Science supporting development

The twelve laboratories of the IAEA’s Department of Nuclear Sciences and Applications are a unique feature in the United Nations. The laboratories support and implement activities that respond to the developmental needs of Member States in a range of subject areas, including in food and agriculture, human health, environmental monitoring and assessment, as well as the use of nuclear analytical instrumentation.

The laboratories conduct applied research and development, deliver training and capacity building to Member States and provide technical and analytical services.

Five of the laboratories in Seibersdorf are agricultural and biotechnology-based and are an integral part of the Joint Division managed by the IAEA and the Food and Agriculture Organization of the United Nations (FAO). They are a unique collaborative model in the UN system and assist Member States in the following ways:

Insect Pest Control Laboratory
Fighting key insect pests through the Sterile Insect Technique (SIT), a method of birth control applied to target insect pest populations.

Animal Production and Health Laboratory
Strengthening food security and livelihoods through improved livestock productivity and control of transboundary animal and zoonotic diseases.

Plant Breeding and Genetics Laboratory
Strengthening food security and resilience to climate change through high-yielding crop varieties resistant to disease, drought and other harsh conditions.

Soil and Water Management and Crop Nutrition Laboratory
Optimizing soil management and agricultural water use efficiency for climate-smart agriculture. Assessing and tracing the fate of radionuclides in soils, crops and agricultural water resources.

Food and Environmental Protection Laboratory
Establishing effective systems to support food authenticity, food traceability and contaminant control, to enhance food safety and international agriculture trade.

Three Seibersdorf laboratories are working in the following areas:

Dosimetry Laboratory
Ensuring the safe and effective use of radiation in cancer treatment and supporting radiation dosimetry by providing calibration and audit services worldwide.
Nuclear Science and Instrumentation Laboratory
Developing, adapting and transferring nuclear instrumentation as well as accelerator applications to
Member States for a wide range of operations from environmental monitoring to materials science to the
preservation of cultural heritage.

Terrestrial Environment Laboratory
Providing environmental assessments and ensuring high quality analytical measurements for radioactive,
industrial, and other pollution in Member State laboratories by providing laboratory reference materials
and conducting worldwide proficiency tests.

The IAEA maintains three marine environment laboratories in Monaco dedicated to the understanding
and preservation of a healthy marine environment and the sustainable development of environmental
resources, they assist Member States in the following ways:

Radiometrics Laboratory
Supporting reliable marine radioactivity measurements, monitoring and assessments. It maintains low-
level counting facilities and produces certified reference materials to improve the quality of measurements
worldwide.

Radioecology Laboratory
Studying the movement of contaminants and bio-toxins in marine ecosystems, including their accumulation
in seafood species; the carbon cycle and the marine impacts of global warming and ocean acidification.

Marine Environmental Studies Laboratory
Accurately monitoring contaminants in the marine environment by developing and transferring analytical
methods, providing reference materials and conducting international proficiency tests, and applying stable
isotopic methods for environmental forensics.

One laboratory is located at IAEA Headquarters in Vienna:

Isotope Hydrology Laboratory
Mapping availability and sustainable management of freshwater and the impact of climate change on
rivers, lakes and groundwater aquifers.

Since their opening in 1962, the Nuclear Applications Laboratories (NA) in Seibersdorf have not received a
comprehensive renovation or significant upgrading of equipment, and in recent years they have increasingly
struggled to meet Member State demands.

The modernisation of the IAEA nuclear applications laboratories began in 2014 with the aim of significantly
enhancing the services and infrastructure that the IAEA can make available to Member States and to position
the laboratories to better adapt to future needs. The Renovation of the Nuclear Applications Laboratories (ReNuAL) project consists of new building
construction, the acquisition of new laboratory equipment to replace ageing
instruments, and infrastructure upgrades. The project is scheduled for
completion by mid-2018. A follow-up project, known as ReNuAL+, will provide
for additional construction, the refurbishment of the remaining laboratories,
and further equipment needs.