

# MUCHA

## NOVA & HR

### MULTI-CHANNEL ANALYSERS FOR RADIOPHARMACEUTICALS

DESIGNED FOR  $\gamma$ -SPECTROSCOPY IN QUALITY CONTROL AND WASTE MANGEMENT

- ✓ RADIONUCLIDIC PURITY TEST
- ✓ FULL SHIELDING
- ✓ NO ACTIVE COOLING NEEDED
- ✓ LOW RUNNING COSTS

*The MUCHAs are  $\gamma$ -radiation measurement systems, designed for the radio-spectroscopy analysis of radiopharmaceutical samples. Elysia is offering two versions optimized for your daily routine. MUCHA Nova and MUCHA HR are all-in-one solutions with an in-built shielding and a shielded cover for best radiation protection and measurement performance. They are designed to ensure low running costs and easy use.*

Besides its use for analysis of radiopharmaceutical samples it is also the perfect solution for the analysis of environmental samples or the determination of very low activities in various samples (food, water, or waste). Our MUCHAs have a sliding lead lid with position detection ensuring optimal traceability. The housing has forced ventilation to limit heat accumulation.

This setup does not require active cooling and is an optimal compromise of resolution vs. sensitivity which makes the systems the perfect choice for the measurement of radionuclidic impurities when the potential impurities profile is established.



#### MUCHA NOVA

The Nova is the daily work horse. The in-built 3x3 NaI detector gives a good resolution without the need of cooling. The 5cm lead shielding ensures a low background and optimized signal-to-noise ratio. The table top system is a full solution with a small footprint.

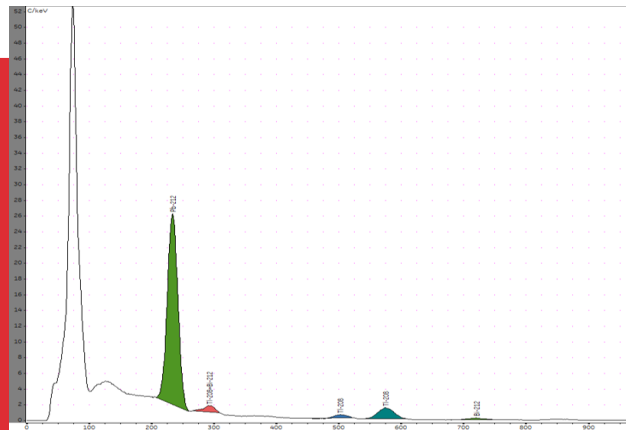
The in-built detector is a solid scintillator containing lanthanides and an energy resolution lower than 3.5% (Cs-137, 662 keV). The combination of a three-layer shielding of lead, copper, and a polymeric material at 360° ensures a low background and optimized signal-to-noise ratio.

#### MUCHA HR

The Mucha HR has been developed for people who are looking for highest resolution and cost-effective alternative to replace the HpGe detectors. The HR detector offers an improved energy resolution compared to NaI detectors increasing the peak detectability at low activity.

Under proper conditions, activity as low as a few Bq (e.g. 9 Bq of Ga-68) can be easily detected in less than 30 minutes.

For some applications, improved resolution is key to allowing a proper separation between two nuclides. This is for example the case for Pb-212, a promising alpha therapy isotope. With the HR detector it is possible to have a separate integration of the Pb-212 gamma ray at 238 keV against the contribution of its daughter product Tl 208 (277 keV). Therefore, it is possible to quantify Pb-212 in a sample based on the 238 keV gamma ray without interference of the daughter products using the High-Resolution probe.

