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Scientists' startup shines light on blood

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The scientist was fascinated by light.
The doctor specialized in blood.

They were both experts in their fields, happily toiling away in separate corners of the University of South Florida in Tampa.

But it was only after they started working together that the men discovered how blood and light could work together in a revolutionary way.

Now, Dr. German Leparc, USF scientist Luis Garcia-Rubio, Ph.D., and colleagues have formed a company to market a new way to test human blood for diseases. Their approach shines a beam of light into a sample of blood, which they say is quicker, cheaper and easier than the standard diagnostic tests used everywhere.

The founders of Claro Scientific believe their test could save lives around the globe by eliminating the need to send blood samples to distant labs and waiting days for results. They also believe it could make money.

Leparc looked around Claro's lab in rented space in north St. Petersburg last week and only half-jokingly said, "I think we're almost at the stage where Hewlett and Packard were in their

sacred garage."

This Tampa Bay startup is a long way from becoming the next HP. But it is the kind of venture Florida's government and business leaders are increasingly interested in launching: high-tech innovations that begin in universities like USF and promise to grow into lucrative businesses.

As Claro's experience already shows, it takes years to move from brainstorm to viable business, and no one can guarantee success. Claro still must win Food and Drug Administration approval and obtain more financial backing.

"There is so much potential," Leparc said, "but we are just at the very, very, very beginning."

The process began more than a decade ago in the lab and mind of Garcia-Rubio.

At the time, he was a professor of chemical engineering at USF using a spectrophotometer to analyze particles in liquids such as paint. This device sends a beam of light into liquid and splits the light into different wavelengths. He was looking for ways to test paint and other products by analyzing what happened to the light that passed through them. Leparc was working for Florida Blood Services, then headquartered at USF.

The two started talking about using the process on a liquid far more fundamental than paint: blood.

Garcia and colleagues learned they could place blood samples in the spectrophotometer and find specific patterns in the wavelengths of light. The patterns revealed whether the samples contained diseases such as malaria, or bacterial infections.

They spent years developing the math and computer programs to identify the distinct "fingerprints" of more than 70 pathogens that can cause diseases.

"We opened a window that was really not open before," Garcia-Rubio said.

This suggested some exciting possibilities.

Workers could take spectrophotometer kits into remote regions of the world and instantly diagnose specific diseases. Such tests now take days before results are available.

The process has applications in the United States as well.

Doctors could use it to diagnose the exact cause of a patient's fever. Now they often treat fevers with antibiotics that attack common pathogens, but which may not pinpoint the specific cause of the illness, Claro officials said.

It also could diagnose a toxic condition called sepsis, which results from infections that sometimes begin after operations. This could give doctors earlier warning about the condition.

Leparc, chief medical officer for Florida Blood Services, said he's especially excited about using the process at a patient's bedside before a blood transfusion. He said as many as 20 people die each year because they receive the wrong blood type. Doctors could use the new process to double-check blood type immediately before transfusion.

"That's one of the applications that gets me excited, because we're in the process of saving lives," Leparc said.

Claro officials say the process also can be used with liquids other than blood, including saliva and tears. For example, they believe it also would be a quick and practical test for urinary

tract infections.

These brainstorms were really just Act 1 in the development of a viable business.

Now Claro officials are moving into the second act: attracting venture capital, testing the process and seeking regulatory approval.

Last year, Garcia-Rubio, now a professor at USF's College of Marine Science, research scientist Debi Huffman and others traveled to a remote, malaria-infested region of Venezuela. Their process proved as accurate as the standard test, they said.

One of the early believers was Innosight, founded by Harvard Business School professor Clayton Christensen, which also employs Matt Eyring, the acting chief executive of Claro.

The company recently got a boost when it learned Jose Olivares, deputy division leader for bioscience at the Los Alamos National Laboratory, would join Claro's management team. Olivares worked with Garcia-Rubio on a national security-related project to use the new process to detect bacteria in water, and he grew excited about the possibilities for public health applications.

"The main thing is, I've seen what it can do," Olivares said. "It's been very successful in the applications that we've challenged it with in Los Alamos."