

EDITORIAL ●●●●●●●●●●



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**Professor Dominique Franco,
Director of the MD-PhD and
Entrepreneurship Programs and
Director of Massive Open Online
Course (MOOC) Development**

**Transforming Education at the
Institut Pasteur**

A look back at the last 18 months (since the publication of the [first newsletter](#)) shows the long way we've come and also the long road forward if we are to continue to propose ever more innovative education programs.

Our development of MOOCs is ongoing and increasingly sophisticated. The MOOC on [Innate Immunity](#) by Jean-Marc Cavaillon and Daniel Scott-Algara is the first MOOC to be developed with a bottom-up approach and our first recording experience without an in-class course running in parallel. Having participated in the MOOC, the learners will be prepared to follow the in-person course to take place in Paris in 2017; this approach could constitute a first step toward flipped classrooms. Also noteworthy, the experience gained in the recording of MOOCs at the CNAM and from the MOOC performed in association with the University of Geneva (on the Zika virus and on the

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The candidates invited to the PPU Interview Week on February 2016. Read about the new call for the PPU Program on [page 7](#).

“One Health” concept) will provide keys to improving upcoming MOOCs.

The [Médecine-Sciences \(MS\) program](#) is entering its second year with a new

class. The first class is now in its Master degree year and will benefit from the newly created medical tutorship program and easy access



to complementary medical courses. Along with other medical students doing their PhD at the Institut Pasteur outside the MS program, they are progressively building a community of medical students with very strong scientific backgrounds, thus forming a pool of potential future leaders in biomedical research.

The first summer school on the creation of start-ups was a success and was appreciated by both learners and educators. The Institut Pasteur fosters entrepreneurship and start-up creation throughout the year with

initiatives such as the [“Creating your own company”](#) monthly event. The positive feedback from both these initiatives is a call for us to go further and to develop additional concrete events to encourage the creation of start-ups within the Institute.

The Institut Pasteur is on the cusp of embodying new and innovative standards of science education. •

Positive Report on the First Institut Pasteur Summer School

by Simon Legendre, Advisor to the President, Strategy and Partnerships

The Institut Pasteur, in partnership with Medicen Paris Region, held its first Summer School on start-up creation in the field of life sciences from July 7 to July 9, on the Paris campus. This event is part of a broader strategy to encourage entrepreneurship and technology transfer activities within the Institut Pasteur, as laid down in the strategic plan and as illustrated with the “Creating your own company” breakfast sessions.

More than 60 people attended the summer school, which provided a forum for fruitful discussions between speakers and participants through lectures and workshops, but also during breaks. This lively event represented a unique opportunity to examine the specific conditions and requirements for creating a start-up in the life sciences. The summer school attracted participants from a wide variety of backgrounds, including PhD students, post-doctoral fellows and academic researchers, as well as representatives from start-ups, the Chamber of Commerce and student organizations.

The eclectic line-up of speakers – all top-tier professionals dedicated to their field – greatly contributed to

the high quality of the discussions. Entrepreneurs, angel investors and venture capitalists, legal experts, sales representatives and heads of business incubators – representing all aspects of business creation in life sciences – joined forces to make this summer school a real success.

The enthusiastic evaluations of participants will encourage us to further integrate entrepreneurship into the Institut Pasteur's teaching activities. Building on this first experience and benefiting from the



Joël Crouzet (CEO, CSO and Founder of InnaVirVax), left, and Jacques Lewiner (physicist and serial inventor), right, two of the Summer School speakers, explained the conditions, requirements and challenges of entrepreneurship.

“ Today there are more and more opportunities to create a start-up based on a scientific discovery and develop it for a global market. Unfortunately the skills necessary for such a big professional leap are not yet fully included in most scientific education programs, so while many students would be interested in launching their own business, we didn't know how to take the first steps. Pasteur's Summer School was a great opportunity to learn about exactly these small technical details, and it turned out that the leap to create a start-up is not so scary after all. The advice and warnings given by carefully selected speakers were perfectly summarized in a very personal closing speech delivered by Xavier Duportet, who led us through his own career path until becoming the CEO of Eligo Biosciences (a start-up located at the Institut Pasteur), illustrating what we can build from a good idea, once we know how.”

