International Research Strategy at **Okayama University**

岡山大学での国際研究の戦略について

A convenient and powerful tool to implement, in Japanese Universities, an international culture of best practices in the field of research

Providing strong momentum towards a recognized international profile

By B. Chenevier:
- CNRS senior Scientist (FRANCE)
- University Research Administrator, Professor (JAPAN)
- *bernard-chenevier@cc.okayama-u.ac.jp*
- *https://chenevier-ura-okayama-univ.com*




- This report addresses the implementation of an International Research Strategy at Okayama University from April 2014 -

Implementation is ongoing in 2020,Pr. Makino is Okayama University President and Pr. Nasu Executive VP of Research.

Forewords**

F-1 The nature or *"raison d'être"* of higher education lies in teaching, learning, and research.

Today, however, the purpose of higher education is a contentious issue. The university's commercial turn has not only undermined the authenticity of higher education, but has also begun to dissolve the academics' 'corporative consciousness.' It will take wise academic leadership to restore the authenticity of higher education and the autonomy and spontaneity of the educative and scholarly community in the current university setting. The paper finds the idea of the university - as it has developed from ancient Greece through modern Germany to today - is vital to restoring the authenticity of higher education.

** Abstract of a paper by Professor Dong KIM from Okayama University (2020) " Upholding the Idea of the University in Times of Changing Higher Education" (ISSN 1883-0234) Vol. 12 pp.1 – 24, 2020.

F-2 This document is a summarized activity report covering a 7 year working period at Okayama University. In the URA division.
It is built in such a way that elements of a strategy of international development of a Japanese University are also introduced. As Japanese universities are frequently working in similar modes, it can be used by a range of them.
A more detailed draft is also available on demand.

Bernard Chenevier,
Okayama, February 2021
bernard-chenevier@cc.okayama-u.ac.jp

Abstract

For many years, Japan has been recognized as a country where the population is highly educated. This is revealed, for instance, by the PISA assessment process: 'Program for International Student Assessment' *. Also, from 2000, the number of Japanese Nobel Prize laureates has been quite comparable to most advanced countries (except the US, however, which is much higher).

In various programs designed to maintain this reputation of highly educated Japanese, numerous attempts have been performed in the past, by the government and MEXT in particular (MEXT: Ministry of Education, Research, Youth and Sports) to help Universities to remain in the leadership of modern societies where development largely relies on increased levels of education.

In 2013, shortly after he became the Head of the Cabinet, Prime Minister Abe expressed his wish to see within 10 years, 10 Japanese Universities in the top 100 of the ARWU (Shanghai, Jiao Tong) ranking. In 2020, as only 3 of them are in the 100 best, it is clear that the ranking of Japanese Universities remains significantly off target.

There are several reasons for this. As usual, reforming universities and getting results of the changes is globally a very slow process, the announced time scale was likely much too optimistic. In the past, similar statements were made at the top level of the government, but later, international specialists in higher education and academic research noticed that each time meager results were obtained.

And as a sad continuity effect, in 2020, it is obvious that the longstanding decline is still at work and there is no significant improvement in the international ranking of Japanese universities despite Abe's wish.

In this context, in early 2014, I got a secondment at Okayama University (in the best 12-15 best Universities in Japan) from my position of CNRS senior scientist with the mission as a URA (University Research Administrator) division member, to contribute the research development of the University.

By doing so, the global attractivity was expected to improve and as a result, preliminary recovery could be expected.

I relied on my background as a CNRS scientist and research manager as well, to implement at the University an original approach relying on concrete elements designed to help promote the University activities.

This document reports on the outcomes of my work at Okayama University. Another outcome of this work is that the main conclusions could feed into the thinking of Japanese decision-makers, responsible for university development policies.

It is shown that I obtained substantial achievements. All of them are a consequence of a single and sustainable strategy: I applied a fairly classical method, the Humboldt ** model used, for instance, at Johns Hopkins University in the USA, that I adapted to the Japanese environment and academic culture.

In this report I detail the various programs I have implemented by following a central idea: to place scientific research at the core of the strategy, selecting only highly flexible programs which rely on peer to peer relations with researchers, and having light administrative requirements. The first phase consisted of a substantial groundwork study of the university's research potential, building up a large but relevant database of research highlights. From its interpretation, I could concretely promote projects that associate Okayama University with 40 prestigious institutions in Europe and North America. My work path also included the creation of a number of international research consortiums where Okayama University is a major partner. As a result, the number of prestigious research and education institutions solicitating Okayama University to partner in international consortiums has been gradually increasing. They have been contributing significantly to the improvement of the international image and profile of the university.

In the last section, the document also proposes an option (the POLE project) intended to consolidate this new impetus of the university and to ensure - from 2022 - the succession of my position in terms of 'international strategist' but also more specifically having Japanese commitment. The ultimate objective of POLE is to add a second step to my 7 years' pathway with the objective to significantly increase the production of large scale consortiums already obtained and even further improve and stabilize the international profile of the University.

Finally it is shown that via the use of a new mindset, obstacles to development of Okayama University and beyond towards many Japanese Universities, can be lifted and new hope of recovery is permitted. Providing that professionals of research, and research management, work in a flexible peer to peer mode with the researchers, this upward trend can be made sustainable. To observe a significant up-grade of global ranking, a time scale of about a decade years is necessary. In this way, the implementation of a long-term sustainable strategy, relying on high-quality research associated with highly relevant graduate programs, will be successful.

I hope this report will provide basics elements for that success.

~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~

* See for instance the article "Japanese 15-year-olds rank high in math, sciences, but reading down: PISA exam" of the Mainichi Shinbun - https://mainichi.jp/english/articles/20191203/ p2a/00m/0na/014000c).

** The concept of holistic academic education (compare Bildung) was an idea of **Wilhelm von Humboldt**, a Prussian philosopher, government functionary and diplomat. As a privy councilor in the Interior Ministry, he reformed the Prussian education system according to humanist principles.

概要

長年にわたって、日本は教育水準の高い国として評価されてきた。このことは、例えばOECDによる国際的な生徒の学習到達度調査（PISA)* などに現れている。また、2000 年以降の日本人ノーベル賞受賞者の数が、米国を除く先進各国と肩を並べていることからも明らかである。この状況を維持し、さらに発展させるために、政府と文部科学省(文科省)は様々な政策や制度を打ち出してきた。例えば、文科省による「スーパーグローバル大学創成支援事業」でる。これらの大学支援プログラムは、教育レベルの向上を通して、将来における大学のアカデミアとしてのリーダーシップの維持を狙ったものである。

安倍首相は2013 年に内閣総理大臣に就任して間もなく、今後10 年で、世界大学ランキングトップ100 に10 校ランクインを目指すと表明した。しかし、2020 年のランキングでは、トップ100 入りは3 校にとどまり、目標から大きく外れることになった。いくつかの理由が考えられる。海外に目をむけると、大学を改革し変化の結果を得るには非常に時間がかかることがわかる。日本における大学改革のタイムスケールがおそらく楽観的過ぎたといえる。

過去にも、政府による同様の表明がなされてきた。しかし、高等教育と学術研究の専門家の分析によると、いずれも不十分な成果しか得られなかった。
このような継続的な努力にもかかわらず、2020 年においても下落傾向は明らかであり、安倍首相の表明にも関わらず、世界大学ランキングにおける日本の地位に大きな改善はみられなかった。

このような状況において、2014 年初頭から、筆者は、フランス国立科学研究センター（CNRS）の研究担当の立場で、岡山大学における戦略的プログラム支援ユニットのリサーチ・アドミニストレーター（URA）として、岡山大学の研究支援に貢献することになった。（ちなみに、岡山大は日本でトップ 12〜15 の大学である）。この職務は、岡山大学の国際的な魅力の向上を狙ったものであり、その結果として、世界ランキングの向上が期待された。

