

Final Report

IUIS ImmunoArgentina 2022 and SECOND ARGENTINEAN SPRING COURSE IN ADVANCED IMMUNOLOGY (ASCAI-II)

“Immunological memory in infections and vaccination: actual knowledge and future directions”.

Immunological memory is a hallmark of the immune system. This fundamental property of the immune system is the basis for vaccination, and the goal of a successful vaccine is to induce long-term protective immunity.

The proposed course was focus on integrating current knowledge concerning the cellular and molecular protagonist involved in the induction of long-term immunity. The program of the course included topics about the characterization of memory NK, B and T cells, in mice and humans, and their role in mediating protection against infections and upon vaccination. The course was also aimed at fostering multidisciplinary collaborations and scientific and student exchange.



Organizer Institutions - The course was conceived by Argentinean scientists and organized by members of different institutions:

- Education Committee of International Union of Immunological Societies
- Center for Research in Clinical Biochemistry and Immunology (CIBICI) - National Council for Scientific and Technological Research (CONICET).
- Postgraduate School, School of Chemical Sciences (FACULTAD DE CIENCIAS QUIMICAS), Universidad Nacional de Córdoba (UNC).

ARGENTINEAN ORGANIZERS



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INTERNATIONAL ORGANIZERS



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University of Kiel, Kiel, Germany



Michelle Letarte

Past-Chair IUIS EDU Committee Sick kids Hospital
& University of Toronto, Toronto, Canada.



Rosana Pelayo

Vice-Chair, IUIS EDU Committee Instituto
Mexicano de Seguro Social, Puebla, México



Immunopedia staff

Bon Holtak
Clive Gray



Faculty - Internationally recognized immunologists that are experts in the topic of the course were invited to be part of the Faculty. Speakers were invited trying to foster gender

diversity. Scientist from Australia, Argentina, Brazil, Canada, Colombia, Mexico, United State of America and Germany were invited as speakers. The course had the participation of:

- **Elina Zuniga** - Division of Biological Sciences, University of California San Diego.
- **Luciana Berod** - Institute of Molecular Medicine, University Hospital, Johannes Gutenberg University Mainz, Germany.
- **Hanne Ostergaard** - Department of Medical Microbiology & Immunology, University of Alberta, Edmonton, Canada
- **Fatima Ribeiro Dias** - Instituto de Patologia Tropical e Saúde Pública, Universidade Federal de Goiás, Goiânia, Goiás, Brazil.
- **Tim Sparwasser** - Institute for Medical Microbiology and Hygiene (IMMH), Mainz University, Germany
- **Mercedes Fuertes** - IBYME – CONICET, Ciudad autónoma de Buenos Aires, Argentina
- **Carolina Amezcua Vesely** - Facultad de Ciencias Químicas, UNC, Córdoba, Argentina.
- **Laura Mackay** - Doherty Institute-Australia.
- **Dieter Kabelitz** - Department of Immunology, University Medical Center Schleswig-Holstein, Kiel, Germany.
- **Adriana Gruppi** - CIBICI-CONICET, Córdoba, Argentina.
- **Ralf Kuppers** - Institute of Cell Biology (Cancer Research). Faculty of Medicine, University of Duisburg-Essen, Germany
- **Rosana Pelayo** - Instituto Mexicano de Seguro Social, Puebla, México.
- **Michelle Letarte** - Sick kids Hospital & University of Toronto, Canada.
- **Luisina Onofrio** - CIBICI-CONICET, Córdoba, Argentina
- **Cintia Araujo Furlan** - CIBICI-CONICET, Córdoba, Argentina
- **Gloria Vásquez** - Universidad de Antioquia, Colombia
- **Marina Palermo** - Academia Nacional de Medicina. Ciudad Autónoma de Buenos Aires, Argentina
- **Belkys Maletto** - CIBICI – CONICET, Córdoba, Argentina CIBICI.
- **Jimena Tosello** - Curie Institute – Paris, France.
- **Jorge Geffner** - IBIRS- CONICET – Ciudad autónoma de Buenos Aires, Argentina.