Noémi Réka Szili
PhD student and Summer School participant



very relevant recommendations of the audience, the Institut Pasteur hopes to run the program again in 2017. We hope that this Summer School will dispel any last misgivings of our participants and that they will go on to take the plunge of entrepreneurship! •



Creating a Community Around Bioinformatics and Biostatistics at the Institut Pasteur

by Antonio V. Borderia and Magnus Fontes, Project manager and Group leader of the International Network for Data Analysis (INDA)

Bioinformatics and Biostatistics have become essential for biomedical research. Multidisciplinary teams will become the norm in the future and so the challenge is to create interfaces and common languages between the different disciplines.

Institut Pasteur answered this urgent need by creating the Center for Bioinformatics, Biostatistics and Integrative Biology (C3BI). An international platform, International Network for Data Analysis (INDA) was formed within the C3BI to unify and coordinate data modeling and data analysis across the Institut Pasteur International Network (IPIN).

One of the main goals for INDA has been to animate and strengthen a community around bioinformatics and biostatistics to engender a rich environment for open discussion. Education has been fundamental and designed so that participants from different countries and expertise freely interact and learn together. INDA has offered several open courses over the last two years and we expect to diversify content and increase frequency of these in the future.

International initiatives

Our flagship course in the international network is the INDA hands-on course on high-throughput sequencing data analysis. Repeated every year, these



Box 1. Pasteur's community around bioinformatics.

courses run for two weeks and are divided into theory and hands-on training. Participants are selected based on the data they bring as well as their motivation and CV. Students are grouped based on topics and supervised by one or two of our teachers. So far, we have organized these courses in Uruguay, Senegal and Brazil (with France and Senegal to follow this year).

INDA also collaborates with big

consortiums such as [LeiShield](#) to develop trainings based on scientific collaborations around bioinformatics. These courses disseminate methods and analyses developed within the C3BI to researchers, providing direct interaction and creating an open discussion to enhance both experiments and analyses.

Another new initiative is the [MISP Research Camps](#), in which we pool participants coming from

mathematics, biology, computing sciences, and statistics to solve data-intensive challenges coming from international research projects conducted at the Institut Pasteur. We also produce high-level talks by experts in immunology, microbiology and modeling (seen [here](#)). Ultimately, we rely on public and societal support and these actions are a cornerstone of our activities. Through our global collaborations, we are organizing new MISP camps in Brazil and Scandinavia next year to help tackle the emergence of new viruses and to leverage existing data collections.

A community building website

Building capacity through the Institut Pasteur community is a priority. Our courses are aimed to deliver high quality education but also to boost interactions and collaborations. For this reason, we created the [INDA collaborative website](#) (see Box 1), which centralizes news and training produced across the IPIN. The website lets students and teachers stay connected and even reach out to past participants. This online forum enhances community learning and provides for continuous feedback. In this way, we offer fertile soil for new scientific collaborations and educational efforts to grow as a community. •



The Innate Immunity Course: a Rebirth

by Marc Cavaillon and Daniel Scott-Algara, Head of lab and Researcher in the Cytokines and Inflammation research unit

In 1950, the first immunology course in Europe was organized at the Institut Pasteur by Marguerite Faure. This three-month-long course was held annually until 2002. It gathered an audience of students from France and from all around the world, particularly from the Institut Pasteur International Network (IPIN), with up to 14 different nationalities represented.

Since 2002, after the discontinuation of the course in Paris, the team in charge (Armelle Phalipon, Daniel Scott-Algara and Jean-Marc Cavaillon) decided to organize an immunology course within the IPIN (Hong-Kong and Algeria), as well as in other countries such as in Mexico, Bolivia or Peru, with local universities or health institutes. The aim is to provide a high-level teaching program for students coming from the organizing country and beyond (i.e. Asia, Africa, and Latin America).

