

Introduction to Solid-State Nanopores: A Hands-on Workshop

The objective of this workshop is to train students, from bachelor's to PhD level, through hands-on experience. Participants will measure real translocations of DNA strands or polystyrene nanospheres in solid-state nanopores, reinforcing theoretical concepts through experimentation. ELEMENTS will provide the necessary equipment, including the loan of current amplifiers such as the [Nanopore Reader 100 kHz](#), and the wetting unit [Ultiflow](#) from [Norcada](#), which students will use for practical training. If needed, an Application Scientist from ELEMENTS will guide participants through the experiments, ensuring expert training. All Required materials will be supplied. Participants will learn key techniques, including nanopore chip wetting, translocation interpretation, data collection, and basic analysis. The workshop can be customized to fit specific educational needs.

Theoretical Module (2 hours)

- Introduction to Solid-State Nanopores: Overview of their purpose, applications, and usage methods.
- Nanopore Surface Cleaning: Importance of the wetting process in optimizing pore stability and performance.
- Open Pore Characteristics and the Resistance Model: Introduction to the electrical properties of nanopores, and the resistance model role in conductance measurements.
- Noise in Solid-State Nanopores: Overview of noise sources, and their impact on signal resolution, and mitigation strategies.
- Translocation Dynamics: Key factors influencing molecule and nanoparticle passage through pores.

Practical Module (4 hours)

- Demonstration: Step-by-Step demonstration of the formation of the wetting process of the nanopore chip surface. Assembly of the ELEMENTS Nanopore Flow Cell with the nanopore chip and measurement of nanopore conductance. Introduction of analyte particles and real-time recording of translocation events. Data Collection and basic analysis of translocation data.
- Hands-On Practice: Guided, hands-on session where participants apply the techniques themselves, from chip preparation to data acquisition and analysis, with individual supervision for personalized learning.

What is included

- Loan of 5 or 10 Nanopore Readers 100 kHz and EDR4 Software
- Loan of 1 Ultiflow unit
- Supervision and Support of an Application scientist throughout all the modules
- Consumables: Nanopore Flowcell, Nanopore Chips, Wetting Solutions, DNA strands, Polystyrene particles, Buffer solutions

What is not included

- Basic Laboratory Supplies: Pipetting tools and other standard laboratory equipment and accessories (e.g. Personal Protective Equipment, tweezers, vials etc.)
- Laptops

Optional:

- Want to run the workshop independently, without an application scientist? Simply rent the equipment and the course materials to run the workshop at your own pace.

Pricing Overview

Description	Price
6 hours Workshop Elements Training On-Site (Europe) <i>Includes instruments & Nanopore Chips for 5 stations with instructor</i>	<i>Ask for information</i>
6 hours Workshop Elements Training On-Site (US/Canada) <i>Includes instruments & Nanopore Chips for 5 stations with instructor</i>	<i>Ask for information</i>
Instrument rental only (EU/US/Canada) <i>Includes instruments & Nanopore Chips for 5 stations</i>	<i>Ask for information</i>
<i>* Please inquire for additional stations and/or training hours</i>	
Discounts	
10% off Instrument Loan for 2nd workshop	
5% off Instrument Purchase after workshop	