



# How PSSC Labs Helped Test Lab CSI<sup>®</sup> Ramp Up Sample Processing by 80x to Scale with Dramatic Demand During COVID-19

**50,000+**

clinical samples processed in three months

**15TB**

of genomic sequence data produced

**80x**

increase in clinical sample volume

## CASE STUDY



"2020 was all about COVID testing. It showcased that PSSC Labs was able to help us manage that volume and track all of it. But in the background, we were still able to conduct all of our sequencing, proprietary techniques, and validations to move towards bringing CSI-Dx<sup>®</sup>, our proprietary test system, for tick borne disease diagnostics to market."



**Colin Brislawn,**

Bioinformatics Lead, Contamination Source Identification (CSI)



Contamination Source Identification® (CSI) provides cutting-edge gene sequencing testing for tick borne diseases, clinical testing, and non-clinical applications like surface tests for infectious agents.

## HIGHLIGHTS

### CHALLENGES

- Meeting HPC needs to process skyrocketing COVID testing demand
- Deploying on-premise to provide enterprise-level firewall security
- Providing CLIA-level encryption at rest for sensitive patient data

### SOLUTION

- Turnkey Rack N' Roll service provided hassle-free, ready-to-use HPC on-premise
- HPC cluster solutions to help CSI® handle COVID-19 testing at scale while continuing ongoing proprietary research
- Top-notch customer service from PSSC Labs provided data security solutions

### RESULTS

- 50,000+ clinical samples processed in three months with PSSC Labs hardware
- 80x in computing power helped CSI® meet COVID testing demand while continuing proprietary research
- 150 genomic sequencing runs
- It took less than a week for PSSC Labs to respond, test, implement, and support a request for encryption solution

# Challenges

## Scaling testing capability to keep up with COVID-19

Justin Wright, Executive Vice President of the clinical diagnostic lab, Contamination Source Identification® (CSI), was feeling overwhelmed.

The 2-year-old company had just launched its clinical testing services, CSI-Dx®, and it was challenging enough to keep on top of Clinical Laboratory Improvement Amendments (CLIA) regulations. But with the outbreak of COVID-19, suddenly everybody needed testing.

Before COVID, the research science lab processed approximately 200 samples per month. Now, due to the dramatic growth of COVID-19, CSI needed to ramp up processing capacity by 80x to meet the skyrocketing demand for quick sample processing at a significantly increased volume. Fulfilling the need required high performance computing / HPC, beyond what CSI had in place.



“Every single metatranscriptomic run might have 20 samples and that’s 100 gigabytes of data. This is not something you can do on a laptop or desktop. 100 gigabytes for each run, and the capability to process multiple runs, meant that we needed high-performance computing capabilities,” explains Colin Brislawn, a Bioinformatics Lead at CSI.

What's more, as a clinical testing company, not only does it need to deliver results, but also comprehensive medical compliance and assurance. That means data security, protecting patient privacy, and having hardware and software that it can understand and trust.

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“When it comes to securing patient data, you can't get it wrong. Based on CLIA recommendations, we knew we needed a solution for the encryption of our on-premises deployment,” says Colin.

With so much to worry about—the HPC needs, the security, and on-premise deployment that provides technical support—CSI needed a compliant solution, fast.

Justin reached out to a team he trusted: PSSC Labs.

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“When it came to getting started in the clinical diagnostic space, we knew that we wanted something on-premises. And PSSC Labs had done a great job for us previously, so we continued on with them,” says Justin.

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# Solution

## A turnkey, on-premise HPC supporting encryption at rest

PSSC Labs worked with CSI to build a computing platform that would suit its needs. Hardware architecture and application-level requirements were all meticulously considered to deliver a turnkey solution that would help CSI quickly scale up its capabilities.

Rolling out the HPC cluster physically into CSI's second-floor lab was a breeze. PSSC Labs' Rack N' Roll service delivers a ready-to-use cluster; all CSI had to do was to uncrate, roll it into place, and plug it in.

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“I think we had one OmniCable that wasn't working, but that was diagnosed with PSSC Labs' help and they sent us a new one. It was literally an uncrate and roll setup. We booted up quickly, and it worked. That was nice,” recalls Justin.

Equipped with HPC / high performance computing, CSI can finally execute both gene sequencing runs and internal software to match and send COVID-19 test results out simultaneously and at scale. Without PSSC Labs' HPC cluster, neither of those tasks could occur. Now, the lab can process up to 1,200 samples a day.

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“We do comprehensive RNA sequencing. This type of analysis is actually quite heavy in the scope of microbial genomics. PSSC Labs worked directly with us to understand our problem and help us build a system that worked well for us,” comments Colin.

Next, Colin and Justin needed to tackle their security challenges. To meet the latest [CLIA requirements](#), they needed to ensure that data at rest and data in motion were both encrypted and protected against insider and outsider threats.

**In less than a week**, PSSC Labs recommended top-of-the-line data security software, got a build working on CSI's system, performed troubleshooting, and configured it. When CSI upgraded its databases and expanded its deployment, the lab followed PSSC Labs' guides and documentation.

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“It's been absolutely awesome. Not only did they come up with the right software and got it working, they also trained us how to lead that deployment process ourselves in the future. Before they even gave us a suggestion, they made sure it was working and brought us a fully finished product for use. And you know, we haven't had a question in six months,” says Colin.

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# Results

## 80x increase in computing power to scale with skyrocketing demand

Thanks to PSSC Labs, CSI was able to process an astounding 50,000+ clinical samples in the third quarter of 2020. Before, it was handling approximately 200 samples every month.

Even as the lab handled COVID-19 testing, the team continued their sequencing, proprietary techniques, and validations in tick-borne disease diagnostics, putting through over 15 terabytes of sequencing runs on the same PSSC Labs hardware.

The HPC capability took CSI to the next level.

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“If we didn’t have PSSC Labs’ on-premise computing solution that we trusted and felt confident in, it would have been quite a magnitude of stress, what with our research plus the whirlwind of demand for COVID testing,” reflects Justin.

What’s more, PSSC Labs helped CSI configure a CLIA compliant encryption plan that would work with PSSC Labs hardware. Right now, all patient data exists in a fully encrypted state, made possible by PSSC Labs recommendations.

Had CSI partnered with a cloud provider that focuses on healthcare deployment instead of PSSC Labs, Colin estimated that it would have been a lot more expensive. Plus, being biologists rather than cloud deployment experts, they didn’t want to take the security risk.

Even more than cool hardware like GPU and AMD Ryzen™ SKUs, what the team was really impressed by was the customer service.

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“I’ve used PSSC Labs’ HPC for the last 10 years. I loved working with them. I loved the quality of support. I loved the lifespan of their products. When we needed to solve a problem with compliance requirements, PSSC Labs didn’t just give us the runaround or tell us to talk to an attorney. They came up with options, pitched it to us, and helped us find ones that worked. We’ll be ordering more from PSSC Labs next year,” says Colin.

Justin agrees, and encourages anyone who feels overwhelmed to give PSSC Labs a call because they can help clients build what they need based on the issues they have.

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“I’ve learned just the real value of quality customer service. I’ll take quality customer service over a cheaper product 10 out of 10 times. The folks at PSSC Labs are genuinely good people. Don’t hesitate to give them a call, because they’re good at what they do,” concludes Justin.

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# Get custom, on-premise, high-performing computing (HPC) systems now.

Whether you need help with an HPC AI, Deep Learning solutions or other Big Data application, PSSC Labs is here for you and your organization.

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