Course/Symposium Description

The course was focus on integrating current knowledge concerning the cellular and molecular protagonist involved in the induction of long-term immunity. The program included topics about the characterization of memory NK, B and T cells, in mice and humans, and their role in mediating protection against infections and upon vaccination. Particular emphasis was placed on the therapeutic and pathogenic roles of the different subsets during chronic infection and the basis of vaccine designs.

The type of fundamental questions addressed by the speakers as well as the technology and the design of the experiments they perform to answer these questions had a direct influence on the formation of the students.

The course also fostered collaborations and student exchange. During poster sessions, the students presented and discussed their own work, allowing maximal interaction of the students between each other and with the faculty. Lunches with speakers facilitated discussions about particular topics of students' interest and also ideas that students want to discuss.

In addition, this course included training in grant writing.



Participants - This course was open to talented graduate students enrolled in academic PhD programs as well as to young postdocs and scientist, engaged in research in the area of fundamental, applied and clinical immunology. Students, postdocs and scientist from Argentina and from Latin America were encouraged to participate. The candidates should have sufficient scientific background and comprehension of English to benefit maximally.

Participants sent a CV resume and a letter of application explaining why they wanted to participate in the course and in which way the course helped their work .

The course was organized for no more than 55 participants.

The initiative for this course was generated at the-CIBICI-CONICET/Universidad Nacional de Cordoba and presented to the EDU Committee meeting in 2018 of IUIS-ICI Congress. The course was planned as a traditional on-site course to be held in a hotel located in Cordoba hills, Argentina in September 2020. Due to the COVID-19 pandemic, it was decided to change it to hybrid course to take place during September 2022. Thereafter, the organizing Committee worked hard to design a high-quality scientific course, understanding that the hybrid modality, could be an opportunity for innovations. The call for the course was open in May 2022.

The Course took place, from 1 to 5 September 2022, at the Auditorium of the School of Chemical Sciences of the Universidad Nacional de Cordoba.

It was organized as a **hybrid course**.

Selected students from Argentina and Latin America that attended the on-site course received **full scholarship from IUIS** for travel expenses and accommodation.

Few students received partial scholarship. In addition, a student from Marruecos assisted online.



IMMUNOPEDIA/PRE-COURSE

All the students performed a pre-course organized by IMMUNOPEDIA. The students reviewed the fundamentals of immunology and papers provided by the faculty (3 for each topic) and the material generously prepared by advanced PhD students from School of Chemical Sciences from UNC (Carolina Abrate, Laura Almada, Yamila Gazzoni, Ximena Volpini). During the whole month of August students answered quizzes weekly, which evaluated their understanding of the topics to be covered during the course.

54 students answer the quizzes sent by IMMUNOPEDIA. Near of 90% of the students answered correctly 4 or 5 questions. These scores indicate that the students studied the papers selected by the faculty.

Regarding the pre-course, the students' comments provided useful information. The students considered that the pre-course should include more videos, more interactive sessions. Updating is critical and making more interesting presentations.

Course program:

Day 1: 5th September

Session I: Innate Immunity:

Type I interferon exhaustion after a viral infection (Elina Zuniga – online)

Metabolism of dendritic cells (Luciana Berod)

Topic discussion: Section Innate Immunity

How to write a Successful Grant (online) (Hanne Ostergaard)

Poster Session: pre-recorded videos plus discussion (hybrid format) (11 presentations, 5 minutes each)

Day 2: 6th September

Session II: Innate Immunity

Trained innate immunity (Fatima Ribeiro Dias)

Natural killer cell memory (Mercedes Fuertes)

Topic discussion: Innate immunity

Session III: Cellular Immunity:

Metabolic checkpoints and T cell fate (Tim Sparwasser)

Origin, function and maintenance of tissue resident CD4⁺ T cells (Carolina Amezcu-Vesely).

