

# Initiating an International professional career in Japan via a Research Internship at Okayama University

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- Interview conducted in Okayama by Pr. CHENEVIER \* in September - 2020 -

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Dr. Olivier TRAMIS

## My interest in Japan

I was born in a small town close to Paris: Soisy-sous-Montmorancy (Ile de France)

At Junior High School, in the lecture of Japan's geography, a photo depicting an empty highway interchange in Tokyo struck my imagination. It made me think about the kanji representing vacuum (無). In "L'Empire des signes" R. Barthes defined that kanji as a paramount paradox, given the number of strokes. This puzzling paradox was likely the very early origin of my interest and curiosity in Japan.



Also in Junior High School, I discovered Origami in 6th grade, first taught by a friend of mine. I was fascinated by the transformation of a single square into a variety of shapes, only limited by our imagination. As the number of origami models available in local libraries was limited, I then acquired the Holy Grail of origami books: the "Origami Tanteidan". It is published by the Tanteidan association that holds a conference/exhibition every year, compiling in a book the newest model instructions from artists around the world. After 3 weeks, I finally received my first copy. The first half presents models by Japanese artists, with instructions in Japanese (the other half is for foreigners (i.e., non-Japanese)). Instructions are mandatory to complete the model. This encouraged me to translate parts of the instructions, to be able to fold the most complex models. “

“I practiced **Judo and Karate** when I was a kid, as they are known to help channel the energy overload of super dynamic kids. Later, when I was a teenager, I went back to karate after practicing soccer. I went back to Karate as a pathway to become stronger, both physically and mentally. As a teenager amid adults, the first years of karate were difficult, which led me to deepen my understanding of this art. For instance, we use in France Japanese instructions, but their true meaning is often not known. I then wanted to discover their meaning by myself, and my interest for the Japanese culture and language grew up.”

“I later bought two Japanese books, a **kanji dictionary** and a **grammar book**. I learnt kana and basics kanji from them.”

## Preliminary contacts with Okayama University - Plans

Olivier graduated from Toulouse-INP, a Technical Institute of Toulouse University. The field of his studies was: "Materials Science and Engineering". He could be trained to interdisciplinary approaches of sciences and technologies. And some specialising in Bio-materials/technologies

As Olivier definitely wanted to get Japanese professional and cultural experience in the country, he started with some contacts at Kyoto University and Tokyo Institute of Technology. Finally he ended this initial period with a meeting at Okayama University after getting in touch with Pr. Chenevier in early 2017. And some connections could be initiated with Professor Imamura's group. He could get a temporary position at Okayama University (Pr. Imamura's group) and applied a couple of times to JSPS supports. More recently in early 2020, in the course of a new stay at Pr. Imamura's group, the opportunity of a MSCA-IF support appeared as a good springboard for his long term career project in Japan. As an engineer, Olivier has great interest in applied research and in technology transfer. His long term goal is to be trained concretely in that field and start its own company project (possibly combined between Europe and Japan). This project is a part of the collaboration between Okayama University and UNISTRA, more specifically focused on the IMS institute (Institut du Medicament de Strasbourg). Okayama University is the Japanese member of the IMS International partnership.

## Research at Okayama University - "The magic fibres"

When I initiated my connections with Okayama University in October 2017, I did not even imagine I would start a long way to an international professional career, including if possible a large part of it in Japan.

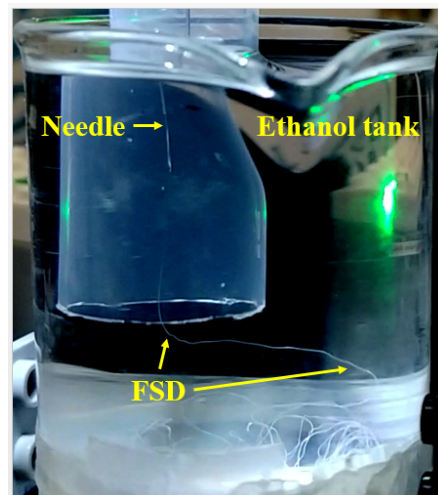
I was integrated in Pr. Imamura's group focused on Bio-Materials and Bio-technologies processes, where I was free and encouraged to develop my own research. So I could implement a strategy of research aiming at controlling proteins interactions in liquids. Ultimately I targeted the development of new methods for advancing drug delivery systems for medical applications.

