

FRANCE - HKUST INNOVATION HUB

FRENCH CAREER FAIR "BONJOUR TALENT" AT HKUST

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The French Chamber of Commerce organized the 2nd edition of the **Bonjour Talents** Career fair on the 9th of February 2018 with the support of French Foreign Trade Advisors and Campus France Hong Kong. Bonjour Talents aims to help **French Companies** source local talents and induce collaborations with Hong Kong universities. This new edition of the career fair brought together 15 major French companies in various fields, such as banking, consulting and engineering, and university students from Hong Kong at the **HKUST Business School** in Central.

The fair was an excellent opportunity for students to meet with potential employers before the busy period of Chinese New Year. **400 registered students** mingled with **professionals** to explore their future career paths. While traditional sectors in Hong Kong still attract new talent in areas such as marketing or supply chain management, other sectors were also gaining more interest (**innovative software, environmental engineering, multimedia, etc.**). By presenting their companies, exhibitors demonstrated that French presence in Hong Kong is not only focused on the service industry, but also has a presence in civil engineering, waste management and transportation technology, with exhibitors such as Dragages and BYME engineering, Suez NWS and Alstom respectively.

The great turnout at this event showed the interest French companies get year after year in Hong Kong. Although French **luxury and cosmetic** consumer good sellers (LVMH Fasion Group, Hermes, l'Oréal, Pierre Fabre) remain the most well-known amongst Hong Kong students, the recent development of the startup ecosystem in Hong Kong is progressively changing the reputation of French corporations towards **innovation and excellence**. Also represented were banks (BNP PARIBAS, Natixis), logistics (Bollore), product design (Baseline), innovation (PALO-IT), Marketing (IPSOS), and F&B (Pernod-Ricard).

Hong Kong is a place **full of opportunities** to develop global projects. The students from the School of Engineering were very impressed by the showcase at the fair. In particular, the opening of the **South Island Line** built by Alstom in December 2016 was one of the French achievements in technology that students found most memorable.

Some of our students came to the fair to find out more about **working overseas**. Edward from HKUST, for example, went to France through an **exchange student program** last year. Although speaking French is an **asset** to French companies, the adaptive capabilities of Hong Kong students combined with their skills in English, Cantonese and Mandarin are highly valued by companies. Recently, these multilingual skills have become even more valued with the **economic and infrastructure development** of the Guangdong area like the Hong Kong-Zhuhai-Macau Bridge, metro extensions, tunnels and underground excavations to connect mainland to Hong Kong.



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CEA TECH, THE CEA'S TECHNOLOGY RESEARCH UNIT

€ Annual operating budget
of €650 million

600 priority patent
applications per year

4,500 researchers

Our industrial partners

80% listed on the
CAC 40

500 SMBs

145 international
partners



CEA TECH

SPEEDING UP INNOVATION
FOR INDUSTRY

A UNIQUE MODEL: PLAYING A KEY ROLE IN FRANCE'S INDUSTRIAL COMPETITIVENESS STRATEGY

CEA Tech is the technology research unit of the French Atomic Energy and Alternative Energy Commission (CEA), which has been established for over 50 years. On behalf of the French government, the CEA is rolling out its unique CEA Tech concept across the country in order to make French manufacturers the go-to organizations for technological innovation and for France to become the industrial economy's leading growth driver.

What makes CEA Tech unique in France is a strategic focus on its four key pillars:

1. Bridging the gap between academic and industrial R&D

CEA Tech operates at Technology Readiness Levels (TRLs) 3 to 7, serving as a catalyst for innovation and an accelerator for businesses.

2. Patent-oriented with a focus on KETs

CEA Tech develops Key Enabling Technologies for all industries and all businesses, from major multinational corporations to SMBs and start-ups. These technologies are protected by patents held by the CEA, the world's leading filer of international patents.

3. Bringing top-level technology platforms to our partners' advantage

CEA Tech boasts international-caliber technology platforms available to partner businesses at competitive costs.