筆者は、CNRS の研究者および研究マネジャーとしての経歴と経験に基づいた具体的な項目からなる、大学の活性化・国際化につながる独自のアプローチを採用した。その結果、筆者は岡山大学の研究の活性化と国際化に大きく貢献できた。これらのアプローチの全ては、フンボルト・モデルとして知られる戦略に基づいている。この伝統的・古典的な教育モデルは、例えば米国のジョンズ・ホプキンス大学においても採用されており、日本の大学向けに筆者が改良したものである。

この報告書は、岡山大学における筆者の職務の成果をまとめたものである。これらの成果は、日本の大学改革の制度を考える立場にある人たちにとっても、役立つものであると信じる。

この報告書で詳述するプログラムは、以下に示す3 項目を中心にすえ、筆者が立案・実行したものである。(1) 学術研究をプログラムの中心とし、(2)“peer to peer mode”による弾力的な運用が可能であるプログラムを選ぶ。(3) 規則による制約を少なくする。

第一段階として、岡山大学において、どのような将来の発展が見込まれる研究が行われているかの基礎調査を実施し、ハイライトとなる研究の膨大な、しかし必要最小限のデータベースを構築した。これらを分析することで、筆者は、岡山大学と欧米の名門大学40 校との、具体的な研究プロジェクトを発足させた。

さらに筆者は、岡山大学を主要なパートナーとする、複数の国際研究コンソーシアムの設立に携わった。今日では、国際的にも有名な研究所や教育機関による、岡山大学の国際コンソーシアムへの参加要請が増えつつある。

報告書の後半では、2022 年実施を念頭においた、岡山大学の発展を加速するための新しいプログラム「**POLE プロジェクト**」を提案する。このプロジェクトは、筆者の職務を後任へスムーズかつ持続可能な形で引継ぐこと

ができるよう計画されている。さらに、岡山大学の国際的なランキングの向上を確実にできるよう設計されている。**POLE** の最終目標は、岡山大学が参加する国際コンソーシアムからの研究と教育の成果を大幅に増やし、岡山大学の国際的な評価を確固たるものにすることである。

報告書のまとめの部分では、新しい考え方を適用することで、岡山大学を含む日本の大学の発展に対する障害の除去と、日本の大学の復活が可能であることを示す。

重要なことは、復活し上昇を持続するには、研究および研究管理のそれぞれを専門とする者が、“peer to peer mode”によって職務を遂行する必要がある、ということである。

世界大学ランキングの大幅な上昇が見られるには、10〜15 年のタイムスケールが必要である。従って成功には、特色あるクオリティの高い研究と、それに付随した大学院教育に裏打ちされた、長期的で持続可能な計画が必要である。

この報告書が成功のための基本的な要素を提供するものであることを願う。

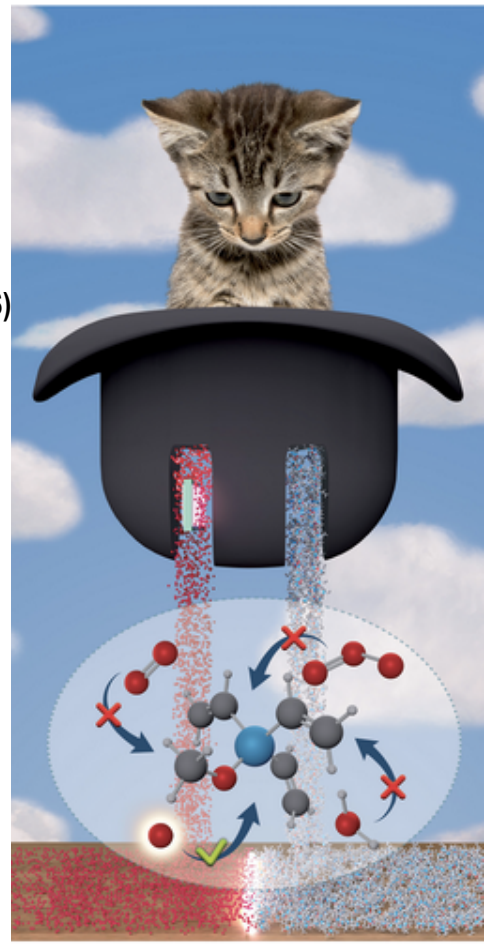
~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~

* See for instance the article "Japanese 15-year-olds rank high in math, sciences, but reading down: PISA exam" of the Mainichi Shinbun - https://mainichi.jp/english/articles/20191203/ p2a/00m/0na/014000c).
PISA の評価プロセス「留学生評価プログラム」などで示されています。（参照 Japanese 15-year-olds rank high in math, sciences, but reading down: PISA exam" of the Mainichi Shinbun - https://mainichi.jp/english/ articles/20191203/ p2a/00m/0na/014000c). https://mainichi.jp/english/articles/ 20191203/p2a/00m/0na/014000c）。

** The concept of holistic academic education (compare Bildung) was an idea of **Wilhelm von Humboldt**, a Prussian philosopher, government functionary and diplomat. As a privy councilor in the Interior Ministry, he reformed the Prussian education system according to humanist principles.

International Research Strategy at Okayama University

Table of Contents
目次



I – Introduction

I - 1 Basics -

After a substantial Introduction section where the main features of Academic research are reported, this document reports on:

** The research-based strategy of development I have been implementing at Okayama University for 6.5 years
** The used strategic Humboldtian model. Emphasis will be put on the flexibility, easy to implement and high yield features of a model that is thus well adapted to Japanese Universities.
** Achievements
** A large part of the report will be dedicated to main conclusions, recommendations and finally future perspectives. This section is specifically oriented in demonstrating how Japanese Universities can rely on their huge potential in terms of research to strengthen their momentum to get *better fortune.*

The objectives of this report are numerous:

To collect in a single document, the major outcomes I could achieve during my time (since April 2014) at Okayama University. This format permits me to easily describe to major partners the new development approach I have implemented.

To show that actual structural innovations and re-profiling to modern Academic trends are possible in a Japanese University

To provide the readers with an assessment of the efforts provided by a japanese University in response to global requirements for keeping a recognized global position.

To go beyond the objectives of a usual "Activity report": suggesting a range of measures to elaborate a "think tank" basis with the aim of further strengthening the international profile of Okayama University (possibly other Japanese University through a mimiking effect) - Finally, the tools needed to further promote the visibility of the research wealth.

In order to settle the final section devoted to " Conclusions, recommendations and perspectives " on a wide basis of consensus, it has been reviewed by a large panel of high-level scientists and research and education managers (from Europe, N-America and Japan) issued from the following fields:

** Humanities and Social Sciences
** Health, Medical sciences
** Plant biology
** Physics
** Chemistry
** Materials Sciences

All reviewers have substantial experience of collaborating with Japanese teams. They are also frequently invited for long and short periods in highly ranked research and education institutions in Japan.

The contents of this report will serve as a basis for publications in local (Okayama University Bulletin for instance**) and International Journals on "Research strategies for Japanese Universities global recovery" (**for instance **Higher Education Management and Policy (OECD):** https://www.oecd-ilibrary.org/education/higher-education-management-and-policy_17269822).

The Report is available in detailed and digest (20 pages) versions.

I - 2 My mission from April 2014 - under the auspices Pr. S-I. Yamamoto

a - From CNRS to Okayama University

For details of my skillls and expertises, see my CV details are in APPENDIX - A-1
I joint CNRS in early 1980's as a physical chemistry specialist and stayed for 6 years at ILL (Institut Laue-Langevin in Grenoble, a world leader research Institute in the field of neutrons sciences and technologies. I prepared a "-These d'Etat" on "Magnetic structures of a series of pnictides of transition metals". The defense took place in November 1990 at Grenoble University. **Pr. J. B. Goodenough**, Nobel Prize of Chemistry in 2019 was a distinguished member of the examination panel.

