

Persistence pays off for researchers aiming to stop parasitic infections



Above: With your support, Dr. Gustavo Salinas and his team in Uruguay are using Instrumental Access equipment to advance their work combatting parasitic worms.

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In Uruguay, your support is helping shed new light on a public health scourge...

Almost one-quarter of the world's population is infected with parasitic worms called soil-transmitted helminths (STH).

These roundworms, hookworms, and whipworms **cause devastating diseases in humans, livestock, and pets.** Left untreated, the parasitic infections can result in malnutrition and impaired development in young children.

Roundworms in particular are the culprit behind several of the WHO's **neglected tropical diseases**, which mostly affect impoverished communities in tropical climates.

But thanks to an important discovery made by an Instrumental Access scientist in Uruguay, there's **hope for new treatments in the future.**

Infrastructure promotes innovation

In 2014, the Department of Biological Sciences at the **Universidad de la República in Uruguay** received an Instrumental Access award.

This influx of Instrumental Access equipment—made possible thanks to your support—helped **Gustavo Salinas, PhD**, and his team accelerate research in molecular parasitology.

His lab put the equipment to use in their work focused on **treatments for infections** caused by one type of STH: roundworms.

Dr. Salinas and his colleagues at the Universidad de la República in Montevideo are the **only research group working with the worm in Uruguay.** They

Stopping parasitic infections ... continued

are pioneering its use as a model for studying its more harmful infectious cousins.

Eight years after the Instrumental Access shipment arrived, Dr. Salinas' lab continues to work on the global public health scourge of STH. Now, they are concentrating specifically on **how the parasitic worms obtain, use, and store energy**.

With patience and persistence, and a foundation of equipment from Seeding Labs, they are now beginning to **understand how STH thrive in the human body...** a key to preventing them from ravaging their hosts.

Piecing together a parasitic puzzle

Soil-transmitted helminths have evolved to flourish in two very different types of environments: in soil, where oxygen is typically plentiful; and inside the gut of a host, where oxygen is scarce.

While infecting a host, the **parasitic worms have a clever survival technique**: they can transform their metabolism and respiration to survive without oxygen (anaerobically).

Scientists already understand how STH survive in both aerobic and anaerobic environments. But precisely how the worms trigger the switch from aerobic to anaerobic survival **remained a mystery... until now**.

Dr. Salinas and colleagues recently **identified a previously unknown gene splice variant** that is key to the switch.

“Our research is guided by understanding how worm parasites live within the human body,” says Dr. Salinas. “We **identified the worm’s Achilles’ heel**, which opens the door for new treatments that are really needed.”

Being able to zero in on the gene splice variant means **scientists have a new weakness to exploit** in the STH, and potentially, a new target for treatments.

The gene splice variant is notably absent in humans. Therefore, it may be possible to develop new drugs that are strong enough to **eliminate the parasite without harming the host**.

Humbly, Dr. Salinas says that the findings so far are modest.

“Having the equipment we needed to move forward, when and where we needed it, made a huge difference. That’s what your support made possible.”

Yet the potential **impact of this discovery is truly exceptional** for the 1.5 billion people affected by STH worldwide.

Hope for the future

It is a testament to Dr. Salinas' perseverance that research on STH has advanced so far. What he and his collaborators have uncovered is a **big step forward in treating the parasites** that infect so many.

“Having the equipment we needed to move forward, when and where we needed it, made a huge difference. That’s what **your support made possible**,” says Dr. Salinas.

With instruments in place, he and his team continue to move forward in their quest to **eliminate these parasitic infections** for good.



Dr. Salinas (*center*) and his team have “identified the worm’s Achilles’ heel,” he says, opening the door for new treatments capable of combatting parasitic infections.

This is just a taste of Dr. Salinas' research! To learn more about his lab's work in parasitology, please visit their home page at <https://pasteur uy/en/laboratories/worm-biology-laboratory/>

2022 In Review: A selection of highlights made possible with your support!



January 2022

More than 7,000 pounds of Instrumental Access equipment arrived at the University of Lagos (Unilag) in Nigeria to **accelerate research on malaria and neglected tropical diseases**.

Thanks to supporters like you, Unilag will equip a WHO-accredited Centre of Excellence that is engaged in a large-scale study of a **new malaria rapid diagnostic test**.



September 2022

Editors of Springer Nature and our partners at Takeda held a panel discussion, “**Achieving Health Equity Together**,” featuring the work of Seeding Labs.