Genes and signals that control resident memory T cell differentiation (Laura Mackey)

Topic discussion: Cellular immunity

Poster Session: pre-recorded videos plus discussion (hybrid format) (11 presentations, 5 minutes each)



Discussion panel: Future of Immunology Education in 2030 - Chairs: Drs Rosana Pelayo and M Carolina Amezcua Vesely

Round Table 1: Groups 1 to 4 – Immunology teaching in 2030

Faculty: Michelle Letarte and Luisina Onofrio

Round Table 2: Groups 5 to 8 – Equal access to translational Immunology. Faculty: Gloria Vásquez and Cintia Araujo Furlan

Poster Session: pre-recorded videos plus discussion (hybrid format) (11 presentations, 5 minutes each)



Day 4: 8th September

Session V: Vaccine development

Antigen selection and vaccine formulation to confer protection against Hemolytic Uremic Syndrome (HUS) (Marina Palermo)

Nanoformulation of the vaccine components: implication for development of T cell memory (Belkys Maletto)

Topic discussion: Vaccine development

Tracking T cell memory dynamics by single cell OMICs (Jimena Tosello - online)

Poster Session: pre-recorded videos plus discussion (hybrid format) (11 presentations, 5 minutes each)

Day 5: 9th September

Poster Session: pre-recorded videos plus discussion (hybrid format) (10 presentations, 5 minutes each)

Memoria inmunológica y esquemas de refuerzo en el escenario de la vacunación frente a SARS-CoV-2 (Jorge Geffner - online)

Closing ceremony - farewell by the organizers and the **Dean of the School of Chemical Sciences**



Course exam - The exam was in an online modality and took place on October 11. Thirty-five students sat for it. Nearly 90 % of these students were scored with excellent grades (ranging from 80 to 100%) (Scale 0-100%).

Outdoor activities:

The course also aimed at fostering multidisciplinary collaborations and scientific and student exchange.

In line with other IUIS courses, this course was very interactive with lots of opportunities for networking. Recreational experiences, social hours and free time were available to promote interactions and forge collaborations. All students were hosted in the same hotel.

Every afternoon, after finishing the poster presentations the students organized different leisure activities such as sharing beers, snacks or a typical beverage from Cordoba named “fernet con Coca”. Faculties joined these activities. In addition, on Friday 5th they had a farewell party.



Couse evaluations by the students:

To the question:

“Overall, do you think that this event has met your expectation and is worth repeating? If yes - what would you like to see different next time? If no - list one reason”,

The following are some representative answers:

The event met my expectation. For the next time, I would prefer the student presentation on site, instead pre-recorded videos.

This course met my expectations as I am beginning to train in the immunology area and it allowed me to better order my knowledge and studies.

Definitely, this course must be repeating, It gave me new perspectives of cellular memory and vaccination.

Yes, the course met my expectations. Next time I would save more time for discussion as far as the panel discussion is concerned.

It was great, however I think that more subjects could be added, for example there wasn't much on viruses, but a lot on T. cruzi and other bacteria.

In my opinion, the course was outstanding. I only suggest to plan the topics discussion as a global exercise involving all of the assistants.

It was very good, but I consider it would be better to have everyone on site.

The modules, expositors and content were great; however, the audio was at times choppy and difficult to understand, making it difficult to follow the theme in question. I'm unsure whether a dual format is appropriate for this type of courses.

To the question:

“How will the Immuno-Argentina 2022 course help strengthen immunology training in your country”

It provided with a lot of valuable information and new approaches towards future education

I believe this course will enhance the quality of immunological research in my country, not only by the knowledge of new techniques, but also to regard some phenomena that we weren't aware of. Besides, it allows the connection between different PhD students that could lead to a collaboration.