Then I moved to Japan in 1990 for a 1st period of 2 years (at an ancestor of NIMS in Tsukuba). It was a Post-Doc stay supported by JSPS: topics - "High-Tc superconducting materials (Bi) - HREM study of structural peculiar features".

After 2 years I returned to Grenoble in my lab: LMGP (100 members) - I progressively increased my management duties and took the head of the Lab in 2003 for 10 years.
My exposure to Japan research support systems was continuously kept vivid from the time of my postdoc stay via several JSPS invitations at NIMS for instance and by inviting Japanese researchers at Grenoble. One of the highlights of the period was the BRIDGE(JSPS) fellowship I could get in 2012 and that ultimately decided my future in Japan.

My experience in the field of research and research management, thus includes international research, large scale international research consortiums, management of staff and supervising a range of students from Master's level to PhD and postdocs.

b - Recruited on a position of URA (University Research Administrator)
I was recruited on a secondment position from CNRS by Pr. S-I. Yamamoto, VP of research in a visit he made at Grenoble in early 2014. At that time, after 10 years of activity, I had just resigned from my position at the Head of LMGP (Joint Institute of research: CNRS and Grenoble-InP, the Institute of Technology of Grenoble University) --

My formal position at Okayama University: URA in charge of International Development of Research. Pr. Morita was President of Okayama University

My initial contract with Okayama University was nearly 5 years long from mid-April-2014 to the end of March 2019 (end of Fiscal year in Japan). It was then extended on a position of Professor and URA from April 2019 to the end of March 2022

****
URA: what is a URA ?
URA conducts research, planning, procurement and management of research funding, and management and utilization of intellectual property in collaboration with researchers at universities and other research institutions. We have established a nationwide system that develops and secures human resource groups, and aims to establish an independent job category for URAs in universities.

(see also for instance: http://ura.okayama-u.ac.jp/english/)
A range of very different profiles can be found amid URAs in Japan, from purely administrative staff to research support or management. Some URAs are specifically oriented to budget concerns, statistical analysis, organizing meetings, promoting research locally and internationally. Here are a few URA skills statements that can be read in University URA web sites.

1. Brain Trust for Improving and Reforming the Research Environment
The top management plays the role of a brain trust that proposes and implements improvements and reforms for the research environment.

2. Go-Between for Researchers and Top Management
The URA's role is to act as a go-between for top management and researchers by extensively consolidating together the opinions and proposals of researchers and reporting these to top management.

3. Agent for Top Management in Front-Line Social and Research Settings
The URA's role is to serve as an agent that works to transmit and entrench the top management's research policies (Okayama University as RU) in front-line social and research settings.

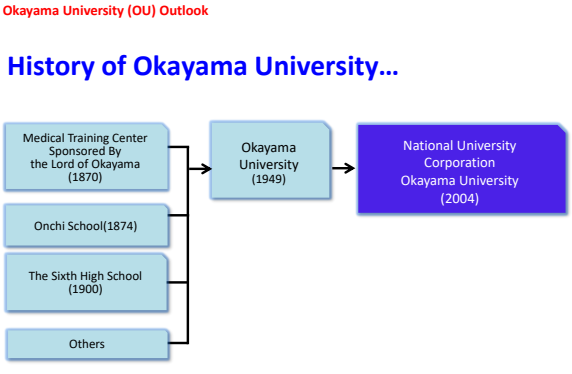
There may be different kinds of UxA in Universities: x can stand for "Research", "Admission", "Global", ...
****

II - Okayama University

II - 1 - At a glance

Okayama University is a national, comprehensive University located in South-West Japan (Chugoku region). 13000 students, 11 Graduates Schools.

Okayama University is steadily ranked among the 12-15 best Universities in Japan and has been granted as TOP-Global University in 2015.
The University is strongly committed to improving its international profile and using research as the major powering engine to reach that goal.



SDG commitment - Sustainable Development Goals

The 17 Sustainable Development Goals serve as a universal call to action to end poverty, protect the planet and improve the lives and prospects of all global citizens.

Since 2015, these global goals for sustainable development have been translated and embedded into the strategic direction of institutions at national and local levels. Okayama University is significantly committed in realizing SDGs that aim to tackle the world's most pressing challenges including poverty, hunger, and inequality, while ensuring social inclusion, environmental sustainability, economic prosperity, peace and good governance. Universities are hubs for knowledge, discovery, and innovation that can provide the expertise, resources, and know-how to contribute and move the UN 2030 Agenda forward. Wealth of new knowledge is steadily generated by our Okayama University high-level professors and researchers, thus passing a rich legacy to the next generations is considered a primary concern. Beyond the classroom, we have a responsibility to bring our innovative ideas to a better life in a broader world, and thereby to improve society. To us, the SDGs embody core themes of sustainability and well-being.

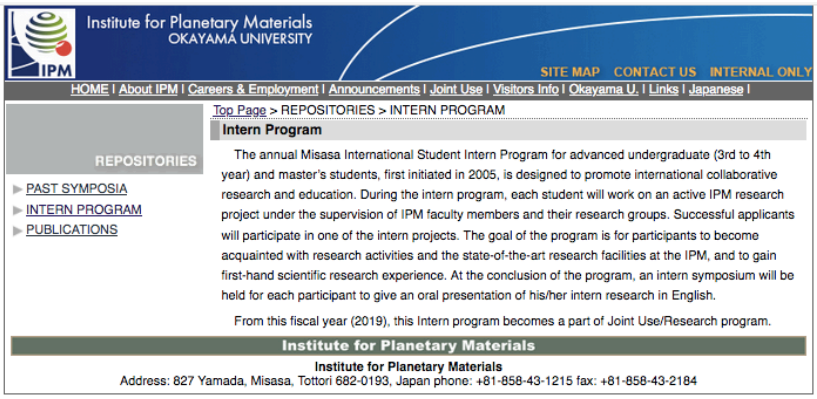
Strong sectors in:

** Medical studies. The Okayama University Hospital is ranked 23rd in Japan(2019) https://www.okayama-u.ac.jp/user/hospital/en/index.html
Specialties in:

Robotics assisted surgery
Lung transplant (the 1st in Japan)
Cryosurgery
Bio-Bank
Medical Imaging

** Physics: solid-state physics and cosmology - http://www.physics.okayama-u.ac.jp/member/member_english.html
Research Institute for Interdisciplinary Science

** Materials sciences with a focus on planetary materials (Institute) and geosciences http://www.misasa.okayama-u.ac.jp/eng/



** Biology: in particular Plants biology (Institute)
http://www.rib.okayama-u.ac.jp/

** Chemistry:
-- carbon chemistry,
-- catalysis,
-- astro-chemistry
** Engineering:
-- chemistry, bio-chemistry, bio-process engineering
-- materials science
-- computer science, cryptography, cybersecurity
-- ultra-fast electronics and spectroscopy
-- .....

The university supports staff to deliver innovative and inclusive research-intensive teaching. The aim is to optimize student learning and prepare students for their future. Okayama University aims at reframing the concept of 'research-led teaching' with a shift to the more dynamic concept of 'research-intensive learning'.

II - 2 - ARWU - Shanghai ranking 2003 (origin of ARWU) - ARWU: Academic Ranking of World Universities

(After Wikipedia) -- Academic Ranking of World Universities (ARWU), also known as Shanghai Ranking, is one of the annual publications of world university rankings. The league table was originally compiled and issued by Shanghai Jiao Tong University in 2003, making it the first global university ranking with multifarious indicators [1][2].

