USIAS

10 years

Université de Strasbourg

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USIAS 10 years

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Foreword

The year 2022 is a special year for the University of Strasbourg Institute for Advanced Study (USIAS), marking a decade of existence. A fitting time to reflect on some existential aspects: what was at the basis of the idea of USIAS, what does it hope to achieve, and what has it achieved in the past 10 years?

This booklet presents a portrait of USIAS in its anniversary year, based on the experiences and reflections of its founders and fellows. The philosophy of USIAS is based on a few key principles, simple in design - if not always in execution - within a landscape of increasingly performance-driven research: curiosity, confidence, courage.

In his classic essay in 1939 The Usefulness of Useless Knowledge [1] *Abraham Flexner, the founding director of the Institute for Advanced Study in Princeton, observed that most of the really great discoveries, which had ultimately proved to be beneficial to mankind, were driven not by the desire to be useful but rather by curiosity. The cultivation of curiosity has not been prioritised in recent decades, and neither has the confidence in researchers, as research has increasingly become subject to performance criteria that capture what can be easily measured, not necessarily what actually matters.*

Inscribed in golden letters above the main hall of the Collège de France *in Paris, founded in 1530, is the famous phrase of Maurice Merleau-Ponty: "Not acquired truths, but the idea of freely-executed research." [2] Acquired truths, our existing knowledge, valuable as it is, can become obstacles to developing new insights.*

As philosopher and psychologist William James wrote in 1909, the human mind tends to favour consistency "between the present idea and the entire rest of our mental equipment… including our stock of previously acquired truths". [3]

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The desire for consistency is an important drive in science, but in a world with many acquired truths it can have an effect of hampering the search of new truths. In combination with institutional incentives favouring feasibility and short-term results, preferably publishable and applicable, this can lead to an unintended conservatism in research. It is within these developments that USIAS finds its mission, to counter some of the resulting dynamics, providing space for researchers to leave the beaten path of disciplinary, institutional and cognitive constraints.

This anniversary year of 2022 was also the year in which a founding Chair of USIAS has been distinguished with an eminent award: Jean-Louis Mandel was awarded the prestigious Kavli Prize in neuroscience. In many ways, his career exemplifies the type of research dynamics that USIAS aims to conserve, as he stepped off several beaten paths at crucial moments. An interview with him offers more insight into his research and the trajectory that brought him to where he is today.

We hope this anniversary booklet will not only mark a decade of USIAS but also will give more understanding and visibility to what is behind these 10 years of USIAS, in terms of values and how to realise these in practice.

Rifka Weehuizen
USIAS Managing Director

1. Abraham Flexner (1939) The Usefulness of Useless Knowledge, Harpers, issue 179, June-November.
2. This quote comes from Maurice Merleau-Ponty (1953) Praise of Philosophy, Inaugural lecture at the Collège de France, 15 January 1953 (Paris: Gallimard).
3. William James (1909) The Meaning of Truth, Chapter VIII (Longmans, Green and Co., New York and London).

USIAS

USIAS celebrates 10 years of research "outside the box"

Founded in 2012, the Institute for Advanced Study of the University of Strasbourg (USIAS) is celebrating its tenth anniversary this year, the occasion to look back at a decade of bold research for scientists by scientists.

"I had this crazy idea, which had little to do with the subject I was working on at the time. And I had never used this kind of approach before."
Alexandre Smirnov, 2020 USIAS Fellow

Over the past decades, the world of science has changed. Increasingly, research is funded through competitive grant systems and is therefore required to fulfil criteria that do not necessarily favour creativity and surprises. When a researcher wishes to obtain a grant, they must submit an application that clearly describes the nature of the project, the scientific basis, methods and data, and the expected outcomes. While this development has stimulated excellence in research, and encouraged research that will – in general - benefit society, it has also brought with it a number of problems. In particular, it puts strong pressure on researchers to produce results that can be converted rapidly into high-impact publications, or which have high potential for application.

Due to the growing pressure on research to have these measurable impacts, researchers are increasingly constrained to produce predictable, incremental scientific results. This development has made the research process more conservative, stifling its inherent plasticity. It discourages researchers from taking risks, and from adjusting and redirecting their ideas and efforts in light of insights and intuitions that emerge in the course of their research.

