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Services and support

A lab in France quickly expanded its sequencing capabilities thanks to the guidance and support of an FAS from Thermo Fisher Scientific

Stéphane Llense is a Thermo Fisher field application scientist (FAS) based in the Greater Paris Metropolitan Region. He has 14 years of experience supporting customers across every aspect of their research, including professional training and troubleshooting. Stéphane tells us that it's particularly important as an FAS to not only provide knowledge, but to impart new skills to the labs he works with so customers can be confident in their use and knowledge of Thermo Fisher products and their ability to achieve and analyze results with those tools.

When asked to identify one of the biggest challenges his customers face, Stéphane says that implementing next-generation sequencing (NGS) can be particularly challenging for those without a background in this advanced technology.

"For new NGS users," he says, "the job of the FAS is to find the correct approach to simplifying and optimizing each step of the sequencing processes." And with the increased demands of the SARS-CoV-2 crisis, he explains, these customers need more support than ever. According to Stéphane, the FAS must listen carefully to the customer, assess their needs, provide quick answers, and guide them to the right contacts.

Stéphane points out the importance of the FAS becoming involved as early as possible in the implementation process.



"With new users who have decided to acquire Ion Torrent™ NGS technology for SARS-CoV-2 research," he says, "Thermo Fisher field teams are there from the very beginning of the purchasing process to start the customer on a path that will lead to mutual trust between them and us."

As an example, he cites Biopath Laboratoires, a customer that had never used NGS technology but needed to implement it as soon as possible to rapidly generate SARS-CoV-2 research data. Their goal was to be able to analyze 1,000 samples per week.

Stéphane helped plan and deliver training and support to meet their rapid and high-volume production goals. He conducted several calls with the lab to help them meet all the implementation prerequisites and provided a week of training to familiarize them with the entire workflow. To help meet their rapid turnaround target, he spent an additional week with Biopath, moving them from analyzing 120 to 1,500 samples by the end of the week—a throughput level that would historically require about a month to reach.

Also functioning as their main point of contact with Thermo Fisher, Stéphane organized calls between Biopath and other Thermo Fisher teams to facilitate a smooth start to their NGS efforts. Stéphane says that strong communication and the ability to provide comprehensive and lasting solutions are key to instilling customer confidence, but he's humble about his personal contribution:

"I always keep in mind that for each problem we have several solutions, and, if needed, I am never alone in facing any issue. I'm part of one Thermo Fisher team, so the right solution may be provided by another of my colleagues."

Stéphane was recently nominated by one of his colleagues and honored by Thermo Fisher as a Guardian of Science—a member of the Services and Support team providing above-and-beyond customer support. To learn more about Stéphane's support of the NGS implementation at Biopath, we reached out to that company's technical director and medical biologist, Hugues Leroy, who discussed their positive experience with us:

What types of laboratory services do you specialize in?

We are a generalist laboratory, producing research results in biochemistry, immunology, hematology, coagulation, and microbiology. We deal with samples directly, providing research for private clinics, public hospitals, retirement homes, and other institutions. We have recently been charged with helping address the diagnostic research demands of the SARS-CoV-2 crisis.

What challenges are you trying to address?

The biggest challenge we face currently is the SARS-CoV-2 crisis and the increased number of samples it represents. In a few weeks, we had to expand our PCR production capacities, learn new PCR techniques, and implement NGS to increase our capacity from a few hundred samples per day to 30,000 per day. The material, logistical, and human challenges were numerous.

What made you look for guidance outside of your lab?

French regulations changed overnight, and the new requirements prompted us to urgently create a *de novo* NGS department with high-capacity capabilities, so we needed advice and help.

In France, we had done very little sequencing thus far. The French government authorized mass sequencing to help the country reach its goals; it was the government and not our team at Biopath that required us to implement sequencing. The government wanted the sequence of the entire SARS-CoV-2 genome, not just the sequence of the spike protein, so we had to do NGS. We ended up having a considerable amount of activity to manage since we still had a lot of SARS-CoV-2 infections in France at that time. So, we quickly went from nothing to 400 NGS sequences per day in our laboratory. It was a big shake-up. That's why it was important for us to have the help of Thermo Fisher.

Can you tell us more about choosing to partner with Thermo Fisher?