Since 2009, ARWU has been published and copyrighted annually by Shanghai Ranking Consultancy, an independent organization focusing on higher education. In 2011, a board of international advisory consisting of scholars and policy researchers was established to provide suggestions. The publication currently includes global league tables for institutions, and for a selection of individual subjects, alongside independent regional Greater China Ranking and Macedonian HEIs Ranking.

ARWU is regarded as one of the three most influential and widely observed university rankings, alongside QS World University Rankings and Times Higher Education World University Rankings. It is praised for the objectivity, stability and transparency of its methodology [1, 2, 3], but draws wide criticism as it fails to adjust for the size of the institution. Thus larger institutions tend to rank above smaller ones [4], [5], [6].

****

References

[1] Philip G. Altbach (11 November 2010). "The State of the Rankings". Inside Higher Ed. Retrieved 27 January 2015. "The major international rankings have appeared in recent months — the Academic Ranking of World Universities, the QS World University Rankings, and the Times Higher Education World University Rankings (THE)."
[2] Strength and weakness of varsity rankings". NST Online. 2016-09-14. Retrieved 2018-03-29.
Marszal, Andrew (2012-10-04). "University rankings: which world university rankings should we trust?". Daily Telegraph. ISSN 0307-1235. Retrieved 2018-03-29.
[3] "University rankings: which world university rankings should we trust?". Daily Telegraph. ISSN 0307-1235. Retrieved 2018-03-29.
[4] Indira Samarasekera & Carl Amrhein. "Top schools don't always get top marks". The Edmonton Journal. Archived from the original on October 3, 2010. "There are currently three major international rankings that receive widespread commentary: The Academic World Ranking of Universities, the QS World University Rankings and the Times Higher Education Rankings."
[5] ""Shanghai Academic Ranking: a French Controversy" by Marc Goetzmann, for La Jeune Politique". Lajeunepolitique.com. 29 August 2013. Archived from the original on 9 January 2015. Retrieved 9 June 2014.
[6] Bahram Bekhradnia (15 December 2016). "International university rankings: For good or ill?" (PDF). Higher Education Policy Institute. p. 16. Retrieved 10 June 2017.

"ARWU presents a further data issue. Whereas in the case of the other rankings the results are adjusted to take account of the size of institutions, hardly any such adjustment is made by ARWU. So there is a distortion in favour of large institutions. If two institutions were to merge, the very fact of merger would mean that the merged institution would do nearly twice as well as either of the individual institutions prior to merger, although nothing else had changed."
****

II - 3 - ARWU ranking of Japanese Universities from 2003 to 2020 (latest release - August-15th - 2020) - Those in the 500 best are considered

In 2013, Prime Minister Shinzo Abe declared that

""He would make 10 Japanese universities rank in the global top 100 within 10 years"".

Abe placed reform of the nation's university education system among the priorities in his economic growth strategy, and set the numerical target based on the World University Rankings (The Japan Times in January 2019)

2013 年、安倍晋三首相は

「10 年以内に日本の大学 10 校を世界のトップ 100 にランクインさせる」と宣言した。

安倍首相は経済成長戦略の重点に国の大学教育制度の改革を掲げ、世界大学ランキング（2019 年 1 月のジャパンタイムズ）に基づいて数値目標を設定

As this report is basically a fact-sheet of my activities there is no need to enter details of a full "ranking" analysis that would rapidly become a little delicate. Instead, it provides a table of data to understand the overall situation of Japanese Universities over a period of nearly 20 years.

SHANGHAI Ranking	ARWU (released each year on August-15th)													
		2003	2004	2005	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	
Nbe d'Univ-JAP (<500)		36			20	19	18	16		16	14	14			
	1	19			21	21	21	20		22	25	26			University of Tokyo
	2	30			26	26	26	32		35	32	34			Kyoto University
	3	68			101-150	77	77	72		83	90	83			Nagoya University
	4	53			85	78	85	96		101-150	151-200	151-200			Osaka University
	5	64			101-150	101-150	101-150	101-150		101-150	101-150	151-200			Tohoku University
	6	101-150			101-150	101-150	151-200	151-200		151-200	151-200	151-200			Hokkaido University
	7	101-150			151-200	151-200	201-300	201-300		201-300	201-300	301-400			Kyushu University
	8	101-150			101-150	151-200	151-200	201-300		151-200	101-150	101-150			Tokyo Institute of Technology
	9	101-150			151-200	201-300	201-300	201-300		201-300	201-300	201-300			University of Tsukuba
	10	301-350				301-400	301-400	301-400		301-400	401-500	401-500			Chiba University
	11	251-300			301-400	301-400	301-400	301-400		301-400	301-400	301-400			Keio University
	12	251-300			301-400	401-500	401-500	301-400		301-400	401-500	401-500			Okayama University
	13	201-250			201-300	201-300	301-400	401-500		401-500	401-500	401-500			Kobe University
	14	351-400			401-500	401-500		401-500		501-600	601-700	700-800			Osaka City University
	15					401-500		401-500		401-500	401-500	401-500			Tokyo University of Science
	16	301-350			301-400	401-500		401-500		401-500	501-600	600-700			Waseda University
	17	251-300			301-400	301-400	401-500			501-600	501-600	501-600			Hiroshima University
	18	351-400			401-500	401-500	401-500			701-800					Kanazawa University
	19						401-500								Nara Inst. of Science and Technology
	20	301-350			401-500		401-500			401-500	501-600				The University of Tokushima
	21	401-450			301-400	301-400	401-500			601-700					Tokyo Medical and Dental University
	22				401-500					701-800					Nagasaki University
	23	251-300			401-500					701-800					Niigata University
	24	301-350								601-700					Tokyo Metropolitan University
	25	351-400													Gunma University
	26	351-400								801-900					Juntendo University
	27	351-400								701-800					Shinshu University
	28	351-400													Yamaguchi University

Comments:

a - Global decline: the number of Japanese Universities ranked among the 500 best, declined from 36 in 2003 to 14 in 2019 and 2020. From 2003 the decline was rapid: from 36 to 20 in 2013. As of 2013 the reduction rate was much slower. The period of the regime change (around 2013) coincides with the gradual implementation of "Research Universities" (2012) followed by the "Top Global Universities" (2015) plans of the MEXT.

a - 世界的な衰退：日本の大学の数は、500 のベストランクにランクインし、2003 年の 36 から、2019 年と 2020 年の 14 に縮小しました。2003 年から、2013 年の 36 から 20 に、急速に縮小しました。2013 年から、削減率は、はるかに遅くなりました。政権交代の時期（2013 年頃）は、文部科学省の「世界のトップ大学」（2014 年）計画が後に続く「大学の研究」（2012 年）の段階的な実施と一致しています。

b - A slow but steady downward-shift of the University of Tokyo is observed.

c - Chiba, Keio, Kobe, Okayama Universities and Tokyo University of Science have been struggling for several years to remain in the top 500 best.

d - Abe san statement is far to be met ... Long and steady efforts will be necessary before his 2013 objective is achieved!!!

****

Many reports about "The global decline of Japanese universities"

See for instance the article by Takamitsu SAWA in Japan times of Jan 18, 2019 (Appendix section)
Takamitsu SAWA is a distinguished professor at Shiga University.

A drastic drop in the number of Japanese enrolled in U.S. graduate schools and a dearth of Japanese research papers written in English are two key factors in the decline of Japanese universities in global rankings. | GETTY IMAGES

****

III - Strategic approach for Okayama University - Objectives

Accounting for Okayama University capabilities and professionalisms, after a few weeks I understood that relying on **a powerful development of research** could be an excellent springboard to thrust the University as a whole to an improved global/international profile.

And to do so, I adapted and implemented a model inspired from the well-known Humboldtian model (see details in section I - 2 c). The strategy should encompass:

** Easy to implement - Limited commitment of Administration services - Small budget

** Be very innovative for a Japanese University

** Be a simple and efficient method to quickly (on a few years scale however) get significant outcomes

** Permit to put Research and Education much closer to each other. Administrative rigidities, legacies of old traditions, are keeping high and thick walls between the 2 sectors. So, significant efforts were dedicated to get inspiration from International Universities where much more integrated approaches have been underway for many years.

