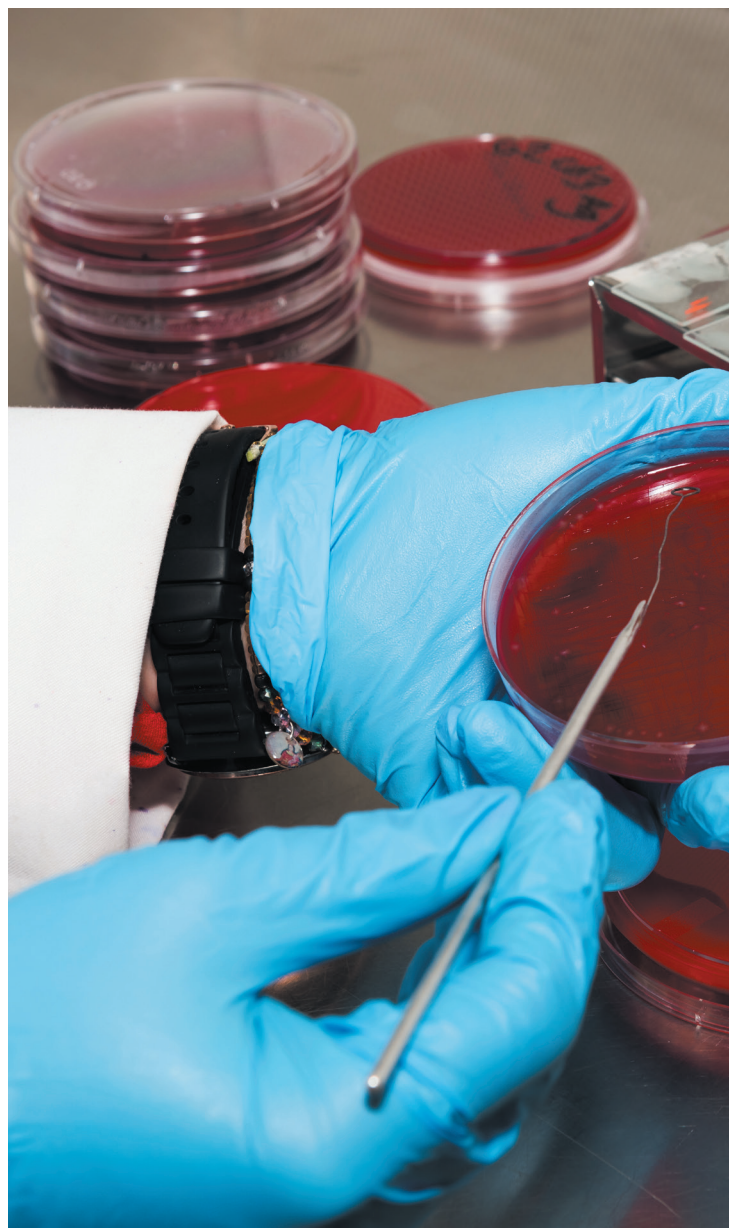


MOLECULES GIVE UNIVERSIDAD DEL ROSARIO RESEARCHERS CLUES ON TACKLING DISEASE

The Research Center on Genetics and Genomics (CIGGUR) at the Universidad del Rosario carries out state-of-the-art research with practical applications for translational medicine. Its major goals are to continue training scientific researchers and become one of the world's leading research centers in its field.

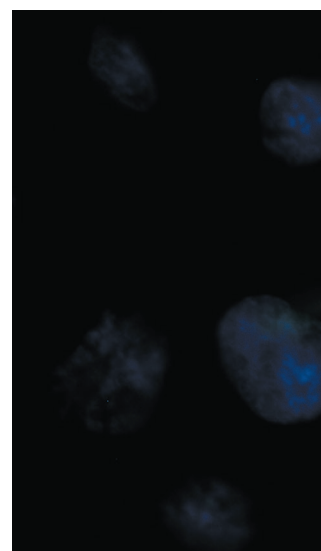
At the end of 2015, the Universidad del Rosario won a major acknowledgement: the GENIUROS Research Group, under the leadership of Dr. Paul Laissue at the School of Medicine and Health Sciences picked up the annual First Prize for Scientific Research, the most prestigious award issued nationally by the National Academy of Medicine.