In addition, while the inflow of young researchers has constantly increased, the number of stable and permanent academic positions has not. The resulting professional stress has increased the pressure to deliver results and publications, which are decisive for careers. With so much at stake in terms of professional future and in combination with the difficulty of obtaining adequate funding, this pressure can lock scientists into a professional trajectory that is dictated by the demands of institutions and society rather than by science itself. What kind of scope does this leave for creativity and risk-taking in a scientific world governed by necessity and efficiency?

"The way the call for applications for the Fellowship at USIAS was formulated pushed me to think 'outside the box' and to really take a risk."

Cyriaque Genet, 2018 Fellow

It was in this specific context, when the mixed effects and unintended consequences of a new research philosophy became evident, that the Institute for Advanced Study at the University of Strasbourg, or USIAS in short, was founded in 2012. This venture, the flagship of the "Initiative d'Excellence" (IdEx) activities of the University of Strasbourg, is part of the national programme "Investissements d'avenir", investments in the future; and it is celebrating its tenth anniversary this year. The institute is partly based on the model of the famous IAS, the first of its kind that was founded in 1930 in Princeton, New Jersey (United States), which has counted among its ranks great names in science such as Albert Einstein. But its real inspiration is the *Collège de France*, which was founded in 1530 with a dual vocation of daring research and education for all and which may be considered as the oldest institute of advanced studies in the world. USIAS has modelled itself on these examples, in order to find the perfect niche in the Strasbourg academic community and to take full advantage of its vibrant and dynamic research.

"As a Fellow at USIAS, I was given invaluable time away from the 'production factory' of an academic job, to experiment and explore avenues I would not normally consider."

Tijana Vujosevic, 2018 Fellow

The aim of USIAS is therefore to restore some of the balance, and to relieve the pressure on researchers to follow the beaten path, by stimulating excellent research in its purest form that is motivated primarily by curiosity and a deep desire to understand. It does so by funding unconventional ideas, stimulating researchers to work outside their comfort zones, to take risks and to channel their time and energy into research that is not about ticking boxes. "When I was a young researcher,» recalls Jean-Pierre Sauvage, 2016 Nobel Laureate in Chemistry and Chair of Chemical Topology and Molecular Machines at USIAS, «this kind of limitations arising from the need to have impact were less strong. We could afford to be dreamy scientists enthralled by discovery for the sake of discovery. The world has changed since then, but USIAS opens a window to that golden age of science."

One of the ways in which this window of opportunity is provided is through a Fellowship programme that offers financial and intellectual space for original research. Each year, around 15 Fellows are selected to conduct their research project over a period of three months to two years. In the 10 years since the creation of USIAS, a total of 186 Fellows have been selected, about 60% from Strasbourg and 40% from elsewhere, in Europe, but also from the United States, Canada, Australia, Japan and Brazil, etc.

"I think that a USIAS Fellowship is the only way of really adding a new direction to your research at the moment, especially for young researchers."

Amparo Ruiz Carretero, 2020 Fellow

Strasbourg researchers are eligible to apply if their project is innovative, involves a substantial degree of risk, requires a significantly higher-than-average investment of time and intellectual effort, and is related to the development of a new approach or to acquiring new skills and knowledge. Alexandre Smirnov, biologist and 2020 Fellow, recalls that his colleagues did not really understand how he could work on two subjects at the same time: mitochondria and bacteria: "I did not know either but felt I had to, if I wanted to unseal a deep sense behind the workings of some of the most ancient RNA-binding proteins, which, being present in simplest bacterial cells and in most complex animals, remind us about our shared origins and the common biological laws we follow." For Sylvain Hugel, a 2021 Fellow, USIAS was also a unique opportunity to combine his 'two scientific lives'. «In the USIAS project, typical zoological field data are combined with cutting-edge neuroscience approaches to try to shed light on how neuroplasticity may be involved in the emergence of new species.» According to international experts, his project could lead to a genuine leap forward in the fields of neurobiology and evolution.

