

UNIVERSIDAD DEL ROSARIO, A PIONEER IN RESEARCHING AUTOIMMUNE DISEASES

The Center for the Study of Autoimmune Diseases was founded in 2007 to research chronic non-communicable diseases, principally autoimmune diseases affecting around 5% of the Colombian population and that have no known cure.



Juan Manuel Anaya reports with pride that thanks to CREA's ongoing research, it has consolidated a scientific hypothesis and provided evidence to support it.





PEOPLE INFECTED WITH ZIKA WHO LIVED NEAR OUTFLOWS OF RESIDENTIAL WASTEWATER OR MARKET SQUARES DEVELOPED GUILLAIN BARRE SYNDROME MORE FREQUENTLY THAN OTHER ZIKA PATIENTS

CONSORTIUM OF TOP-LEVEL CENTERS IN AUTOIMMUNITY

CREA is the only research center in South America that participates in the Autoimmunity Consortium and Network, a dynamic community of medical specialists in rheumatology and immunology who work with other researchers in these fields to share their knowledge of autoimmune diseases and collaborate on research at different centers.

In 2016, Colombia experienced a health emergency due to the presence of the Zika virus. As in several other parts of the world, cases were multiplying, and authorities asked the population to take certain necessary measures, in particular to avoid bites from mosquitoes of the *Aedes* species, the insects that transmit not only this disease but also yellow fever, dengue, and chikungunya.

Cúcuta was the most closely-monitored city, due to its high number of Zika cases and the possible association of the disease with Guillain-Barre syndrome (GBS). Researchers from the Center for the Study of Autoimmune Diseases (CREA) of the Universidad del Rosario arrived in that city to analyze the cases and found that there may indeed be a relation between Zika and GBS. They wrote about this in the July 2016 issue of the journal *Medicina*, published by the Colombian National Academy of Medicine.

↑ In the 10 years since its founding, CREA has increased knowledge and generated research questions about autoimmune diseases to facilitate their prediction and prevention.

“GBS develops after an infection when the immune system recognizes characteristics of the infectious agent that resemble proteins belonging to the organ itself, in this case the gangliosides. At the same time that it recognizes the infectious agent, however, the immune system recognizes the organism’s own gangliosides through a mechanism called molecular mimicry or cross reactivity,” explains Juan Manuel Anaya Cabrera, the founder and director of CREA.

The researchers at this center, one of several at the School of Medicine and Health Sciences of the Universidad del Rosario, point out that 1% of individuals infected with the Zika virus show signs that their immune system is defending them from the foreign microorganism but at the same time is attacking their own organism through the production of antigangliosides and other proteins that cause changes to the peripheral nervous system. Gangliosides are molecules in the cen-

THE MAIN AUTOIMMUNE DISEASES IN COLOMBIA ARE AUTOIMMUNE THYROIDITIS, RHEUMATOID ARTHRITIS, SYSTEMIC LUPUS ERYTHEMATOSUS, TYPE 1 DIABETES, AND MULTIPLE SCLEROSIS. THERE ARE NOT MANY SPECIALISTS IN THESE DISEASES, THEY ARE NOT EASY TO DIAGNOSE, AND THEY MOSTLY AFFECT WOMEN.

TRAINING, THE PURPOSE OF CREA

CREA is the most productive scientific unit at the Universidad del Rosario, producing 160 documents published in Scopus over the last 10 years. Knowledge generated at the Center is transmitted to other professionals for use in treating and researching autoimmune diseases. The frequency of these diseases has increased due to the growth and aging of the population, so there is an increasing number of patients suffering from cancer, autoimmune diseases, and neurological and cardiovascular conditions.

The Center maintains an ongoing schedule of seminars in its areas of research, and it sponsors two graduate diploma programs (in autoimmunity and translational medicine) for undergraduates at the School of Medicine and Health Sciences, and for general practitioners, internists, and rheumatologists.

tral and peripheral nervous systems that lose their properties when attacked by these antibodies, leading to the neurological damage observed in cases of GBS.

“This disease is characterized by feelings of weakness in the extremities, generally in the legs and then in the arms, with a loss of reflexes. Symptoms may intensify until the patient cannot use his or her muscles and is left almost completely paralyzed,” explains Anaya.

ZIKA AND GUILLAIN-BARRE

CREA’s study called Autoimmune Responses in Individuals Infected by Zika (Respuesta Autoimmune en Individuos Infectados por Zika – RAIZ) analyzes the basis of this relation between Zika and GBS. Researchers at the Center have identified a high rate of coinfection and described the environmental conditions that favor the development of GBS. They have also identified cases of other equally serious neurological manifestations among Zika patients, including encephalitis and transverse myelitis. They are now seeking to identify the genetic factors that make people infected with Zika more prone to developing GBS, or that protect them from it.

