

Ignacio Pino Co-Founder & COO, CDI Labs



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CDI Labs, founded in 2008 in Mayagüez, Puerto Rico, is a specialized CRO focused on drug development and clinical-stage research, particularly in antibody specificity, biomarker exploration, with emphasis on autoimmune diseases and immunoncology. CDI is leveraging proprietary technologies like its "human on a chip" system to analyze protein interactions and advance the understanding of antibody-antigen relationships. Ignacio Pino, co-founder of CDI Labs, established the company with a vision to make a significant impact in Puerto Rico's emerging biotech sector. Despite challenges in attracting investment to Puerto Rico, CDI Labs has secured institutional backing and built a strong leadership reputation in the protein interactomics field.

Could you provide an overview of CDI Labs?

CDI Labs is a specialised Contract Research Organisation (CRO) that offers deep insights into the immune system. Whether it is in the drug development phase helping to select monoclonal antibodies for therapeutic or diagnostic programmes or focusing on the clinical stage, we are able to thoroughly investigate the specificity of these molecules, which is critical in this field.

Our work also extends into the immunology space, where we explore biomarkers, particularly autoantibodies. These are antibodies that mistakenly target the body's own tissues, and they are

commonly found in conditions such as cancer, autoimmune diseases, and neurological degenerative disorders. A good example would be diseases like multiple sclerosis, which have been extensively studied in this regard, as well as emerging concerns like long COVID, where the generation of autoantibodies is increasingly linked to the symptoms experienced.

At CDI, we partner with pharmaceutical companies and academic institutions, particularly large research centres, to explore these areas in great depth.

We are now advancing further with newer technologies, which allow us to bring the same level of insight into other parts of the human proteome. The proteome refers to all the proteins in our body, many of which are either damaged or altered in disease. Ultimately, the answers to most diseases lie within the interactions of these proteins.

At present, we are focusing on one of the most crucial interactions—the antibody-antigen relationship. However, our vision is to expand this focus and decode the entire range of protein interactions within the human body.

What technologies does CDI Labs provide?

At CDI Labs, we take pride in the fact that our approach is quite unique. One of the key factors that sets us apart is that we design and manufacture most of the reagents and essential components used in our own tests. These are proprietary technologies that we have developed, which means that the services we offer and the interactions we have with our clients are built on our own inventions.

We also hold the largest collection of human proteins that can be used in large data experiments. To put it simply, it is like having a “human on a chip.” We print these proteins onto a glass slide, which allows us to display them in such a way that we can test them with various substances—whether it’s a drug or a patient’s serum. This is an extremely powerful tool.

By using this “human on a chip,” as well as several other variations that we have developed, we can explore the immune system in a much deeper way. It is a bit like the difference between looking at the immune system through a telescope and looking at it through the Hubble Space Telescope. The level of detail and insight we can now achieve is far beyond what was previously possible.

As for our clients, while we don’t work directly with the manufacturing arms of companies in Puerto Rico, we do engage with the R&D departments of many of the large firms based there. These companies are primarily focused on biologics, antibody therapies, and immuno-oncology. A significant portion of our work revolves around these areas, particularly in the context of autoimmune diseases, cancer, and the development of cell therapies.

Additionally, we have recently started collaborating with vaccine developers, as newer research is uncovering the role of self-generated antibodies in diseases like long COVID.

Given the increasing demand for specialised CRO services, what makes Puerto Rico an ideal hub for growth?

There are a few key factors. In the CRO environment, you need a balance between research and manufacturing. It is a hybrid model. On one hand, you need a research lab that fosters innovation, with highly skilled and intelligent individuals developing novel concepts. On the other hand, you must operate with the same precision and caution as a manufacturer, especially when it comes to quality. Research is conducted within a quality framework, ensuring that the data we produce is reliable. This is crucial for our clients, whether they are in the pharmaceutical or biotech industries, as they often use this data to support their drug development dossiers or to present biomarkers to regulatory agencies. In the case of academic institutions, high-quality data translates into high-quality publications.