The programme is also open to applicants from outside Strasbourg whose expertise could be shared with local researchers. Lianne Habinek, a researcher in literature and history of science at MIT (USA) and a 2019 Fellow, remarks: "The very warm welcome I received from my Strasbourg hosts was invaluable. I have been involved in the life of the department, which has allowed me to present my work to a circle of academics who are exciting and new to me, and to receive stimulating feedback from them." These relationships are lasting and have led to concrete research collaborations. Similarly, Tijana Vujosevic, an architectural historian at the University of British Columbia and a 2018 Fellow, met scholars in Strasbourg with whom she will continue to collaborate in the future from Vancouver.

In the service of the ideals of USIAS, a board of researchers with remarkable backgrounds was established; it currently consists of eleven permanent Chairs, who have received prominent distinctions, and includes three Nobel Prize winners and two Kavli Prize winners[1]. The Chairs, who have a long and rich experience in research, were instrumental in formulating

1. See the interview in this booklet with Jean-Louis Mandel, who was awarded the Kavli Prize in Neuroscience this year.

Sylviane Muller, Chair and founding member of USIAS. © USIAS

the mission and modus operandi that breathed life into the institute. They meet several times a year to review and select applications on the basis of creativity and novelty, with the help of international experts. "For these applications, we do not require preliminary results,» notes Sylviane Muller, laureate of the 2015 CNRS Innovation Medal and Chair of Therapeutic Immunology at USIAS. "We ask for unconventional ideas and a degree of real risk; there is room for surprise."

"The experimental results were unexpected and surprising, and have guided the general interest of my laboratory into new areas that I would never have considered otherwise."

Manuel Mendoza, 2019 Fellow

However, as Rifka Weehuizen, managing director of USIAS observes, the programme is not just about remarkable individual projects by outstanding individual researchers; in terms of its function, it is consciously envisioned as part of an overall "research ecosystem". Ideas are like seeds that need sufficiently fertile soil to emerge and grow, and the Fellowship programme can help to fertilise that soil, through its direct and indirect effects.

The presence of Fellows from outside of Strasbourg, who bring fresh ideas and perspectives, can similarly have a vitalizing effect, in some cases long-term; based on positive experiences, a number of researchers from elsewhere have decided to settle more permanently in Strasbourg after their Fellowships.

The institute also aims to overcome the boundaries between research domains by providing real opportunities for exploration and experimentation, necessary to enable the emergence of new transdisciplinary approaches.

"USIAS is an ideal institution to allow researchers to explore new avenues of research, the success of which is not at all guaranteed in advance."

Jules Hoffmann, Chair

Marie Bizais-Lillig, expert in medieval Chinese poetry and 2021 Fellow, describes how the Fellowship allows her to acquire the considerable skills needed to manage setting up a state-of-the art database. "I am used to working with ancient Chinese documents rather than with digital technology." Amparo Ruiz Carretero, a chemist and 2020 Fellow, introduced for the first time a new screening technique in the field of supramolecular electronics, which has been used for some twenty years by researchers from other disciplines – thereby collaborating with researchers from a completely different community than her own. For Alexandre Smirnov, this malleability of research is part of the mission and identity of USIAS, "which generates a unique intellectual climate". Marie-Paule Felder-Schmittbuhl, biologist and 2014 Fellow, remarks: "The Fellowship at USIAS was an opportunity to get to know the Strasbourg scientific community and its attractiveness, and to be part of a very diverse and dynamic community. I really appreciate this system, it stimulates creativity, locally, in science.»

Once a Fellow is selected, they have more or less complete control over their grant, with minimal administrative interference. This freedom reduces time-consuming administrative demands, and it both signals trust and fosters confidence and independence in researchers. For Gaëlle Blond, 2015 Fellow, and Stéphane Baudron, 2019 Fellow, the Fellowship did just that, providing "an independence that serves as a pillar for the establishment of a broad and challenging research project, through which one can distinguish oneself." Moreover, the local dimension of the institute allows for a more personalised management of projects and Fellows, who are part of a community in which the lines of communication are short.

"The principle of trust in the researcher is at the centre of the discussions and decisions at USIAS."

Jean-Pierre Sauvage, Chair

"The initial project funding at USIAS has increased twelvefold as a result of new, highly competitive grants that have been obtained since."

Thomas Hermans, 2014 Fellow

The USIAS experience thus strengthens the voice of researchers and the credibility of their projects. Thomas Hermans, a chemist and 2014 Fellow, recalls how, thanks to the support of the institute, his «cross-disciplinary research hobby became a successful large-scale project."

