

## LETTER FROM THE PRESIDENT ●●●●●●●●



photograph © Giovanni Cittadini Cesi

### **Professor Christian Bréchet, President of the Institut Pasteur**

Teaching, training, and in general education, are at the heart of the Institut Pasteur's missions and part of the legacy of our founder Louis Pasteur. For more than 125 years, since the Grand Cours de Microbiologie, first organized by Emile Duclaux in 1889, the Institut Pasteur has played a leading role in the teaching of science.

A most specific feature of the Pasteurian teaching spirit is the emphasis put on experimentation and practical work, which is both its strength and its singularity. Moreover, teaching at Pasteur has been markedly influenced by the development of the Institut Pasteur international network worldwide, which has a strong influence both on the scientific topics covered in the Pasteurian courses and on the origins of our students. Over the past forty years the Institut Pasteur's teaching has progressively included new courses and established strong partnerships with Parisian universities. The creation of new courses has been

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**The Institut Pasteur joins the iGEM competition.** On the left (dark hair), Deshmukh Gopaul and Floriane Cherrier (blond hair), manager and adjunct manager of the IP iGEM team. [See story p. 10.](#)



closely associated with the emergence of new disciplines at the Institut Pasteur, such as molecular biology, developmental biology and neurosciences. Every year, more than 900 trainees from 60 countries attend one of the 42 international courses organized at the Institut Pasteur in Paris or in the International Network. The involvement of Pasteurian scientists in education, the legacy of Louis Pasteur and his lieutenants, is a key component of our success. Yet, we need to strengthen this commitment at two tiers: the reinforcement of partnerships with universities, which will contribute to enhance the number of university positions at the Institut Pasteur; and the introduction of “chairs of excellence”, which will largely take into account teaching activities.

Our strategy regarding teaching at the Institut Pasteur will focus on the following objectives:

### Interdisciplinarity

We are experiencing a truly revolutionary approach whereby, beyond fashionable wordings, a new vision of science is emerging, associating biology with mathematics, physics, informatics and chemistry. In this context, we believe that we do need a change of paradigm, which would target students and young scientists. Systems biology and synthetic biology are novel themes the Institut does need to address. Quantitative biology is also on the agenda. This new era further dictates that the Institut Pasteur must partner with the “grandes écoles” and universities and instill an atmosphere of imagination at the service of teaching. The Institut should however retain its singularity that is the combination of theory and practical

experimental approach. Along this view, the Centre de recherches interdisciplinaires (CRI, the Center for Research and Interdisciplinarity) will be an important partner.

To respond to new scientific challenges in science, the Institut Pasteur will create in the next year a “grand cours de biologie computationnelle et integrative”. The introduction of integrative biology implies a complete conceptual overhaul, which must be appropriated by all fields of research at the Institut Pasteur: therefore, it will not only concern

students, but all Pasteurian scientists. The newly created Center for Bioinformatics, Biostatistics and Integrative Biology (C3BI) will be at the heart of this program.

### An ambitious development of our teaching facilities

The buildings devoted to teaching at the Institut Pasteur are part of our heritage; organized close to the historical “serre” (greenhouse), they have contributed to the very special atmosphere surrounding





teaching at Pasteur. The renovated facilities in the Louis Martin Pavillion of the former Pasteur hospital have provided this unique blend of history and fully modern equipment and organization. The ambitious project for the the Emile Roux Pavillion, which will nearly double the size of facilities dedicated to teaching, will markedly expand the capacity of the Institute to set up novel courses while retaining the same spirit.

### Teaching worldwide

The international dimension of education at the Institut Pasteur and in the Institut Pasteur international network can be furthered by increasing the number of exchanges between faculty members, students and partners from around the world. Thus, the Institut Pasteur will amplify its efforts to train high-level scientists from all over the world, by establishing international partnerships with foreign organizations (both academic and private). In parallel, the Institut Pasteur will significantly increase the number of students of the Pasteur-Paris University International Doctoral Program (PPU) by 2018.