Puerto Rico stands out because of its strong history of pharmaceutical involvement. We've developed a deep-rooted understanding of quality. Here, the concept of a quality department is widely recognised, and this awareness is ingrained within the local workforce. It is something that is sometimes overlooked in other ecosystems. As a result, Puerto Ricans tend to have an inherent understanding of what is required to maintain quality standards and achieve positive outcomes. This familiarity with quality processes is absolutely critical to success.

Talking about antibody development, the field has expanded rapidly, particularly with China building significant manufacturing capacity. What sets CDI Labs apart in this competitive landscape?

Initially, we developed thousands of antibodies, and while the development process itself is important and has its unique aspects, what really sets us apart is our screening methodology. It is not just about making antibodies; it is about evaluating how specific those antibodies are. This is where we truly shine. We are able to scrutinise how precisely an antibody binds to its intended target without interacting with anything else—this is what makes an antibody effective. It is supposed to be like a silver bullet, and we can assess just how well it performs in that regard.

Over time, we have moved from not only developing and screening our own antibodies to screening those developed by others. We put them through rigorous tests, and if they don't meet the necessary specificity standards, they don't progress to the next phase of development. Specificity is absolutely critical for these molecules.

I would confidently say that, from our experience in R&D, we are among the best in the world when it comes to screening for specificity. I can back this up with over 400 research papers published on the subject.

However, our expertise doesn't stop at R&D. We are also highly proficient in manufacturing, particularly at smaller scales. This allows us to conduct experiments efficiently, and Puerto Rico's broader ecosystem excels in scaling up production. If any of the antibodies we have screened or developed here need to move into clinical settings, we can seamlessly manage the tech transfer process. This means we provide the initial recipe for the manufacturing process, ensuring that pharmaceutical companies can scale up production without compromising the key attributes of the molecule.

When we talk about specialised services, fields such as CRI, SPR, and cell engine technologies have yet to see significant manufacturing activities in Puerto Rico. Why is this offering important for CDI Labs, and which clients are you aiming to serve?

At CDI Labs, we focus on our core strength—providing highly precise, proprietary specificity. In many ways, we approach molecules differently from technologies like SPR (Surface Plasmon Resonance) or BLI (Bio-Layer Interferometry). While those methods tend to focus on affinity—essentially, how tightly molecules bind—we are more concerned with identifying who binds, and just as importantly, who doesn't bind. This distinction is what we excel at delivering.

However, we recognise that our work is part of a larger process. Eventually, the molecules we study will need to undergo testing under BLI or SPR conditions. In Puerto Rico, this is currently handled more through public-private initiatives, such as those supported by the Molecular Science Building. For instance, if a client requires both our specific screening and BLI measurements, we could partner with such organisations to provide a comprehensive service.

Ultimately, if we see a sustained demand for these capabilities from our clients, we would certainly consider expanding our services. For now, however, we are staying focused on what we do best—ensuring the highest quality and specificity in our screening processes.

Looking ahead, how do you envision CDI Labs' growth trajectory?

The future looks incredibly promising, particularly as we find ourselves at a pivotal moment in life sciences where high-quality data is more critical than ever. One of our key focuses will be extracting as much value as we can from the field of artificial intelligence.

In some areas, training AI is relatively straightforward—there is an abundance of literature and resources available online. But when it comes to training AI to predict how a drug will bind, the necessary data simply isn't readily available. Fortunately, this is where we come in. We have the ability to generate that data in large quantities—essentially providing the raw material that these AI systems require to learn and evolve.

The need for vast amounts of data is essential because these algorithms need to be fed large datasets to learn and then tested to refine their predictions. So, while the long-term goal is to create AI models that can predict drug interactions with high accuracy, each screening we conduct along the way contributes not only to the growth of our data but also to the immediate discovery of something potentially ground-breaking. For example, discovering a panel of biomarkers or identifying an autoantibody responsible for a particular disease.

