

Streamlined workflow management enables sequencing at scale

Implementation of BaseSpace™ Clarity LIMS™ Software enables Rapid Novor to future-proof their growing laboratory operations



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Rapid Novor is a technology-centric company focused on providing next-generation protein sequencing solutions and antibody discovery services. Rapid Novor's goal is to empower life science breakthroughs by offering protein sequencing and characterization services to facilitate the reliable discovery and development of novel reagents, diagnostics, and therapeutics. The company was founded in 2015 with only three members and in just a few years has grown to a team of over 50 employees, successfully completing over 6000 peptide sequencing projects.

As the company continues to expand and innovate, it is essential that systems are in place for efficient sample and workflow tracking. Also crucial is the ability to store data in a single location that can easily be accessed by all collaborators within the organization. To support the company's rapid growth and success, Rapid Novor recently invested in BaseSpace Clarity LIMS Software, an innovative laboratory information management system. This sophisticated software solution is designed to help laboratories manage workflows and optimize operations with accessibility in the Amazon Web Services (AWS) cloud environment for enhanced data security, reliability, and flexibility. BaseSpace Clarity LIMS Software provides comprehensive and highly configurable preset protocols, offering a scalable and flexible solution that empowers faster adoption of new technologies, techniques, and analysis needs.

We spoke with Iain Rogers and Lehna Shukster from Rapid Novor about the company's mission, the impactful work they are doing, why they chose BaseSpace Clarity LIMS Software to manage their laboratory operations, and how this system supports their growth now as well as in the future.

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Q: Can you tell me about Rapid Novor?

Iain Rogers (IR): Rapid Novor is primarily a protein sequencing service company. We have developed a proprietary *de novo* peptide sequencing technology that allows us to derive the full-length amino acid sequence of any protein. Our REmAb service offers monoclonal antibody sequencing from small protein samples for fast, full-length peptide sequencing. We have turned something that used to be highly uncertain and labor-intensive, taking months to complete, into a routine, automation-compatible process that produces reliable answers within a week. The REmAb service is now well established and has successfully completed more than 6000 projects. The basis of the company is founded on this core protein sequencing capability. We have recently developed further capabilities to sequence polyclonal mixtures of antibodies, known as REpAb, and are expanding into characterization of these antibodies, which has significant impact in both the discovery and downstream development of therapeutic drugs. We have technology development teams under the same roof as the mass spectrometry and wet lab teams and we use our own technology, which enables us to provide novel insights that help our clients to advance their research.

Q: What is Rapid Novor's mission?

IR: Our mission is to empower life science breakthroughs with next-generation protein sequencing. The longer-term vision is about elevating human health through decoding immunity. There are certain fundamental human needs that can only be met through improved technological innovation and that's what Rapid Novor is all about. We do our part to make new discoveries possible, which will ultimately help to make diagnostics and therapeutics easier, faster, cheaper, and more reliable and have a positive impact on human health.

Q: How did Rapid Novor track samples and manage workflows in the beginning? What challenges did you face?

Lehna Shukster (LS):When Rapid Novor first started, we were a small team, and it was manageable to communicate with the group directly without the need for a laboratory information management system (LIMS).We used a combination of tools for communication and project management. This setup worked well when we were processing smaller batches of samples. But as our sample numbers as well as team sizes grew, it became challenging to keep track of

information because it was stored in several different places. For example, during this time, each technician processed approximately 30 samples a week, and stored the associated data, including instrument-generated data, gel images, etc for each of these samples in separate locations. We needed a consolidated system to store and access all laboratory data in one place, which was why we began looking into a LIMS.

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Q: What features were you looking for in a LIMS?

LS: We needed a streamlined system that provided sample tracking and reporting, with flexibility to accommodate our workflows. Our team required a LIMS that would consolidate large volumes of sample data into a single location and be easily accessible to the team with just one search. One of the key features we were interested in was compatibility with barcoding because we are phasing towards more automation and we needed a system that offered this capability.

Q: Why did you choose BaseSpace Clarity LIMS Software?

LS: When we decided to implement a LIMS for our workflows, we were in discussion with Illumina and another company with a similar system. BaseSpace Clarity LIMS Software had a great interface and was already configured for sequencing workflows, which were definite benefits. But it was the support provided by Illumina, in terms of responsiveness and servicing, that sparked us to make the decision to choose BaseSpace Clarity LIMS Software.

