2017
ANNUAL REPORT

6091

Together, let’s beat cancer
institut-curie.org
**HISTORY**

### 1891
Marie Curie leaves Poland for Paris to study physics.

### 1909
Creation of the Institut du Radium, on the initiative of Institut Pasteur and the University of Paris.

### 1911 and 1903
Pierre and Marie Curie receive the Nobel Prize for physics in 1903.
Marie Curie receives a second Nobel Prize in 1911 for chemistry. She remains the only woman to have won two Nobel Prizes.

### 1920
Creation of the Curie Foundation.

### 1925
Albert Einstein and Marie Curie go walking on the banks of Lake Geneva in Switzerland.

### 1935
Nobel Prize in chemistry awarded to Irène and Frédéric Joliot-Curie.

### 1977
Opening of the Pediatrics department

### 1995
Opening of a cellular biology division

### 2016
Institut Curie’s Institut Carnot label renewed.
The MC²¹ medical-scientific program’s priorities are approved.

### 2017
Celebrating the 150th anniversary of Marie Curie’s birth.

### 1921
Marie Curie, accompanied by her two daughters Irène and Ève, makes a triumphant trip to the United States. President Warren G. Harding officially presents Marie Curie with 1 gram of radium, provided through the generosity of American women.

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### 2017
Celebrating the 150th anniversary of Marie Curie’s birth.
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“A good team is a team with members who go above and beyond the call of duty.”

Marie Curie
How do you look back on 2017?

“My term as Chairman of the Board of Directors was dominated by four main chapters: the resorption of the Hospital Group deficit, the implementation of recommendations from the Cour des Comptes (Court of Auditors), the establishment of the MC² strategic plan and the launch of a vast plan for the renovation and construction of premises for the future of the Foundation.”

Prof. THIERRY PHILIP, Chairman of the Executive Board

2017 was a year of both continuity and change. Continuity in terms of the development plan since we continued to implement the MC² (which stands for Marie Curie 21st century) strategic plan. This project is one I often summarize in a single word: “openness”. This term can be traced back to the very roots of Institut Curie, since Marie Curie, its founder whose 150th birthday was celebrated this year, was already a woman engaged with the world. Institut Curie continues this approach by developing hospital, academic, scientific and industrial partnerships in France and abroad, by forming collaborations to conduct research and care at the highest level. In 2017, Institut Curie strengthened its international engagement. This requires, for example, the development of the accommodation of foreign patients, promotion of our know-how and certification of our clinical research and transfer activity by the Organization of European Cancer Institutes (OECI).

In terms of changes, it was my final year as Chairman of the Board of Directors, since the foundation is currently amending its bylaws. Under the new governance, Daniel Thierry, a founding member, is now Chairman of the Supervisory Board and I am Chairman of the Executive Board.
Having decided not to renew my mandate as Director of the Research Center in 2018, 2017 was my last full year as Director of the Research Center. A new Director is set to take over in September 2018.

I could summarize these five years in three words: Sharing, Talents and Curiosity, to face scientific, technological and medical challenges, and explore the frontiers of knowledge in all disciplines (biology, physics, chemistry, etc.).

Our international position is proven by our success in international calls for bids (ERC, CoFUND, ETN, H2020 collaborative projects) and by our exchanges with the NCI and the Weizmann Institute for example, our seminars program, our sabbaticals and the international conferences organized by members of Institut Curie.

Over the past five years, we have combined anticipation and adaptation for innovative projects taking into account the changing environment, the complex economic context, institutional changes, and the French and international science policy landscape.

“The Curie spirit, a spirit of engagement, guided us in discovering new talent and developing our international dimension as a leading international Research Center in Basic Biology and Cancer Biology.”

Prof. PIERRE FUMOLEAU, General Director of the Hospital Group

2017 was a year of transition, with the departure of the Director of the Hospital Group in early March, and the start of my term in early September. The medical project was reviewed in order to extend the benefit of Institut Curie’s medical expertise even more broadly, and continue to roll out international patient pathways.

2017 was also a year with many new hospital collaborations. Their aim is to strengthen the organization of the Hospital Group in its specific locations, to be shared for greater efficiency, but also - and above all - to improve patient care by structuring courses of treatment, as illustrated by the creation of the Curie-Montsouris Chest Center. 2017 was also marked by the selection of the very high throughput SeqOLIA genome sequencing platform, bringing together AP-HP, Gustave Roussy and Institut Curie.
About us

A leading player in the fight against cancer, Institut Curie brings together an internationally-renowned Research Center and an advanced Hospital Group that provides care for all types of cancer – including the rarest forms.

Founded in 1909 by Marie Curie, Institut Curie comprises three sites (Paris, Saint-Cloud and Orsay), where more than 3,500 members of staff are dedicated to achieving three objectives: hospital care; scientific research; and the sharing of knowledge and the preserving of legacy.

As a private foundation that is recognized as serving the public interest, Institut Curie is supported by donations and grants. This support is used to fund research that will improve treatments and the quality of life of cancer patients.

Institut Curie’s 2015-2020 Strategic Plan was directly inspired by the model invented by Marie Curie in 1909 aimed at bringing researchers and physicians together to find new treatments for cancer patients.

The Curie Museum: the year of Marie Curie

The Curie Museum is a repository of the history of the sciences and medicine, and also serves as a tribute to Institut Curie. 2017 marked 150 years since the birth of Marie Curie, with a major public event serving as a cultural highlight: the Marie Curie, A Woman at the Panthéon exhibition. Marie Curie’s legacy meant this anniversary was celebrated around the world, with the Curie Museum attending festivities in Poland, Belgium, the United States, Lebanon and beyond.