These immediate findings are invaluable, but they also form part of the larger dataset that we will feed into the AI training process. We aim to provide highly curated, high-quality data—data that our clients can then pass to their informatics teams to help train more effective predictive algorithms. This is the type of data that will allow AI to fulfil its potential, particularly within the field of life sciences.

Is the local talent pool equipped to support initiatives in AI and data analytics?

While there are areas where further collaboration with government bodies and other key players in the ecosystem is needed, we are optimistic about the potential for growth. By engaging with these stakeholders, we can gain valuable insights on how to accelerate progress, such as identifying gaps in the education system that need attention. We are actively involved with the University of Puerto Rico, particularly the Mayagüez campus, which is just two blocks away from us. We regularly participate in curriculum reviews in panels composed of representatives from multiple companies,

and it is encouraging to see how our feedback shapes the academic programs. While there are still areas to improve, we have a strong and growing talent pool.

Founded in Mayagüez in 2008 with just three employees, our company now has 38 team members, most of whom are based here. While we have a manufacturing site and demo centre in Maryland, a sales team in the U.S., and a small office in Toronto to access specific knowledge, our goal is to build that expertise here in Puerto Rico. With continued collaboration, I am confident we can foster the specialized knowledge we need locally.

What challenges have you encountered in building CDI Labs, particularly when it comes to attracting investors to Puerto Rico?

Attracting investors to Puerto Rico has been a challenge, but we have made significant progress. For the first time, we have convinced institutional investors specializing in CROs and R&D services to back us, which is a big step forward. However, I believe we could have reached this point much sooner had we been in a more established ecosystem like Silicon Valley or Cambridge. We have taken proactive steps, opening a small office in these ecosystems to establish a presence. But our core strength remains in Puerto Rico—our loyal, dedicated team, which is the engine driving CDI Labs.

Despite the challenges, we have managed to build CDI Labs with a fraction of the capital compared to other companies in similar fields. This speaks volumes about what can be achieved here. Today, investors are more focused on capital efficiency and sustainable investments, and the companies that can thrive with minimal resources will ultimately succeed. We are building that foundation and, as we continue to prove ourselves, I am confident more capital will follow.

What we really need now are success stories. CDI Labs needs to reach full maturity, whether that is going public or being acquired. We need to become a case study for others to emulate. In established ecosystems, success stories are common, but here we are still laying the groundwork. By focusing on what is working well, we can draw attention to Puerto Rico's potential and open doors for future growth.

Puerto Rico has something unique—we have an intrinsic connection to biology. Our understanding of life sciences is deeply embedded in our culture and DNA.

On a more personal note, you have mentioned your background in veterinary medicine, and now, you are a biotech entrepreneur. What led you to found CDI Labs?

I have always had a passion for veterinary medicine, practicing it for nearly a decade. However, a personal experience shifted my career path when my father was diagnosed with cancer. This situation prompted me to explore how I could apply my knowledge to address something so close to home. At the same time, my father was an entrepreneur in real estate, and I found myself stepping in to help him complete his projects. Balancing veterinary practice and learning about real estate became an unexpected challenge, but it also ignited my entrepreneurial spirit.

After my father's passing, I was determined to create something meaningful in Puerto Rico. I connected with pioneers in Puerto Rico's biotech sector, who recognized the local talent, the government's support, and the strategic advantages of the island for biotech development. This environment, with its skilled workforce and ideal location, drew me into the field.

Until recently, I served as CEO, but I stepped down to allow for continued growth. A few years ago, I brought Barney Saunders on board, whose extensive expertise in research tools and diagnostics has been invaluable to our team. With his guidance, our reputation has strengthened, and he now enjoys the lifestyle and opportunities Puerto Rico offers, embracing the risks and rewards of building something impactful on the island.

What would you like your final message to be for our global readers?

My advice would be to not focus solely on the pursuit of success. For those with the capital to invest, there is a responsibility to consider the broader impact of their actions. While making money is important, it should be done with purpose. We need to foster a mentality of “money with purpose” in today’s world.

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