I first worked on the development of adhesion of proteins. I studied electrostatic interactions between proteins and various substrates. I found that an electric field applied to a metallic substrate forced the adsorption of proteins with basically no affinity for this substrate. This has been the topic of a paper, published in 2019.

In another research topics, I followed-up the work of former students on sugar-based antifouling coatings. I also improved a methodology to obtain spontaneous foaming from sugar-based solutions containing various drugs. Foaming reduces the drying time, and increases the dispersion of the drug within the sugar matrix. This latter topic also led to a paper, published in 2020. Another one is in preparation. **So in terms of papers published in international journals**, my research work at Okayama University has been very fruitful.

Finally, I could use the new skills I previously acquired, to work on the process of sugar fibres as drugs carriers. Aqueous sugar solutions containing drugs are precipitated in an organic solvent. Under suitable conditions, fibres (FSD) are produced. The fibres contain drugs, which can be subsequently released upon dissolution in water. As the whole process is very original, this topic created an opportunity to submit a research proposal to European Commission: in the **MSCA-IF program** - MSCA stands for Marie Slodowska-Curie Action. IF: Individual Fellowship. This program offers substantial support for research and for technology transfer as well.

In my proposal (SUFIVEC: A comprehensive approach to develop and implement nano SUGar Fibres as innovative drug delivery VECTors), I wish to “*substantially improve the efficiency, at low cost, of future generation medical drugs, working specifically on the dispersion of active molecules in biological solutions. This matter has been a long-standing bottleneck for the large scale development of advanced and efficient drugs used for precise medicine*”. **The fibres, somewhat "magic"** “*will be also designed so as to serve as innovative solid-state storage solution for biologics and their conjugates, the polysaccharide matrix acting as a protective agent*”. Finally, “*exhibitions will introduce SUFIVEC through a more general “medicines of the future” approach, in schools, universities and public spaces such as small museums of sciences.*” I paid specific attention to those features and I could initiate within SUFIVEC connections with a venture company located in Strasbourg area. The main partners of this project are University of Strasbourg (and more specifically the recently launched Institute: Institut du Medicament de Strasbourg) and Okayama University.



A long fibre (FSD) is initiated at the tip of the injection needle. Then upon growing, the fibre develops. No break: this results from the repulsion of polysaccharide and ethanol. A winder could collect the long fibre to prevent entangling (one of the topics of SUFIVEC).

## Perspectives of international professional career

As an engineer I am interested in applied research and in technology transfer to large publics. I like to combine achievements from different fields of research. This interdisciplinarity is reflected in the European project, which combines know-hows from biotechnology, physical-chemistry, hydrodynamic and technical design. This way I aim to propose a comprehensive picture of the research outcomes. More generally, it often happens that a scientific bottleneck in a field can be partially removed in another field. Similarly, looking at a problem from different points of view helps to solve it. This is why I am interested in using my skills in a range of disciplines, and in collaborating with various institutions.

As solving complex problems requires interdisciplinarity I am also working at expanding my international network.

## My daily life at Okayama - Practical features

Daily life in Japan is without any doubt an exceptional experience for a European.

### **Living in Okayama: public transportation, people, events....**

Okayama city offers excellent public transportation: local bus and railway networks (university, local train station, shopping malls) are dense, well organized and easy to access. They make it possible to reach a large number of local or regional destinations. Okayama City is also conveniently connected with major Japanese cities via the Shinkansen network. Riding a bike is the favourite and utmost convenient transportation way, as bikes-parkings - mandatory in Japan - are quite numerous.

People are helpful and friendly. If you request some help, they immediately consider your issues and do their best to solve them. In daily life there are many customs, like the famous “ittadakimasu” before eating, followed by “gochisosamadesu” after. Another striking feature is the mutual respect that is reflected in the language and customs of Japan: I find it so agreeable and admirable. One learns quickly to do likewise, to be attentive, to listen to others and to behave with respect.