His project co-fellow Michael Coey from Trinity College, Dublin (Ireland), elaborates: "In the USIAS project we have developed something really quite remarkable, fluidic channels without any solid walls, leading to near frictionless transport, uncloggable devices, which can be in principle scaled down to the sub-micron level."

Izabela Sumara, biologist and 2014 Fellow, points out that USIAS enabled her to develop an unusual collaboration, opening up a whole new area of research for the laboratory, and that has attracted substantial research funding. "USIAS funding has helped me to develop topics that have since led to the award of four research grants and four PhD grants, for a total amount of c. 1,3 M€."

As Jules Hoffmann, Nobel Prize in Physiology 2011 and a USIAS Chair points out, it is not only the Fellowship programme that exemplifies the principles of USIAS. As well as their governing responsibility within the Board, the eleven permanent Chairs, also do research within the context of USIAS, and the pivotal freedom and flexibility is also crucial for their work.

Jean-Marie Lehn, Chair of USIAS. © USIAS

Thomas Ebbesen, Kavli Prize for Nanoscience in 2014, USIAS Chair and director of the institute, knows how important it is not to get bogged down in one scientific field or one approach. In the course of his career, he quite radically changed research direction three times, which was very fruitful. "Each time I tackled a new topic, I had relatively little knowledge in the field, and therefore few preconceived ideas about what was possible or not." His research at USIAS has helped him explore other disciplines and make an impactful contribution. In recent years, he and his team have established a new way to control chemical reactivity and material properties, using only quantum fluctuations in the vacuum - a major discovery that has opened up a whole new disciplinary field.

While the Chairs of the institute are appointed for their excellence and important scientific contributions, they also see the appointment as an honour, a recognition, and a great window of opportunity, according to Georges Kleiber, Chair of Language Sciences at USIAS. This is also of concrete importance, because it is not only disciplinary barriers that have to be overcome in the system. In research, retirement is in many ways an artificial moment,» observes Sylviane Muller, «USIAS allows us to continue working on subjects that we are passionate about and to which we have much to contribute.

As USIAS celebrates its tenth anniversary, it is already looking ahead. Starting this year, the institute has created new, temporary Chair positions in each of the three main scientific fields - life sciences, humanities and social sciences, and natural sciences - named after renowned scientists in these respective domains with important links to Strasbourg: Marc Bloch, Paul Ehrlich and Marguerite Perey.

The aim is to increase the financial and intellectual freedom of outstanding Strasbourg-based researchers, and to increase their visibility among a wider academic audience, among other things through an inaugural lecture modelled on the *Collège de France*. Ultimately, this approach aims to establish and strengthen the links between the generations of researchers at the University of Strasbourg and within USIAS.

"Within the University of Strasbourg, USIAS, with its scientifically 'multicoloured' composition, contributes to the decompartmentalisation of disciplines, and stimulates a better mutual socio-scientific understanding."

Georges Kleiber, Chair

Palais Universitaire in Strasbourg.
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For those who have benefited from its resources and possibilities, and those who are still actively involved, the Institute for Advanced Study of the University of Strasbourg fulfils a necessary, vital mission in the world of science. A mission that can be accomplished effectively thanks to the context in which USIAS operates: that of the great University of Strasbourg, with its rich history of intellectual progress.

USIAS contributes to the vitality of Strasbourg's research and its impact in the academic world in France. The members of its Board hope that, in the future, the Institute will continue to carry out its mission with brio, and will aim to increase its visibility. "We can - and should - remain humble," says Sylviane Muller, "without being invisible. This will help to maintain and attract even more great minds to Strasbourg."

Pierre Chambon, titulaire de Chaire honoraire, 10 mai 2017.

Nalini Anantharaman, titulaire de Chaire, (avec Adriano Marmora), 6 avril 2017.

Jules Hoffmann, titulaire de Chaire, (avec Alberto Mantovani et Wolf-Hervé Fridman), Symposium annuel 24 novembre 2017.