The Institut Pasteur international network is at the heart of our 2014-2018 strategic plan. Teaching and training will be obviously part of this commitment. This will be achieved by reinforcing the existing tools and develop our course offer within the network open to scientists and medical doctors. Teaching is a key component of the newly-created Center for Global Health Research and Education (CGH). As an example, our international teaching strategy will promote the training of scientists in Africa by our scientists working within

the African Pasteur institutes. Thus, setting up collaborations with English speaking countries in Eastern Africa, fostering novel schemes of training largely based on research will be one of the key actions of the African hubs of the Center for Global Health Research and Education.

### Introducing digital tools into our programs

The Institut Pasteur does enthusiastically embrace the huge change induced by technological innovations in education and the introduction of MOOCs at the Institut Pasteur is part of this move. Keeping up with technological evolutions will be most important for our teaching activities: the Education Center, the Center for innovation and Technological Research (Citech) as well as the Center for Bioinformatics, Biostatistics and Integrative Biology (C3BI) will contribute to this technological and conceptual watch.

### Reinforcing the links between science and medicine

The medical expertise within the Institut Pasteur needs to be strengthened: to do so, the Center for Translational Research (CRT) was set up in 2014. However, human resources and the contribution of the Institut Pasteur to the medical dimension of research of the Institut Pasteur remain limited. The creation of a high-level MD-PhD program, in partnership with the Ecole Normale Supérieure (ENS), the Institut Curie, the College de France and the Ecole Supérieure de Physique et de Chimie Industrielle de la ville de Paris (ESPCI), will contribute to remedy these problems. This

program will significantly reinforce the medical expertise within the Institut Pasteur and will attract high-level students, who could pursue their career at the Institut Pasteur or within the network. It will be closely related to the reinforcement of the programs (“postes d’accueil et contrats d’interface”) favoring research activity at the Institut Pasteur and in the network for MDs at various levels of their career tracks

### Strengthen links with industry / business

The Institut Pasteur believes in the importance of creating value around its research and in the necessity for our teaching activities to reflect it. Therefore, we are investing in programs and education events (courses, seminars, workshops) that strengthen our links with industry, particularly through training modules that focus on entrepreneurship via a close, innovative collaboration with industry, academics and start-ups.

The Institut Pasteur fosters the application of discoveries and strives to accelerate the pace of the transfer from bench to bedside, for the benefit of society. Through our courses, we wish to make the Institut Pasteur a melting pot for start-ups, at the heart of innovation. Education is not only a major heritage of the Institut Pasteur, but also the key to our future. To meet the challenges of modern education, the Institut Pasteur will explore untapped opportunities, to take the Institut Pasteur to the next level as an international center of excellence for education. ●



## New leaders and new initiatives



**Doctor Monica Sala,  
Executive Director for Education**

**A**t the beginning of 2015, Christian Bréchet, President of the Institut Pasteur (IP), launched the renovation of the Education Department by naming four new leaders. Monica Sala was appointed as the Executive Director for Education; Dominique Franco was chosen to direct the development of the MD-PhD and entrepreneurship programs, as well as to direct the development of massive open online courses (MOOCs); Roberto Bruzzone was asked to manage the Training Programs within the International Network of the Institut Pasteur in close collaboration with the IP International Division; and Paul Lazarow was confirmed as Dean of the Pasteur-Paris University International Doctoral Program (PPU).

**T**his new team has been charged with developing IP Education in conjunction with Arnaud Fontanet, head of the Center for Global Health Research and Education (CGH), and Olivier Gascuel, head of the Center for Bioinformatics, Biostatistics and Integrative Biology (C3BI). Specifically, the Executive Direction for

Education (DDE, “Direction déléguée à l’Enseignement”) is responsible for managing the IP Tutoring that guides more than 250 PhD students studying at IP Paris each year, as well as for organizing courses with sessions on theory and hands-on practical training.

**A** complete restructuring of IP Tutoring, whose website is [here](#), is underway to ensure better and more personalized oversight of PhD students, including early detection and resolution of possible problems. Courses scheduled at the Education Center of IP Paris span topics related to microorganism biology, infection, epidemiology and public health (courses can be seen [here](#)). Up until now, courses have been offered at the Master2 degree, PhD, and professional training levels. New courses are planned that will complete the Education Center program by the 2015-2016 academic year (i.e. ento-

mology, microscopy, valorization of research, outbreak investigation). Organization of Master1 level courses is in progress to support the IP MD-PhD program, and courses/programs addressed to undergraduate students (from secondary school to Licence level) is also ongoing (one week training for secondary school students, Amgen, iGEM, Pasteur Foundation Internships). This will not only fulfill Institut Pasteur’s Education mission for French and international youth, but encourage loyalty to the Institut Pasteur on the part of scientific youth. ●

For more information please see the education website [here](#).