** Incorporate **a great deal of flexibility** in the system: for instance, programs such as SAKU (section V - 2), EU-Commission supported programs for research related matters and Research Internships (section V - 1) or I-Ma-C (section V-3) for those oriented to Master Students levels

** Train a range of Okayama University staff to become familiar with **EU concepts of Research supports** - In particular to H2020 and Erasmus programs more oriented to International students mobility, and to international best practices in terms of negotiation and/or participation in large scale international research consortiums

III - 1 - Implementing a substantial culture of International research - European support for research - Connections with EU delegation in Tokyo and EU Commission in Brussels

Although Europe is the wealthiest large scale area in the World (population close to 550 Millions), the attractiveness in Japan is still mild and presence of Europeans in Universities, participation in joint collaborative projects deserve to be greatly increased. The main stake of my mission for the development of research was actually to root a real culture of academic practices globalization.

Europe has a huge power in the field of support to research and education: the Europe Commission has been implementing for tens of years large programs, periodically renewed every 7 years. The current period ends in 2020. In 2021, the new version will be called **Horizon Europe.**

I In an attempt to anchor the international future of OKayama University in a wide, powerful and stable perspective, I took the opportunity to work with Europe. The skills and needs of the university were well suited to develop high level joint projects and thus promote the University towards International excellence.

Connections with EU delegation, CNRS, DWIH, EURAXESS-Japan, all in Tokyo and EU Commission in Brussels

****

The DWIH represents and promotes Germany as a location for science, research and innovation, supports knowledge exchange on the German and Japanese science, research, and innovation landscapes, communicates between actors of both countries and thus, creates the preconditions for research cooperation. It connects Japan and Germany bi-directionally, in an interdisciplinary fashion, and advocates exchange on future challenges. To do so, it relies on its research-based partners in Germany who facilitate and shape the work of the DWIH on site.

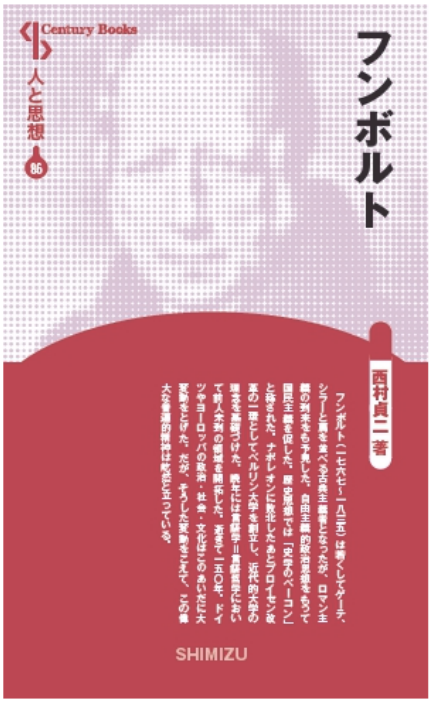
****

Keeping tight connections with major funding agencies is crucial. I had a number of meetings with *EU delegation, CNRS, DWIH, EURAXESS-Japan, all in Tokyo and EU Commission in Brussels*.

Gediminas RAMANAUSKAS, Head of the EU Delegation to Japan (Tokyo) attends the BE-ARCHAEO kick-off meeting at Okayama University - February - 2019. On his left and right side, Pr. MAKINO President and Pr. SANO VP of Education. Representatives of each BE-ARCHAEO partner were present.

Delegations from those institutions visited Okayama University quite a few times.

Those opportunities allowed us to introduce the best features of our research and new strategies to reach a recognized global status



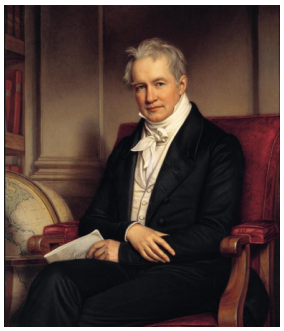
The required features of the Introduction of section III are the main pillars of the Strategy of Development I had planned to implement at Okayama University. I adapted accordingly my URA mission to the development of International Research by using the skills I could get during my career of CNRS researcher and Lab. Director as well (see my CV in Appendix A-1) ==> So my "URA" profile was more oriented to **International Research Partnership Development**

The detailed strategy relies on a simple but efficient approach inspired from the Humboldtian model. Several Universities (such as Johns Hopkins University) are fully organized along the main features of this model.

The Japanese literature also includes a few references to the Humboldt model. The big matter is whether it is understood and implemented.

** **フンボルト － e-Book**
https://elib.maruzen.co.jp/elib/html/BookDetail/Id/3000086224?2

** **フンボルトの教育理念** ––– Basic Principle / Idea of University Education
https://repository.kulib.kyoto-u.ac.jp/dspace/bitstream/2433/185476/1/dbk05000_%5B031%5D.pdf



** **Humboldt International (2001)**
Der Export des deutschen Universitätsmodells im 19. und 20. Jahrhundert

Rainer Ch Schwinges (Herausgeber) --- 503 Seiten
Schwabe Verlagsgruppe AG Schwabe Verlag ---- 978-3-7965-1735-8 (ISBN)

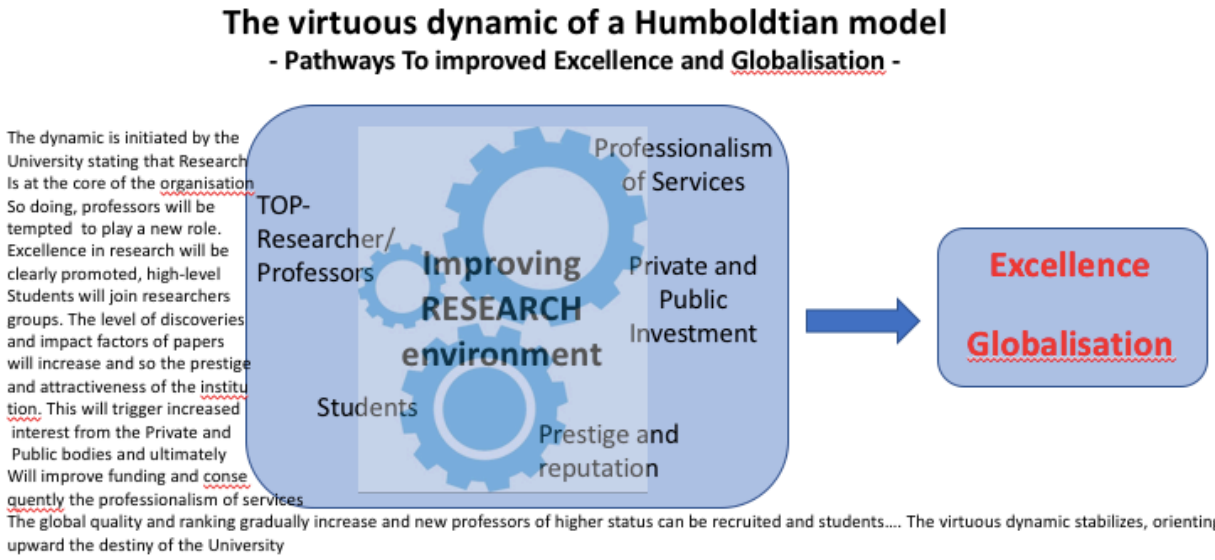
III - 2 - The Humboldtian model

(After Wikipedia) -- The Humboldtian model of higher education (German: Humboldtsches Bildungsideal, literally: Humboldtian education ideal) or just Humboldt's Ideal, is a concept of academic education that emerged in the early 19th century and whose core idea is a **holistic combination of research and studies.** Sometimes called simply the Humboldtian model, it integrates the arts and sciences with research to achieve both comprehensive general learning and cultural knowledge, and it is still followed today. This deal goes back to Wilhelm von Humboldt, who in the time of the Prussian reforms relied on a growing, educated middle class and thereby promoted the claim on general education.

