

Preservation Breakthrough Enables Freeze Dried Blood with A Long Shelf Life

20 May, 2021

In 2016, bioengineer Jonathan Kopechek was using ultrasound to deliver drugs and molecules into cells at the University of Louisville when a graduate student from another lab, Brett Janis, came to him for help. Janis needed a way to get a preservative inside of cells to protect them from damage once they were frozen and he thought Kopechek's ultrasound delivery method could help him achieve it.

The experiment worked. The team was able to pack cells full of preservatives using ultrasound pulses, which protected them during freezing and, later, drying. The two teamed up with Janis's mentor, Michael Menze, with the goal of preserving cell lines for research. But they soon realized their discovery could have far reaching applications. Their first thought: preserving blood, which only lasts about six weeks if refrigerated. "We realized that if we could store blood as a dried powder, that it would no longer need to be refrigerated. That would allow it to last much longer," says Kopechek.

But making dried blood available to doctors and patients would require funding, entrepreneurial education, and access to expertise and resources. The team found all of those in a proof-of-concept grant through the NIH-funded University of Louisville Expediting Commercialization, Innovation, Translation, and Entrepreneurship (ExCITE) program. The grant allowed the researchers to build a flow device and show that their blood preservation technique could work. They founded a startup, DesiCorp, and published their findings in the journal Cryobiology.

“We realized that if we could store blood as a dried powder, that it would no longer need to be refrigerated. That would allow it to last much longer...”



The University of Louisville ExCITE
2301 S 3rd St,
Louisville, KY 40292

State-District
KY - 03

Technology
Medical Device

Primary Institute
Heart, Lung, and
Blood (**NHLBI**)

Project Details
from NIH RePORTER
The University of Louisville ExCITE

Contact
Jonathan Kopechek
jonathan.kopechek@louisville.edu

(continued on back)

ExCITE support also led to the team's acceptance into the National Science Foundation (NSF) commercialization accelerator program called I-Corps, Kopechek says. "We would have probably never gone through the I-Corps program without the experience that we had in the ExCITE program. That's where we first started thinking about commercialization." The team has since received funding from the NSF, Department of Defense, and NASA, as well as a Small Business Innovative Research grant from the Defense Health Agency, totaling more than \$2 million.

Kopechek says his team decided to start a company instead of licensing elsewhere because they wanted to see their invention make it to patients. Because of the ExCITE program, they believed they had the resources available to be successful, not only through funding, but through mentors and coaches who helped them navigate the product development process. "We didn't feel like we were trying to do this on our own," says Kopechek.

The company is currently completing blood preservation studies with cells and will soon start safety testing in animals.

Kopechek says he envisions a day when remote medical clinics, space programs, and military medics can stock blood long term instead of relying on supplies with a short expiration date. Someday, access to dried blood supplies could save millions of lives.