## Meet the Education Department Leaders

### IP Paris and the IP International Network



Above: Paul Lazarow, Monica Sala, and Dominique Franco, the Paris-based leaders of the Education Department. Above right: Roberto Bruzzone, HKU-Pasteur Research Pole, School of Public Health, The University of Hong Kong. Right: Arnaud Fontanet, Head of the Center for Global Health Research and Education (CGH) and Co-director of the Pasteur-CNAM School of Public Health.



## MOOCs and Videos Bolster eLearning at Institut Pasteur



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

### Early eLearning at Institute Pasteur

Since 2008 the **Vaccinology course** has provided students with, in addition to lectures, an **e-learning platform** through which they can access extra lessons as well as participate in collaborative work sessions with the HSeT Foundation.

Concurrently, the Association of Former Students of the Institut Pasteur (AAEIP) whose website is [here](#), has produced regular videoconferences in collaboration with "Connaissance et Savoir, Transmission et Valorisation Numériques" (CSTVN) of Paris XI and l'Agence Universitaire de la Francophonie (AUF). The videoconferences are broadcast in French and disseminated via the International Network of Pasteur Institutes (RIIP). They are viewable pre-recorded on YouTube or live [here](#). The next broadcast date is May 27, 2015.

### Expanding Web-Based Education with Videos and MOOCs

The Education Center will also offer videos of selected conferences online. "Frontiers in Biological Psychiatry", website found [here](#), will be the first to make conferences available in this format. The recordings will be accessible on a web channel available only to Labex BIOPSY

The Institut Pasteur Education Department will extend their web presence further by using new models of online communication and education, notably by further developing Massive Open Online Courses (MOOCs).

### The making of a MOOC

A way of teaching that began a few years ago in the United States, a MOOC is a step above conventional e-learning. An online course aimed at unlimited participation and open-access, MOOCs got their start as a way of exchanging information online and building a course together. In universities MOOCs have tended to take the form of a conventional course in which teachers take the role of party organizers. They are seen on the screen explaining the content of the slides. The entire course is divided into short sessions of approximately ten minutes (which is estimated to be the maximum amount of time a student will have to focus on it.) A film of each session is produced in a recording studio. Each film shows the teacher's presentation and a limited number of slides. An array of effects can then be applied to increase the audience's attention.

### How a MOOC works

The course is put online via a specialized web platform and becomes available for a limited period of time. There are numerous platforms worldwide, the most famous in the United States. In France the platform FUN (French Numerique University) is dedicated to MOOCs produced by French universities and other French educational structures. To measure the success and interest of the course, the number of participants is recorded as is the rate of discontinuation during the course. Although access to the course is usually free, it has been shown that audience participation remained more stable when a fee was charged for access to the course. To measure the degree of student understanding of a particular lesson, most often a teacher



can administer a short series of multiple choice questions on-line, the results of which are also available to the student. In addition there may be an examination at the end of the course with a number of multiple choice questions. A web forum with a community manager is offered during the period that the MOOC is available on the web. Also, a direct online chat with the director of the course takes place once a week.

### Wide-spread, valuable and lasting?

MOOCs are mostly used by universities and institutes to advertise their knowledge, educate the students and show off. In addition to university use, MOOCs are now very popular in large companies to educate employees, especially for safety training. While MOOC-ing is decidedly hip, the long-term place that MOOCs will take in student education, in the general diffusion of knowledge and the internal training, is unknown. Recently there was even some negative backlash from some renowned professors. All the same, the educational committee of Institut Pasteur deemed that this innovative way of education is significant and merits the Institute's participation.