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IR: Price is always a consideration. In addition to being cost-effective, we ultimately chose BaseSpace Clarity LIMS Software as this was the option that would create value and build confidence.

Q: How did you implement BaseSpace Clarity LIMS Software?

LS: When we initially set up BaseSpace Clarity LIMS Software, we had an Illumina technician work with us to understand our workflows and our goals for the system. Because this system was already configured for sequencing, it was relatively simple to match the workflow to ours. It was just a matter of labeling samples according to our protocols and then adding in the data slots. The whole implementation process was fairly smooth because we were already working with established workflows.

Q: Did you require any additional support while integrating BaseSpace Clarity LIMS Software into your workflows?

LS: We have always been able to reach out to Illumina support teams for implementation of various aspects of the LIMS. It was important for us to get training on the application programming interface (API) because we are in the process of automating our workflows. It is a much more complex task than just setting up a simple workflow, which we are in the process of implementing with continued support from Illumina.

Q: How has implementing BaseSpace Clarity LIMS Software impacted the business?

LS: Implementing BaseSpace Clarity LIMS Software has really simplified our sample and process tracking. It has helped us immensely with troubleshooting and process analysis by giving us the ability to pinpoint where things are sticking and what's working well. When we need to review records, it is easy to track without having to go through written laboratory logs or notebooks. Everything is stored in one place, which makes data more accessible. Our lab team is very flexible and with the LIMS each individual can find the answers they need without a meeting. This has been a big process improvement.

IR: In terms of business impact, one of the goals that we set for the year revolves around the throughput for the REmAb solution. This is something that we've really sped up and we're continuing to innovate in this space. We track the number of samples processed every single week and that number is trending upwards. It's improving. The LIMS is one of the initiatives that is contributing to a higher throughput. The LIMS also gives a greater ability to deal with spike in demand. Earlier this year we received a couple of big customer orders and having a system like BaseSpace Clarity LIMS Software really helped to ensure everything was working its way through the lab and nothing was getting missed. That spike in demand would have been much more challenging to manage without the benefit of having such organization.

Q: What influenced your decision to choose BaseSpace Clarity LIMS Software hosted on the cloud versus on-premise?

LS: Our team is very flexible and adaptable, with a significant portion of our group working remotely. That's why we opted to have BaseSpace Clarity LIMS Software on AWS Cloud. Additionally, we were satisfied that our data would be more secure and protected than we could achieve with an on-premise solution.

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Q: How have your needs changed since you first started using BaseSpace Clarity LIMS Software?

LS: We are a very adaptive lab. Due to increased demand and higher throughput, we have had to change our workflow three times since the first one was set up with LIMS. Having a flexible and scalable LIMS has really simplified this process. Another key change has been our need for automation as our business continues to grow. When we first established BaseSpace Clarity LIMS Software, we didn't use the API features at all but now we are dependent on this functionality to automate processes. I have really enjoyed working with BaseSpace Clarity LIMS Software, its flexibility, and what it has allowed us to do. I hope we continue to grow with it!

IR: Shortly after we implemented BaseSpace Clarity LIMS Software, we also purchased the Illumina MiSeq™ Sequencing System to provide next-generation sequencing (NGS) in addition to our existing protein sequencing tools. If DNA is the blueprint, then protein is the house. If you understand both of those things, then you're going to go a lot further.

Q: What does the future look like for Rapid Novor and how does BaseSpace Clarity LIMS Software fit into that vision?

IR: The future for Rapid Novor is to continue along the path to executing on our mission and vision. Practically, we're going to continue increasing throughput and making the core service even more accessible to all kinds of researchers. I mentioned the world's first polyclonal sequencing of proteins, which we see as a new modality for antibody discovery and, particularly, for discovery of therapeutics against hard targets. Our antibody discovery service is a very exciting direction for the company, and we will be trying to build partnerships around that. We're also introducing new services, including epitope mapping and analysis of antibody binding kinetics. Our goal is to give researchers a full suite of tools and services such that they can get the answers they need reliably and quickly. Systems like BaseSpace Clarity LIMS Software really help speed the process along. At the end of the day, if we can make the R&D process better, cheaper, faster, reduce the uncertainties in there, get people to the answers faster, and provide them with tools to get their jobs done, then we're contributing overall to human health.

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Learn more

BaseSpace Clarity LIMS Software, illumina.com/products/by-type/informatics-products/basespace-clarity-lims

Rapid Novor antibody sequencing services, rapidnovor.com/services/antibody-sequencing/

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