



WHERE THE TESTING HITS THE ROAD

Flambeau Diagnostics creates game-changing sample prep for mobile testing.

BY **KIMBERLY HAZEN** AND PHOTOGRAPHS COURTESY OF **FLAMBEAU DIAGNOSTICS**

Dave Beebe (pictured above) is no stranger to ground-shifting ideas. At the University of Wisconsin–Madison, his research group in the Departments of Pathology and Laboratory Medicine and Biomedical Engineering spurred a fair share of companies pioneering the incorporation of industrial methods such as injection molding and micromilling. The 30 patent families resulting from these innovations are no accident.

So, when the public-private partnership Operation Warp Speed was announced to accelerate the development of COVID-19 vaccines, plus therapeutics and diagnostics, Beebe was ready. “I’ve been involved in close to 10 startups and, honestly, that’s the only reason this worked,” Beebe says.

His company, Flambeau Diagnostics, secured one of the coveted 25 spots in the National Institutes of Health (NIH) Rapid Acceleration of Diagnostics (RADx Tech) initiative, a \$500 million program to accelerate game-changing testing technologies.

While Operation Warp Speed is more widely known for the efforts to get a COVID-19 vaccine developed, it has a smaller initiative for diagnostics. It was in this program that Flambeau Diagnostics came to the table with new sample prep technology for saliva tests. In simple terms,

sample prep is how a sample is cleaned and the key component to be tested is isolated. Depending on the material taken from a human body, the sample may be easier or more difficult to clean.

Saliva is one of the “dirtier” fluids to sample, Beebe explains. “The challenge is that saliva is biologically complex and it’s coupled with other contaminants such as caffeine and food, so it makes isolating the key component a bit more tricky.”

“Mobile solutions are ideal for underserved populations.”

— Dave Beebe, Flambeau Diagnostics

Flambeau’s saliva-based RapidX test amplifies and detects the nucleic acid particles of SARS-CoV-2 RNA. Compared to nasal swab tests, the saliva sample is more comfortable and can easily be collected, even by the patient.

Knowing their technology was fast and easy, Beebe and his team took it on the road. Flambeau Diagnostics created and deployed mobile diagnostic laboratories that return accurate SARS-CoV-2 saliva test results in as little as one hour. “What we’re developing is an end-to-end solution that will allow people to give consent on their

phones, or even spit in a tube at home,” Beebe outlines. “Mobile solutions are ideal for underserved populations.”

The broader use of mobile testing could apply in rural towns where small populations don’t have access to easy testing, plus Native American reservations, and immigrant communities that are less trusting of conventional health care.

The end game for Flambeau Diagnostics? “Ultimately and personally, it all comes down to impact,” Beebe says. “Long term, we will judge our success on the impact on the next pandemic.”

To this end, the instrumentation has been designed so that it can run any assay and easily and quickly be adapted for a new reagent.

Since the time needed to develop vaccines for new infectious diseases is critical, and contact tracing and containment are critical for stretching out the time needed for vaccine development, Flambeau Diagnostics aims to provide a way to mobilize testing to identify and contain early infections. “If we could have stretched out that first part of the current pandemic — even by a couple of months — we could have saved a couple hundred thousand lives,” Beebe states. “That’s where our solution will have a huge impact.” **IB**