“Marie Curie wasn’t the first female scientist, but she’s certainly the best known.” Hélène Langevin, physicist, daughter of Frédéric and Irène Joliot-Curie, Marie Curie’s granddaughter.
Our Scientific Advisory Board

Made up of internationally-renowned oncology specialists, this body issues recommendations to the Board of Directors on an annual basis, thus supporting the institute in its decision-making process. In 2017, two new members joined the SAB: Nancy E. Davidson, Senior President of the Fred Hutchinson Cancer Research Center (United States) replaced Prof. Martine Piccart, and Angela Nieto, departmental head at the Instituto de Neurociencias de Alicante (Spain) replaced Denis Duboule.

Prof. Iain Mattaj
Chairman of the Scientific Advisory Board
Director-General of EMBL - Heidelberg, Germany

Prof. Ian F. Tannock
Vice-Chairman of the Scientific Advisory Board
Professor of Medical Oncology and Medical Biophysics, Ontario Cancer Institute/Princess Margaret Hospital - Toronto, Canada

Prof. Anton Berns
The Netherlands Cancer Institute – Amsterdam, Netherlands

Prof. Pascale Cossart
Professor, Institut Pasteur – Paris, France

Prof. Denis Duboule
Professor of Genetics, Director of the Genetics and Evolution Department, University of Geneva
École Polytechnique Fédérale – Lausanne, Switzerland

Prof. Alain Fischer
Physician, Professor of Pediatric Immunology and researcher in Biology (Inserm, Paris Descartes University, Necker Hospital) – Paris, France

Prof. Eileen E.M. Furlong
Professor, Head of the Genome Biology Unit, EMBL – Heidelberg, Germany

Prof. Stanley B. Kaye
Professor of Medical Oncology, Head of the Medicine section at the Institute of Cancer Research and Unit Director at the Royal Marsden Hospital – Sutton, UK

Prof. William Gillies McKenna
Head of the Oncology Department at Oxford University – Oxford, UK

Prof. Paul Nurse
President of the Royal Society and Chief Executive, UK Centre for Medical Research and Innovation (UK CMRI) – London, UK; Nobel Prize 2001 in Medicine

Prof. Thomas Tursz (died on 27 April 2017)
Professor Emeritus in Oncology (University of Paris XI), Honorary Chief Executive of Gustave Roussy – Villejuif, France

Prof. Ronald D. Vale
Professor, Head of the Cellular and Molecular Pharmacology Department, University of California – San Francisco, United States

Prof. Marc Van de Vijver
Professor of Pathology, Head of the Pathology Department, Academic Medical Center – Amsterdam, Netherlands
Key Figures

3,500 employees

171 foreign post-docs out of a total of 262

115 foreign doctoral students out of a total of 256, including 13 from 9 countries recruited in 2017 as part of the IC-3i program (for international, interdisciplinary and inter-sector students), co-funded by the H2020 funds of the European Union

82 nationalities represented

144 residents and 83 hospital students

13 new patent requests filed

47 R&D partnerships with companies

16 technology platforms
26 ERC grants underway (37 since the creation of these highly competitive grants) including five awarded in 2017: 1 ERC consolidator and 4 ERC starting grants

751 publications in international journals

10 high-priority medical-scientific programs

50,652 patients, including 9,771 new patients

364 patients outside France and its overseas territories

1,687 patients included in a clinical trial

197 clinical trials (154 for adults and 43 for children)

14,695 visitors to the Curie Museum

No. 1 for European breast cancer care regarding patient recruitment

No. 1 French Comprehensive Cancer Center regarding the number of patients treated

No. 1 French Research Center on Cancer

€358 M operating income

204,000 active donors

Amount of resources coming from personal donations:

Private Donations: €29.2 M

Bequests: €22.6 M

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ROLLING OUT FUTURE PLANS

In 2015, Institut Curie launched major plans for the future: the MC²¹ project. Scheduled to run until 2021, this project is inspired by the model created by Marie Curie in 1909: drawing on the collective strengths of researchers and physicians to bring patients new treatments as quickly as possible. MC²¹ is designed to usher Institut Curie into a new era in oncology.

The project is underpinned by the institute’s three founding pillars: a medical project, a scientific project and a medico-scientific program. For these plans to be successful, significant investment will be plowed into the institute’s three sites with a view to developing its technological platforms or headhunting and training the very best emerging talent capable of tackling the oncology questions of the future.

This project depends on an ambitious real estate initiative totaling close to 170 million euros, which will allow us to build new oncology intake buildings at each of the three sites, to renovate all our research buildings and to expand Institut Curie generally. All attentions and efforts are now being focused on building the Comprehensive Cancer Center of the future.

MC²¹, towards a Comprehensive Cancer Center

AN OVERVIEW OF THE REAL ESTATE PROGRESS MADE AT EACH OF THE SITES IN 2017

PARIS

Systemic biology and overall care of the patient

No. 1 Cancer Hospital in Paris
No. 1 Cancer Immunotherapy Center in France
No. 1 Center dedicated to cancer in the under 25s (SIREDO) in France
The Curie-Montsouris Chest Center
No. 1 Paris Diagnostics & Theranostics Platform
9 Mixed Research Units

→ Opening in April of the post anesthesia care unit and the first three operating theaters, designed from what is known as the integrated model, meaning directly linked to associated medical functions, such as imaging. This first stage is set to be completed in 2018 with the delivery of seven new integrated operating theaters.

→ Opening of the Cancer Immunotherapy Center with a brand-new integrated clinical investigation unit.

→ Renovation work on all research buildings and laboratories continued.
**02 SAINT-CLOUD**

**Precision medicine and better definition of the patient journey**

The largest Cancer Hospital in the west of Paris

Demolition of the old buildings acquired by Institut Curie to make way for site extension. The Saint-Cloud rehabilitation project is the most extensive and large-scale component of the MC²¹ establishment’s real estate program.