These courses, usually one-week-long, focused on only one aspect of immunology, namely innate immunity. Innate immunity had recently undergone a rebirth, in the context of the new definitions of immunology proposed by Emil Janeway and Polly Matzinger (i.e. that the immune system was no longer defined only by an aim to distinguish between self and non-self).



Innate Immunity Courses organizers.

Far left, the first Innate Immunity course organizer, Marguerite Faure, (from a Musée Pasteur 1934 photograph of the Macheboeuf Michel Chemistry Lab). Middle and right, Daniel Scott-Algara and Jean-Marc Cavaillon, the current course organizers.

The priority given to MOOCs by the Education Department encouraged the members of the past team to propose both a new course and a MOOC on innate immunity and infectious diseases. Once the proposal was accepted, Jean-Marc Cavaillon and Daniel Scott-Algara started to organize the teaching program on the Paris campus, with the aim to hold the course alternatively in Paris and in the IPIN. In 2017 in Paris, this will be a two-and-a-half-week program, with outstanding lecturers from France, Switzerland, Spain, Italy, and the UK. The course will cover the cellular and molecular players of innate immunity, the host-pathogen interactions, the regulation of the innate immune response, its link with

inflammation and diseases. The course will also offer lectures on the new tools available today to study the immune system.

Because the investigations carried out within the IPIN mainly focus on infectious diseases, virologists, bacteriologists, parasitologists and mycologists need to know more about the interaction of their favorite bug with the host. Accordingly, this course aims to offer both basic knowledge and the most up-to-date information on the mechanism of defense of the host against the pathogens. •

New Session for the MD-PhD Program

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The MD-PhD program *Médecine Sciences* is continuing in 2016-2017 and we will have the pleasure of welcoming seven promising new students.

The students who entered the program in 2015 will now suspend their medical studies for (at least) a year, to complete a Master's degree. Following this year, they will either resume their medical studies or pursue a PhD and resume their medical studies again afterwards, not before 2020. During their first year, students followed a wide range of high-level courses that were designed to create a core of professionals possessing dual expertise in science and medicine. The Institut Pasteur welcomed these students twice during the first year to give them a general overview of the Institut, its main research themes, and its pre-doctoral programs as well as its office in charge of the integration and career guidance of scientists.

In 2016-2017 the Institut Pasteur will go further and do its best to attract these students to our courses, and we will also propose internships in our research units. In 2016-2017 a medical tutoring program will be implemented to help students maintain a strong link with medicine. Tutors from the Institut Pasteur have been handpicked; they are all active physicians, most of them being heads of a service in a hospital in various disciplines, such as neurology, infectious diseases, hepatology or pathology. In addition to their medical activities, these tutors conduct research projects and most of them are principal

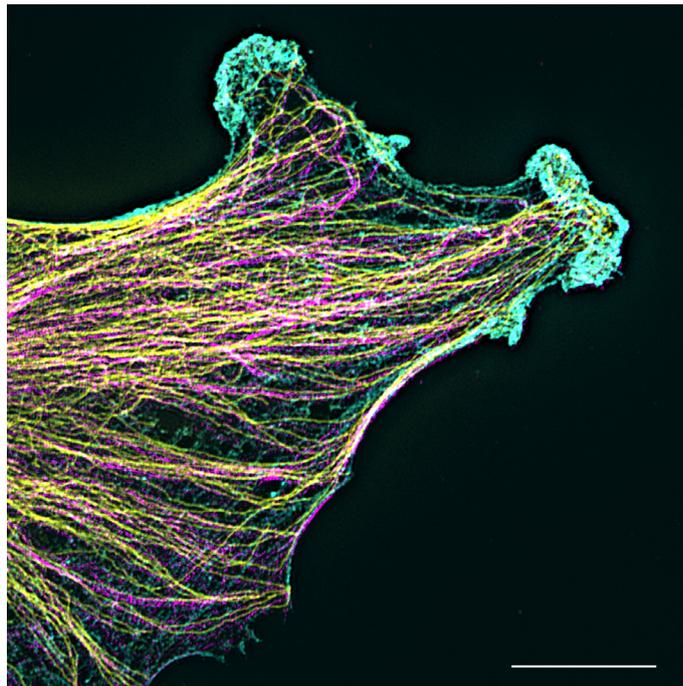


Image of the cytoskeleton of a migrating glioma.