Johns Hopkins University (USA) for instance is built on the Humboldtian model of higher education and is thus strongly dedicated to research. Johns Hopkins is recording the "Covid" statistics:
(https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6)

****

The Johns Hopkins University is a private research university in Baltimore, Maryland. Founded in 1876, the university was named for its first benefactor, the American entrepreneur, abolitionist, and philanthropist Johns Hopkins. His $7 million bequest (approximately $147.5 million in today's currency)—of which half financed the establishment of the Johns Hopkins Hospital—was the largest philanthropic gift in the history of the United States up to that time.[5][6] Daniel Coit Gilman, who was inaugurated as the institution's first president on February 22, 1876 led the university to revolutionize higher education in the U.S. by integrating teaching and research. Adopting the concept of a graduate school from **Germany's historic Heidelberg University**, Johns Hopkins University is considered the first research university in the United States.
****



For Okayama University (and thus for many Japanese universities), **implementing a Humboldt type strategy of development means:**

"Implementing a range of programs directly related to research (for instance large scale "Research and Innovations" programs supported by the EU commission or any other funding agency) or in connection with research: for instance MSCA-RISE, ERASMUS. Local programs like SAKU, the I-Ma-C and the Invitation program of International students are all very flexible and input a new breathing mode in the University.

All those programs, are still considered in most of Japanese university as independent because referring to different sections of Administration - this strongly mitigates the impact of each of one - are strongly interconnected in a Humboldtian approach. This is the strategy I have followed at Okayama University. This is the strategy that provided lots of outcomes featured in this report. All implemented programs (SAKU and my Missions abroad, Research Internships, EU Commission research projects, I-Ma-C ...) are all connected: they all aim at strengthening each other to give a strong and dynamic boosting to the University. All of these programs include by some ways, staff training to the best practices in top Institutions abroad, contributing to heighten the global skills and mindsets.

III - 3 - Sustainability - Timeline

Changing the profile of a University is a long-term task that requires much more than simple programs supported financially for 5 years. **The efforts should be long term** and planned over periods of 20-30 years: the best Universities did access international notoriety over 50 years, 1 century periods.

For example, Stanford University: *Since its opening in 1891, Stanford has been dedicated to finding solutions to big Challenges and to preparing students for leadership in a complex world. From Nobel Prize winners to undergraduates, all members of the Stanford community are engaged in creating new knowledge.*

Professionalism: Changing the profile of University starts by up-grading the image and reputation. It is a very long effort that requires a range of professionals in the field of research, research management, science communication, promotion. This also means professionals for recruiting the suitable staff at any position in the University.

Changing the profile of University by relying on the Research resource: to give an example of the time it took to make Okayama University able to propose and participate significantly (participating as an advisor or welcoming a student for a 1 or 2 weeks stay does not contribute of course to the situation improvement) in international large scale consortium: 2 years to build a Data Base, a resource of research skills and competences. Then another 3 years of missions abroad to promote the research quality. And then when participating an additional 2 or 3 years of submission before acceptance. And finally 6 to 8 months of administrative paperwork before a kick-off can take place. In total about 10 years just to get the project started. Then before papers related to that project can be published another 2 years are requested. **Globally, it takes ~15 years from the early intention to change profie until the papers will be published in International Journals, being noticed and cited by the targeted community. Moreover, one has add to some additional delay to observe a possible impact in the global rankings.**

So I took great care in implementing a range of sustainable programs, with no deadlines - But whereas advanced international Universities have structured full professional teams to develop project engineering, this type of organization is quite limited in most of the Japanese Universities. At Okayama University, the progress is slow and to make it faster a new momentum should be added: this point is considered in Section VII where a project to increase the University power to reach an International profile is proposed **(The POLE project)**. It is designed as sustainable and without time limit.

In 2013, shortly after he became the leader of the Cabinet, Prime Minister Abe expressed his wish that within 10 years, 10 Japanese universities would be in the top 100 of the ARWU Shanghai (Jiao Tong) ranking. In 2020, only 3 of them are in the top 100, and it is clear that the ranking of Japanese universities continues to be significantly off target

IV - Research achievements

IV - 1 Primary bricks - A data base of research topics (Okayama University)

To elaborate the full strategy, I needed to grab the elementary bricks, i.e understanding the major research strengths and formulate them in the form of a database. To get a detailed picture free of statistics bias of what was going on in terms of research, I decided to perform a long haul field work: collecting data directly from researchers themselves. This gave rise to a series of nearly 300 interviews of Scientists (45mn each). About 60 % were issued from Physics, Chemistry and Materials. 20% from Biology, 10 % from the medical sector and another 10% from Humanities and Social Sciences. All interviews (about 15 % of the Faculties) were performed in English, in "peer to peer" format and in an informal way. This was likely the origin of the success of the interviews As a result I could built a detailed portfolio of Okayama University research activities

The interviews also resulted in a collection of 130 research topics for International Students (see an example of a research Internship proposal in APPENDIX section - A-4).

This database was a precious wealthy reservoir to promote Okayama University in the International arena (**11 missions - 2 to 3 weeks - abroad, mainly in Europe from 2014 to 2019 ==> 50 Universities, most of them in the 250 world top)**

The database also gave rise to the international research Internships program that has been now running for nearly 6 years - More than 120 Master level students from Europe (and in a short future from N-America) have been welcomed in Research teams at Okayama University - (see next section for more details)

Developing high-level research Internships appears as a natural task when it comes to the research development in a University and it is right in line with Humboldtian concepts. Firmly connect research and education is still not implemented in most of Japanese Universities where Education and Research are considered as practically independent and services work along that line.

IV - 2 EU Commission oriented research projects

IV - 2 - a Generalities

From 2014 to 2020 ==> H2020 (Horizon 2020)
Beyond 2020 ---- Implementing Horizon Europe - strategic planning

The strategic planning process will focus in particular on the Global Challenges and the European Industrial Competitiveness as pillars of Horizon Europe. It will also cover the Widening Participation and the Strengthening of the European Research Area part of the program as well as relevant activities in other pillars.

Image describing the preliminary structure of Horizon Europe. 3 pillars - Excellent science, global challenges and industrial competitiveness and innovative Europe. Preliminary structure of Horizon Europe

IV - 2 - b MSCA-RISE - A great opportunity for Japanese Universities

Marie Skłodowska-Curie Actions (MSCA) are a set of major research fellowships created by the European Union/European Commission to support research in the European Research Area. These fellowships are among Europe's most competitive and prestigious research and innovation awards.

As MSCA-RISE are open programs (any type of topics can be proposed) and as the logistic requirements to participate is extremely simple (a Letter of Commitment is requested), that type of programs is specifically well adapted to the international promotion of Japanese Universities. Via professional Web sites it also provide an international window for the partnering institutions, a strong asset for Japanese Universities.