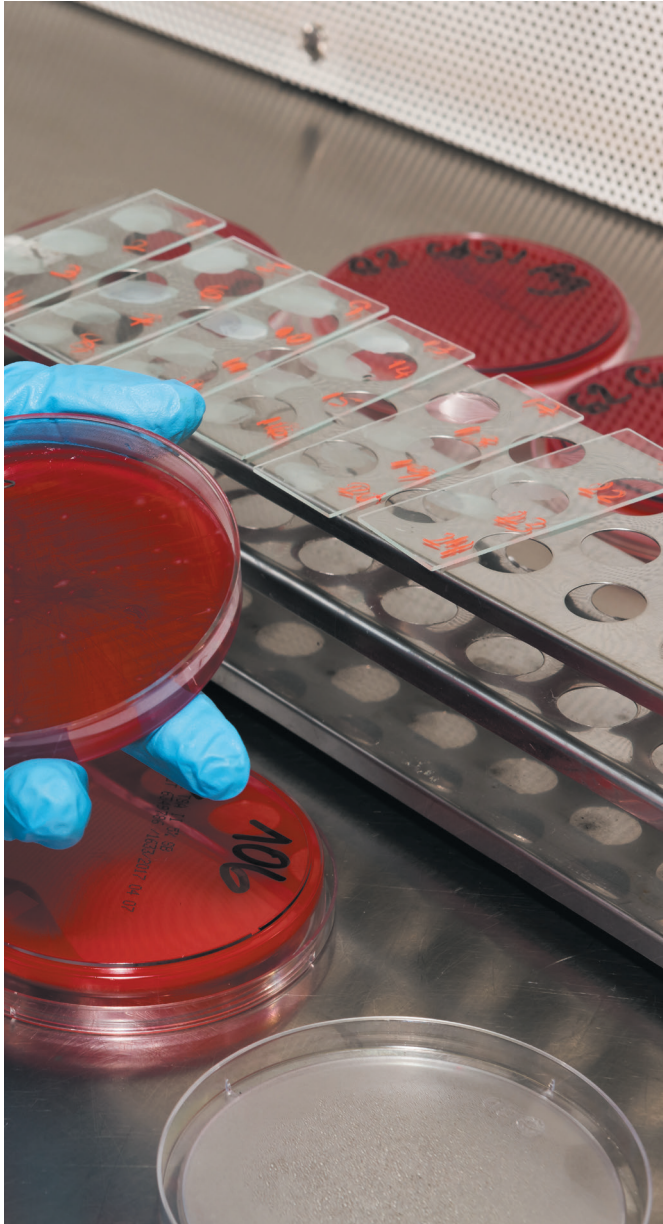
The Academy's award reflected the work done by Dr. Laissue and his team in using advanced technology to study the human genome and identify the genetic molecular factors that lead to two disorders common among women: recurrent miscarriage and premature ovarian failure. The researchers were successful, and women now have access to more information about the reasons for these disorders.



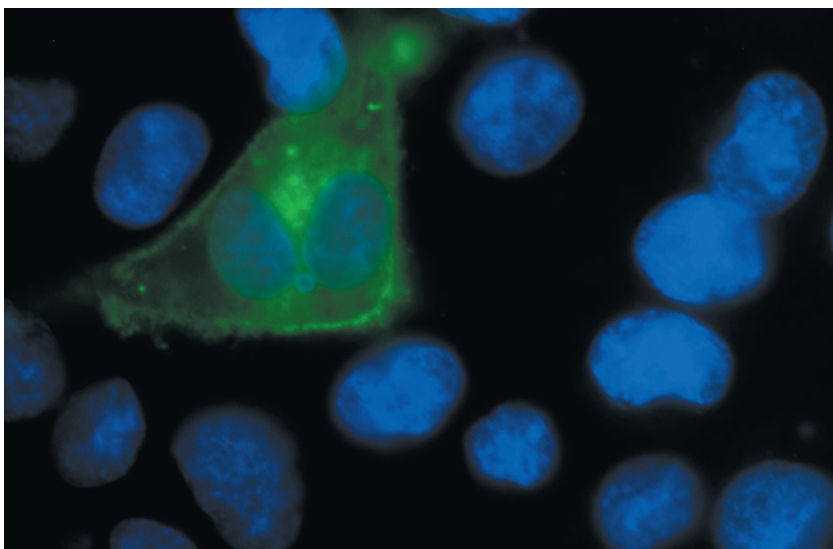
“The impact of this work,” explains Laissue, “is that until recently people who suffered from these kinds of infertility received clinical diagnoses but were given no explanation for their condition, and no early intervention was available. Some women with premature ovarian failure (who are under 40 years of age but do not have menstrual cycles), may have ultimately been able to have children, and their daughters could be carriers of these mutations. Now we have a way to help them.”