Instrumental Access awardee Dr. Robert Paulino-Ramírez (*above left*) of the Universidad Iberoamericana in the Dominican Republic shared his experience **responding to his community’s public health needs**, which was bolstered with equipment from Seeding Labs—and made possible by your support.

Our CEO Melissa P. Wu, PhD (*above right*), described how scientific resources are distributed inequitably around the globe. She called for a shift of allocations to **include researchers and their institutions in developing countries**.



June 2022

Thanks to your generosity, our **first-ever Instrumental Access shipment to Botswana** left our warehouse! Equipment now has a new home at Botswana University of Agriculture & Natural Resources (BUAN).

“Instrumental Access equipment is coming at the right time; it will **help us do cutting-edge research** fast and productively here in Botswana,” says Dr. Force Thema of BUAN (*above, far right, with students*).

Equipment will support **teaching and research on sustainable development** in the agricultural and natural resources sectors.



October 2022

To celebrate the expansion of our partnership with Thermo Fisher Scientific, Instrumental Access awardee Dr. Abebaw Fekadu Wassie (*above right, with students*), head of the Center for Innovative Drug Development and Therapeutic Trials for Africa (CDT-Africa), was invited to speak to their leadership team in California.

Dr. Fekadu shared how the partnership supports CDT-Africa’s vision “**to establish a state-of-the-art African biomedical discovery lab** for students from across Africa to receive training.”

Thank you for your generosity that sustains our work! To support achievements like these in 2023, please visit <https://donate.seedingslabs.org>.



Twins study delivers new findings!

Two Nigerian scientists one step closer to explaining high rate of twin births

Two Instrumental Access-supported scientists, Profs. **Roseangela Nwuba, PhD**, of the University of Ibadan, and **Akhere Omonkhua, PhD**, of the University of Benin, recently shared an **inspiring update on their collaboration**, which we first told you about in last year's Impact Report.



Using molecular biology techniques made possible by their Instrumental Access shipments, they are **making strides toward understanding** why Igbo-Ora, Nigeria, has the world's highest rate of non-identical (dizygotic, or DZ) twins.

They began by **examining the local diet** to understand its effect on fertility. Profs. Nwuba and

Omonkhua found that diets contained foods rich in a chemical called phytoestrogen.

Phytoestrogens are the catalyst for **“a cascade of events that cause twin births,”** Prof. Omonkhua explains.

This exciting initial phase of research is **slated for publication** in the coming months.

And now, these brilliant researchers will turn their joint investigation to **examining the genetic factors** that may also influence the rate of DZ twinning in this part of Nigeria.

Instrumental Access equipment—provided thanks to your generosity—have helped them **pursue the next stage of their research**. *Thank you!*

Learn more about this groundbreaking collaboration at <https://seedinglabs.org/twinning>

Opening up a world of scientific opportunity for scientists-in-training

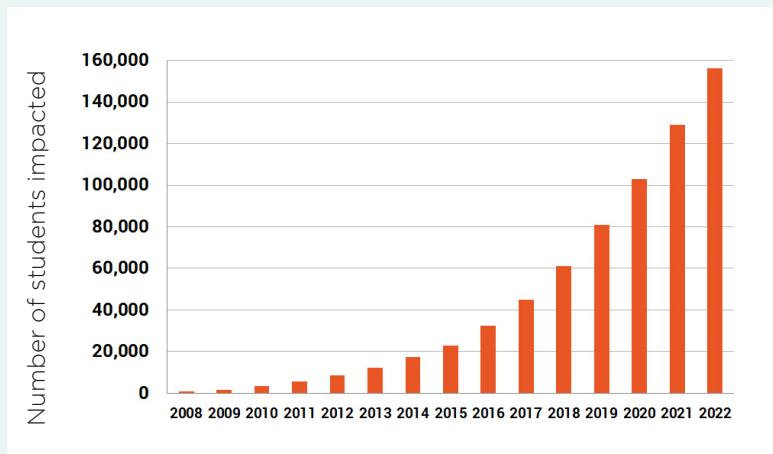
With your ongoing support of Seeding Labs, more university students each year are experiencing a world of scientific opportunity at their fingertips.

This chart shows the number of students each year whose training has been **impacted by your generosity...**

Since 2008, **156,000 students** worldwide have access to much-needed equipment at their universities.

No more traveling great distances to better-equipped labs... no need to watch videos of experiments online... no crowding around one single instrument...

You have helped make **hands-on STEM education** possible for thousands of scientists-in-training and counting!



Pictured above: Each year, the number of university students with access to equipment from Seeding Labs has grown, thanks to your continued support!

You can continue that support by making a gift at <https://donate.seedinglabs.org>