

CUSTOMER TESTIMONIAL

A new lease of life

Researching effective
new ways to prevent
cardiovascular disease at
the University of Columbia



COLUMBIA
UNIVERSITY



PURELAB® Quest enables world-leading research into lipid metabolism

Preventing disease

Scientists at the University of Columbia in New York are studying the regulation of cholesterol and triglyceride levels in the bloodstream, which could lead to effective new ways to prevent cardiovascular disease. Their work particularly focuses on the secretion of very low-density lipoproteins

(VLDL) from the liver and how this is disrupted in non-alcoholic fatty liver disease. They use ultrapure water to carry out a range of molecular biology and analytical techniques to investigate these processes in cultured cells, mice and humans.



Researchers recommend the ELGA PURELAB® Quest

“This is an excellent water purification system without having to pay an exaggerated amount of money. Most small to medium labs will find the unit appropriate for their needs.”

Antonio Hernandez-Ono, Associate Research Scientist



Raised levels of triglyceride-rich lipoproteins in the bloodstream are associated with an increased risk of cardiovascular disease. Plasma lipoprotein levels are maintained through a complex balance of their secretion from the liver and intestines and metabolism in the blood. Deepening our understanding of the physiological mechanisms that regulate blood lipid levels could lead to effective new interventions that can help reduce the risk of cardiovascular disease.

Ultrapure water is key for experimental success

Researchers based at the Department of Medicine at Columbia University College of Physicians & Surgeons are studying the secretion of apolipoprotein B-containing lipoproteins from the liver.

The team carries out a variety of experiments that involve measuring changes to specific genes, lipids and proteins extracted from liver cell lines and primary liver cells harvested from transgenic mice. They use ultrapure water for preparing the buffers and solutions for several molecular

biology techniques - including RNA extraction, RNA-seq, lipid extraction and Western blotting.

The researchers also perform clinical studies with human volunteers who they ask to drink specific amounts of lipids and non-radioactive stable-labeled amino acids. They then take serial blood samples, which they can use to track the metabolism of specific lipoproteins within their body over time. The team uses ultrapure water to prepare these samples for analysis using gas chromatography-mass spectrometry (GC-MS), which enables them to precisely measure the levels of labeled lipoproteins.

A convenient and reliable supply of ultrapure water

A newly installed **ELGA PURELAB® Quest** laboratory water purification system, which is positioned on a bench and attached directly to a sink tap, now provides the laboratory with a reliable and convenient supply of ultrapure water (18.2 MΩ).

The unit meets the scientists' daily requirements of around two to five litres of high-quality water per day for their experiments.

“ We find the system easy to use - and we like that we can set it to dispense a specific volume and then leave it, which is really convenient,” says Antonio.

“ It also looks like it will be straightforward to change the consumables ourselves as we can just plug them in and out.”

The team were previously using double-distilled water generated from an older laboratory water purification system. But they were encountering problems with the reliability of their results - particularly from their GC-MS analysis.

“ We weren't getting clear results and suspect these problems were due to inadequate water purity,” says Antonio Hernandez-Ono, Associate Research Scientist. “ So we were having to repeat these experiments.”

As preparing blood samples for GC-MS analysis takes more than a week, this impacted on the researcher's time as well as wasting reagents and clinical samples.

“ These samples have been collected from people taking part in a clinical trial - and so there will only be a limited amount available,” says Antonio.

“ You may want to take several measurements to get as much information from them as you can, but this might not be possible if you wasted precious material because you had to repeat failed experiments.”

The team also finds it very reassuring that the system clearly tells you the exact level of water purity as they dispense it.

“ I think the **PURELAB® Quest** is going to be a game-changer for these experiments,” says Antonio.

“ Previously, we would have questioned the water when an experiment went wrong - but we can now confidently rule that out of our troubleshooting as we know that we're using high-quality ultrapure water.”

Key features of the PURELAB® Quest

- Generates high-quality ultrapure, pure & ro water directly from the tap
- Competitively priced with a low running cost

- Multiple water quality sensors & inbuilt periodic recirculation to constantly monitor & guarantee water purity
- Compact design for minimal lab space
- Simple plug and play installation

- Fast flow rate for quicker reagent preparation
- Uses reclaimed materials for minimal environmental footprint

Dedicated to Discovery

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Unrivalled product design has achieved international recognition and awards.

Worldwide technical service teams support science & healthcare globally with specialist expertise.

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