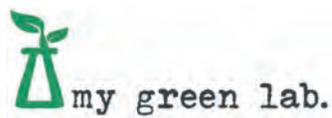


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[ **inside**view ]



Profile Feature as seen in *Nature* October 25th 2018

# THINKING OUTSIDE THE ICEBOX ON LAB SUSTAINABILITY

A conversation with **PHIL WIRDZEK**, president and executive director of I<sup>2</sup>SL



Ultra-low temperature freezers (ULT, -80°C) are one of the most energy-intensive pieces of equipment found in labs. They could be operated more efficiently by implementing simple cold-storage management best practices, yet few researchers invest the time to do so. To reduce the environmental impact of ULTs and other cold storage units, two non-profits — the International Institute for Sustainable Laboratories (I<sup>2</sup>SL®) and My Green Lab — joined forces to launch the first Laboratory Freezer Challenge in 2017. I<sup>2</sup>SL president and executive director, Phil Wirdzek, along with My Green Lab executive director, Allison Paradise, describes how the challenge continued to spur hundreds of new and international labs into action in 2018.

**People often don't think about energy consumption in labs. Is it a big deal?**

Absolutely. Typical research university lab buildings consume 40-60% of all energy on campus. Of that, ~25% is due to lab equipment. An average ULT freezer consumes as much energy as a single-family home (~20 kWh/day), and collectively cold storage units (e.g. ULTs, refrigerators, cold rooms) contribute substantially to a lab's energy use. But there's a lot that can be done to reduce the environmental impact of cold storage, including defrosting (~10% energy savings); changing the set point on ULTs to -70°C (~40% savings); purchasing energy-efficient models to replace older units (up to 70% savings); and throwing away superfluous samples to make space in existing units. Stirling Ultracold, our sponsor, brought to this industry a unique technology that significantly reduces the energy consumed by freezers in laboratories. That laid the groundwork for others to develop energy-saving models.

**What was the inspiration behind the International Laboratory Freezer Challenge?**

The sustainable laboratory community has been keen to address energy consumption of cold storage, and a competition seemed like a great way to

do that. When I<sup>2</sup>SL and My Green Lab launched the first North American Laboratory Freezer Challenge in 2017, that competition caused a significant level of interest from others outside North America. Thus, the organizations coordinated with sponsors to offer the International Laboratory Freezer Challenge in 2018.

**What were the results of the International Laboratory Freezer Challenge?**

More than 170 labs from around the world participated this year, collectively saving an estimated 1.6 million kilowatt hours. This is the equivalent of ~1,200 metric tons of CO<sub>2</sub>, or the CO<sub>2</sub> sequestered by more than 1,400 acres of forest.

**Who were the winners?**

We awarded both organizations and individual labs for their work. The individual lab winners were the Janssen Immunology Biology Lab at La Jolla, California, Immunology Therapeutic Area, Janssen Research & Development LLC; the Inorganic and Radiation Analytical Toxicology Branch at the Centers for Disease Control and Prevention (CDC) in Georgia; the Brain Inflammation Group, Luckman Lab, and the SPB Group Labs managed by Elena Redondo at the University of Manchester (England); and the Eye and Vision Biorepository at Eversight in Ohio. The organizational

**THE COMPETITORS COLLECTIVELY SAVED AN ESTIMATED 1.6 MILLION KILOWATT HOURS.**

winners were the University of Illinois Urbana Champaign, CDC, and the La Jolla, California campus of the Janssen Pharmaceutical Companies of Johnson & Johnson.

Winners were determined based on the amount of energy saved and the number of points scored by taking simple actions such as properly maintaining freezers, adjusting storage temperatures, and retiring and replacing inefficient units.

**Are there prizes?**

Yes, and this is one of them! People are very excited to have their pictures in *Nature*. Winners were recognized October 16, 2018, at the I<sup>2</sup>SL Annual Conference awards in Raleigh, North Carolina. The competition and prizes were made possible due to the generosity of our sponsors: Stirling Ultracold, Eppendorf, and Thermo Fisher Scientific.

**What do you see as the larger goals of the challenge?**

There are two main goals of the Freezer Challenges. The first is simply to raise awareness about the environmental impact of cold-storage. As former

scientists, neither Allison nor myself ever once thought about our lab refrigerators or -80°C freezers, aside from making sure they were still functional and that samples remained where they were left. And the second goal, given the environmental impacts is to educate scientists on what they can do to mitigate those effects. An additional benefit seldom seen by the scientists are reduced overhead costs. To be honest, scientists are wasting a lot of money. The money spent on creating, using and operating labs inefficiently, including cold storage, is not sustainable. The more we can do to reduce overhead costs for labs, the more resources can be redirected to research.

**Where is the Freezer Challenge headed in the future?**

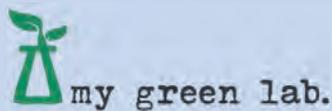
Both organizations, in conjunction with our sponsors, are hoping to offer the challenge in the future. Keep in touch with us at freezerchallenge.org. More information about our organizations can be found at i2sl.org and mygreenlab.org.



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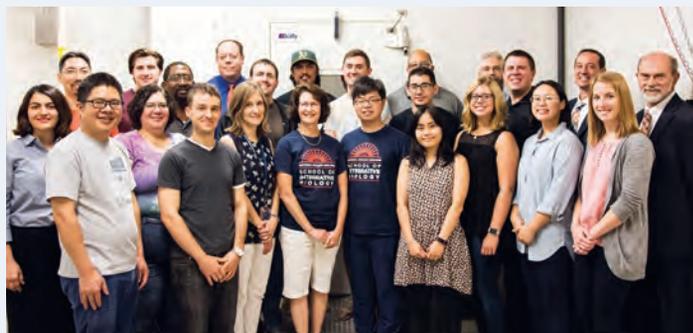


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## ORGANIZATIONAL



The University of Illinois, Urbana-Champaign



Centers for Disease Control and Prevention

## BOTH ORGANIZATIONAL AND INDIVIDUAL LABORATORY

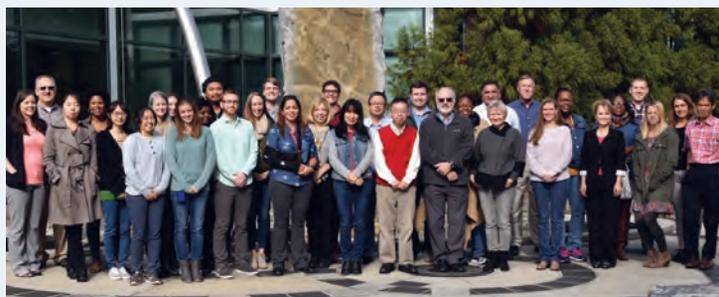


The La Jolla, California, campus of the Janssen Pharmaceutical Companies of Johnson & Johnson/Janssen Immunology Biology Lab

## INDIVIDUAL LABORATORY



The Brain Inflammation Group, Luckman Lab, and the SPB Group Labs managed by Elena Redondo at the University of Manchester



The Inorganic and Radiation Analytical Toxicology Branch from the Centers for Disease Control and Prevention



The Eye and Vision Research Biorepository at Eversight

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