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Interview with Jean-Louis Mandel

recipient of the 2022 Kavli Prize in Neuroscience

"Dialogue with the families of patients is essential to our research"

© Fondation Maladies Rares / The Kavli Prize

A physician and geneticist, Jean-Louis Mandel was director of the Institute of Genetics and Molecular and Cellular Biology (IGBMC) at the University of Strasbourg (CNRS/Inserm) from 2002 to 2006, where he dedicated his career to the study of the genetic origins of rare diseases. Holder of the Collège de France's chair of Human Genetics from 2004 to 2016, he also holds the Chair of Human Genetics at the University of Strasbourg Institute for Advanced Studies (USIAS) since 2012, where he is also member of the Governing Board. In 2022, he was awarded the Kavli Prize in Neuroscience for his discovery of the genetic mechanism responsible for fragile X syndrome.

Very early on in your life, you became interested in both art and science. After a few years spent at the Paris Conservatory studying the violin, you finally opted for scientific studies. What led you to make such a decision?

Jean-Louis Mandel: During the three years that I spent in Paris, I realised how much more talented than me some of my colleagues were. I am talking about people who went on to have brilliant musical careers, such as the great soloist Pierre Amoyal, who was a pupil of Jascha Heifetz; Emmanuel Krivine, who became director of the National Orchestra of France; or the renowned violinist Augustin Dumay. Besides that, I also suffered badly from stage fright. If you want to become a soloist or to play chamber music, your performance must be consistent – every second counts! – whereas, when doing research, you can hesitate or even make a mistake one day and do better the next. Error is part of the daily life of a scientist, it is constitutive of one's work, I would say. The pressures are not the same. Moreover, the world of science had fascinated me since I was a child. My father, Paul Mandel, was a professor at the Faculty of Medicine in Strasbourg, and a researcher. He created a large laboratory of neurochemistry – a field, now part of the larger domain of neurosciences, of

which he was one of the pioneers. I witnessed him being very enthusiastic about his work, and scientists, all very friendly, interesting and from various countries, would often come and visit him at our home. On the advice of my father, I therefore embarked on a double course in science and medicine at the University of Strasbourg, even though I must concede that I was not very diligent in the latter.

Since 1982, your work has revolved around the search for the genetic origins of rare diseases, although this was not your specialty during your thesis. How did this topic spark your interest?

It was very much the result of a series of coincidences. At the time, in medical school, we only had two hours of lessons on genetic diseases, so it was an area that I knew very little about. Then, I went to work on my thesis in biochemistry and molecular biology at Pierre Chambon's laboratory. Once the thesis had been completed, my military service was imminent, which was just not my cup of tea. Fortunately, there was an alternative called "Cooperation", which consisted of sending young doctors and teachers to the former French colonies, particularly in Africa, and I had heard that it was possible to go to Canada via this system. Pierre Chambon thus introduced me to Lou Siminovitch, the father of genetic research in Canada, who accepted me as a post-doc in the Department of Medical Genetics at the University of Toronto, where I was supposed to teach in French. I must admit that I never uttered a single word in the language of Molière while I was over there, except when it came to explaining the spoonerisms of "Le Canard Enchaîné" (a French weekly newspaper). It was during these two years that I attended some fascinating conferences on the topic of genetic diseases.

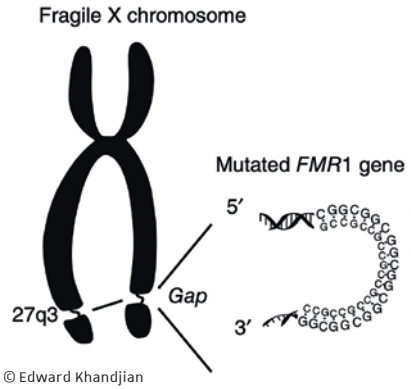
Were you able to explore this newfound interest as soon as you came back to Strasbourg?