In the long term, a 20,000 sq. ft. space, dedicated to research, and equivalent to a brand new hospital, will open on this site.

The goal here is to bring care and research closer together, with one major priority in mind: to serve as an example of excellence in precision medicine and patient pathways by rolling out a clinical research division.

→ Creation of a Data Center
→ A major Clinical Bioinformatics and Biostatistics Center
→ Benchmark Center for Radio-Pharmacology and Imaging
→ Benchmark Center for Biomarkers
→ A Human and Social Science Center

**03 ORSAY**

**Radiation Biology and Radiation Therapy**

The largest Proton Therapy Center in Europe

8,800 patients since the center opened, including many children, in particular since anesthesia was developed on-site

3 Mixed Research Units

Experimental Radiotherapy and Radiology Platform

→ Work continues with a view to building a translational research building to house the RadexP Experimental Radiotherapy Platform, the Pre-Clinical Investigation Laboratory and the In Vivo Experimentation Platform. In all, the building will measure a total of 1,300m² and stand next to the Proton Therapy Center; it is scheduled for completion in 2019. Its purpose is to develop new radiation techniques and new radiotherapy and proton therapy protocols to boost effectiveness and reduce side effects.

“...This research unit will be just next door to the Proton Therapy Center and will make it easier to carry out experiments with proton beams. It will also facilitate interaction between clinical and research staff.”

Rémi Dendale, Director of the Orsay Proton Therapy Center
A driver of international projects

A leading international institution for cancer research and treatment such as Institut Curie needs to interact with its environment in order to extend its reach, enhance the scientific and medical community and remain at the forefront of innovation and basic knowledge.

To share their expertise with a broad audience, physicians and researchers from Institut Curie are involved in a number of Europe-wide and international projects.

A DRIVER OF INTERNATIONAL PROJECTS

RAIDS: RESULTS ARE IN FOR THE FIRST EUROPEAN CERVICAL CANCER TRIAL

Funded by the European Commission, RAIDs pooled combined resources from Germany, the Netherlands, Serbia, Moldova, Romania, Hungary and France. “Thanks to these collaborative research efforts, new biomarkers and potentially one or more new targeted therapies should soon be in place, allowing us to improve patient care for women with cervical cancer,” explained RAIDs coordinator Suzy Scholl from Institut Curie.

LIFETIME: A VISIONARY PROJECT

Established in 2017, the LifeTime consortium brings together over 60 scientists and clinicians from 18 countries and 52 different institutions. Its goal is to become a prestigious Future and Emerging Technologies (FET) flagship funded by the European Commission. It is coordinated by both Nikolaus Rajewsky with the Max Delbrück Center (MDC) in Germany; and Geneviève Almouzni with the Institut Curie and CNRS in France. Developing and applying emerging technologies based on single cell analysis, its long-term vision is to allow physicians to assess the molecular state of patient tissues in real time, leading to early diagnosis and effective interception of the disease.

LIBRA FOR GENDER EQUALITY

Institut Curie is also involved in the Libra project. This European H2020 project, developed within the EU-LIFE alliance, advocates gender equality in research. The purpose of the Libra project is to pursue this goal and implement innovative actions to achieve it.

In 2017, 20 female postdoctoral scientists took part in leadership seminars and sessions aimed at encouraging young female researchers to apply for senior positions, reflecting on their future career paths, building networks and learning about the experiences of women in senior roles at Institut Curie or academic institutions.

MAGNEURON, FOR DEVELOPING NANOmedicine

The H2020 Magneuron project is developing an original initiative to prevent the nerve-cell degeneration seen in diseases such as Parkinson’s. The idea is to take skin cell scrapings from patients, transform them into neurons and add magnetic nanoparticles before reinjecting them back into patients’ brains. The neurons are then accurately and magnetically drawn to the afflicted areas. These studies are also an opportunity to develop new general knowledge in nanomedicine and biomedical imaging that could also be applied to oncology.

UM CURE FOR UVEAL MELANOMA

The H2020 UM Cure project aimed at identifying therapeutic options for metastatic forms of uveal melanoma, the most common form of eye cancer in adults, for which Institut Curie is an internationally recognized specialist in both research and treatment. The study involves 11 European partners backed by the European Union.
MARIE CURIE: AN ENDLESS SOURCE OF INSPIRATION FOR INSTITUT CURIE

Just like its founder, Institut Curie and its specialists take an international approach and enjoy worldwide recognition. In 2017, they were elected and appointed to head up a number of international bodies:

Geneviève Almouzni, Director of the Research Center, appointed Vice Chair of EU-LIFE and Chair from 1st January 2018.

Étienne Brain, Physician specializing in Medical Oncology, Chair of the Breast Cancer Group of EORTC (European Organization for Research and Treatment of Cancer).

Prof. Édith Heard, Head of Genetics and Developmental Biology Unit, Director-General of the EMBL from 2019 on.

Prof. Thierry Philip, Chairman of the Executive Board, Chair of the Organization of European Cancer Institutes (OECI) from June 2018 on.

Prof. Philip Poortmans, Head of the Oncological Radiotherapy Department, elected Chair of the European Cancer Organization (ECCO) since January 1, 2017, and President since January 1, 2018.