RISE projects are popular in the Japanese Academic community - Lots of proposals are made (see table below: global Japanese performance in MSCA)

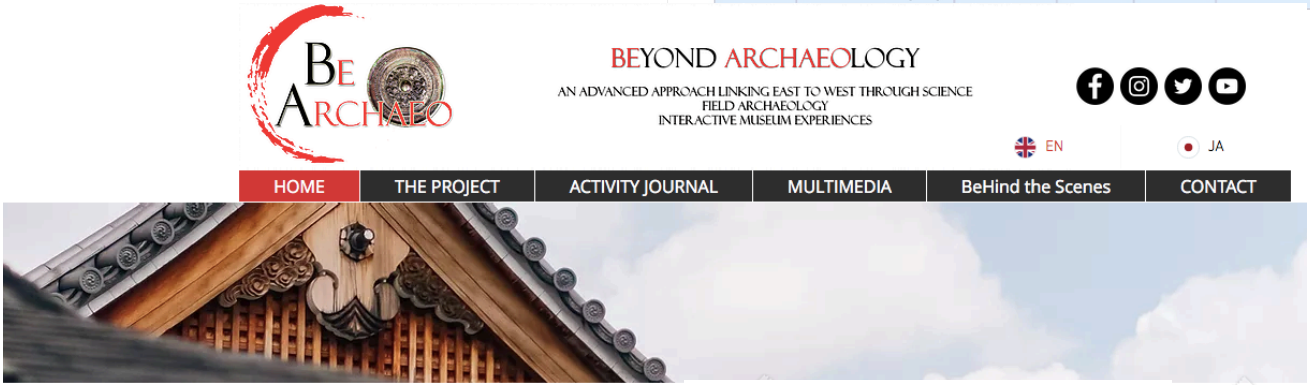
Japan's MSCA Performance in H2020

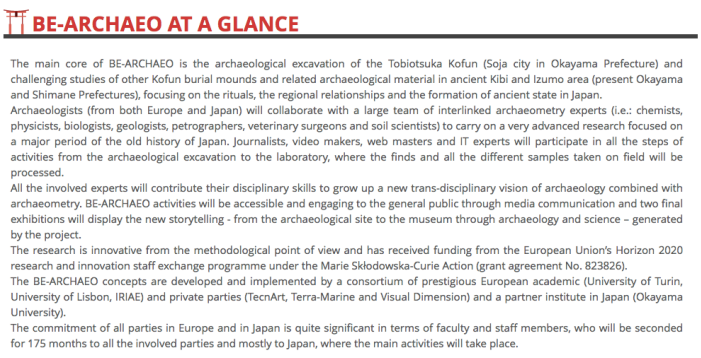
Action	Number of Participations of JP organisations*		EU contribution (in EUR million) to JP organisations	Number Of Projects	JP researchers involved	Researchers going to JP organisations
COFUND	2	(2)	N/A	2	16	0
IF	9	(9)	N/A	9	41	9
ITN	21	(20)	0.05	17	12	1
RISE	74	(74)	N/A	52	118	649
Total:	**106**	(105)**	**0.05**	**80**	**187**	**659**

IV - 2 - c RISE strategy at Okayama University

RISE projects are popular in the Japanese Academic community - Lots of proposals are made (see table below)

Motivations to participate in RISE (see previous section)





In February 2020 at Okayama University:

2 RISE are running:
BE-ARCHAEO
CMB-INFLATE 1st on Waiting list in August - 2020 -
Finally accepted for funding in January 2021

3 RISE applications
submitted at the call closing on May 2020

HEAT Rejected - Aug-2020
RENOVATE Rejected - Aug-2020 Resubmission in 2021
CMB-INFLATE 1st on Waiting list in August - 2020 -

In February 2021, **another 3 RISE proposals are in preparation** for submission in 2021

BE-ARCHAEO (bearchaeo.com): focused on **Tobiotsuka KOFUN** site the project started at Okayama University on early 2019 (kick-off, see figures) and quickly became recognized as a success story among the RISE (2014 - 2020). At the Webinar event organized on May-19th-2020 by EURAXESS-Japan, the BE-ARCHEAO teams have demonstrated the quality of the project and the outcomes, after simply few months of project ongoing.

175 months of Mobility, most of them in excavations at the Tobiotsuka site - next to Okayama city
Exhibitions in Museums: Museum of Ancient IZUMO - Shimane prefecture) and Museum of Eastern Arts in Turin
Co-Authored papers
Breakthroughs in artefacts discoveries by using high-tech methods: an unknown chamber was discovered by

IV - 2 - d Research and Innovation calls -

From European Commission President Jean-Claude JUNCKER: ***"Research and innovation*** *create investment opportunities for new and better products and services. Therefore, they increase competitiveness and employment. This is why in H2020, the investment Plan for Europe through the European Fund for Strategic Investments is investing so heavily in innovation related projects and SMEs (over 30 billion euros).*
Research and Innovation is a key component of thematic policies. It is central to the Digital Single Market, both to enable industry to benefit from digital technologies and to underpin scientific advance through the development of a European Science Cloud. It is equally self-evident that Europe's ambitions on energy and on climate change will depend, ultimately, on the development and deployment of new clean technologies."

Okayama University has now reached a level of Excellence in participating in that type of calls. Invitations to participate issued from prestigious International institutions are on the rise. The report gives a few examples of that type of projects (below).

CAREFUEL - ==> CAtalytic innovative REnewable methanol FUEL synthesis

Answering the H2020 call: Research and Innovation Actions
LC-SC3-RES-25-2020 - International cooperation with Japan for research and Innovation on advanced biofuels and alternative renewable fuels

Origin of Okayama University partnership in CAREFUEL

In December 2019, Okayama University, UCC/Tyndall and SACLA/SPRING-8 organised an International Conference at Okayama (Convention Center):

In a specific session focused on "Networking", among the Invited speakers, the Chair of MINATEC in Grenoble, Dr. JC Guibert was invited to give a talk. Later he visited the University and met Pr. Nasu, VP of research. Dr. Guibert understood the quality of research of Okayama University and its potential.

When CEA / Minatec decided to participate in the LC-SC3-RES-25-2020 call, Guibert recommended Okayama University and I was contacted.

Joint EU/JST supported program: Japanese teams do apply to JST support via a SICORP proposal. The EU and SICORP interconnected proposals will be evaluated and a final decision (Europe and JST) will be made in a conciliation meeting.
JST support to Japanese consortium: up to 50 M Yens over the full duration of the project (4 years)

Partnership:

Coordinator:	CEA Paris/Grenoble Dr. Alain BENGAOUER
Japanese partners:	Okayama University - Pr. Yuta NISHINA Nippon Shokubai Co Ltd. Waseda University NIMS - Tsukuba - Dr. Hideki ABE (coordinator of the Japanese consortium / SICORP proposal)
Other partners:	8 European partners including 2 companies, 1 Canadian partner

Dead-line of proposal submission: early September 2020
Rejected in early December 2020 - 13.5 / 20 !!!

Abstract

CAREFUEL project aims at setting an experimental proof of concept (TRL 3) of a disruptive CO2-to-methanol catalytic conversion technology. CAREFUEL is expected to obtain very high conversion efficiency (per pass yield higher than 50% and up to 95%) at low cost The target is a production cost reduction of at least 20% compared to state-of-the-art processes. For that purpose, CAREFUEL will leverage the skills of an international and multi-disciplinary consortium (8 European partners including 2 companies, 4 Japanese partners including 1 company, and 1 Canadian partner), to develop novel low-temperature catalysts, as well as innovative materials for in-situ water removal during the CO2 hydrogenation reaction, leading to multifunctional intensified reactors operating under dynamic reaction conditions.
CAREFUEL will bring two scientific and technological breakthroughs in the CO2-to-methanol catalytic conversion process:
- *novel catalysts with high activity and selectivity at low temperature (200°C);*
- *innovative water permeation membranes and water adsorbents materials for in-situ water removal.*

CRADLE - Collaborative Resilience Addressing Disasters in Lasting Emergencies
Answering the H2020 call: Research and Innovation Actions
Work Programme 2018-2020
Secure societies - Protecting freedom and security of Europe and its citizens

SU-DRS01-2018-2019-2020: Human factors, and social, societal, and organisational aspects for disaster-resilient societies

Specific Challenge: The resilience of societies heavily depends on how their citizens behave individually or collectively, and how governments and civil society organizations design and implement policies for mitigating risks, preparing for, reacting to, overcoming, and learning from disasters.