When we carried out georeferencing on patients, a control group, and seven families, we found that there are two fundamental environmental factors involved. People infected with Zika who live near outflows of residential wastewater or market squares developed GBS more frequently than other Zika patients. This burden of infection was corroborated through laboratory analyses, and suggests that the disease may have a higher environmental than genetic burden, explain CREA researchers Yeny Acosta, Diana Monsalve, and Carolina Ramírez.

AUTOIMMUNE DISEASES

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eases to facilitate their prediction and prevention.

Anaya reports with pride that thanks to CREA’s ongoing research, it has consolidated a scientific hypothesis and provided evidence to support it. It has also identified two important phenomena, and named them: polyautoimmunity, or the presence of an associated disease (when a second or third autoimmune disease coexists with the first one in a patient), and family autoimmunity (when family members suffer from autoimmune diseases other than that suffered by the initial patient).

“Through observation we have seen that many patients develop a second and some-

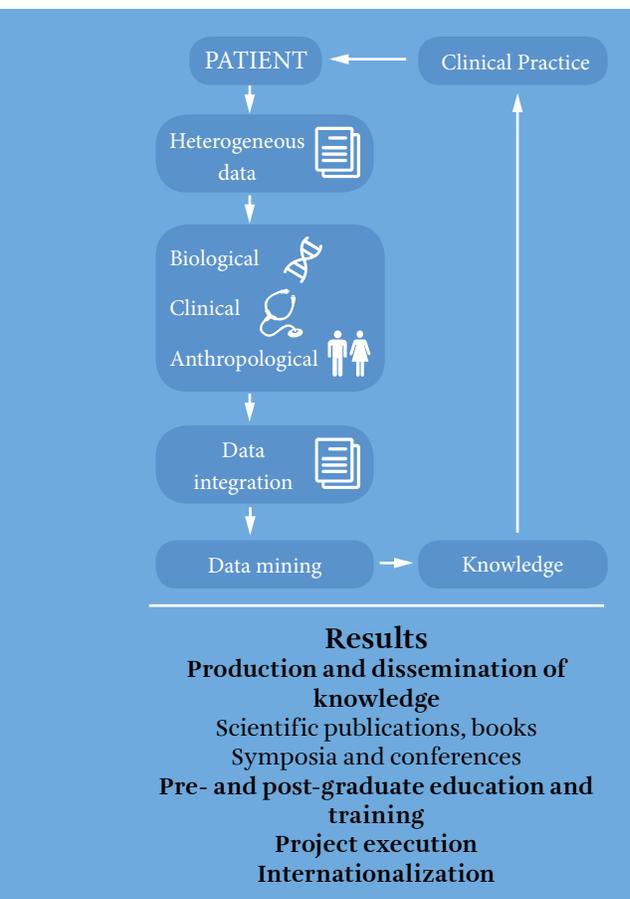


Universidad del
Rosario

CREA IS A TRANSLATIONAL MEDICINE CENTER

From the laboratory to the patient
and from the patient to the
laboratory

- Publications and dissemination of research
- Management and administration
- Medical team (specialists)
- Patient care
- Nursing
- Ethics committee
- Clinical coordination
- Research assistants
- Laboratory for immunological and biological research
- Basic research on molecular biology
- Data coordination
- Analytical coordination



times a third autoimmune disease over the course of their lives, and that these diseases often seem unrelated. We have also found that their first-degree relatives, although they did not have the same disease, did suffer from one or more other autoimmune diseases,” says the professor, explaining how the two terms were coined.

CREA principally researches the five most significant autoimmune diseases: rheumatoid arthritis, systemic lupus, multiple sclerosis, autoimmune diabetes, and autoimmune hypothyroidism. Three studies are currently under way, these being RAIZ, the search for common mechanisms among autoimmune diseases, and biomarkers in autoimmunity (BIOMA). These are large-scale population genetics studies in immunology and epidemiology, conducted with patients and their families.

“The purpose of the immunological system is to distinguish what belongs to the organism from what is foreign to it. If it is unable to make this distinction, it will attack the organism itself. This constitutes an autoimmune disease, which affects the body’s organs and systems,” explains Anaya, underlining the importance of studying these diseases.

The main autoimmune diseases in Colombia are autoimmune thyroiditis, rheumatoid arthritis, systemic lupus erythematosus, type 1 diabetes, and multiple sclerosis. There are not many specialists for these diseases, they are not easy to diagnose, and they mostly affect women. ■

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