Not immediately, no. First, I worked with Pierre Chambon on a very exciting project on egg white protein genes. Put that way, it may seem trivial, but we were using the very newest methods in genetic engineering. This led me to participate in a fundamental discovery: the structure of genes is fragmented, which means that the coding sequence, contained in what we now call exons*, is interrupted by non-coding sequences, called introns*, and therefore does not consistently match the structure of messenger RNAs, the molecules derived from DNA that are read for protein synthesis. During this work, I became aware of the genetic variability in the hen. At the same time, I began teaching biochemistry at the Faculty of Medicine, but realised that students were not interested in this field, unless it was associated with diseases. So, I started giving courses in which biochemistry and genetics were intertwined. I then recalled the notion of genetic variability, in particular because of its potential usefulness in the diagnosis and study of rare diseases. As a researcher, I believe teaching to be very enriching, because you can't just talk about your own research topic to your students. You have to broaden your horizons, by taking an interest in other subjects. In my case, it allowed me to find the research subject that would go on to become the very basis of my whole scientific career. Besides, I thought it was time for me to strike out on my own, so I launched my first project that consisted of using the same technologies we had used with the hens, but on the human genome. I was motivated, but some obstacles had yet to be overcome.

What obstacles?

A few months after the initiation of this project, the quadrennial visit of the Chambon laboratory by the CNRS – the French National Centre for Scientific Research - took place, during which I was able to present my project. Unfortunately, the committee didn't seem convinced, especially because I was interested in human genetics without having been trained in it. Nonetheless, Pierre Chambon supported me and I was able to continue. And, as early as 1983, we began to obtain very promising results. That's when I started working on fragile X syndrome, which was a very little-known disease at the time. It was the subject of my very first publication in the field of medical genetics, in collaboration with Jean-François Mattei, who later became Minister of Health under Jacques Chirac's presidency, and his wife, Marie-Geneviève. They were among the first geneticists to be interested in this disease in France.

You have been awarded the 2022 Kavli Prize in neuroscience for your work on this disease. What was the fundamental discovery that earned you this recognition?



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Fragile X syndrome is characterised by behavioural problems and intellectual and cognitive difficulties, among other things. In the 1980s, virtually nothing was known about the causes of this disease, but we did know that it was associated with an anomaly – detectable in certain conditions – of the X chromosome, that seemed to break, hence the name "fragile X". It took eight years for my team to map this region of the genome, which led us to discover a new and astonishing form of mutation in 1991, called "unstable expanded repeats", which is characterised by the repetition of groups of nucleotides* in or around a given gene. In the case of fragile X, the cause is the unstable repeat of nucleotide triplets (CGG) in a specific location of the X chromosome. It was the very first time that such a mechanism was identified, and it was very quickly determined that it was also the source of other rare genetic diseases that had been clinically recognised for a long time, but whose causes remained unknown.

* *see glossary p.16*

Such as?

In 1992, it was identified as the cause of myotonic dystrophy – or Steinert's disease – one of the most common muscular diseases. In 1993, an American team found this mechanism to be the source of Huntington's disease, a horrendous neurodegenerative and hereditary disease, which is better known because it only appears around the age of 35 or 40, and has therefore affected people who had achieved celebrity in show business prior to being ill – like the American folk singer Woody Guthrie or French actress Sophie Daumier. In the years just after our discovery, this mechanism was identified as being at the origin of an array of rare diseases, including three neurological disorders that affect balance and coordination by our laboratory, between 1996 and 1997. After that, nothing for a good while. In recent years, however, new genome sequencing technologies have unblocked the situation, in particular by making it possible to analyse large DNA fragments, a method called "long-range sequencing". New computer analysis techniques that are faster and more efficient, have also made it easier to find these repetitions among the immense flow of information of the genome. It is due to these technologies that we were able to shed light on the origin of the most frequent genetic form of Charcot's disease, or amyotrophic lateral sclerosis (ALS), which is called Lou Gehrig's Disease in the United States, as a tribute to a great baseball player affected by it.

Has this discovery made it possible to develop treatments for fragile X syndrome?