4. Creating value by transferring patents to the industry

CEA Tech has built a results-oriented organizational culture based on a long history of cooperation between research and industry. Our experienced researchers and staff deliver in transferring new technologies to industrial-scale manufacturing facilities.

CEA Tech has 4,500 researchers and administrative staff dedicated to bringing manufacturers a broad range of Key Enabling Technologies and 600 priority patent applications per year. CEA Tech works with 80% of the CAC 40 companies, 500 SMBs, and 145 international clients and has a €650 million annual turnover.

In 2017, CEA Tech was ranked first for most innovative research institution in Europe and second in the world by Reuters

CEA TECH'S TOP-LEVEL RESEARCH AT INNOVATIVE LABORATORIES

CEA Tech is composed of three labs :

- LETI, specializing in micro- and nanotechnologies and their integration into systems.
- LIST, in charge of smart digital systems.
- LITEN, dedicated to new energy technologies and nanomaterials.

Together, they develop a broad portfolio of technologies for ICT, energy, and healthcare.

ICT

When it comes to information and communication technologies, the market is demanding smaller and smaller systems while still requiring enough processing power to handle exponential growth in data volumes without increasing costs. To overcome these challenges, LETI brings its knowledge of SOI that has already helped make embedded systems more energy efficient; LITEN is innovating better energy solutions; and LIST is investigating ways to improve system architectures and the code that drives software.

RENEWABLE ENERGY AND ENERGY EFFICIENCY

CEA Tech is helping drive the development of renewable energy through research on production—PV and bio-based energy in particular—and is looking at ways to store renewable energy and convert it into electricity. The goal is to give renewables a larger share of France's energy mix. Batteries are the main focus of CEA Tech's energy storage research. CEA Tech is also tackling ways to reduce overall energy consumption in two energy-hungry sectors: building and industry.

HEALTHCARE

CEA Tech offers a broad range of solutions for healthcare: biomaterials, drug delivery systems, miniaturized medical systems, connected objects and sensors for diagnostics and monitoring, and knowledge of data collection, processing, and analysis, including Big Data. CEA Tech is also driving advances in medical imaging and, with its leading R&D in robotics and cobotics, robotically-assisted surgery.





Prof. Antoine Triller (French National Institute of Health and Medical Research) and Prof. Hyoukeun Park (HKUST) are two scientists working on neurotransmitter release and receptor diffusion dynamics during inhibitory synaptic transmission. Their project is funded by the French National Agency for Research (ANR) and the Research Grant Council (RGC). As their project is starting soon, Prof. Antoine Triller is eager to share about this collaboration.

WHO ARE YOU, PROF. ANTOINE TRILLER?

I was born in Paris, France. In January 1995, I joined the **Ecole Normale Supérieure (ENS)**. I was the chairman of the biology department at ENS from 2004 to 2006, and in 2006, I created and became the director of the Institute of Biology of ENS (IBENS). My research interest has always been in the field of cell biology of synapses and the consequences of their dysfunction in so-called **synaptopathies** including epilepsy, neuropathic pain and **neurodegenerative diseases**. In 1985, visualizing the receptors in the Central Nervous system for the first time, I found that they were accumulated at synapses. In 2003, I developed the use of the **Quantum Dot to label single receptors** and follow them in living neurons. A new paradigm for the synapse has since emerged, abandoning the notion of a relatively stable structure in favor of a **highly dynamic metastable complex**, with membrane components continuously diffusing in the plane of the membrane and recycling between internal and surface compartments. This innovative view of the synapse stability and plasticity is the result of the ingenious applications of powerful single molecule super-resolution microscopy combined with state-of-the-art computational analyses. I was then able to derive the functional implications of these discoveries and unravel unsuspected patho-physiological processes in Alzheimer and Parkinson neurodegenerative diseases.

HOW DID THE COLLABORATION WITH PROF. HYOKEUN PARK START?