### Pilot MOOC for Institut Pasteur

In 2014 the first MOOC was pioneered at Institut Pasteur by Professor Arnaud Fontanet, Director of the Center for Global Health Research and Education (CGH), in association with the Conservatoire National des Arts et Métiers (CNAM). The course featured was Principles and Methods in Epidemiology, a topic largely represented in Health MOOCs. **This MOOC**, diffused on the FUN platform, gathered more than 3,000 followers during its first diffusion and another 3,000 on the second one, a good sign of success.

### More MOOCs: Vaccinology and . . .

Institut Pasteur is now engaged in the production of a second MOOC, this one associated with the Vaccinology course directed by Doctors Frédéric Tangy and Armelle Phalipon. This MOOC is being recorded off-site at CNAM since there currently is no recording studio at Pasteur. (However, the **construction of an on-site recording studio** is planned.) Other Pasteur MOOCs will follow, starting with "Microbes and the Brain" in association with Dr. Pierre-Marie Lliedo's course by the same name, and "Emergent viral diseases" directed by Roberto Bruzzone, with significant contributions from the Institut Pasteur International Network (RIIP).

### MOOCs as Standard IP Educational Tool

With this rapid growth, the creation and use of MOOCs will have become routine at Pasteur by the end of 2016. How might this new resource impact your educational activities? The educational committee will soon launch a first call for proposals on new Institut Pasteur MOOCs. ●



**Learning and eLearning:** Above: Professor Arnaud Fontanet conducting field work for his Epidemiology course. Below: in the recording studio Fontanet prepares to create the the **Epidemiology MOOC**.

## Paris Region Cluster



**Vanessa Proux,**  
**Committee**  
**President and**  
**Directrice de**  
**l'Institut Sup'**  
**Biotech de Paris**

The Training Committee consists of 25 members who represent all stakeholders involved in training: universities, schools, small businesses, large industrial groups, recruiting firms, biocluster, and so on. This committee demonstrates the cluster's commitment to aligning existing and future trainings (whether they be initial, continuous or alternating) with the skills needed by members of Medicen. Good skills contribute to the success of projects across an organization and the recruitment of an intern, apprentice or employee costs both time and money. The goal of recruiting is to achieve a positive return on investment for the company.

In this context, the Medicen training committee has established the following objectives:

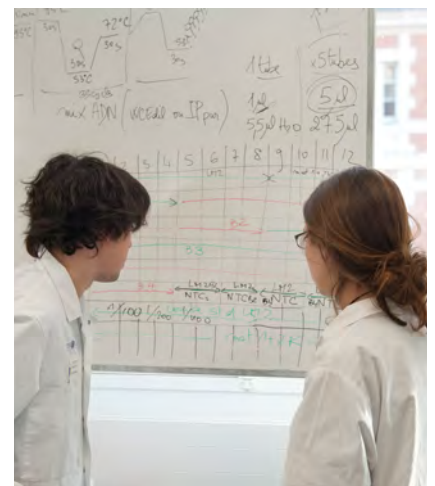
- **Identify** and map bac +5 training programs that meet the five themes of DAS (in vitro diagnostics, diagnostic and interventional imaging, regenerative medicine and biomaterials, ICT & health, translational medicine).
- **Establish** an endorsement procedure for trainings.
- **Develop** a communications plan to promote the commission, and thus the cluster, by:
  - Reaching the general public and enhancing the sector's image by presenting careers and training



to students, students or teachers. Initiatives started today will be structured and organized accordingly.

- Creating events to spur networking between students and companies in the cluster.
- Using the events programmed by Medicen to present one or two courses at a time in a manner that is succinct and powerful.

The Training Committee has prioritized the launch of an endorsement procedure for trainings. Indeed, an endorsement will add value to both companies and courses. It will permit us to:





- **Structure** and improve the readability of trainings in the territory of Medicen cluster (Ile de France)
- **Help** businesses, particularly SMEs / ETI, to find the skill-sets necessary for developing their programs and facilitate the recruitment of interns, apprentices and graduates.
- **Meet** businesses' training needs in both the areas defined by the DAS and also on cross-disciplinary as well as those related to strategy
- Foster a correspondence between the skills needs of businesses and

the training in the area. Endorsement may encourage trainings to adapt their curriculum or spur the creation of new courses.