HALL OF FAME

- Prof. Françoise Brochard-Wyart: Honoris Causa Doctor at the Zurich Federal Polytechnic (ETH)
- Antoine Coulon, Ines Drinnenberg, Jean-Léon Maître, Leïla Perié: ERC Starting Grants
- Prof. Édith Heard: European Society of Human Genetics Award
- Prof. Philip Poortmans: Japanese Society of Radiation Oncology Prize
- Raphaël Rodriguez: 2017 Franco-British Young Leaders alumnus
- Mijo Simunovic: Science & SciLifeLab Prize
- Danijela Vignjevic: ERC Consolidator Grant
- 19 member researchers at EMBO (European Molecular Biology Organization)
- The only French hospital with a booth at the leading international oncology event, ASCO
- The first hospital group to have been awarded the French Healthcare label launched by the French Ministry for Foreign Affairs
ENGAGEMENT
Institut Curie thus honors the pioneering, humanist spirit of Marie Curie, and her engagement in the world. Its mission of training health professionals and future researchers extends well beyond the borders of France, and it welcomes patients and physicians in training from around the world. This strategy of engagement is conveyed in many ways, but covers all the missions of Institut Curie.

- Sharing medical expertise by training international doctors in-house at the institute or in their own countries.
- Training of future leaders in oncology: physicians, researchers and physician-researchers.
- Doctors and researchers took part in a huge number of congresses and conventions: ASCO, ASCB, AACR, San Antonio Breast Cancer symposium...
- Hosting renowned doctors and researchers on sabbatical.
- Meetings and discussions with major institutions such as NCI and the Weizmann Institute with a view to forming partnerships.
- An international call to arms to defend independent scientific research and safeguard its integrity from political, economic and ideological factors. On April 22, 2017, thousands of protestors took to the streets for the worldwide March for Science; 12,000 people took part in France, including around 50 members of staff from Institut Curie.
- Involvement in Pause, a national program established in 2017 aimed at providing emergency assistance to exiled scientists, which has already helped host 126 scientists from Syria and Turkey in particular, placing them in 62 French higher education and research establishments.
- Helping French-speaking African teams to effectively treat children with eye cancer by developing training, clinical research, and raising awareness among the population.
An institute that operates on a global scale

UNITED STATES

Meeting and discussion with the NCI with a view to forming a partnership.

IN EUROPE

- OECI: Organization of European Cancer Institutes
- EU-LIFE, with 13 European centers of excellence in life sciences
- EORTC: European Organization for Research and Treatment of Cancer
- EpSSG: European Pediatric Soft-tissue Sarcoma study group
- EMBO: European Molecular Biology Organization
- ITCC: Consortium of Innovative Therapeutics for Cancer in Children
- Core Life: Institut Curie, with its CurieCoreTech, has become the first additional new member to join this prestigious pan-European excellence alliance for core facilities since its foundation 5 years ago.

INTERNATIONALLY

- SIOP: International Society of Pediatric Oncology

BRAZIL

Talks and also hosting and training doctors and researchers from the São-Paulo based A.C.Camargo Cancer Center, South America’s leading not-for-profit private oncology establishment.

SUB-SAHARAN AFRICA (MAI, DEMOCRATIC REPUBLIC OF CONGO, IVORY COAST, SENEGAL AND MADAGASCAR)

Developing a network of experts in five Sub-Saharan African countries to improve the treatment of retinoblastoma, an eye tumor in children, as part of the Franco-African Oncology Group (GFAOP).
JAPAN ➝ A consortium agreement signed to promote exchanges between institutes and Nagoya City University.

KENYA AND TANZANIA ➝ Rolling out palliative care training physicians and nurses from the Aga Khan Foundation’s hospitals in Kenya and Tanzania, thanks to backing from the Association Française de Développement (French development agency) and Expertise France.

LEBANON ➝ Working with the Lebanese University to host and train doctors in pathology and radiology.

ISRAEL ➝ Meeting and discussion with the Weizmann Institute with a view to forming a partnership.

CHINA ➝ Advice and support from design to equipment plans and doctor training for the new hospital plans in Changchun in China’s north-eastern region.

INDIA ➝ Hosting and training a physician from the APOLLO group of establishments at the Proton Therapy Center.

Signing of a memorandum of understanding in progress with the NCBS-inStem in Bangalore (India): training for PhDs and post-docs.

VIETNAM ➝ Training and consultancy agreement signed with the Vinmec Hospital in Hanoi for cancers in adults and children in a continuation of collaborative projects undertaken with public hospitals in the country, in particular in terms of ophthalmology and retinoblastoma care and treatment.
Since its founding, Institut Curie has by definition been a very open, engaged establishment. Polish-born Marie Curie travelled to the United States in 1921 to be given a gram of radium to use in her research, handed over directly by President Warren G. Harding himself.

Today, Institut Curie continues to establish academic, industrial, university and hospital partnerships whenever possible. This outward-looking approach lies at the heart of the MC21 strategic plan.

According to Prof. Thierry Philip, Chairman of the Executive Board

“Marie Curie was a woman of the world”

Industrial partners
BECOMING A LEADING REFERENCE IN ONCOLOGY
TECHNOLOGY SHARING TO CONSOLIDATE THE LINKS BETWEEN RESEARCH AND CARE

A major agreement with the Institut Roche
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A three-year partnership for immuno-oncology, personalized medicine in pediatric oncology and epigenetics.

Working on artificial intelligence with OWKIN
-------------------------------------------------
Partnership signed with OWKIN, a software and services start-up specializing in artificial intelligence. Aim: to speed up the development of new software designed to analyze clinical records based on cutting-edge artificial intelligence methods, and to draw on Institut Curie’s collated data to predict progression and provide patients with better care.

