Golgi complex. *EMBO J.* **31**, 4535–46 (2012).
2. Kozlov M.M., Campelo F., Liska N., Chernomordik L.V., Marrink S.J., McMahon H.T. Mechanisms shaping cell membranes. *Curr. Opin. Cell Biol.* **29**, 53–60 (2014).
3. Campelo F., van Galen J., Turacchio G., Parashuraman S., Kozlov M.M., Garcia-Parajo M. & Malhotra V. Sphingomyelin metabolism controls the shape and function of the Golgi cisternae. *eLife.* **6**, e24603 (2017).

PROJECT 2. ENLIGHTENING TANGO: Unraveling the biophysical mechanisms of collagen export from the endoplasmic reticulum.

Collagens are the main secreted proteins in mammals, constituting about 25% of our total dry body weight. Collagens, like all conventionally secreted proteins, are synthesized in the endoplasmic reticulum (ER), from where they travel along the secretory pathway for secretion. However, conventional COPII vesicles, exporting proteins from the ER have a well-defined size of about 60-90 nm in diameter, whereas collagens can reach 450 nm in length and are virtually unbendable. Hence, a fundamental, but yet unresolved, issue in the field is **the mechanism of collagen export from the ER** and their subsequent transport along the secretory pathway.



TANGO1 rings at the ER, as seen by STED nanoscopy (see Raote et al. 2017). Scale bar=200 nm.

The goal of this project is to unravel the **biophysical mechanisms** by which large cargoes, such as collagens, are exported from the ER. In particular, we will study the molecular and biophysical mechanisms by which the ER-resident protein **TANGO1** controls collagen export. In **collaboration** with the lab of Prof. **Vivek Malhotra** at the CRG, Barcelona, we will merge molecular and cell biology techniques with **cutting-edge optical nanoscopy** (such as 3D STORM imaging, intracellular single particle tracking) and **theoretical biophysics** into a unique multidisciplinary approach that will deliver the first structural, dynamic and physical understanding of the pathways involved in collagen secretion.

Key publications:

1. Malhotra, V. & Erlmann, P. The pathway of collagen secretion. *Annu. Rev. Cell Dev. Biol.* **31**, 109–24 (2015).
2. Ricci M.A., Manzo C., Garcia-Parajo M.F., Lakadamyali M., Cosma M.P. Chromatin fibers are formed by heterogeneous groups of nucleosomes in vivo. *Cell* **160**, 1145-58 (2015).
3. Manzo C. & Garcia-Parajo M.F. A review of progress in single particle tracking: from methods to biophysical insights. *Rep. Prog. Phys.*, **78**, 124601 (2015).
4. Raote, I., Ortega Ballido, M., Pirozzi, M., Zhang, C., Melville, D., Parashuraman, S., Zimmermann, T., Malhorta, V. TANGO1 assembles into rings around COPII coats at the ER exit sites. *J. Cell Biol.* **216**, 901-909 (2017).

Eligibility and Conditions

- Both **physicists** eager to work in fundamentally important cell biology problems hand-by-hand with biologists, as well as **biologists** keen to be part of a multidisciplinary team of biologists and physicists are very much encouraged to apply. When applicable, candidates must hold an internationally recognized master's degree and/or PhD (or evidence of its completion in the nearest future) preferably in cell biology, biochemistry, biophysics, physics, chemistry or related areas.
- The candidate should have a proven track record of academic excellence. Positively valued will be experience in cell biology, light microscopy and computer programming (e.g. ImageJ, Matlab).
- No restrictions of citizenship apply to the ICFO pre- and post-doctoral contracts.

Application procedure

The formal application should be submitted by e-mail to: icfojobs@icfo.eu, with cc to felix.campelo@icfo.eu and maria.garcia-parajo@icfo.eu. E-mail submissions must include the mailing label "SMB" and your last name printed before the label. Suitable candidates are requested to submit:

- A presentation letter with declaration of research interests.
- Curriculum Vitae, including a full address, a contact phone number and e-mail address and a copy of the passport.
- A scanned copy of your University academic transcripts in English or Spanish.
- A scanned copy of the degree, if available at the time of application.
- The contact e-mail of three potential referees.
- A proof of English command (IELTS, TOEFL, etc.) in the case that English is not the first language or the undergraduate degree was acquired in a country where English is not the official language.
- If available, a scanned copy of standardized GRE test results. Note that submission of GRE test results is optional, but they can be particularly helpful for evaluating candidates with degrees obtained outside the European Higher Education Area.

Please note that candidates should be willing to be contacted by phone during the entire selection process.

Deadlines

The call will remain open until suitable candidates are identified. Candidates must contact icfojobs@icfo.eu for informal inquiries regarding the application as well as for submitting the application. Informal science- and project-related enquiries are very much welcome, and may be addressed to Dr. Felix Campelo (felix.campelo@icfo.eu).