I had the chance to meet Prof. Hyoukeun Park when he was giving a seminar at Ecole Normale Supérieure and came to visit my lab. I knew his former post-doc mentor well, and when I heard Hyoukeun's presentation, I immediately understood that the combination of our respective knowledge and technology would allow us to solve difficult problems in understanding the stability and plasticity of synapses.

WHAT ARE YOU WORKING ON?

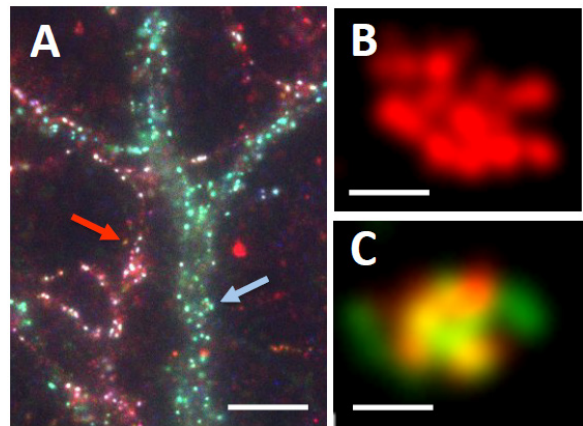
The aim of this project is to understand the **relationship between neurotransmitter release and receptor dynamics during synaptic transmission** at the microscopic and molecular level. To this aim we will make use of **real-time super-resolutive microscopy**. Transfer of information requires the precise alignment between the releasing sites of neurotransmitters in presynaptic terminals and the locations of activated receptors in postsynaptic differentiations. Recently, super-resolution microscopy has allowed to define the "nano-columns" at excitatory synapses, which are substructures allowing the apposition of presynaptic release sites and postsynaptic receptors-enriched nano-domain. Although inhibitory synapses regulate the excitability in the network accurately and rapidly, the functional alignment between releasing sites of inhibitory synaptic vesicles and inhibitory receptors has not been studied yet. One reason for this is the difficulties of real-time imaging of individual vesicles and receptors whose sizes are smaller than the optical resolution of classical fluorescence microscopes. **Our objective is to investigate simultaneously exocytosing presynaptic vesicles and the diffusion and stabilization dynamics of apposing receptors in living neurons**, thus providing a functional counterpart to nano-columns. This project will be possible thanks to recent progress in single-molecule fluorescence technique.





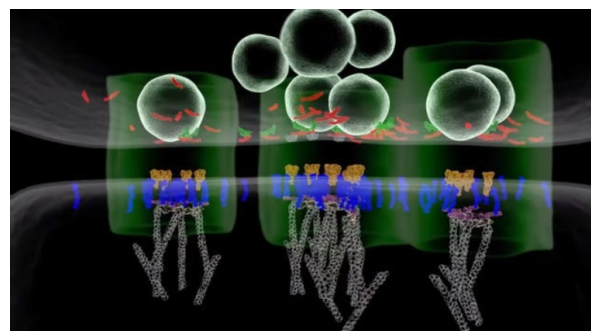
PORTRAIT

Prof. Hyokeun Park at HKUST built a state-of-the art **real-time nanometer-accuracy three-dimensional (3D) tracking microscopy setup**, which enables us to track an individual synaptic vesicle (40 nm in diameter) with better accuracy than its diameter. I tracked individual postsynaptic receptors in live neurons for the first time and found dynamics of receptors in postsynaptic compartments. I recently developed single particle tracking (20 nm pointing accuracy) using super-resolution PALM (Photo-Activated Localization Microscopy). I showed an activity dependent stabilization of both gamma-Aminobutyric acid (GABA) and glycine receptors (GlyR) by the scaffolding protein (Gephyrin) at synapses. The combination of our skills will allow us to study the specific properties of GABAergic and glycinergic nano-columns in cultured striatal and spinal cord neurons respectively. To this aim, we will first **develop microscopic and molecular tools to simultaneously access the release of neurotransmitters** and the diffusion behavior of receptors. We will then be able to investigate **how neuronal activity controls exocytosis** and its consequences on apposed receptors. This will lead us to propose a framework for the molecular control of functional nano-column at inhibitory synapses.