Hospital Group
TO PROVIDE INNOVATIVE CARE AND TREATMENT FOR ALL PATIENTS

Founding the Curie-Montsouris Chest Center
-----------------------------------------
Founding a center that combines all the expertise required to treat chest diseases. This new institute brings together expertise in medical imaging, biopathology and radiotherapy in an integrated network to develop optimized treatment strategies and gives patients access to the latest therapeutic innovations while working to consolidate research into lung cancers, among others.
THE CURIE MUSEUM:
THE YEAR OF MARIE CURIE

If there was one place where celebrations of Marie Curie’s 150th anniversary were destined to be a major event, it was the Curie Museum. The museum works all year round to bolster national and international awareness of the Institut Curie’s founder. In addition to lending out a number of exhibitions and items to celebrate this anniversary, the Curie Museum took part in a commemorative initiative in Poland in partnership with Pierre and Marie Curie’s grandchildren, featuring international media filming and interviews, international projects such as the ‘Marie Curie in the World’ exhibition in Lebanon and elsewhere...

WHITE HOUSE HISTORY
@WhiteHouseHstry

President Harding honored scientist Marie Curie for inspiring a generation of women at a 1921 White House ceremony.

THE CURIE MUSEUM: THE YEAR OF MARIE CURIE

A flagship platform project in high-speed genome sequencing spearheaded by the AP-HP, Institut Curie and Gustave Roussy, selected as part of France’s official Genomic Medicine 2025 framework. Backed by the Île-de-France region’s seven universities and the Imagine University Hospital Institute, SeqOIA pools the expertise required to make new bounds in genomic medicine for patients suffering from genetic diseases or cancers.

Q-Life: predicting the future of organisms

Project selected as an ‘Institut de Convergence’ as part of the future investments program led by the general commission for investment coordinated by Bruno Goud from Institut Curie. Bringing together over 70 teams from different establishments, its goal is to model how living organisms function using quantitative methods from statistical physics, fluid mechanics and mathematics on different scales, from cells to organisms.

Sharing knowledge

DOCTORS, RESEARCHERS AND CAREGIVERS CONTRIBUTE TO THE INSTITUTE’S REPUTATION AND TO SHARING KNOWLEDGE BY TAKING PART IN CONVENTIONS AND SYMPOSIA AROUND THE WORLD.

Institut Curie’s specialists also train and/or advise Vietnamese caregivers in childhood and adult cancers, and provide training to Chinese care staff, Indian physicians and Kenyan and Tanzanian care staff in palliative care. They are also working to develop a network of experts in five Sub-Saharan countries to improve the treatment of retinoblastoma, an eye tumor in children.

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Institut Curie is committed to training the researchers, doctors and care staff of the future, including Masters, PhD and post-grad students from the institute itself and in hospitals (nurses, caregivers, etc.). Yet it also helps with career progression outside its premises.

The IC-3i (Institut Curie–international, interdisciplinary and cross-sectoral) doctoral program was launched in 2016 and saw 13 new postgraduates from nine different countries recruited in 2017. A total of 25 young scientists from 15 countries, including 13 European countries, are currently receiving training from Institut Curie, thanks to the program co-funded by the European Union’s H2020 fund.

In 2017, 53 postgraduate students from 14 countries, 54% of whom were female, defended their theses at the institute. Their work was acknowledged with a graduation ceremony on December 14, 2017.

Institut Curie offers in-house staff training throughout their careers, such as in the latest imaging or bio-computing techniques.

To help share its expertise with as wide a community as possible, in 2017 Institut Curie organized ten international classes led by renowned experts on current oncology subjects: molecular biology of the cell, non-coding genome, epigenetics evolution related to chromatin, post-transcriptional gene regulation, cytoskeleton in 3D, breast cancer, developmental biology, oncology, molecular genetics & epigenetics, pigment cell development & melanomas. The melanoma class was attended by 180 doctors from 24 countries.

Institut Curie also speaks at conventions and congresses in order to share its findings with the wider medical and scientific community.

Its experts work with universities to train the next generation of doctors, pharmacists and researchers, helping them to fine-tune their knowledge on their way to obtaining their diplomas.

Finally, the institute builds bridges with emerging names in science, such as in February 2017 at the MIT European Career Fair near Boston, the United States’ biggest event aimed at introducing top students to European opportunities. In December, Institut Curie held a booth at the American Society for Cell Biology (ASCB) congress. The event enabled close to 300 attendees (primarily students, researchers and doctors) to get to know the institute and find out more about its training opportunities and its hospital’s expertise.

Institut Curie and the PSL University are proud to have established a new radiotherapy professorship last year. On November 7, 2017, marking the 150th anniversary of Marie Curie’s birth, it was awarded to Prof. Philip Poortmans, Head of the Department of Oncological Radiotherapy at Institut Curie.

Second-year postgraduate student Lara Al-Zoubi describes it as “an incredibly enriching experience, both intellectually and socially. Everyone, from the people I work with to those at the various platforms, training unit and Institut Curie student association (ADIC), helped, inspired and motivated me with my studies, in a really friendly atmosphere.”
117 Masters (27 in first year, 90 in second year)

256 PhD and 262 postgraduate students

144 in-house students and 83 hospital students, all trained at Institut Curie in 2017

71 different nationalities
“I see Marie Curie as an inspiration. She reminds us that science has great beauty and that curiosity is what gives life meaning.”

Geneviève Almouzni, PhD, Director of the Research Center

At Institut Curie, researchers further knowledge in biology and at interfaces between biology, physics and chemistry to help make original discoveries and find innovative applications to assist in the fight against cancer.

