

2 PhD and Postdoctoral Positions in Nuclear Envelope Mechanics & Membrane Repair

Project Overview

Our research investigates the biophysical battle between cellular damage and recovery. **Nuclear mechanics** are fundamental to maintaining cellular identity and genomic integrity. The **nuclear envelope** (Figure 1) is a dynamic mechanical shield for our genome. However, **environmental stressors and pollutants** (such as mechanical stresses or nanoplastics) can compromise this shield, leading to nuclear ruptures, genomic instability, and cellular aging.

Understanding the "Why" is critical: by identifying how external stressors weaken nuclear mechanics, we can decode the physical origins of environmental diseases.

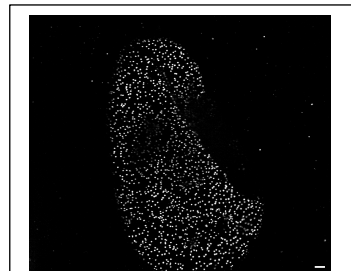


Figure 1: STED image of nuclear pores on living cell

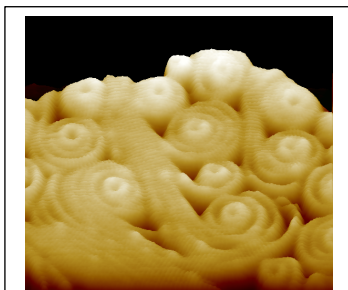


Figure 2: Fast-AFM image of ESCRT proteins

To combat this damage, the cell employs the **ESCRT (Endosomal Sorting Complex Required for Transport) machinery** a sophisticated molecular "repair kit" that seals membrane holes and restores cellular integrity (Figure 2).

Working across *two collaborative labs*, we will use biophysical tools as **STED, Fast-scan AFM, and confocal microscopy** to visualize and quantify these events in real-time. Our goal is to bridge the gap between environmental stressors and membrane biophysics, uncovering how life persists under pressure.

Join a multidisciplinary collaboration between the [Cell and Tissue Mechanobiology](#) group and the [Cell Membrane Organisation and Dynamics](#) laboratory.

Open Positions:

1. PhD Student: Nuclear Envelope Mechanics & Stress Response

Focus on how external physical and chemical stressors alter the structural integrity of the nuclear envelope.

- **Requirements:** Master's degree in Physics, Biophysics, Engineering, or related fields.
- **Focus:** Mechanobiology, advanced imaging, and cellular stress response.

2. PhD Student: ESCRT-Mediated Membrane Repair

Explore the mechano-molecular dynamics of the ESCRT machinery in repairing membrane damage.

- **Requirements:** Master's degree in Life Sciences, Biochemistry and Molecular Biology, Biology, Biotechnology, Physics or Biophysics
- **Focus:** Membrane remodeling, protein-lipid interactions, and high-resolution microscopy.

3. Postdoctoral Researcher: Membrane Repair & In-vitro Systems

Lead the experimental efforts in membrane restoration.

- **Profile:** Strong background in biophysics.
- **Technical expertise:** Hands-on experience with AFM, optical microscopy, or in-vitro reconstituted systems (GUVs, supported bilayers) will be highly valued.

Benefits of Joining Biofisika Institute:

- **International Environment:** Collaborate with researchers from diverse cultural backgrounds, fostering a rich and stimulating intellectual atmosphere.
- **Cutting-Edge Facilities:** Access to state-of-the-art platforms in super-resolution and force microscopy.
- **Interdisciplinary Collaboration:** Work alongside experts in various fields, encouraging the exchange of ideas and knowledge.
- **Professional Development:** Access to workshops, seminars, and conferences to enhance your skills and broaden your academic horizons.
- **Collaborative Excellence:** Work at the intersection of two specialized labs in a world-class research institute.

Application Process:

Submit your *CV*, a *cover letter* (stating your research interests), and contact details for *two referees* before **20.05.2026** to:

Dr. Adai Colom (adai.colom@ehu.eus) and **Dr. Ion Andreu** (ion.andreu@ehu.eus)

The Biofisika Institute and UPV/EHU is committed to diversity and encourages applications from all qualified candidates.