GABAAR/GlyR/Gephyrin

GABAAR and GlyR form nanoclusters both on neurons connected via purely GABAergic (red arrow) or mixed GABA-Glycinergic (blue arrow) transmission. Data from cultured spinal cord neurons. Calibration bars: 5--m and 0.1--m in A and B-C respectively



Neurotransmitters cross the synaptic cleft - the gap between synapse and neuron - via a protein nanocolumn that spans the two cells

HOW WILL SOCIETY BENEFIT FROM YOUR RESEARCH?

We expect to understand, at the molecular level, the dynamic events taking place during synaptic transmission in real time and how to modulate them. This will provide a new framework for **understanding the action and developing new pharmacological agents that are able to tune synaptic transmission**. Ultimately, the objective of this fundamental research is in the field of so-called synaptopathies. This word denominates pathologies in which synaptic transmission is affected and includes diseases such as epilepsy, neuropathic pain and also neurodegenerative diseases such as Alzheimer and Parkinson. as the fabrication of advanced materials via self-assembly.

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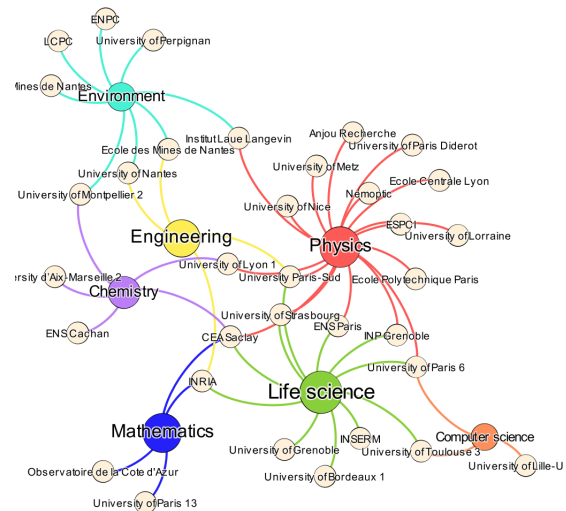
SERVING SCIENCE & DIPLOMACY

Through its **advocacy of universality and sharing**, scientific cooperation has quite obviously a potential for generating extremely positive images which States can take advantage of by drawing on the **networks forged by the scientists** and encouraging them.

The importance France has attached, for over fifty years, to **develop major physics research facilities** and, very recently, data bases, libraries and shared scientific **computing networks**, like GANIL (National Large Heavy Ion Accelerator) and the Soleil synchrotron at the national level, or the European Organisation for Nuclear Research (CERN) and European Southern Observatory (ESO) at the European level, or the International Thermonuclear Experimental Reactor (ITER) at the global level, is an essential asset for maintaining the high quality and competitiveness of our research and our economy. Indeed, the hosting of a major research instrument in France creates a **hub for international scientific elites** and provides opportunities to boost academic cooperation.

The Hubert Curien Partnerships (PHC), are bilateral programs which support the mobility of researchers and constitute a privileged instrument of French scientific cooperation with its partners. The PHC are financed and managed in France by the Ministry of Foreign Affairs in liaison with the **Ministry of Higher Education and Research (MESR)**, and one or more partner institutions abroad such as the **Research Grant Council** in Hong Kong. 67 PHC or similar programs are implemented with foreign partners. They represent more than **2,000 projects every year**, and generate around **10,000 mobilities** of French and foreign researchers. **80% of the projects result in the publication** of one or more articles in a referenced journal.

French research, ranked fifth in 2015 in the world in terms of spending (**2.27% of GDP**, i.e €49.8 billion) and 6th for publications (with 3,6% of publications worldwide). On his side, **China** is incredibly rising from the 5th six years ago to the **second place just behind the US** with 17% of the scientific publications. China and France cooperate since many decades, and the collaborations at a high level between researchers are deepening day after day. Today, **Hong Kong universities** represent **11.6%** of all the co-publications produced by **the CNRS in China**.



