

EXTREME EXACTNESS VITAL FOR NEW MEDICAL INSTRUMENT

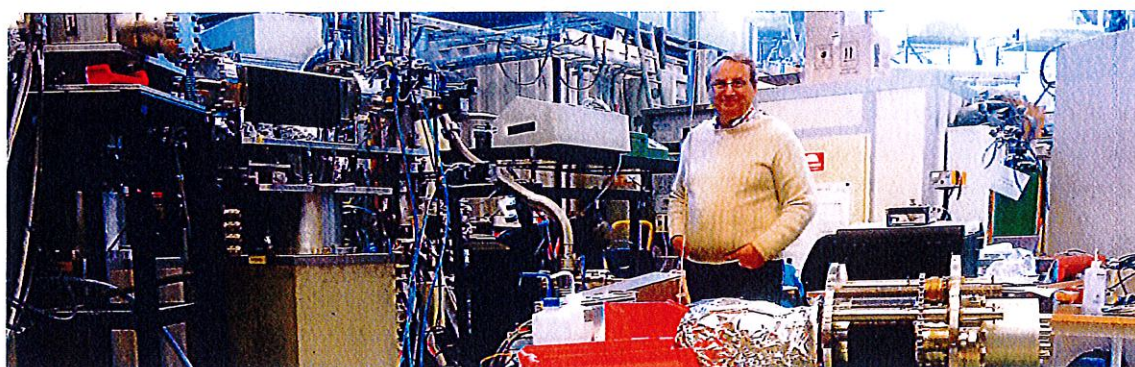


Image Experiments at MAX IV Laboratory allowed Chromalytica's Lennart Olsson to optimise the instrument and eliminate sources of error.

The spin-off company Chromalytica is developing an instrument based on UV light allowing a single exhalation to replace blood and urine samples and invasive diagnostic methods. Optimising the instrument and eliminating sources of error required an extremely precise light source in the ultra short wavelength range. Such a light source is available at the MAX IV Laboratory in Lund.

An increase in average life expectancy and various lifestyle factors have resulted in an increased burden on public healthcare. But new, effective diagnostic methods can reduce the response time and costs, as well as human suffering.

The air we exhale contains a series of markers for various diseases – from different forms of cancer to diabetes and schizophrenia. But in order to measure and map these markers, we need sensitive and reliable instruments.

DISCOVERING DISEASES AT AN EARLY STAGE

"Exhaled air is like a finger print", says Lennart Olsson, co-founder of Chromalytica. "By analyzing it chemically, we can rapidly obtain masses of specific information, which currently require more resource-intensive and slow diagnostic methods. Our goal is to develop a multi-instrument that can rapidly and easily provide a picture of the patient's state of health – and which can be used to discover

various diseases at an early stage. We already have a database with about 1400 significant substances and the research is constantly providing us with new knowledge on the connection between substances in exhaled air and different diseases."

A 15-MINUTE PROCEDURE

Chromalytica's instrument functions according to the principles of spectral light absorption in the ultra short wavelength range. The exhaled air is concentrated and run through a thin so-called light pipe, in which it is illuminated using a controlled UV light source. A spectrometer helps to measure which wavelengths have been absorbed – providing a clear picture of the content of the exhaled air. The whole procedure takes approximately fifteen minutes and it provides answers to many questions that currently require advanced laboratory analysis. Hopefully the test can replace other less pleasant diagnostic methods for patients, and in some cases it could result in biopsies being avoided.

POWER AND PRECISION

Chromalytica's analytical tool is based on extreme precision, in which the slightest deviation in the measuring environment can entail significant errors in the results delivered, which of course is naturally unacceptable for a medical analysis instrument. So in order to obtain precise data and discover any potential sources of error, Chromalytica turned to the MAX IV Laboratory.

"In the MAX IV Laboratory we got access to a powerful and perfectly calibrated UV light source which gave us a completely controlled measuring environment. The experiments we conducted allowed us to identify and correct various limitations in the instrument. Among other things, the measurements provided us with a clear

picture of how various components affected the linearity of the instrument – this helped us to refine the specification requirements to our subcontractors. It would have been virtually impossible for us to produce all this information ourselves. Now we got it all down in writing. It saved us a lot of time and over the long-term, it will result in a better instrument of analysis."

"The MAX IV Laboratory gave us access to an extremely precise light source, which allowed us to evaluate our technology in a controlled environment. This accelerated our development process."

Lennart Olsson, co-founder Chromalytica AB,
Medeon Science Park, Malmö

Fact box:

Chromalytica's measurements were conducted at the I3 beamline at the MAX IV Laboratory. Researchers have access to high intensity UV radiation whose wavelength can be minutely controlled at the experimental station. It allows for highly accurate measurements of various materials, e.g. the properties surfaces or nanoparticles, but it can also be used to test sensitive equipment such as Chromalytica's instrument.

Science Link is a network between leading research facilities of photon and neutron sources and its users. The project aims to support and encourage innovation and entrepreneurship in the Baltic Sea Region. Apart from the research facilities, the network also includes scientific institutes, universities and regional organisations that serve as service and promoting units. Science Link is part-financed by the European Union (Baltic Sea Region Programme) and involves 17 partners from 8 countries during the project period 2012 to 2014.

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