Neuroscience is one of the many research options open to students of the *Médecine Sciences* program. This image is a super resolution microscopy (SIM) image showing a chemically fixed migrating human glioma cell. The cellular cytoskeleton is targeted by immunofluorescence to reveal specifically nanoscale 3-dimensional juxtaposition of cytoskeletal network components: micro-tubules (yellow), vimentin (red), and actin (cyan).

© Institut Pasteur/Cécile Leduc et Sandrine Etienne-Manneville, unité de Polarité Cellulaire, Migration et Cancer.

investigators in a research laboratory.

Scientific conferences by leaders in their disciplines will also be offered to students in this program, starting in February 2017, to illustrate the potential of translational research and the fruitful careers at the interface of medicine and science.

To help students prepare to take the competitive exam that is required to enter the program in 2017-2018, they will be given online access to resources in mathematics, physics and chemistry, applied to biology. These online courses will be developed in coordination with

other MD-PhD programs in France, especially the Ecole Normale Supérieure in Lyon. These courses, designed to help students revising for their exams, will also illustrate the relevance of the interdisciplinary approach encouraged by the program.

The Institut Pasteur hopes that students from this program will succeed in their ambitious curriculum and contribute to strengthen the links between research and medicine at the institute. •

Visit of Student Delegation from the Zhejiang University

Morningside Cultural China Scholars Program

The Institut Pasteur was happy to receive the visit of a student delegation from the Zhejiang University of the People's Republic of China (PRC) on July 13, 2016.

Every year 30 students are selected from 5,000 undergraduates at the excellent

Zhejiang University to participate in the high-level Morningside Cultural China Scholars Program. In addition to their regular studies, these scholars take extra classes in Chinese classics, Chinese history, and international affairs. The goal is to produce future

leaders who are deeply rooted in Chinese civilization and have a broad understanding of global issues. Through travel, the program also exposes the students to the cultures, societies, and economic and business conditions of other regions and countries.



In addition to France, for their inaugural trip to Europe, the group visited several countries, including Belgium, Germany, Italy, Switzerland, Spain and the U.K. where they met business, academic, and political leaders.

The Morningside Scholars visit to the Institut Pasteur took place on July 12-13. The scholars attended a conference by Professor Christian Bréchet, President of the Institut, followed by an intensive and open discussion.

Additionally, Dr. Yan Li, post-doctoral fellow at the Institut Pasteur, and Zhu Seng, PhD student, presented the research

Top, Professor Zhou Shengchun presents the Zhejiang University Morningside Cultural China Scholars Program to Professor Christian Bréchet. Middle, Monica Sala, Executive Director for Education, and Susannah Celli, Dean of the PPU, with the Zhejiang University delegation at the Institut Pasteur. Bottom, the delegation in the Duclaux Auditorium at the Institut Pasteur.

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activities of the laboratories where they work, directed respectively by Pr. James Di Santo and Pr. Chiara Zurzolo. The PhDs and post-doctoral fellows of the Chinese community at Institut Pasteur played a great role in the organisation of this visit which was coordinated by Dr Yongzheng Wu, principal investigator in the Cellular Biology of Microbial Infection lab and head of the education and training programs with China.

This visit was a great moment of exchange and discussion with a variety of Chinese students whose educational profiles spanned from arts and humanities to science. ●

Celebrating the Academic Achievement of PhDs

Save the Date for the Fourth Annual Institut Pasteur Graduation Ceremony!

