

Martín Rumbo



Source: [CONICET, IIFP Website](#)

Dr. Martín Rumbo is a Principal Researcher at the Argentinean National Research Council (CONICET) and Professor of Biology at the National University of La Plata, Argentina. He has a degree in Biochemistry (1994) and a PhD in Sciences (1999) from National University of La Plata. He then conducted his Post-doctoral research at the Swiss Institute of Experimental Cancer Research (ISREC). He has established a research group at the Instituto de Estudios en Inmunología y Fisiopatología (IIFP-CONICET) at the National University of La Plata, dedicated to the study of the innate mechanisms of the mucosal immune response. The general aim of the group is to develop rational strategies for the modulation of mucosal innate response for improving human health. They have settled different national and international collaborations in the

field of host-pathogen interaction and also established a collaborative project with Fundacion Favaloro (Buenos Aires, Argentina) based on the study of the immunobiology of intestinal transplant. In the vaccinology field he has contributed to the development of an acellular vaccines against *Bordetella pertussis* and *Bordetella parapertussis*, the etiologic agents of the disease known as whooping cough.

Current Position and Research Institute: Director of the Institute for Immunological and Physiopathological Studies (IIFP- CONICET- UNLP CICPBA), Professor of Biology at the Exact Sciences Faculty, UNLP.

What are your research interests and why? My research interests are all related to how the mucosal immune system works, how does the immune system integrate the information both from the environment and our own internal metabolism to generate a response, in order to protect us from infections or other pathological processes. Since these are multifactorial phenomena, we are kind of forced to work on different fields. For example, we study intestinal transplantation, but also mucosal infections in search of mechanisms to improve vaccine efficiency. A common theme of all our research projects is the role of the innate immunity in mucosal tissue.

[\(Want more detail on Dr. Rumbo research projects visit his research groups' website \)](#)

Is it common in Argentina to focus on several research topics at the same time as you do? Well, our research group is not the perfect example of how a research group works in Argentina or in any part of the world. In most cases research groups are more focused and conduct many research projects around a specific theme of immunology. Our group developed through time from some ideas generated in our lab and other work with collaborators

We develop different research projects that aim to answer questions relevant to health issues, in which the mucosal

immune system is relevant. This is how we reached areas like transplantation immunology by collaborating with groups that were working on intestinal transplantation in Argentina or by collaborating with the group that are referents on microorganisms infection that lead to vaccine development. Another example is the collaboration with microbiology groups in our University, specialised in probiotics. The common theme between all the research projects is the response and regulation of mucosal innate immunity.

How did you become interested in immunology? I think that like many of us, I started my studies in Biochemistry interested in understanding how our organism works, and I had an inclination to do research since I always wanted to understand how and why things work., When I had to study immunology I found it fascinating and from that moment, I knew I wanted to conduct research in the field of immunology. My first experience conducting immunology research was on the role of wheat proteins in celiac disease. From that, I continued studying the regulation of the mucosal inflammatory response.

How has your research contributed to better understanding your research area? Through the years our group has made several contributions from the development of immunochemical methods for food control to certify food and pharmaceutical products that are safe for celiac patients, this analysis and certification is still performed in our institute today for several companies. We also made contributions to the understanding of how intestinal transplantation work at a cellular lever and how the rejection mechanisms are triggered. Some other contributions are on how the innate immunity recognition system (specially Toll-Like Receptors) mediates the immune response to intestinal bacteria. The basic knowledge generated during that research project led us to an important contribution to the development of a new vaccine for whooping cough (*Bordetella Pertussis*) in collaboration with the group of Dr. Daniela Hozbor, now patented in the USA.

Also, in collaboration with Dr. Graciela Garrote we began to explore an original concept of immunomodulation using lactate (and other short-chain fatty acids), which were traditionally seen as discard metabolites, today it is well reported to have an immunomodulatory function and we were one of the firsts groups to report this activity.

These are some of the contributions that we made, all of them started as a simple question for basic research, very conceptual, but in the end, they resulted in practical applications. I think it is good that we have participated all the way from basic research to clinical relevance.

What have your biggest difficulties been so far in your research? One of the biggest problems in research is always the lack of financial resources, whether it is in Argentina or in any part of the world, the struggle to get funds is always there. When one works in immunology and tries to solve novel questions one must generate new techniques that may end in failures or not the best results may be somehow frustrating. I think that frustration management is one of the things that one must learn when doing research, because one may do a lot of work, and sometimes it is just a little fraction that ends being conclusive and ends in a publication.

How did the COVID-19 pandemic affect Argentina (Question asked in March 2021)? In particular, at the beginning of the pandemic there was a strict lock-down with few cases of COVID-19 in Argentina. Suddenly, from one week to the other we have to reprogram all our life and activities. The lock-down was long, but it was meant to diminish the rise of cases and preparing the health system.

We have some consequences after the first wave concerning public health and also financial struggle. However, we are now facing a second wave and the risk of new strains or variants, so we face a nebulous horizon with a lot of uncertainty which we, not only in Argentina but everywhere, have to learn to deal with.

How has your institute adapted to the COVID-19 Research effort? When the pandemic was declared it was clear for the Directive board of our institute that we have a clear role to play, so we promoted the participation of our institute in several research projects and we made our facilities, resources and volunteers available for a joint effort among several institutes of the National University of La Plata, some local hospitals and clinics. We helped increasing the molecular diagnostic, participated in studies to understand the course of the disease by studying clinical samples and we also developed monoclonal antibodies directed against viral proteins to use in diagnostic methods.

We are also working on a joint effort to develop a new vaccine using a novel adjuvant to complement the immune response to SARS-CoV2 proteins and last but not least we are exploring the repositioning of anti-inflammatory drugs as treatment of the COVID-19 disease.

We try to contribute from all the branches of knowledge we have available on our institute to develop new tools to help us understand the disease. The most positive thing to point is the joint effort made with different research centers, universities, hospitals and health authorities, such as the Health ministry of the Buenos Aires province.

Do you have any recommendations for the immunologists-to-be?

I think it is important to follow your passion for the things that clearly motivate you. There is a lot of different areas of study in immunology, but it is essential to follow your vocation, your own personal motivations and make them compatible with the line of research you want to follow. There is no thing like a “made-path” in immunology but you must make your own way through immunology following your own interests. And as I said before, there may be a lot of frustrations and you may not advance as quick as you want, but in the end it all get balanced if you are doing what you love.

To learn more about the Instituto de Estudios Inmunológicos y

Fisiopatológicos (IIFP)
<https://iifp.conicet.gov.ar/>

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Interview by Dr. David E. Romanin