



Case Study – December 2023

eLabNext Significantly Improves Diel Lab's Data Management and Sample Inventorying

“The use of eLabJournal has significantly improved my lab’s ability to manage individual experiments related to each project conducted in the lab. In addition, we have significantly better data management and traceability of data now that we are fully onboarded with eLabNext’s platform.”



Diego Diel

DVM, M.S., Ph.D., Associate Professor of Virology in the Department of Population Medicine and Diagnostic Sciences at Cornell University College of Veterinary Medicine

The Diel Lab at Cornell University College of Veterinary Medicine

Established in 2014, the [Diel Lab](#) is led by Diego Diel, DVM, M.S., Ph.D., and focused on understanding the molecular mechanisms underlying DNA and RNA virus infection, immunity, and pathogenesis of a host. The lab's long-term goal is to use this basic research to develop novel vaccines and vaccine platforms for humans and animals. They also focus on developing next-generation diagnostics for viral detection, identification, and characterization.

Between 2014 and 2019, the Diel Lab operated as part of the Department of Veterinary and Biomedical Sciences and the Oscar E. Olson Research Laboratories at the South Dakota State University. In 2019, the Diel Lab moved to the Department of Population Medicine and Diagnostic Sciences at Cornell University College of Veterinary Medicine, where it currently operates. It employs a talented team of 10 scientists and Ph.D. students with broad basic and molecular virology expertise.

Currently, the Diel Lab is studying how picornaviruses and coronaviruses (including SARS-CoV-2) evade detection by the innate immune system. During the COVID-19 pandemic, the lab began studying the broad host range of the SARS-CoV-2 virus and discovered that the virus infects [white-tailed deer](#) as well as [tigers and lions](#) housed at the Bronx Zoo and can act as reservoirs for variants of concern. Lastly, the lab studies the effects of genetic changes on viral pathogenesis, infection dynamics, and tissue tropism.

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Goals

Short-term: In the short run, the Diel Lab seeks to better understand the molecular mechanisms underlying DNA and RNA virus infection, immunity, and pathogenesis of a host.

Long-term: The long-term goal of the Diel lab is to develop novel vaccines and vaccine platforms for humans and animals. They also focus on developing next-generation diagnostics for viral detection, identification, and characterization.

Challenges

| To better inventory samples and reagents

Managing and organizing inventory clearly and accurately in a laboratory of students and scientists is challenging. In particular, coordinating the tracking and replenishment of samples and reagents requires a robust process to prevent reagent shortages or expirations and sample loss or misplacement. Effective communication, adherence, and training to establish inventory protocols are crucial to maintaining the integrity and efficiency of ongoing research and experiments.

| To accurately and consistently document experiments, records, and data

Accurately and consistently documenting experiments, records, and data in a virology lab with a large team can be problematic when there are variations in documentation practices and data interpretation. Maintaining uniform SOPs for data recording, storage, and analysis is critical to ensure consistency and prevent errors or inconsistencies. Regular training and quality control measures are essential to mitigate these challenges and uphold the integrity of research findings.

The Diel Lab was looking for an easy-to-use and cost-effective solution that could be implemented by all team members in the lab to ensure all critical data, samples, and reagents are managed so that the lab's short- and long-term goals can be achieved.



Solution

| eLabNext improves institutional collaboration and organization

To deal with the above challenges, the Diel Lab looked for lab digitalization options online and found the eLabNext website. The eLabNext platform was initially established in the Virology Lab at [Cornell's Animal Health Diagnostic Center](#). Following successful implementation, the software was ported over to the Diel Lab.

Specifically, the lab used eLabInventory to establish inventory, sample, and specimen tracking workflows. The laboratory inventory management software integrates with eLabJournal, which was also implemented by the Diel Lab as an all-in-one electronic lab notebook, removing the lab's reliance on paper lab notebooks and the associated time manually searching for data and experimental records. If not for the eLabNext software, the Diel Lab may have inadvertently discarded critical samples and managed data improperly, leading to its loss.

As the Diel Lab is involved in internal and external collaborations, an additional benefit to using the eLabNext platform is that it is easy to share data and experimental details across multiple users. This enables the lab to efficiently engage in multi-institution collaborations and partnerships with open communication channels and data sharing.

In addition, eLabNext helps to manage the organization of multiple projects by categorizing experiments and entries into separate folders. The improved structuring allows more efficient and productive lab operations.

Results

| eLabNext enables more accurate sample inventorying and data management

A year later, the eLabNext platform is an everyday part of operations in the Diel Lab. This time was required to thoroughly inventory the lab's data, reagents, and samples and import them into the software. The effort was well worth it. Now, the lab enjoys more efficient operations through more accurate sample inventorying and improved traceability of reagents, experiments, SOPs, and data generated by each experiment.

Implementing a specialized software platform has significantly improved efficiency in our sample storage and retrieval processes. This software provides a centralized and digitized system that meticulously catalogs and tracks each sample, streamlining the organization of our extensive sample inventory. It has drastically reduced the time and effort previously spent on manual record-keeping and searching through physical archives. Moreover, the platform's robust search and retrieval features enabled the Diel Lab to pinpoint the exact location of samples within seconds, ensuring quicker access for experiments and research, and ultimately enhancing the laboratory's overall productivity and precision in sample management.



About eLabJournal

eLabJournal offers an intuitive and flexible solution to manage information in your lab. The all-in-one Electronic Lab Notebook also includes sample tracking and protocol management modules. eLabJournal improves efficiency when documenting, organising, searching, and archiving data, samples and protocols. The software is suitable for any lab ranging from small academic laboratories and start-up companies to large academic institutes and globally operating companies.



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