Since 2013, the Institut Pasteur has held the annual ceremony in honor of PhD students who recently defended their thesis. For the second time, some of the most brilliant graduates of the RIIP will have the good fortune to participate. This award ceremony is one of the major highlights of the academic year, and a fantastic opportunity for graduates to celebrate their hard work and academic accomplishment with family and friends.

For more information, check for updates on website [here](#) or contact the organizers at: ipgraduation@pasteur.fr ●

Photos from the 2015 graduation ceremony.

Right, President Christian Bréchet addresses the new doctorants. Below, the group photographed in front of Bâtiment Duclaux.



When: Friday December 16th, 2016

Where: CIS Auditorium

Invited: Pasteur employees, guests of graduates and representatives of partner organizations

Guest speaker: Professor Alim-Louis Benabid, Lasker Prize 2014 and Breakthrough Prize 2015

Chair: Professor Christian Bréchet, President of the Institut Pasteur

Organizing committee: Friederike Jönsson, Laura Sinigaglia (StaPa), Guy-Franck Richard and Sylvie Malot

If you graduated recently and/or you wish to participate, please confirm your presence before the 1st of December to ipgraduation@pasteur.fr



New Call for the PPU Program!

The call for the 2017 class of the PPU program was published this summer. The research laboratories on campus that want to welcome a PhD student sent the PPU office their projects, which are now on [the PPU website](#).

Until November, students from all over the world can contact the principal investigators proposing the projects. Finally, in December, twenty-eight candidates will be selected and invited at the Institut Pasteur for the final selection on February 2017.

In the meantime, the PPU office is preparing the “Welcome Day” for the

students who will start their PhD on October 3, 2016. They are 19 students coming from Argentina, Bolivia, Brazil, China, India, Italy, Malaysia, Mexico, Pakistan, Portugal, Spain, and Ukraine. The name of this class is still a secret, but it will be revealed soon! •



Roberto Bruzzone, Named Interim Director for the Institut Pasteur Korea

Roberto Bruzzone has been appointed Interim Director of the Institut Pasteur Korea. As a consequence, Professor Bruzzone will leave his position as Director of the International Training Program of the Institut Pasteur, after one year of service. The Department of Education and the Department of International Affairs thank him for his great work and look forward to our continuing collaboration on the International Training Program of the Institut Pasteur. •

Calendar: Education Events

- OCT 24-28** **IP Mouse Sperm and Embryo Cryopreservation Workshop** [read more](#)
- NOV 8** **Creating Your Own Company Breakfast Meeting***
PhDs and post-docs meet Florence Séjourné, CEO of Davolterra
8:30 a.m., CFJ, room 28-01-01 A
- NOV 29-
DEC 2** **The International Scientific Symposium of the Institut Pasteur International Network** [read more](#)
- DEC 7-9** **"Improve the implementation of the vaccination policy"**
Workshop [read more](#)
- DEC 16** **Graduation Ceremony** [read more](#)
- DEC 19** **Creating Your Own Company Breakfast Meeting***
PhDs and post-docs meet Stéphane Bancel, CEO of Moderna Therapeutics
8:30 a.m., CFJ, room 28-01-01 A

*Limited places available. Please contact Lisa Riffaud at lisa.riffaud@pasteur.fr to register.

Course Offerings

COURSES OPEN FOR ENROLMENT

Five news courses!

[Online enrolment](#) for courses scheduled for 2016-2017 university year is open.

Viruses and Cancer
September 26-30, 2016
[IN ENGLISH](#)
[Read description online](#)

Retroviruses
September 3-7, 2016
[IN ENGLISH](#)
[Read description online](#)

Course on Antibiotics (AdCAB)
October 9-20, 2016
[IN ENGLISH](#)
[Read description online](#)

Innate Immunity
April 10-25, 2017
[IN ENGLISH](#)
[Read description online](#)

Integrative Structural Biology
July 17-22, 2017
[IN ENGLISH](#)
[Read description online](#)

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