Three inside one: biobank, CRO, reference lab

Valerie Neff Newitt

December 2019—Don't even try to put Boca Biolistics into a box. The Pompano Beach, Fla., company is the rare outside-the-box model of three levels of service under one roof: an expansive biorepository, a contract research organization, and a reference laboratory that earned CAP accreditation in March.

Mauro

Joseph Mauro, president and CEO of Boca Biolistics, has been developing the "new" model for two decades. "The thing that makes us different is that we're a vertically integrated company encompassing a biobank, CRO, and reference lab. There aren't many players in this space. LabCorp and Quest have been buying CRO companies, so they are moving into that area, but they are not biobanks. They do not have all of the platforms we have."

Mauro lists the benefits to what he describes as "one-stop shopping": a shortened turnaround time between collecting and testing samples and generating and providing data, cost consolidation and package discounting, and less stress on the clients' own staff.

One of its clients is Hologic, where Sree Panuganti, PhD, is a scientist who develops diagnostic assays. "At Hologic, we have considered all three levels of service that Boca provides for various projects, and we've selected one or two based on our project-specific requirements," Dr. Panuganti says. "It's hard to pick one service that we find most useful. Some projects use the biobanking services more than other services. For our current project we find the reference testing is the most important service." For that, she says, she's impressed with the turnaround time and high-quality results.

Dr. Kiechle

Frederick L. Kiechle, MD, PhD, is chief medical director of Boca Biolistics Reference Laboratory. Having spent 33 years directing clinical laboratory divisions at the University of Pennsylvania, William Beaumont Hospital in Michigan, and, most recently, Memorial Healthcare System in South Florida, Dr. Kiechle says, "I've experienced it all—academia, staff pathologist at a health care facility, and private practice—and I understand the value this model brings to pathologists, labs, hospitals, diagnostic companies, and others."

Often tasked with serving as principal investigator, Dr. Kiechle guides projects bound for the Food and Drug Administration through Boca Biolistics' CRO division. "I oversee specimens when they arrive, what we do with them, and their final disposition; comparative testing; data collection and handling. I've had plenty of experience with CRO and FDA projects, and it's a big job to make sure it all runs smoothly and stays on deadline," he says.

When CRO work is done in a busy clinical lab setting, he says, it can paralyze normal operations. "A great deal of

extra time is required of the PIs, usually a PhD or an MD running that section of the lab, as well as the technologists and technicians who must run the tests. Consider that some of these projects require testing 10,000 specimens in a short period. It can shut down normal service activity." Once this work is done within a busy hospital lab, the staff will never want to do it again, Dr. Kiechle says, adding that all of it can be handed over to a CRO.

Sharon Stosur, MS, MLS(ASCP)^{cm}, founder and president of the nonprofit Preeclampsia Paradoxology for Professionals and a former specimen acquisition specialist for a large IVD manufacturer, says Boca's multiple levels of service are a plus for sample integrity. "Specimens can be procured, tested, aliquoted, and stored, which offers greater assurance that the specimens have not been subjected to excessive shipping and handling, with the added risk of diminished sample integrity."

The client journey typically begins with Biobanx, the company's biorepository. "When a diagnostics company or a lab is developing a new assay or revamping an existing assay," Mauro says, "they first need to do research and development, which requires specimens from archives in a biobank. We can provide them with the specimens they need."

Once clients know their assay or platform works, they prepare to take it to clinical trials. "We can help them with specimens there, too. We ask clients what they are looking for. They may say, for example, they need to prospectively collect a thousand HIV patients and the associated clinical data to test on their platform. In this case, they do not want biobank specimens but instead prospectively collected patients like in any normal setting."

The CRO department handles the regulatory components of prospectively collecting samples, getting them consented, and gathering the paperwork required for FDA submission.

The CRO differs from others in that it is full service, Dr. Kiechle says. "Sometimes that includes helping to design and write proposals. Or, if you hand us a proposal, we'll show you a budget and how we can help you get it done most efficiently."

The specimen collection process is extensive. "We are distinguished by our very large global reach in specimen acquisition," Mauro explains. "For example, if you are conducting an HIV study, you need HIV samples from around the world to make sure you have a valid assay that is picking up all the different strains and subtypes in HIV-1 and HIV-2. The only true way to do that is to get samples from Africa, Latin America, Asia, the United States, et cetera. We currently gather samples from more than 50 countries around the world."

Such widespread geographic sample gathering is difficult for many laboratories, he says. "It's complex and takes time and effort. They have to get those countries set up to be able to provide them with samples. They have to get export approval, and they must deal with the foreign ministries of health to get permission from each country. Then a CDC import permit also must be maintained."

Gulrez Singh, MS, formerly of Roche Molecular Systems as director of biospecimen management, began using Boca in its early days. "They were one of our key suppliers, sourcing a variety of well-characterized biological materials of human origin, from geographically diverse populations, with reasonably short turnaround times," she says. "In those days biobanking was a novelty, and their service was unique. Though more vendors have since entered the global material acquisition scene, these guys went into tough environments, such as West Africa when there was civil unrest, for example, and they always successfully worked around it." New companies are still on the learning curve, Singh says. "These guys have perfected their work. Experience matters."

Boca's collection gathering prowess was fully demonstrated during the height of the Zika outbreak in 2016. The company found itself in the enviable position of having already collected a mountain of samples from the Dominican Republic. "When Zika started to explode, we started doing longitudinal draws from patients," Mauro says. "We collected serum and plasma and urine. We had monstrously deep involvement in Zika as it got more and more active."