2017 highlights

A NEW APPROACH TO CELLS IN THEIR ENVIRONMENT

Yohanns Bellaïche’s team demonstrated that focusing on a single isolated cell is no longer relevant to understanding division. A cell’s six surrounding cells impact and even contribute to its division.
Nature, March 2017

A NEW ACHILLES’ HEEL IN CANCEROUS STEM CELLS

Raphaël Rodriguez’s team demonstrated the molecular action mechanism capable of altering cancerous stem cell proliferation: salinomycin and the synthetic equivalent they developed themselves.
Nature Chemistry, May 2017

UNDERSTANDING HOW THE IMMUNE SYSTEM IS ACTIVATED

Immunologist Ana Maria Lennon-Duménil worked with Matthieu Piel to show how calcium ‘triggers’ dendritic cells, picking up speed to fight off threats to the organism.
Science Immunology, Oct. 2017

FIGHTING REPLICATION STRESS, A SOURCE OF GENETIC INSTABILITY

Sarah Lambert’s team demonstrated two mechanisms – one involving the Ku factor, the other involving Rad51 and Rad52 proteins – that give cells enough time to repair damage caused by oxidative stress.
Institut Curie’s commitment to transparency and ethics in recruitment and managing science-based careers was acknowledged in 2017, with the institute being awarded the European Commission’s HR Excellence in Research label.

AMBITIOUS SCIENTIFIC PROJECTS

The Single Cell project was bolstered in 2017, and aims to analyze all elements and processes at play on a single-cell scale. Further understanding of this should ultimately lead to our ability to provide patients with personalized cellular medicine. It will also form the basis for the ambitious LifeTime project, submitted as a Future and Emerging Technologies (FET) flagship funded by the European Commission (see p.10), co-coordinated by Nikolaus Rajewsky with the Max Delbrück Center in Berlin and Geneviève Almouzni with Institut Curie and CNRS.

The institute also coordinates the Q-Life project, an initiative that was awarded a future investment label in 2017, bringing together over 70 PSL University teams, including 25 from Institut Curie. The project’s goal is to understand and model living organism functions (see p.17).
In 2017, Institut Curie became the Core for Life alliance’s first French member, joining seven other European research establishments in pooling expertise and technological platforms.

**MUTUAL INSPIRATION AND CONSTRUCTIVE COMPETITION**

In 2017, seven new research teams joined Institut Curie to work on a variety of themes: **Anton Granzhan’s team** and the development of new molecules capable of identifying DNA damaged structures and likely to serve as therapeutic targets, **Giorgio Seano’s team** and the highly vascularized microenvironment of brain tumors and **Raphaël Ceccaldi’s team** and DNA repair mechanisms...

All these young team leaders receive support from the institute to ensure they can begin research into their chosen fields in the very best conditions. In 2017, four of them were awarded Starting Grants from the highly competitive European Research Council (ERC): Antoine Coulon for his work into the spatiotemporal structure of the nucleus, Ines Drinnenberg for her work on the centromere (the center of chromosomes), Jean-Léon Maître for his research into embryonic development among mammals and Leila Perié for her work on implementing a tracking system to monitor the development of single cells in the organism.

Danijela Vignjevic, who was awarded an ERC Starting Grant in 2012, confirmed the quality of her research by being awarded a Consolidator Grant for senior researchers in order to continue her work (combining physics and biology) into colon cancer.

“I decided to join Institut Curie because it’s one of Europe’s top institutes. The exceptional basic and translational research here is genuinely interconnected and fosters a synergetic collaborative atmosphere.”

**Giorgio Seano,**
PhD, Head of Gene Regulation of the Immune Response to Cancer team
Pioneering spirit
“Marie Curie was a pioneer, she immediately grasped the full medical potential of her scientific findings.”

Sergio Roman-Roman, PharmD-PhD, Head of the Department of Translational Research

Known as MC² – for Marie Curie 21st century – the 2015-2020 strategic plan was directly inspired by the model invented by Marie Curie in 1909, aimed at bringing physicians and researchers together to find new treatments for cancer patients as quickly as possible, an approach that has continuously proved beneficial to patients and forms the bedrock of the Comprehensive Cancer Center of the future.

2017 highlights

NEW ‘INTEGRATED CANCER RESEARCH SITE’ LABEL
The INCa re-awarded Institut Curie its label as an integrated cancer research site (SiRIC), with its primary goal being to understand why some cases of breast cancer, childhood cancer and uveal melanoma are resistant to treatment, and to find a solution.

SIREDO, A CENTER DEDICATED TO CANCER IN THE UNDER-25 AGE GROUP
This center pools the strengths of Institut Curie, including the care and research - basic, translational and clinical - teams, who devote themselves to cancers affecting the under-25s. A total of more than 70 scientists and around 50 caregivers work at the center.

PREDICTING THE EFFECTIVENESS OF IMMUNOTHERAPY
Prof. Bidard and the circulating biomarker team demonstrated that the circulating tumor DNA rate seems to be a good indicator of anti-PD-L1 and PD-L1 immunotherapy responsiveness and is closely linked to tumor size.
Ann Oncol. April 2017

SCANDARE: INCREASING PRECISION
Until now, precision medicine was focused mainly on gene alterations for the choice of therapeutic strategies. With SCANDARE, specialists at Institut Curie wish to include new dimensions, namely the tumor environment and the immunological response.
The links between care and research, that Marie Curie held so dear, are more central than ever before to the institute, allowing us to pick up the pace in the fight against cancer and improved patient care.

These links are being consolidated in the medico-scientific program (MSPg) that “brings together all projects with a crossover between research and care, co-managed by a doctor and researcher, whether their teams work side by side in the same space, such as the new immunotherapy center, or they collaborate within a single network without physically sharing space, as is the case for uveal melanoma research, for example,” explains Sergio Roman-Roman, Head of the Department of Translational Research.

“There’s no hard and fast rule for these projects. It all depends on the field and stage of advancement.”