- Bring visibility to the trainings that match the needs of a sector, or several sectors sharing transversal and collaborative projects.

**T**he main criteria for endorsement focus on the program content and its alignment with the DAS Medicen and development strategy in the areas of health, the steering process, relations with the workplace, workforce old, the international

aspect of training, pedagogy projects and integration of targeted skills into the curriculum. To these generic criteria may be added specific criteria of the DAS and defined by the DAS commissions.

**T**he Training Committee aims to start the certification process by reviewing the first applications this fall. ●

## Education Teams Consolidate in Former Hospital Buildings

### Broadcast Studio to Be Constructed

**C**hange is afoot in the former hospital buildings, Pavillon Louis Martin and Pavillon Emile Roux. The Education Department is drafting plans to consolidate their offices and construct a broadcast studio in these historic buildings that flank the greenhouse. Education staff currently working among four different sites will benefit from this centralized location. All of Institut Pasteur will benefit from the cutting-edge broadcast studio which will be dedicated to video and MOOC production.

**D**elphine Delonca-Louette, the technical project manager, is shepherding this project from start line to finish. She is leading a careful selection process to find the architectural firm, among six competitors, who will partner this project. A committee who was especially selected for this role is conducting oral interviews with the six potential firms who have already submitted proposals. In conversation she alludes to the types of challenges the architecture team might solve, such as creating a fully modern facility within a historical building whose proportions don't

readily fit specifications such as, "A light fixture at four meters high."

**S**olutions will be found and the finalized studio will house the production of numerous MOOC and eLearning efforts. A location literally in Institut Pasteur's backyard will make for an efficient and

personalized production process just as the creation MOOCs and videos become established as standard practice at Pasteur.

**A** choice of firms is expected in May. The studio is planned to be operational at the start of the school year in September 2017. ●



**Tradition meets innovation.** Left, Pavillon Emile Roux and Pavillon Louis Martin, site of Education expansion and broadcast studio construction. Right, photograph of a typical broadcast studio.



The Education Department is celebrating the success of two Institut Pasteur students who won prizes for presenting their thesis in three minutes flat at the as part of the globally-recognized competition "My Thesis in 180 Seconds" (MT180) in March. On March 23, Keï's Nabhane Said Halidil, PhD in the Signaling and Pathogenesis Laboratory, directed by Fabrice Agou, won the Paris-based competition held in the imposing Richelieu amphitheater at the Sorbonne University. March 24 Lanjio Wang, a doctoral student in the department of Medical Entomology (Vectopole) at the Institut Pasteur of French Guiana, easily captured first prize for the regional contest held there.

Brandishing only a single slide and their wits, contest participants must convey the essence of their thesis in the space of three minutes. "My Thesis in 180 Seconds" competitions, also referred to as "Three Minute Thesis," (3MT) are used worldwide and were originally developed by the University of Queensland in Australia. The competition aims to help young academics refine communication skills and effectively share their work with a broad audience and across research disciplines.

Keï's Nabhane Said Halidil, whose relaxed and clear presentation includes a physical demonstration of a molecular hug (and the touch of humor requisite for such an analogy) started by "brilliantly passing" an initial pre-selection process, says his lab head Fabrice Agou. He then competed against 18 PhD students in the final round, finally winning the "Prix de Public" (Public's Choice Prize) which can be read about [here](#).



Above, Keï's Nabhane Said Halidil presenting his thesis to win the "Prix Public" at the Sorbonne. Below, Lanjio Wang presenting her thesis to win the regional contest at Institut Pasteur of French Guiana.

Seven thousand kilometers away, Lanjio Wang won the regional contest using a language she is still learning – French – to present her thesis: "Insecticide resistance in mosquitoes (arbovirus vectors)." Despite competing in a language that is not her own, she made her research concise, clear and compelling, winning the regional prize. In her radio interview [here](#) she reports that in fact the French language aspect was the biggest challenge. With her win, Lanjio was chosen represent French Guiana at the national final in Nancy June 3.

These recent wins set a strong precedent and are sure to inspire other students to take up the challenge. Those looking for motivation can easily learn more thanks to the amount of media at hand. Watch Keï's presentation [here](#) to see what a winning presentation is like. Hear the about the process by listening to interview with Lanjio [here](#).

