



Elettra Sincrotrone Trieste

# Research Associate at the Elettra Nanoinnovation Laboratory

Deadline: 19 January 2025

Ref: DA/24/64

## Background

Elettra Sincrotrone Trieste is an international multidisciplinary research center operated as a user facility, featuring a 2.0/2.4 GeV, third-generation synchrotron light source (Elettra), a new free-electron laser light source (FERMI) and a variety of support laboratories. The extremely high quality of the machines and beamlines has set new performance records and has been producing results of great scientific and technological interest. In order to allow the laboratory to remain competitive in the next 20 years, an entirely new source - Elettra 2.0 - belonging to the new generation of storage rings (DLSR or Diffraction Limited Storage Ring) is being developed. The new source will exhibit a major increase in the brilliance and coherence fraction of the photon beams. The Elettra 2.0 optics is based on our enhanced symmetric six bend achromat structure (S6BA-E) with a 12-fold symmetry and an emittance of 212pm-rad at 2.4 GeV. The new structure creates also straight sections in the arcs permitting the installation of additional insertion devices, thus increasing the number of beamlines. Existing beamlines will have to be upgraded and new beamlines developed to take full advantage of the characteristics of Elettra 2.0. The new machine is scheduled for commissioning in the second half of 2026. See <http://www.elettra.eu> for more information.

## Beamline/Activity/Project description

The Nanoinnovation Lab (NIL) at Elettra applies advanced nanotechnologies to biology and medicine, and (bio)materials. NIL main activities use Atomic Force Microscopy/Fluorescence Microscopy integrated set-ups to study biological interactions at the molecular, cellular and tissue scales, with full control of physiological parameters. Also, detailed information on cell and tissue biomechanics derived, at high resolution (i.e., with subcellular details) from nanoindentation techniques, are used to study disease (e.g., cancer; neurodegenerative diseases) progression and to evaluate the effect of specific therapies. Finally, the NIL has renown expertise on biomimetic models of plasma membranes, synergistically studied with AFM, X-ray and neutron scattering techniques, for the evaluation of nanovesicles (in particular extracellular vesicles, EVs) and nanoparticles uptake mechanisms, in relation to membrane parameters such as order and fluidity.

The laboratory has recently been renewed and equipped with a Chiaro Optics11 Nanoindenter for high-throughput biomechanical studies, and with a state-of-the-art, high-resolution, fast scanning AFM (Cypher VRS 1250, Asylum Research, Oxford Instrument).

## Job description

The successful candidate will be introduced in the NIL environment contributing to the ongoing, in-house scientific projects and technological developments in the context of human diseases, with specific focus on cancer mechanobiology. In particular, the candidate will be responsible of the experimental set-up both for 2D and 3D biological samples (cells, organoids, hydrogels, and living tissues), focusing on: high-throughput nanoindentation; Atomic Force Microscopy (AFM) morphomechanical imaging; fluorescence microscopy and immunostaining protocols.

In addition, she/he should provide high-quality support to external users, thus gaining opportunities for collaborative work with national and international research groups.

## Qualifications

A PhD (or at least 3-years post-degree working experience) in Nanotechnology, Physics, or closely related disciplines is required, together with the following technical skills:

- proven expertise in advanced 2D and 3D cell culture techniques (including establishing, maintaining, and troubleshooting complex cellular models);
- proficiency in sample preparation protocols tailored for biomechanical measurements, particularly for applications involving Chiaro Optics11 Nanoindenter and fluorescence microscopy (which includes techniques such as immunostaining, sample mounting and data analysis);

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- expertise in atomic force microscopy, encompassing both imaging and sample preparation for nanoscale characterization (which includes familiarity with surface roughness analysis, and adhesion force measurements).

Working experience on extracellular vesicles (EVs) and nanoparticles, including their isolation/synthesis, characterization, and application in biomedical research, would be considered a plus.

Excellent oral and written communication skills in English are required, with the ability to clearly present research findings and prepare scientific publications.

The candidate should possess good time management skills, good attitude to interact with collaborators and users, and to work as part of a multi-disciplinary team.

## General information

The deadline for the submission of the application is January 19, 2025.

The appointment envisioned is a fixed term contract of a duration of 12 months. The salary will be commensurate with previous experience and qualifications of the candidate.

Applications should include full curriculum vitae signed by the applicant (preferably using the European Curriculum Vitae Format in PDF), with the names and contact information (including electronic mail) of at least two professional references.

The interviews may be held via video conferencing.

The ranking of eligible candidates resulting from this selection procedure may be used for additional appointments within the following 24 months.

Permanent employees of Elettra Sincrotrone Trieste S.C.p.A. and employees or former employees of any Italian Public Entity who have exercised authority over Elettra Sincrotrone Trieste S.C.p.A. or have negotiated with Elettra - Sincrotrone Trieste S.C.p.A. within the last three years will be excluded from the present selection procedure, in accordance with the provisions of article 21 of the Italian legislative decree no. 39/2013 and in conjunction with article 53 (subsection 16ter) of Italian legislative decree no. 165/2001. We thank all applicants in advance.

For more information, please contact Loredana Casalis (email: [loredana.casalis@elettra.eu](mailto:loredana.casalis@elettra.eu)).

To apply for this position please visit the following link:

<https://www.elettra.trieste.it/it/about/careers/working-withus.html?id=4237>

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