Despite being elementary, my Japanese allowed me to “survive”: I could find my way, I could request some help by my own. For instance, the word “sumimasen” is often used to say “I’m sorry” or “excuse me”. If one helps to carry a bag, the other person may say “sumimasen” rather than “arigatou”, as the person feels grateful but ashamed that he/she needed help. This aspect of the Japanese culture is fascinating, and at the same hard to understand for a foreigner. I want to learn more about this as a pathway to a deeper understanding of this culture.

The events I took part in (for instance a harvest in Kumenan, photo also showed me that the local population is so far - even at the opposite - from the usual “Tradition vs High-Tech” clichés.

Local temples and shrines are surrounded by modern, sometimes very high buildings. This is even more striking in big cities (Tokyo, Osaka). Many cities still have their castle, built centuries ago, and still in a very good conservation state (Okayama castle by night, photo below). It is common to see young, fashioned people going out of their pimped cars to pray at the temple. This





blending of tradition and modernity is awesome !

I really enjoy living in Okayama city. This is a quiet yet active place, where many cultural events are held. I feel at home here, and I am willing to stay long – and settle here. I know this path is a hard one but I'm ready to take it.

### ***Okayama University Campuses - Tsushima***

Tsushima Okayama University campus is very attractive with lots of greenness and it is situated conveniently only 3 kilometres from the main train station. Many shops and living quarters, relatively cheap, offer a very simple and agreeable daily life. In addition, one can get around the city easily by bus or bicycle, or on foot. I bought a bicycle, and I could enjoy its



convenient use (light and easy to park) to go almost anywhere on the campus and its neighbourhood.

I was especially fond of a rice curry (side photo, bottom left corner) topped with fried pork, from a local restaurant near the campus. That dish is cheap and tasty. I went so often that I ended up chatting a lot with the owner !

Another of my favourites is the **J Terrace Cafe**, a quiet café, located next to the main administration building on Tsushima campus. I had there numerous meetings /discussions with Pr. Chenevier in the preparatory phases of my proposal to EU Commission

There is ample and very good accommodation for foreign students and invited faculties – I highly recommend it.

### ***Practising a martial art: Karate***

I had the chance to practice Karate in Okayama. In the class, the most striking difference compared to French classes, is the teacher/students relation, which is closer to that of a family with a clear hierarchy. For instance, when the teacher enters the dojo, the students cease all activities, turn toward the teacher and bow. The same occurs when the teacher leaves, with senior members accompanying him outside after bowing.

Members of the club are friendly, open-minded and easy to talk to. I was pleasantly surprised to see them being direct and tell me what they thought, far from cold and distant people as Japanese are frequently reported abroad. The hierarchy is rigid in Japan, but I have not seen so far any questioning nor misconduct during a training session. I am glad to learn karate “live”, in Okayama, and I now feel as a member of the club despite my limited Japanese practise. I think this mostly results from the kindness and open-mindedness of the club members.



### ***As a matter of conclusion:***

The experience of Japan I could gain from 2017, largely surpassed my expectations.

Professionally, I succeeded in gradually focusing my research activities on the development and engineering of biomaterials. Relying on international collaborations, especially in Asia, I succeeded in proposing innovative approaches for the “medicine of the future”. By seeking prestigious support from the European Commission, I hope to initiate a long term professional career, firstly in France and later in Japan.



Dr. Tramis enjoys a sand onsen in Beppu, Kyushu, also renowned for its steam, transpiring in the city streets.

My daily life in Japan, more specifically in Okayama, has been enriched on a daily basis in many aspects. This also supports my decision to settle in Okayama in the future.

I will be back in France soon (Mid-September). I hope to return to Japan in a few months, as I will miss the Japanese lifestyle. Hopefully the “magic fibres” will be an opportunity for me to continue the work I initiated in Okayama, as well as to deepen my understanding of the Japanese culture.

When I live in Japan, and the feeling is even stronger when I am not there, a "need for Japan" embraces me: this is a “Besoin de Japon” (cf Jean-François Sabouret). Therein, Sabouret's passion, views and understanding of the Japanese culture through interacting with local populations, gives a picture far from "clichés" frequently spread out in France.