

## Temperature Monitoring

**Problem:** A researcher or lab manager's worst nightmare is to walk into their lab and find a freezer, refrigerator, or any temperature controlled storage unit that has failed overnight and ruined or jeopardized precious samples, specimens, tissues, or products—not to mention the loss of countless hours of research. A real-life example most of us are sadly familiar with by now is the loss of critical autism research samples at Harvard in June 2012 due to a freezer failure which thawed 147 brains donated from deceased people with autism. Although an alarm and monitoring system was present, it failed to notify staff of the freezer malfunction so the problem could be rectified quickly. A higher level system of monitoring with built-in redundancy could have helped produce a better outcome, however most are cost prohibitive for individual labs to install and maintain. Many temperature monitoring systems do alert staff, however they stop at a certain point and don't have automated measures to continue alerting until a confirmation is received and corrective action is taken.

**Solution:** Temperature monitoring systems should be affordable and allow remote monitoring of all temperature controlled storage units, while also securely logging data and offering immediate alerting whenever conditions exceed pre-defined thresholds. In today's modern world, the convenience, flexibility, and importance of cloud-based monitoring and mobile application access to system statistics cannot be overemphasized. This could have quickly headed off the catastrophe at Harvard if offsite check-in on freezer system statistics had been enabled, and continual alerting had been possible at initial signs of freezer failure.

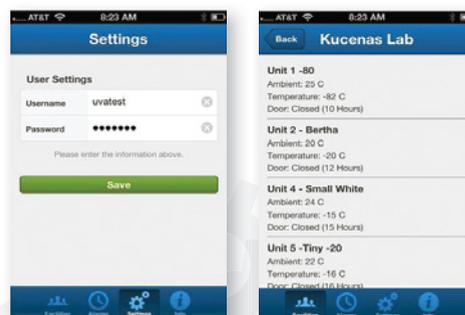
Recognizing the importance of these concepts and striving to create a monitored environment for her laboratory specimens, Sarah Kucenas, Ph.D., Assistant Professor of Biology at the University of Virginia's Physical & Life Sciences Building who runs the Kucenas Lab, was inspired to look into Minus80's new technology. Sarah's goal was to offer better protection for the contents of the lab's -80C and -20C freezers as she and her colleagues investigate the role of glial cells in the formation of the nervous system early in development, and investigate the preservation of the nervous system during disease and injury. Like Harvard, Sarah's lab also experienced the failure of two storage units and wanted to incorporate temperature monitoring to protect specimens and guard against a repeat experience.

To provide the monitoring and protection Sarah needed for the lab, a Minus80 control unit was installed on the freezers that needed to be monitored. These control units send real-time information wirelessly to an onsite data gathering appliance, which then sends the information to the Minus80 cloud-based monitoring center. The control unit installed easily in minutes and constantly monitors the storage units' interior temperature, ambient room temperature, door open/close status, and movement of unit.

With this solution in place, Dr. Kucenas and her lab manager receive immediate alerts if issues arise with the freezers or incubators. A mobile application allows them to monitor real-time status, and historical reporting allows them to track the performance of each unit. All of this was done without any capital investment by the lab.

Without a complex installation, this temperature monitoring solution is now available to researchers like Sarah Kucenas. More importantly, this is available as a low cost monthly subscription service and this system can also grow and scale so users can flexibly manage monitoring needs as they change. Different from other solutions, it also meant no large amount of capital to secure, no upfront equipment to purchase, and no ongoing maintenance of expensive servers.

For more information, please visit: [www.minus80monitoring.com](http://www.minus80monitoring.com)



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