The GENIUROS research group is a pioneer in Colombia for this kind of research in molecular medicine, and for trying (at a later





← CIGGUR was established to produce innovative applied knowledge and contribute to improving diagnostic and prognostic methods for different diseases by offering this new information to patients and clinical practitioners.



GENIUIROS IS ONE OF THE FIRST RESEARCH GROUPS CREATED AT THE UNIVERSIDAD DEL ROSARIO, SOME 20 YEARS AGO. IT IS RANKED AS A1 (THE HIGHEST NATIONAL RANKING) BY COLCIENCIAS, THE ADMINISTRATIVE DEPARTMENT OF SCIENCE, TECHNOLOGY AND INNOVATION

stage) to prevent these conditions by understanding the molecular mechanisms of the disorders. This will enable practitioners to improve their diagnoses, prognoses, and treatments in applying translational medicine. In other words, the knowledge acquired in laboratories can be brought to clinical contexts where the health of patients can be improved.

In this way, GENIUIROS contributes to fulfilling the goals of the Research Center in Genetics and Genomics (CIGGUR), to which it belongs. CIGGUR was established in 2015 by the School of Medicine and Health Sciences to produce innovative applied knowledge and contribute to improving diagnostic and prognostic methods for different diseases by offering this new information to patients and clinical practitioners.

“We don’t have any major centers for genetic research in Colombia at this time, but our goal is to become a leading laboratory in South America for the genomic and functional study of frequent diseases,” says Laissue, who is also the director of CIGGUR.

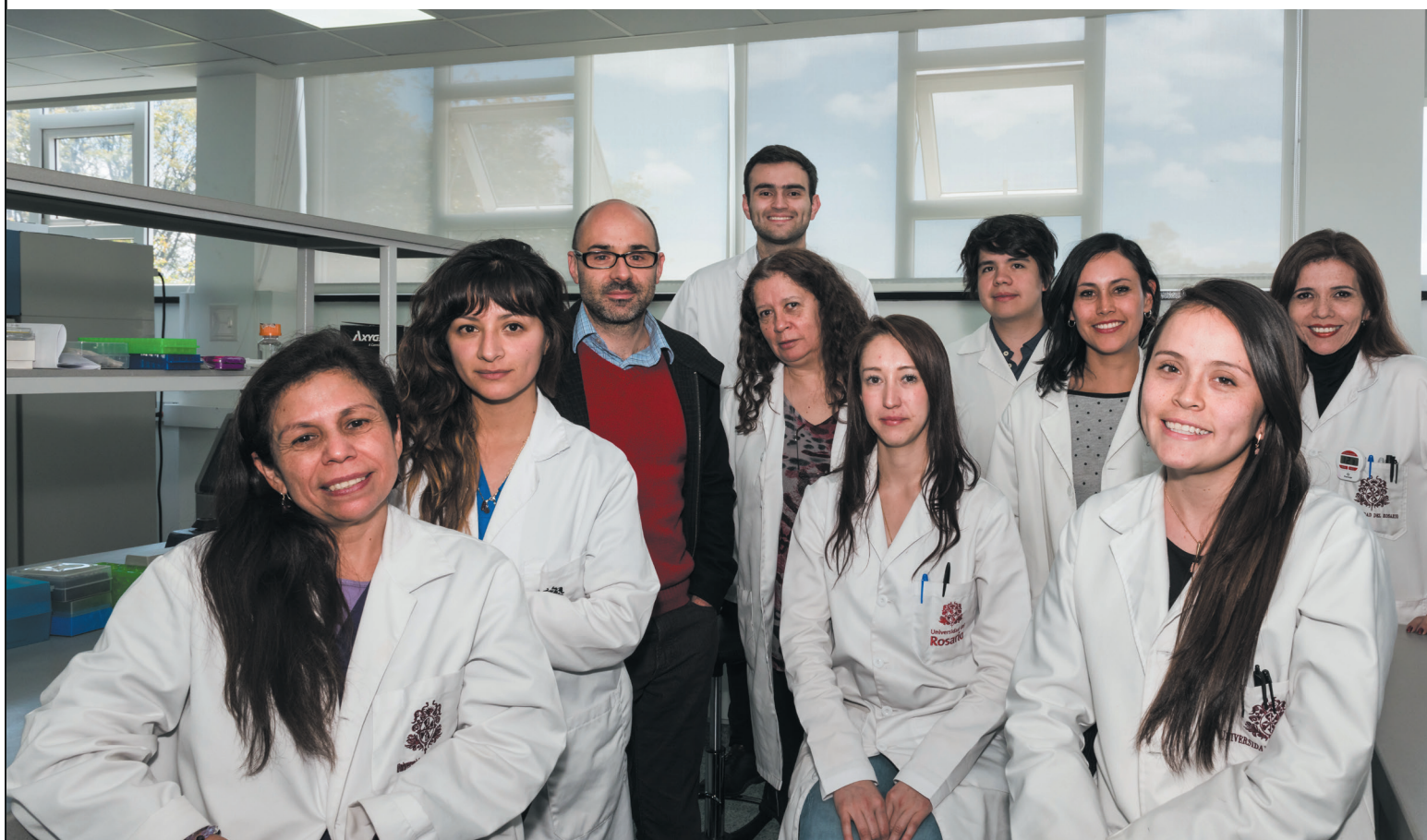
GENIUIROS is one of the first research groups to be established at the University del Rosario, about 20 years ago. It is ranked as A1 (the highest national ranking) by COLCIENCIAS, the country’s Administrative Department of Science, Technology, and Innovation. In the last few years, researchers at GENIUIROS have published over 50 high-impact articles in eminently prestigious and specialized scientific publications.