That year Mauro was invited to a worldwide Zika conference in Washington, DC. "Keep in mind that a company like

mine and people like me normally do not get invited to events like that," he says, noting that such spots are usually reserved for academicians, researchers, and makers of diagnostic tests. "However, I presented all of the specimens that we were collecting." At that point, Boca Biolistics had already been in discussion with the FDA as diagnostic companies were clamoring to get Emergency Use Authorization approvals.

He says about a dozen assays became available relatively quickly because of the samples they provided, which allowed for EUAs. "I feel we are indirectly making a contribution to patient testing and clinical evaluations. We're not making the tests, and we're not doing the research, but we're providing important resources for both."

"It's an incredible story," Dr. Kiechle says. "In the year and a half I've been here, I've already written two abstracts for Zika and one abstract for dengue based on data we've collected in the Dominican Republic. And there is still so much more information to pull out. It is like sitting on a gold mine."

When proposals have been considered and samples gathered, clients can elect to have testing done at Boca Biolistics Reference Laboratory.

"Our newly acquired CAP accreditation is helping this part of the business to grow. It took us a lot of time and effort to get it, and we are very proud of that distinction," Mauro says. "Diagnostics companies are now saying, 'You've given us the research samples and you are doing clinical trial collection. Now can you also do testing for us as part of the submission package?' The answer is yes. We can do all manner of comparative testing."

Clients can specify the platform or platforms on which they want an assay tested—Abbott, Roche, Hologic, DiaSorin, Bio-Rad, Cepheid, Accelerate, and Gold Standard Diagnostics. "We are bringing on new platforms from new manufacturers in 2020," he says.

"We proceed to test the samples in our lab, generate the data, and provide it to the client along with the rest of the samples we collected. Now they can take that entire package and, if they don't need anything further, submit it to the FDA," Mauro says.

Boca can handle submissions to the FDA on behalf of a company, he says. "We do have the capability to do the biostats on the data that come out. We are able to submit to FDA and we have done that process, though infrequently, for some smaller companies. The larger companies have their own regulatory staff and typically do it in-house. But can we do it? Sure. Everything from selling research samples, clinical trials, and then comparative testing. That's really what makes us different."

Offering a closer look at the reference laboratory, Mauro says: "We don't do a lot of clinical testing yet, but now with CAP accreditation we hope to expand in that area. But most of the testing we do is research based or in response to diagnostic companies that need us to do testing on their samples or their assays to make sure they work."

For comparative testing, sometimes clients' requests are instrument specific. "For example, a company might say, 'We need to do testing but we want it done on the GeneXpert.' Great. We've got that," Mauro says. "Sometimes they'll say, 'We just need another competitor that is an approved assay, so tell me what you've got.' If we have it, we have it. If we don't, we network with another reference lab that does. We'll work with one of our partner labs and say, 'We've got this study, we're going to do this component, then we'll send the samples to you to do the other component.' The reference labs we're working with see that as good revenue. It's diagnostic. They're not billing insurance, Medicare, or Medicaid. They're basically getting a check from industry and that's very attractive."

Most of the testing currently falls into three categories: tropical diseases (much of which revolves around dengue studies), oncology, and infectious diseases. It is oncology services that Mauro foresees enabling the company's expansion. "The oncology space is hot—has been for years—but recently it's through the roof. Our clients are putting a great deal of money into oncology research, liquid biopsy specifically. As a result, we are putting a substantial amount of our resources—revenue and staffing—into oncology. Then we will drill down a little more, mainly looking at doing liquid biopsy."

He and others at Boca are talking now with companies about three or four contract projects of more than $1 million each. “Initially we are going to help with the collection of solid tumors—biopsies or resections—from all over the world,” Dr. Kiechle says. “We’re also going to collect plasma specimens over a period of six months or five years, depending on the client. In those specimens we’ll be looking for circulating tumor DNA to see how well they predict disease and/or relapse versus using usual cancer biomarkers. So that’s phase one.”

Boca is partnering with a next-generation sequencing laboratory (one Mauro hopes to acquire) so that collected specimens can undergo genomic testing. “That’s the last piece of the puzzle for us—to have a component of our lab that can do NGS testing. This way we can add value to specimens,” Mauro says. “If a researcher is looking for 100 breast cancer tissue sets with specific biomarkers, the whole genome sequencing will already be done. Would that help? Of course. So again, we’re back to the concept of trying to be that one-stop shop.”

Boca is also guiding other labs to mine the value in their own specimens. “More and more frequently, hospital labs and other reference labs are looking to develop or implement a biobank for themselves that would allow an additional stream of income,” Mauro says. “Instead of just testing samples, they could be selling samples that are valuable for research. Right now they are throwing those samples out. We don’t see it as a conflict. Helping a lab to generate extra income or just preserve a resource it already has instead of discarding it definitely pushes research forward.”

Turning the sale of specimens into a new income stream for labs requires minimal work and resources, he says. “We have one lab that employs a licensed tech to pull samples and ship samples to clients. But when the tech is not doing that, he’s working for the lab in other capacities. So it’s a full-time salaried employee who is generating even more money for the lab—a financially viable asset.”

Mauro calls this revenue “bottom-line” money because it is selling samples that otherwise would be discarded. “And just throwing them out, logging biohazards, and so on, adds up to revenue that you have to spend to get rid of the samples. So a lab is saving a little bit. And in today’s health care economy of diminishing reimbursements, every single dollar counts.”

Valerie Neff Newitt is a writer in Audubon, Pa.