The Education Department in close collaboration with the Center of Translational Research (CRT) is going to promote initiatives to train PhD students at the Institut Pasteur to win the next MT 180 competition. ●



Institut Pasteur will send its first team to contend in the International Genetically Engineered Machine (iGEM) competition. This marks the start of an annual tradition at Institut Pasteur which will dispatch a new student IP iGEM team every year.

The iGEM competition is a worldwide synthetic biology contest that was initially aimed at undergraduate university students, but has since expanded to include divisions for high school students, entrepreneurs, and community laboratories, as well as 'overgraduates'.

The IP team has named their project, "PlastiCure, or the unexpected virtue of bottles." Students can [register here](#) to participate in the IP iGEM team.

The IP iGEM team is supported by the Executive Direction for Education (DDE). The IP iGEM team competition enrolment was funded by Institut Carnot, Pasteur MI.

**Sponsor the iGEM team [here!](#)**

**Read more about the competition on the iGEM website [here.](#)**

**Check for related updates on the Education website [here.](#)**



Institut Pasteur's first iGEM team. [See page one](#) for larger photo.



Far Left: Institut Pasteur's IP iGEM logo. Left: The logo created by this year's team for their project, "PlastiCure, or the unexpected virtue of bottles."



## The Third Annual Institut Pasteur Graduation Ceremony



**When:** Friday December 11, 2015

**Where:** CIS Auditorium

**Invited:** All Pasteur staff, guests of graduates, and representatives of partner organizations

Since 2013, the Institut Pasteur has organized an annual ceremony in honor of PhD students who defended their thesis throughout the year. All Institut Pasteur staff, guests of graduates, and representatives of partner organizations are invited to this festive event.

This year's ceremony will be held on December 11. The guest speaker will be **Professor Françoise Barré-Sinoussi, Nobel Prize laureate** in Physiology or Medicine in 2008. Professor Christian Bréchet, President of the Institut Pasteur, will chair the event in collaboration with Madame Rose-Marie Van Lerberghe, Chairman of the Board.

The organizing committee, Aziz El-Amraoui, Friederike Jönsson, and Sylvie Malot are already hard at work planning this celebratory, student-centered event. Check for updates on the thesis ceremony website [here](#). Or, for more information contact the organizers at : [ipgraduation@pasteur.fr](mailto:ipgraduation@pasteur.fr)



**The organizing committee.** Left to right, Aziz El-Amraoui, Friederike Jönsson, and Sylvie Malot.

**Images from graduation ceremonies past.** From top left: Professor Bréchet speaks, question and answer session, Salle des Actes, and left, PhD student and her colleague as musicians.





## COURSES IN SESSION

### Modeling of infectious diseases May 18-29 **IN ENGLISH**

This two-week course provides a thorough introduction to mathematical modeling of infectious diseases for students and professionals in science, medicine and public health.

[Read full description online](#)

### Infectious Transfusion Safety May 18-29 **IN FRENCH**

This two-week course presents current knowledge on epidemiology and research around the prevention of transfusion-transmissible infections.

[Read full description online](#)

## COURSES OPEN FOR ENROLLMENT

### Advances in stem cell biology June 29 - July 11 2015 **IN ENGLISH**

This two-week course combines lectures and practical sessions to leading edge technologies and questions in stem cells biology in the context of organogenesis and regeneration in different organisms.

[Read full description online](#)

### Frontiers in Biological Psychiatry July 6 - 10 **IN ENGLISH**

This one-week course presents a combination of lectures and tutorial sessions to guide participants through methodological approaches and most up-to-date openings in psychiatry.

[Read full description online](#)

For more information about courses offered by the Education Department [click here](#).