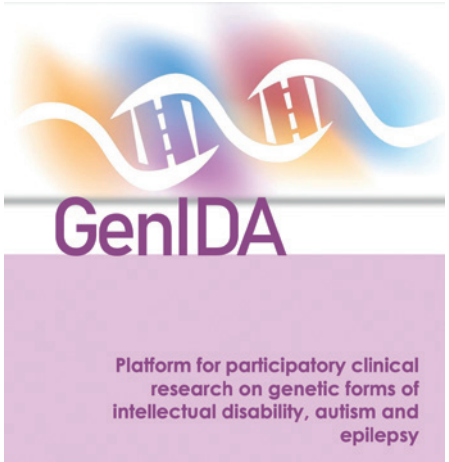
To date, there is no specific treatment for fragile X syndrome. You need to understand that it is far more difficult to conduct clinical trials with patients with intellectual disabilities and behavioural disorders than it is with patients with other conditions. For diseases in general, everything is explained directly to the patient, who participates willingly in the trials. But if the patient is not autonomous enough to give their consent, the family must be involved. It is a cumbersome and difficult process. Some paths do exist; we have found potential therapeutic strategies, but the problem is to carry them out in these cases. Fortunately, these avenues continue to be explored, in particular by Hervé Moine's team at the IGBMC. On the other hand, there is what we call "genetic counselling". Fragile X syndrome can be transmitted by people who do not show signs of the disease, sometimes in distant branches of the same family. However, the discovery of the underlying mechanism has allowed the development of diagnostic tests through which one can identify the risk of transmitting the disease to one's children. This way, people who are not carriers can be reassured, and those who are can be offered a prenatal diagnosis. However, in France we are still quite wary about extending this kind of preconception tests, supposedly for ethical reasons. One of my personal battles is to allow everyone who wants such tests the opportunity to do them, especially since it is a practice that has already been in place for 25 years applied to prenatal screening for trisomy 21.

You have been in contact with the families of patients for a long time. How important was this relationship in your research work?

To work on the genetic origins of such diseases, we need the collaboration of the families. From the beginning, it was obvious to me that we had to establish contact and get closer to these people. It is not possible to be interested in this subject from a purely scientific point of view, without taking the patients' daily life into account. On this matter, I will always be crystal clear: collaboration and dialogue with patients and their families has been essential to my research on all the genetic diseases on which I have worked. I have been involved in the scientific councils of family associations, such as the French association of Fragile X where I was present for the recent celebration of its 30th anniversary. Moreover, from time to time, I would take the young researchers and students of the team with me to meet these families so that they could really see that their subject of work is more than just DNA contained in test tubes. It is motivating for them to realise that entire lives are involved but it does also generate a certain expectation which, as researchers, we wonder if we'll be able to satisfy.

Have you had difficulties finding funding, since you are working on rare diseases?

I would tend to say no. Very early on, the French association against myopathies (AFM) understood the importance of genetic research. If France has a national "Rare Diseases" plan today, it is in particular thanks to the efforts of the AFM that has made decision-makers but also the general public and doctors aware of genetic diseases, through the telethon, and related sporting and cultural events. It is true, however, that research is more and more expensive and that it is more difficult to obtain sufficient funds for more innovative projects. For example, for my GenIDA project – a participatory initiative to collect information on patients with intellectual disabilities or autism spectrum disorders – all our funding requests fell through. It's thanks to the University of Strasbourg Institute for Advanced Studies (USIAS), where I hold the Chair of Human Genetics, that we were able to set up this project. More than finding the actual money, the real difficulty lies in finding it to test new things, to take risks or to initiate large-scale efforts...



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Jean-Louis Mandel after the announcement of the Kavli Prize, 1 June 2022.
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How does being awarded the Kavli Prize impact your work?

I must admit that this is an unexpected recognition. I thought that the time of prizes had passed for me, especially for my fragile X discoveries, which date back from over 30 years! Today, it is becoming difficult for the current generation of young teams to find funding that enables them to be competitive. Moreover, in the field of genetics, machines are becoming more and more expensive that are obsolete more and more quickly, because technology is advancing rapidly. And, even if ideas are and will always remain central, access to technology can be decisive in the success of a study. I therefore want the funding associated with the prize to nurture the research of the teams of the neurogenetics department of the Institute of Genetics and Molecular and Cellular Biology (IGBMC), to make a real difference to some of their projects.

Interview conducted by
William Rowe-Pirra, science journalist.

Glossary

Intron: During transcription of DNA into RNA, introns are segments of the gene that are not conserved. They are cut and removed during the step called splicing.

Exon: Unlike introns, exons are segments of a gene that are retained in RNA after transcription and splicing.

Nucleotide: An organic molecule that constitutes the basic element of DNA, composed of a nucleic base – denoted by A, C, G or T depending on its structure – associated with a sugar and a phosphate group.