Ten priority areas have already been identified to date, but “all projects that bring together researchers and doctors around shared issues are MSPg, and MSPg is a dynamic program, which means priorities can shift and evolve over time,” according to Sergio Roman-Roman.

The current priorities are at different stages of advancement and development (see following page).

ENCOURAGING COLLABORATION

Institut Curie is continuing to develop its PIC3i programs, which stands for collaborative inter-disciplinary, cross-field and inter-establishment programs. In 2017, four PIC3i programs combining research and care were launched, to study tissue fibrosis, an adverse effect triggered by radiotherapy and leukemic cell population behavior, analyze protein coagulation that may lie at the root of some cancers, and develop an animal model of a rare form of cancer, primary brain lymphoma.

Among the seven new research teams set up in 2017, three are dedicated to the interface between research and care: Joshua Waterfall and his team’s work into sarcoma, Céline Vallot and her team’s work into the role and dynamics of epigenetic modifications in cancer, and Aurélien Latouche’s research focus in turning biomarkers into tools used to predict disease progression or responsiveness to treatment.

“What encouraged me to come and work at Institut Curie is its close working relationship with the Hospital Group’s clinicians and the Research Center’s biologists. This ensures I’m able to identify research topics that are relevant from a clinical perspective.

Prof. Aurélien Latouche,
Head of Statistical Methods for the Precision Medicine team
10 high-priority medico-scientific programs

2017 highlights

Breast Cancer | coord. Prof. Martine Piccart & Fatima Mechtai-Grigoriou
- Continued research into triple negative breast cancer with a view to launching a clinical trial.

Radiotherapy and Radiation Biology | coord. Prof. Philip Poortmans & Marie Dutreix
- Launching work on the experimental radiotherapy platform.

Uveal Melanoma | coord. Prof. Nathalie Cassoux & Sergio Roman–Roman
- Improved classification, thanks to an international study that Institut Curie took part in, for in-depth analysis of uveal melanomas, a little-known and rare form of eye cancer.

Immunotherapy | coord. Sebastian Amigorena & Emanuela Romano
- Opening of the Cancer Immunotherapy Center with a brand-new and integrated clinical investigation unit.

Pediatric Cancers | coord. Olivier Delattre & Prof. François Doz
- SIREDO launch, the first integrated basic research center for pediatric, adolescent and young-adult oncology care.

Sarcoma | coord. Sylvie Bonvalot & Josh Waterfall
- Josh Waterfall’s translational research team set up for the study of certain forms of sarcoma.

Early Trials | coord. Prof. Christophe Le Tourneau & Prof. Aurélien Latouche
- Prof. Aurélien Latouche’s team is working on several research topics, notably the validation of prognostic biomarkers that enable a disease’s changing characteristics to be predicted, as well as the predictive biomarkers that enable treatment responsiveness for a disease.

Genetics and Epigenetics | coord. Geneviève Almouzni
- Translation research into Dynamics of Epigenetic Plasticity in Cancer team, led by Céline Vallot.

Urological Cancers | coord. Prof. Yves Allory & François Radvanyi
- Prof. Yves Allory gives new impetus to urological cancer treatment and consolidates research into bladder and prostate cancer.

Lung Cancer | coord. Prof. Nicolas Girard & François Radvanyi
- The Curie-Montsouris Chest Center founded to accelerate access to the latest innovations for as many patients as possible, and at the same time to intensify research efforts into France’s deadliest cancer.
HUMANITY
“I see Marie Curie as a seamless bridge between research and care.”

Prof. Pierre Fumoleau, General Director of the hospital group

Like its founder, who was able to see the medical applications in her findings, Institut Curie understands the importance of foresight, driven by therapeutic innovation as well as by developing new patient pathways and regional partnerships, and consolidating links between cities and hospitals.

2017 highlights

PIERRE FUMOLEAU, THE HOSPITAL GROUP’S NEW GENERAL DIRECTOR

Upon arriving in September, Prof. Pierre Fumoleau pledged to continue expanding medical initiatives and the medical and scientific program of the MC21 strategy project.

CUSTOM CARE FRAMEWORK: FOR IMPROVED TREATMENT OF SARCOMAS

With this diagnosis initiative, Institut Curie invites general practitioners and surgeons to send their patients in before any therapeutic procedure, and above all before any surgery, in order to ensure the best patient care possible.

IMMUNOTHERAPY: A REVOLUTION THAT’S NOT YET FULLY UNDERSTOOD

A study led by Prof. Christophe Le Tourneau revealed that in a non-negligible minority of patients suffering from ENT cancers, anti-PD-L1 and PD-L1 immunotherapies triggered an acceleration in tumor growth, which indicates a need to continue research in order to extend their use to a maximum number of patients. *Annals of Oncology*, April 2017

GENETIC PREDISPOSITIONS: A NEW FORM OF CANCER IDENTIFIED

Dr. Claire Saule and Prof. Dominique Stoppa-Lyonnet demonstrated that women carrying BRCA1 or BRCA2 gene mutations have a higher risk of developing not just breast and ovarian cancer, but a rare form of endometrial cancer too. *JNCI*, August 2017
Innovating to improve the patient experience

Over and above our emphasis on treating patients, well-being, lies at the heart of IC’s priorities.

Relieving suffering is a top priority. With this in mind, the Déclic program (chronic cancer-related pain) was expanded in 2017: 100 patients enjoyed access to the program with extra scalability planned over the next three years. This therapeutic educational program helps patients better understand their pain and improves pain management abilities via self-hypnosis, meditation and relaxation techniques.

CANCER AND E-HEALTH

In December, the Appli Chimio app entered its clinical trial stage. This home-monitoring program for chemotherapy and targeted oral therapy patients is funded by the Agence Régionale de Santé Île-de-France (regional health agency) and allows patients to declare any potential symptoms that may arise, triggering a notification sent to the health network or oncology unit.