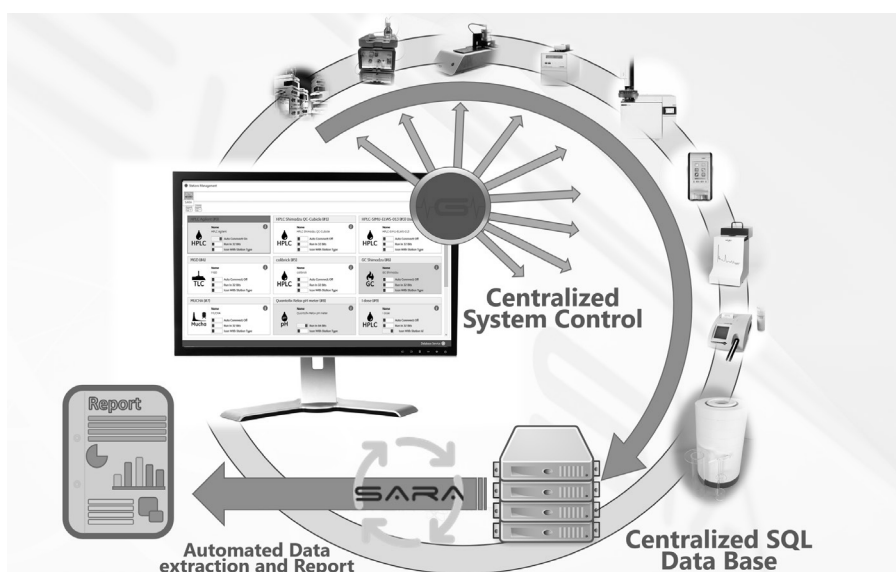


## Software

The MUCHA systems are fully integrated into the GINA X software. The software facilitates easy and intuitive use. GINA X includes a live spectrum display, spectral analysis, manual and automatic data analysis, calibration, peak integration, half-life time determination and radionuclidic purity determination: in % of a reference value and in Bq of each impurity.

All data is stored on the GINA X SQL database and is integrated into the optional SARA software solution. The software is designed for GMP use and compliance with the technical requirements of the 21 CFR part11. It also includes a comprehensive audit trail and a data file protection. For advanced GMP needs the system can be extended with a user-access module and a certificate of analysis generator.

Different measurement modes and settings are available. Automatic energy calibration is achieved by using a suitable calibration source. Background spectra can be accumulated and subtracted automatically. The spectrum resolution can be selected between 'low,' 'medium,' and 'high'. The nuclide peak can be identified using a nuclear medicine-oriented nuclide library where gamma peaks and half-lives are stored for each isotope.



Isotopes					Energy Emissions : C-11		
Print							
Nuclide	Symbol	Half-Life	Unit			Energy (KeV)	Emission (%)
Americium-241	Am-241	432,20	Years				
Cadmium-109	Cd-109	1,30	Years				
Carbon-11	C-11	20,30	Minutes			511,00	199,5
Carbon-14	C-14	5700,00	Years				
Cerium-139	Ce-139	137,60	Days				
Cesium-137	Cs-137	30,17	Years				
Chromium-51	Cr-51	27,70	Days				
Cobalt-57	Co-57	271,79	Days				
Cobalt-58	Co-58	70,86	Days				
Cobalt-60	Co-60	5,30	Years				
Copper-64	Cu-64	12,70	Hours				
Erbium-169	Er-169	9,40	Days				
Europium-152	Eu-152	13,52	Years				
Fluorine-18	F-18	109,80	Minutes				
Gallium-67	Ga-67	3,26	Days				
Gallium-68	Ga-68	1,13	Hours				
Indium-111	In-111	2,81	Days				
Iodine-123	I-123	13,22	Hours				

## Features

- Radionuclidic purity (in %)
- Half-life time determination
- Simple operation
- Live spectrum display
- Advanced spectrum analysis
- Calibration to Bq
- Nuclide database
- Measurement management
- Internal shielding with shielded lid



## Accessories

Different sample holders are available. The typical sample is a 4 ml HPLC vial (i.e filled with 1 mL sample, diameter 15 mm), evacuation or dispensing vials of 10-25 mL are also frequently used (standard diameter 25 mm).



# Specifications

## Technical

	MUCHA Nova	MUCHA HR
Range	4096 channels	4096 channels
Energy range	30-2048 keV	30-2048 keV
Extended max counts	accuracy deviation <3%	1 MBq sample of PET tracer (1 minute nuclide identification), no impact on subsequent measurements, accuracy deviation <3%
Energy accuracy	better than 7%	better than 2% (100-1500 keV) after calibration
Status light	Control of the warming-up time, calibration up to date, error (critical or non-critical), device status (ready, measuring)	
Digital communication	USB 2.0 & 10/100 Mbit/s Ethernet	
High voltage	0-1300 V	0-1300 V
Preamplifier	automatic	automatic
Amplifier	automatic	automatic
Display	on PC (GINA X)	on PC (GINA X)
Power	100-240 VAC, 50-60 Hz	100-240 VAC, 50-60 Hz
Working Temperature	15-40°C	15-40°C
Shielding	in-built 5 cm lead,	in-built 5 cm lead, a copper and a polymeric shielding (suppression of K-alpha X- ray from Pb)

## Physical

Dimensions	W 250 x H 450 x D 430 mm (device closed)
Weight	107 kg

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