Thermo Fisher was the only company able to meet our urgent NGS needs. Again, the French government wanted us to ramp up quickly. So, we had contacted the two main NGS suppliers, Thermo Fisher and another leading NGS supplier. The other supplier was not able to respond within the necessary time frame. They told us it would take at least a month to come up with an offer. Thermo Fisher responded quickly. I take my hat off to the Thermo Fisher team in France. I would like to tell them "well done," because they did a really good job, and they were able to deliver an NGS system to us within 15 days. We couldn't believe they would be able to get it done at such speed. Frankly, it blew us away. That is why, in the end, we worked with Thermo Fisher. We also already knew the company because we had one of their capillary electrophoresis instruments—an Applied Biosystems™ SeqStudio™ Genetic Analyzer—so we knew the quality of the products. And considering the seriousness and excellent reputation of this company in the world of molecular biology, we did not hesitate for a second.

How did you implement the NGS lab and how did your FAS help?

We were helped immensely by the Thermo Fisher team who came on-site for the implementation of the Ion GeneStudio™ S5 Prime System and Ion Chef™ System. Stéphane was at the helm of the implementation, training the laboratory team, helping us through the analysis of the first results, and helping us optimize and organize our efforts.

Stéphane was excellent in his ability to reassure the technical team. You have to put yourself in the shoes of our laboratory technicians who had never done NGS; and all of a sudden, they're asked to do mountains of sequences every day. There was real stress. Stéphane was very good in his ability to reassure the technicians on their technique, as well as calm everyone as they learned the process.

How has Stéphane helped since implementation?

The implementation went very well, but inevitably there were a few runs where we had problems with results, things that were not right, where we did not understand why it hadn't gone well. Each time in these cases, we contacted Stéphane. Either we were able to reach him right away on the phone, or he would call us back within the hour and then connect to our server and look at the results. Looking at the information with him, we always managed to find the origins of the various problems and ensure that we had solved them or that we would no longer encounter them. We had phone contact with him several times a week for a month any time we encountered a problem.

An example of one difficulty we faced was to accurately quantify our results. It was complicated to manage standardization of the concentrations of the libraries that we put on the semiconductor chips. It was by following Stéphane's guidance that we were able to evaluate different quantification techniques we could use to do all of this in a few days. He really guided us on this. He wasn't simply suggesting something that might work; instead, he was in the work with us. Even though it was after the training, we were fortunate to have Stéphane with us again during this dynamic process, to help us try to find the best solution. I think if he hadn't been there with us, hands-on, during this quantification of the library, we would not have been able to manage it.

If I may add, it could not have been easy for Stéphane either; he too had to be under stress. He was commissioned by Thermo Fisher to complete this mission and arrive at the goal just like that, in a lab where no one had done NGS. At the end of the technical training, the lab had to complete 400 sequences per day. It was stressful for him, I'm sure. However, he never showed it. And he was always the person everyone in the lab relied on.

It's clearly thanks to Stéphane that we were able to execute so many sequences.

How well have the systems you installed performed?

The quality of the Thermo Fisher solution was impressive. What amazed us the most was the ease of use of the systems and their ergonomics. Frankly, I wasn't expecting something so easy to use at this high level of technology. The actions needed to operate the Ion GeneStudio and Ion Chef systems are minimal: just insert 2 to 3 ready-to-use reagent packs, press start, and let the whole process take place. Amazing. I don't know how Thermo Fisher managed to create something so simple to operate with technology that is ultimately so theoretically complex. And yes, the Ion 550™ chips have allowed us to greatly increase our production capacities.

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Can you share any additional details about this production ramp-up?

As I said, we had never done NGS in our lab before. In just one day, thanks to the systems themselves and the training from Stéphane, we went from zero to about 30 sequences per day. In a few weeks, we were able to adapt very quickly and produce hundreds of sequences per day without having to delegate any work to other laboratories. The different chip sizes allowed us to adapt our efforts according to the quantity of sequences we had to provide. And the ease of use of the Ion Torrent™ systems has helped us a lot, and the efforts of just two in-house NGS technicians allowed us to succeed in the production increase.

So the success of our lab, for me, resulted from three elements: it's Stéphane, the quality of the products manufactured by Thermo Fisher, and obviously, the work of the good team in our lab, which was able to rise to the challenge.

What plans do you have to use this solution in the future?

Currently, the French government has decided to sharply reduce the number of SARS-CoV-2 sequences to be produced. Our NGS sector has therefore significantly reduced its activity at the present time, which has allowed us to start thinking about the other types of analyses that we had hoped to do with NGS once the SARS-CoV-2 crisis subsided. We now want to do NGS research in oncology and have already established partnerships with public hospitals for this.

If another lab was going to have Stéphane as their FAS for a project, what would you say to them?

I would tell them that they are in good hands—that they couldn't be in better hands than with Stéphane. Again, he has been fundamental to our success, and that is something that I could say without any reservation to any laboratory.

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