Innovative, award-winning technology for 2017: a virtual reality headset designed to relieve patient stress. The headset provides the wearers with relaxing images and voices. It is available at the Saint-Cloud site for patients awaiting chemotherapy and catheter insertion. Its positive effects were applauded by the French Institute for Patient Experience in November.

INNOVATION ACROSS THE BOARD

In terms of prevention, a vast majority of cervical cancers are linked to certain papillomaviruses (HPV) being integrated into tumor cell genomes. Looking for circulating tumor DNA in the blood containing papillomavirus would appear to be an ideal way of detecting pelvic cancer relapses, most of which are related to this virus. In 2017, Institut Curie received support from a clinical research hospital program funded by the French National Cancer Institute (INCa) to explore this possibility via a multi-site study.

Institut Curie is a vocal supporter of improving patient care and treatment. In 2017, Prof. Philip Poortmans, Head of the Radiotherapy Department, published a column co-written with two other medical specialists in the medical journal The Breast. In light of the surge in the number of mastectomies carried out over the past few years, particularly in the United States, the three writers sought to remind readers that early breast-conserving surgery in the event of early cancer is preferable, as opposed to the pointless and traumatic experience of full breast removal.
I had the opportunity to enter into relationships with the international department regarding the treatment of my aunt in the Institut Curie, supported by the Tunisian “CNAM”.

I really appreciated the help I received to facilitate the “short notice” arrival of my aunt, to accomplish all the administrative tasks and to have a good follow-up and management of her medical file. What I also appreciated were the communication (by phone or by email) with the different people working in this department which was very easy and very fluid, the professionalism in the review of the medical elements by the medical team and, above all, a true cooperation and transparency in the exchanges of information. Thank you for your professionalism and for your exceptional humanity. I am very grateful to you!“.

Mrs Houida K – Tunisia

INTERNATIONAL PATIENT SERVICES: A TAILORED SERVICES OFFER FOR INTERNATIONAL PATIENTS

In 2017, Institut Curie developed its service offering for international patients. The aim is to offer patients care that they could not receive in their own country.

To better meet the needs of these patients who come without French health insurance, Institut Curie has formed a dedicated team, made up of a physician, treatment coordinators, and support staff, and developed a range of specific services to include first opinion, second opinion, sample analysis, treatment and concierge.

It provides the highest quality healthcare for hundreds of patients from more than 30 countries.

• Interpreters are available 24/7, covering more than 130 languages
• A web platform to take in patients’ charts and images
• Concierge services are planned to facilitate patients’ stay and travel
• Foreign patients’ satisfaction is tracked through a continuous survey
Institut Curie’s economic model is characterized by multiple financing sources, both public and private: public grants, sponsorship and public generosity play a key role that ensures the institute total independence particularly for continuing to kick-start new and innovative programs.

THE UNWAVERING SUPPORT OF OUR SPONSORS IS CRUCIAL

In 2017, Institut Curie was supported by 204,000 donors. 11% chose to pledge regular donations, a sustainable form of support that helps us better manage and plan out our projects. A total of €51.8m was collected, €29.1m of which came from donations and sponsorship, with another €22.6m from legacies and bequests.

130 associations and local organizations supported Institut Curie in 2017. Across France, hundreds of their volunteers pour heart and soul into helping the institute’s doctors and researchers.

Institut Curie is also lucky enough to have partners and sponsors who, in different ways, support the institute in developing innovative projects. In 2017, for example, Swiss Life supported our initiatives by rallying its sales staff and employees to take part in the “Une Jonquille pour Curie” event. Raising over €85,000, Swiss Life reasserted its status as the campaign’s biggest contributor, significantly boosting fund levels for the new Cancer Immunotherapy Center.

From its inception, Institut Curie’s strength has resided in its ability to bring the benefits of research to the patient. Public generosity is an essential resource to achieve its missions. Our donations earmarked for innovative research programs, the 3i collaborative programs (PIC3i) that foster dialogue between specialists with a multidisciplinary approach. In 2017, six PIC3i programs and 11 ongoing were funded, thanks to public generosity, for a total amount of €846,000. Institut Curie’s priority programs are also backed by “protected medical time” (TMP). Entirely funded by public generosity, this protected medical time allows doctors to take part in research projects in addition to their clinical work. In 2017, over 26 protected medical time slots were funded, thanks to public generosity, for a total amount of €1,684,627.
IN 2017, FOR EVERY €100 GIVEN BY OUR DONORS OR TESTATORS, €82 FUNDED OUR SOCIAL MISSIONS.

* In 2017, Institut Curie began to use funds that had been placed in reserve in previous years to fund the strategic plan.

MAJOR PUBLIC FUNDING

**Hospital Group**
- Assurance Maladie (the French health insurance fund), as an institution of private care in the public interest
- Billing of treatments to patients without national health insurance
- Industrial players, patrons, charity organizations, and public or semi-public organizations for funding of clinical research and innovation
- Public generosity (donations and bequests) collected by Institut Curie

**Curie Museum**
- CNRS (which pays for one permanent position and contributes to operations)
- Public generosity

**Research Center**
- Research bodies (CNRS, Inserm, universities)
- Annual subsidy from the French Ministry of Higher Education and Research and Innovation
- Public and quasi-public funding in response to calls for bids
- European Research Council (ERC) and European Commission
- Private funding: patrons, charity organizations that support medical research (Ligue contre le Cancer, Fondation ARC pour la Recherche sur le Cancer, Fondation pour la Recherche Médicale, etc.)

**Private donations**
- €51.8 M

**Donors**
- 204,000

**Sponsoring partners**
- 33
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