In addition to the National Award for Medicine, GENIUIROS also won the 2014 Research Prize at Colsubsidio’s Biennial Competition for Pediatrics Research in recognition of its consistent work.

LINES OF RESEARCH

GENIUIROS and CIGGUR conduct their work on four major lines of research: clinical dysmorphology and recessive pathologies, the functional genomics of common diseases, pharmacogenetics and pharmacogenomics, and the molecular genetics of cancer.

“This research is done to train scientists, and carry out research that can be applied through translational medicine, so what is done in the laboratory will be brought to the patient and vice versa, creating bidirectionality between what is needed in clinical practice and what the laboratory can provide in



terms of molecular, diagnostic, prognostic medicine and the treatment of disease,” says Laissue.

CIGGUR is part of Colombia’s first Institute of Translational Medicine, which is directed by geneticist Mauricio Arcos Burgos. The Institute also includes the Center for the Study of Autoimmune Diseases (CREA); the Center for the Study of Highly Prevalent Neurological Disorders, Neurodegenerative Diseases, and Neuropsychiatric Disorders (NEUROS); and the Center for the Study of Communicable and Biochemical Diseases (MICROS).

“The idea is to create a doctoral school within the School of Medicine, where each research center will manage its own doctorate. This will allow us to multiply our productivity,” says the professor.

CIGGUR’s most recent accomplishment was to launch a new 305 square-meter research laboratory to lead the way in research on genetics and genomics in Colombia.

“When we started CIGGUR, we had to develop better research spaces because a lot of what we do is experimental, says Laissue.

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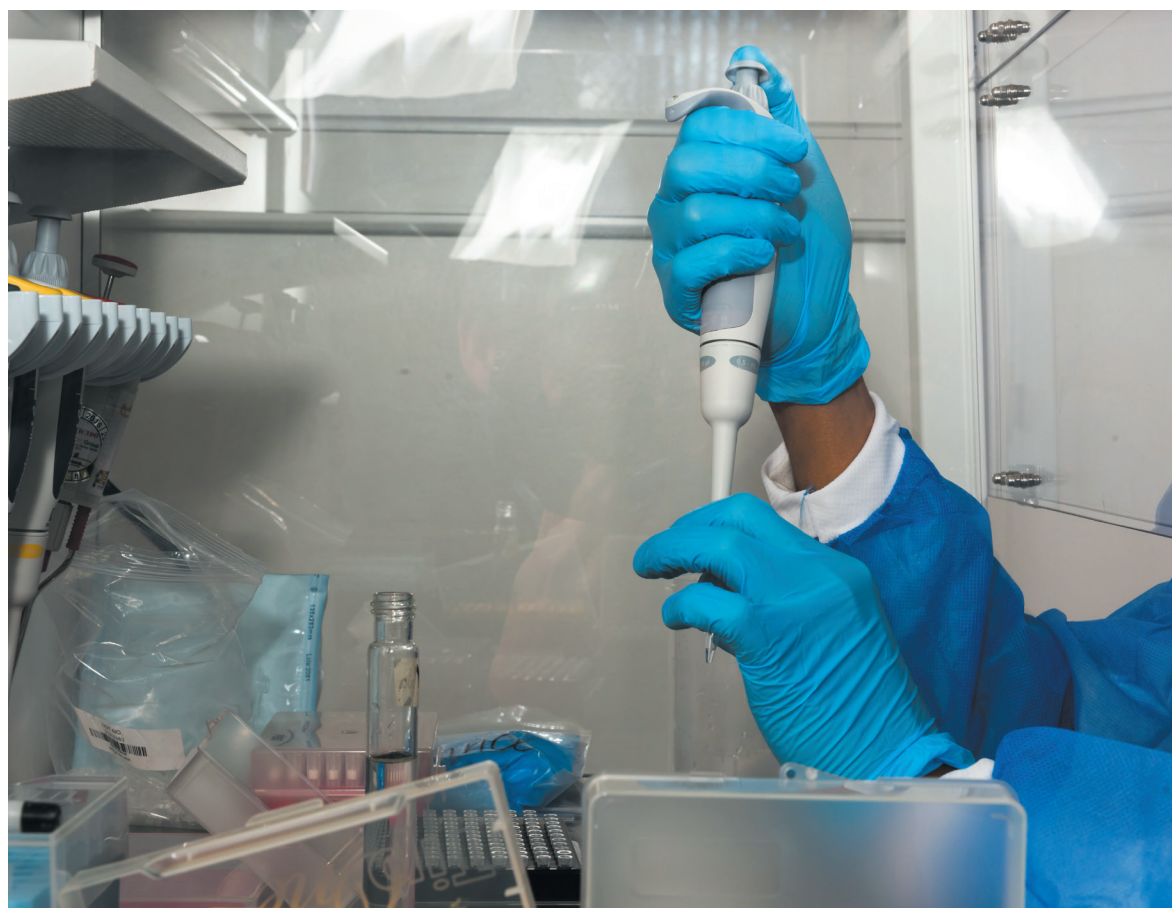
The new laboratory is specifically designed to practice different techniques for the study of molecular biology, cellular biology, and functional genomics, and it has several areas with high technology equipment for some very specific kinds of research. Sophisticated procedures are used in these spaces, which allow researchers to maximize their efficiency and work in innovative ways that also contribute to the training of students.