Firstly, the hybrid format was great for the ones who couldn't afford the travel, but not because of that we missed the opportunity to learn, the pre course was good to help me to remember some basic stuff and to learn new things too. What we learn we share and that help to strengthen immunology information between our peers. Thanks also to the opportunity to expose my work i have other ideas of what more to do and also thanks to my other partners information in their expositions also i have more inquiries to do and analyze. And also, I met some new people with whom I can have contact and also with that spread information about immunology.

Getting more knowledge and skills in immunology

Knowing the work of other colleagues and strengthening ties can help unify criteria and all work for the same goal.

It helps to create new collaborations and contacts that can be very beneficial for everyone

Taking a course in countries like ours opens the door for more PhD students from our countries to participate and it also helps to generate collaborations with people from the some country or from abroad.

General conclusions:

- I. The topic of the course was extremely relevant taking into account the pivotal role of vaccination to control infection disease and more relevant in the context of the COVID-19 pandemic. Understanding vaccine strategies requires a good knowledge of all basic immunological phenomena, as well the immunopathogenesis of the target diseases.
- II. The course was planned as a traditional on-site course to be held at the mountains in Cordoba, Argentina in September 2020. Due to the COVID-19 pandemic, it was decided to change it to hybrid course to take place during September 2022. Thereafter, the organizing Committee worked hard to design a course with the hybrid modality. Because of technical requirement (online activities) we had to move the location to the University. In addition, we have to modify the program because many speakers were not able to participate on September 2022 because their busy agenda.
- III. The students' opinions emphasized the importance of networking and the exchange ideas and cultures. Most of the Latin American student do not have the opportunity to attend to international conferences or do short internships in lab abroad.
- IV. The hybrid course allows to meet students and Faculty from different countries that otherwise would not have the possibility to attend the course. Additionally, many speakers were able to accept the invitation to an on-line course because they have a busy agenda. However, the traditional face-to-face courses offer the possibility of personal interactions among students and Faculty and open new avenues for collaborations. In general, the student preferred the poster presentation in person. In our experience was difficult to promote the interaction with the student that attend the course online. In conclusion even though the hybrid format is a good tool for participation the IUIS should keep promoting the presential course.
- V. The local organizers were absolutely satisfied with the course. We think that the lectures were excellent, and we are complacent with the participation of the student in the discussion section. We are convinced that students learned a lot and importantly they interacted and exchanged experiences and ideas.
- VI. The language was a struggle, but after all the students were happy for the challenge.

Acknowledges

The local organizer would like to thanks:

IUIS committee for the support. Special thanks for Bon Holtak for her excellent work.

IUIS and LAVA therapeutic for the financial support. Special thanks to the students and speakers for their participation and the commitment.



Budget Report:

Expenses	Quantity	Total
Local Transportation students/speakers		U\$ 318
Transportation for selected Argentinean students	21 students	U\$ 2261
Students Accommodation	21	U\$ 4.319
International Airplane ticket for selected Latin American students	5 students	U\$ 6384
Coffee Breaks (2 per day for 4 days – 1 for day 5) - Informal lunches	50 individuals	U\$ 3750
Farewell party	50 individuals	U\$ 1870
Secretary assistance during 6 months	1	U\$ 970
Special dinner with the speakers	11 individuals	U\$ 384
Meeting supplies: name tags, Banner		U\$ 184
Speakers Accommodation	7 speakers	U\$ 4376
Streaming assistant fees (for additional time)		U\$ 1.300
Auditorium rental		U\$ 1980
Equipment rental		U\$ 2000

Funds from IUIS (20.000 dollars), funds from the company Lava Therapeutics (10.000 dollars). Total: 30.000 dollars.

We have a negative balance (\$U100) that was covered with the local organizers' own funds.

School of Chemical Sciences of Universidad Nacional de Cordoba provided the Auditorium, streaming assistant, videos edition, students registration in Postgraduate school, web platform, institutional video for IUIS (in process) and administrative support.