## Calendar

### KEY DATES in the coming months

- MAY** 18-29 Modeling of infectious diseases ●  
18-29 Infectious Transfusion Safety ●
- JUNE** 25-26 Workshop on Education  
30 Evaluation and Governance in Science ●  
29 - July 10 Advances in stem cell biology ●
- JULY** 6-10 Frontiers in Biological Psychiatry ●

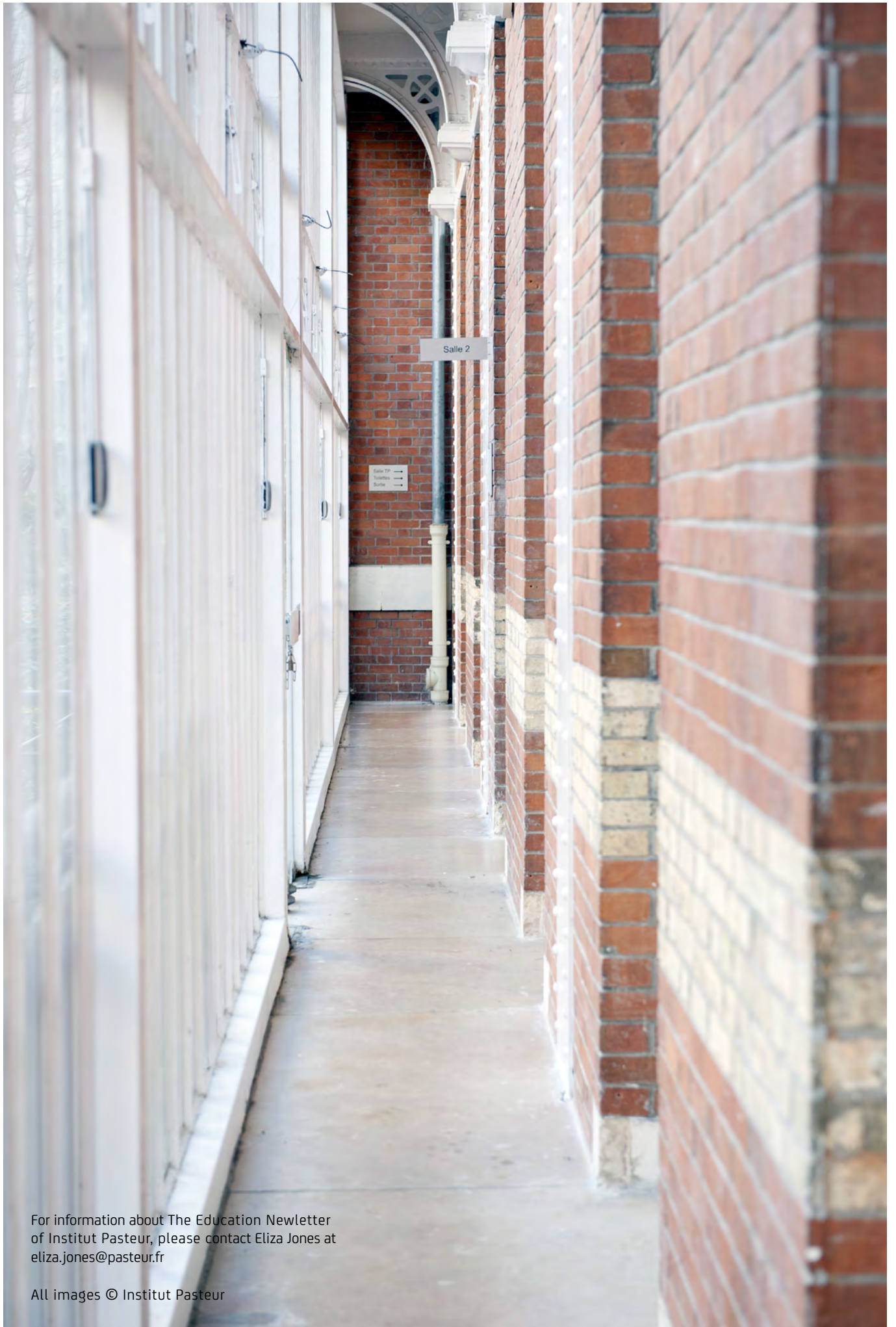


### FRIDAY DECEMBER 11, 2015

The Third Annual Institut Pasteur Graduation Ceremony ●

#### KEY TO LISTINGS

- Course
- Annual Event
- Speaker
- Round Table Discussion



For information about The Education Newsletter of Institut Pasteur, please contact Eliza Jones at [eliza.jones@pasteur.fr](mailto:eliza.jones@pasteur.fr)

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