Thematic and institutional links of previous procore with HKUST

Called PROCORE in the HKSAR, the objective of the Hubert Curien Partnerships is to develop excellent collaborations in science and technology between France and Hong Kong in all areas, including social sciences. This program covers the costs of transportation, the stay of researchers, and the organization fees of bilateral workshops. Projects or workshops must be jointly proposed by a French researcher and a Hong Kong researcher, designated as co-leaders. The active participation and mobility of **young researchers**, in particular doctoral or post-doctoral students, is **one of the first criteria** for the selection.

Since the creation of the PROCORE funding scheme in 1999, 233 projects have been supported jointly by RGC and the French governments, among them, **63 with HKUST's teams**. Collaborative projects mostly involve universities in Paris area (24 projects) and Lyon (4 projects) in chemistry, mathematics, information technologies, life sciences, physics and environmental sciences.

This year, the applications will be opened from the middle of March to the end of June 2018.



3 MARCH 2018

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SPOTLIGHTS ON



ALEXANDRE YERSIN SCHOLARSHIP

For the 19th consecutive year, the Consulate General of France in Hong Kong and Macau offers scholarships for excellence to master students. This scheme for Hong Kong and Macau residents provides €12,500 per year, composed of an allowance of €660 per month, social welfare, public liability and repatriation insurance, accommodation help, a social and cultural activities guide, and intensive French class at Alliance Française before their departure.

FOR THIS EDITION, THE DEADLINE FOR APPLICATIONS IS APRIL 30TH, 2018

HUBERT CURIEN PARTNERSHIP THE PROCORE SCHEME

The Hubert Curien program (PHC), "Procore", has been developed by the French Ministry of Foreign affairs, with the support of the French Ministry of National Education, Higher Education and Research as well as the Hong Kong Research Grant Council (RGC). Its objective is to foster collaborations in science and technology between France and Hong Kong in all areas including the social sciences. This program covers the costs of transportation and accommodation for researchers, the organization fees of bilateral workshops.

FOR THIS EDITION, THE DEADLINE FOR APPLICATIONS IS JUNE 15TH, 2018



ESTP SUMMER SCHOOL OF APPLIED SCIENCES

EPF-ESTP Paris Summer Programme on Smart Cities & Engineering for Sustainable Architecture offers an in-depth study on topics such as engineering for eco-cities and smart cities, green issues, city planning and architecture for the future. Mainly designed for Undergraduate and Master students with a major in Engineering or Architecture, the program is composed of 2 modules:

- The module in Paris (Cachan) focuses on topics such as eco-cities and smart cities, city planning, spatial planning and economic issues for sustainable development
- The module in Troyes focuses on practical application using innovative teaching methods and modern technology

The program fee of €2,500 covers: Tuition and documentation, welcome and farewell events, access to EPF and ESTP Paris facilities, free internet access, official program certificate, cultural and social events transfers from Cachan Campus to Troyes Campus, lodging expenses for 3 weeks.

FOR THIS EDITION, THE DEADLINE FOR APPLICATIONS IS MAY 1ST, 2018

POST-DOC MAKE OUR PLANET GREAT AGAIN



France's ministries of Europe and foreign affairs and of higher education, research, and innovation have implemented a program of support for foreign postdoctoral researchers wishing to conduct further research in France on a topic related to **earth systems, climate change and sustainability, or the energy transition**.

Under the program, approximately 20 postdoctoral researchers will receive co-financing of up to €50,000 for research beginning after September 2018. Foreign researchers holding a doctoral degree are encouraged to respond to this call for proposals.

Candidates must include with their application a letter from a French host institution agreeing to co-finance the candidate's research.

Institutions hosting the selected researchers will receive co-financing in the amount of €2,083 per month to support the candidates' research over a period of 12 to 24 months.

<https://www.campusfrance.org/en/make-our-planet-great-again-funding-programs>

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