

Agilent case study: Aarhus University Hospital

# NovoCyte Flow Cytometers Lead the Way

This interview was originally published by AH Diagnostics, the official channel partner in the Nordics for Agilent flow cytometry systems.

Mikkel Steen Petersen and his colleagues at the Department of Clinical Immunology at Aarhus University Hospital in Skejby do both cutting-edge research and important routine analysis. The three Agilent NovoCyte Flow Cytometers and the NovoCyte Quanteon have become the backbone of the lab and are favored by students, lab technicians, and researchers alike for the ease-of-use and stability.

The Department of Clinical Immunology and Blood Bank at the University Hospital in Skejby is a busy department. It is always buzzing with activity and the many professionals doing both research and important daily work. The research covers diverse topics, spanning from mesenchymal stem cells to HIV, yet the common motif is always immunology.

The blood bank is located just downstairs from the lab where flow cytometry is being used to monitor the quality and characterize blood components, using the four Agilent NovoCyte Flow Cytometers. Mikkel Steen Petersen lists some of their other work that involves flow cytometry: "As a clinical immunology research lab, we are involved in transplantations, and we run a large number of tests on individuals suspected of immune defects or dysregulation. All these tests involve analyzing blood samples using flow cytometry," Mikkel explains.



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## From the retirement of one instrument to the purchase of four NovoCyte Flow Cytometers

"At that time, we were about to replace an old gamma-counter instrument that had just broken down. Back then, we typically relied on radioactivity-based assays to provide a coarse measure of cell proliferation," Mikkel says.

Mikkel came across the NovoCyte by chance and quickly decided to try out the new instrument. "Instead of simply replacing the outdated gamma-counter with a new one, we could get a brand-new flow cytometer at roughly the same price. By performing our proliferation assay on the NovoCyte, we were able to obtain a much more refined and precise picture of the type of subsets the cells belong to, as well as how each subset reacts to stimulation. Flow cytometry provides a very nuanced picture," Mikkel says about the thoughts behind replacing the old radioactivity measurer with a brand new NovoCyte.

*"When we received the NovoCyte, it turned out to be extremely easy to use."*

The NovoCyte shows a whole new level of user friendliness which made especially the daily routines much easier and training very fast to complete. "Soon after we received the first NovoCyte, we were able to see that the NovoCyte was extremely easy to use for everyone in the lab. On previous flow cytometry instruments, we had to go through time-consuming procedures involving manual parameter adjustments every day before running any actual samples. However, we could immediately see that the design team from Agilent Technologies had thought about this and made the NovoCyte intuitive and easy to use. Starting up the NovoCyte is fully automated, and literally only involves pushing a single, green button. Manually adjusting voltages and gains have become a thing of the past, and the software is blissfully free of clutter.

*"If you have any prior flow cytometry experience, you'll be ready to use the NovoCyte on your own after 15 minutes. For new users, it's a matter of hours, not days, before you can operate it independently."*

*"It is great to have AH Diagnostics (Agilent Technologies partner) as a vendor and service provider. Not only because of their competence but also their reliability. You can just give them a call, and technical assistance isn't far away. That's worth a lot to us."*

Because the Department of Clinical Immunology Research has so many critical clinical research samples, about a year later they got a second NovoCyte, and soon after a third. The fourth instrument, purchased only last year, was a NovoCyte Quanteon, which is a next-generation NovoCyte.

Mikkel says: "We decided to purchase the NovoCyte Quanteon, rather than any of the other next-generation flow cytometers out there, for several reasons. With the NovoCyte Quanteon, there was no need for additional staff training, as it runs on the same software as the NovoCyte. Also, the NovoCyte Quanteon is a fairly competitive instrument, with silicon photomultiplier (SiPM) detectors for enhanced sensitivity and four lasers for a wider selection of useful fluorochromes."

## It's all about the NovoExpress software

The clinical research work rarely ends when a sample has been run. The data must be analyzed and interpreted, and the results must be presented in a format and a context that the team can relate to. Mikkel explains how the NovoExpress software solves this: "The software is designed to simplify data export to downstream laboratory information management systems (LIMS). For instance, tables, statistics, flow plots, and graphics can all be exported by simply right-clicking. Our LIMS-system then picks up these files, and the medical team just logs on to see the subsets, NK degranulation, and subpopulations in a way that is easy to read and allows comparisons with historical data. It is all very easy to achieve with the NovoExpress software."

The software's ease-of-use is something Mikkel appreciates: "In a clinical research department, where samples are often urgent and arrive on short notice, it's a huge plus to have a flow cytometer that you can simply turn on and be ready for analysis fifteen minutes later. At the end of the day, you can load the last samples and tell the software that you'd like the system to shut down after the run – and then go home. Cleaning, decontamination, and shutdown are taken care of automatically," Mikkel explains.

The software also allows the user to work on gating, analyzing, and exporting results while the instruments is acquiring – which means that the lab technicians have often finished data analysis by the time the last sample has been acquired. "Before the NovoCyte, data acquisition and analysis were done separately. Now, we can do both simultaneously, which is a real time-saver," Mikkel continues.

*"In my opinion, the NovoCyte is a solid instrument, and the acquisition software is truly outstanding and well beyond the competition."*

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