Thanks to investments by the University, which amounted to 1,300 million pesos (US\$445,000) in 2016 alone, the laboratory now has the most robust fluorescence microscope in Colombia and the only digital PCR system in Latin America for transcriptome studies. Investments in new equipment this year could reach 1,500 million pesos (US\$513,000).

With these advances, CIGGUR has gained international visibility and attracted resources from COLCIENCIAS and collaborative agencies to help finance its research. It has also attracted more students to its programs. These positive developments have allowed it to increasingly self-finance its research activities.

← The GENIUIROS research group is a pioneer in Colombia for this kind of research in molecular medicine, and for trying (at a later stage) to prevent these conditions by understanding the molecular mechanisms of the disorders to improve their diagnoses, prognoses, and treatments.

→ CIGGUR's most recent accomplishment was to launch a new 305 squaremeter research laboratory that will help it lead the way in research on genetics and genomics in Colombia.



GENIUIROS AND CIGGUR CONDUCT THEIR WORK ON FOUR MAJOR LINES OF RESEARCH: CLINICAL DYSMORPHOLOGY AND RECESSIVE PATHOLOGIES, THE FUNCTIONAL GENOMICS OF COMMON DISEASES, PHARMACOGENETICS AND PHARMACOGENOMICS, AND THE MOLECULAR GENETICS OF CANCER

TRAINING SCIENTISTS

Another of CIGGUR's important products is the training of scientists. Beginning with research incubators in the under-graduate Medicine program, young researchers receive training in genetics and genomics. They may then go on to a master's degree in Human Genetics, the oldest such program offered by the University and currently in line for formal external accreditation. This degree program is also intended to train scientific researchers. Students in the program work on different projects and produce their theses, some of them going on to the doctoral program in Biomedical Sciences.

"The training of our students is very robust. The fact that a master's student graduates having already had an article published in a high impact journal, or a doctoral student graduates with five published articles, means that we are far above international standards. This speaks well of our levels of excellence in training and research," explains Laissue.

CIGGUR is currently conducting research on such common diseases as cancer –especially colon cancer– in cooperation with Bogotá's Méderi Hospital, into cardiovascular diseases in collaboration with the Cardioinfantil Foundation, and on fertility disorders, preeclampsia, recurrent miscarriage, premature ovarian failure, and adverse reactions to medicines, among other things.

CIGGUR also works with numerous institutes in Colombia, including the Valle del Lili Foundation and international hospitals and institutions such as the Cochin Institute and the Pasteur Institute of Paris, Cornell University, the Albert Einstein College of Medicine in New York, and the Universities of Melbourne and Brisbane in Australia.

CIGGUR hopes that different research groups, either clinical or molecular, from other faculties and other universities will collaborate with the Center in the future to benefit from its experience and develop new research that will attract the private sector to develop patents and sell services. ■