Origin of Okayama University partnership in CRADLE

As Okayama University and University of Turin (UNITO) have strengthened their connection from 2014 (several EU projects - BE-ARCHAEO -, URA missions at UNITO and visit of the UNITO dean at Okayama University in 2019) Okayama University is a UNITO privilegied partner in Japan.

CRADLE mainly originates from University of Turin

Okayama University is coordinating:
** the actions of the 2 Japanese partners (Okayama University and AMDA-MINDS) and
** the connections with the European coordinator.

Partnership:

Coordinator:	DS Tech Roma - Italy
Japanese partners:	Okayama University - Pr. Ken AOO AMDA-MINDS – Mr. Toshio SHIRAHATA

****

AMDA-MINDS (AMDA Multisectoral and Integrated Development Services) is a non-governmental organization. It originates from the Office of Project Operations and Community Services of the Association of Medical Doctors of Asia (AMDA). It was incorporated in April 2007 and succeeded all of the Japan-funded mid-/long-term humanitarian and development projects from AMDA. AMDA and AMDA-MINDS were founded in Okayama City.
****

Other European partners:	Academics from Spain, Greece and Italy including **University of Turin** Civil Society partnerships

Dead-line of proposal submission: early September 2020
Rejected in early December 2020

Abstract

Disasters and emergencies expose civilian populations to various challenges, being stressors that place victims at risk for emotional and physical health problems.

A major strategy for coping with these challenges is to increase the community's resilience capacity. Community resilience denotes a community's ability to lead itself in order to overcome changes and crises. Furthermore, information concerning disaster events are rarely considered strategically or integrated effectively across planning for community resilience.

Based on these assumptions, the Collaborative Resilience Addressing Disasters in Lasting Emergencies (CRADLE) project will create an ecosystem combining advanced tools and innovative concepts of information gatekeepers. Through this ecosystem, the production and dissemination of information will generate trust and credibility for decision-makers and citizens by providing more reliable information. It will also promote the ecosystems of information gatekeepers as information bridges. Moreover, CRADLE ecosystem will help citizens to overcome emergencies' secondary effects. This will be done by providing assistance to elderly and disabled people assistance, by mitigating social exclusion resulting from loss of a job, financial urgency, and others. Ultimately CRADLE will contribute in lessen the impact of disasters and emergencies by improving the quality of life of affected populations.

IV - 2 - e MSCA-Individual Fellowship (IF)

Generalities

Individual Fellowships (IF) are a great option if you are an experienced researcher looking to give your career a boost by working abroad. They offer exciting new learning opportunities and a chance to add some sparkle to your CV.

TYPES OF INDIVIDUAL FELLOWSHIPS

There are two types of Individual Fellowships:

a - European Fellowships

b - Global Fellowships

Both types of Fellowship can also include a secondment period of up to three or six months in another organisation in Europe.

SUFIVEC - a IF (Global) research proposal where Okayama University is the partner of the outgoing phase

Origin of Okayama University partnership in SUFIVEC

The main proposer of the project is Dr. O. Tramis who graduated from Toulouse INP in France. Dr. Tramis has been fascinated by Japan for many years. He started his first research contacts at Okayama University after getting in touch with me in early 2017. He then got a temporary position at Okayama University (Pr. Imamura's group), applied a couple of times to JSPS supports. Finally in the course of a new stay at Pr. Imamura's group, the opportunity of a MSCA-IF support appeared as good springboard for his long term career project in Japan. This project is a part of the collaboration between Okayama University and UNISTRA, more specifically the IMS institute (Institut du Medicament de Strasbourg). Okayama University is the Japanese member of the IMS International partnership.

Partnership:

Beneficiary/Coordinator:	UNISTRA / IMS - Dr. Alain WAGNER (VP of IMS - Technology Transfer)
Proposer:	Dr. Olivier TRAMIS
Japanese partner:	Okayama University - Pr. Koreyoshi IMAMURA
Secondments at:	
	Université Paris VII - Pr. Marc RABAUD
	Singapore Technical University - Pr. M. HASHIMOTO
	SYNDIVIA Company - Dr. Sacha KONIEV (Strasbourg)

Dead-line of proposal submission: early September 2020

Abstract

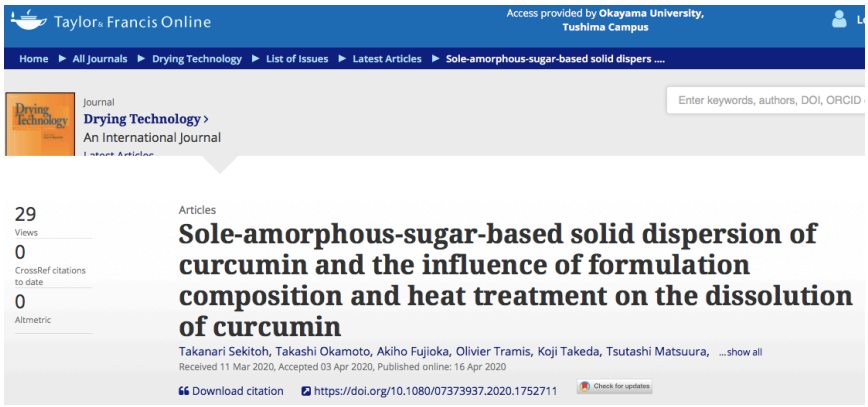
SUFIVEC is a highly multidisciplinary research (MSCA: I-F) project aiming at substantially improving the efficiency, at low cost, of future generation medical drugs. Major SUFIVEC efforts will be devoted to overcome a long-standing and major bottleneck located in the hydrophobicity of the drug, responsible of its aggregation and potency loss. To meet this objective, innovative dispersions methods will be set-up, to actually obtain a higher solubility of the active molecules (drugs, biologics or drug-biologic conjugates). Active molecules will be mixed with a soluble dispersing agent (polysaccharide) and processed in a multi-component drug delivery system shaped as a microfibre.

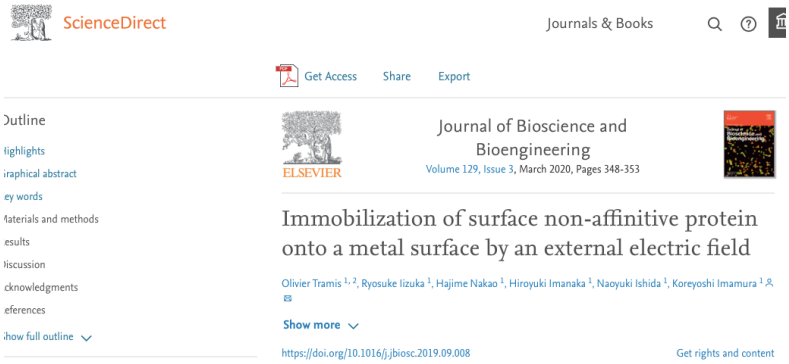
The dispersive power of the polysaccharide is expected to significantly increase SUFIVEC's drugs' solubility by at least 50%. This will help to surpass the usual yield of 25% of drug-biologics conjugation. The multi-component fibres (polysaccharide + drug-biologic conjugate) will increase the blood residence time of the conjugate by limiting the fibers in-vitro aggregation. Moreover, microfibers will serve as an innovative solid-state storage solution, the polysaccharide matrix acting as a protective agent for biologics and their conjugates.

Ultimately, to perform a proof of concept in pre-industrial conditions, tests of fibres potency will be done in the field of anti-cancer drugs in collaboration with the SYNDIVIA Company (Strasbourg area). As SYNDIVIA is focused on the development of cutting-edge molecules for cancer treatments, applications of SUFIVEC fibres will thus be investigated at the top level of innovation in drug delivery systems for cancer treatments.

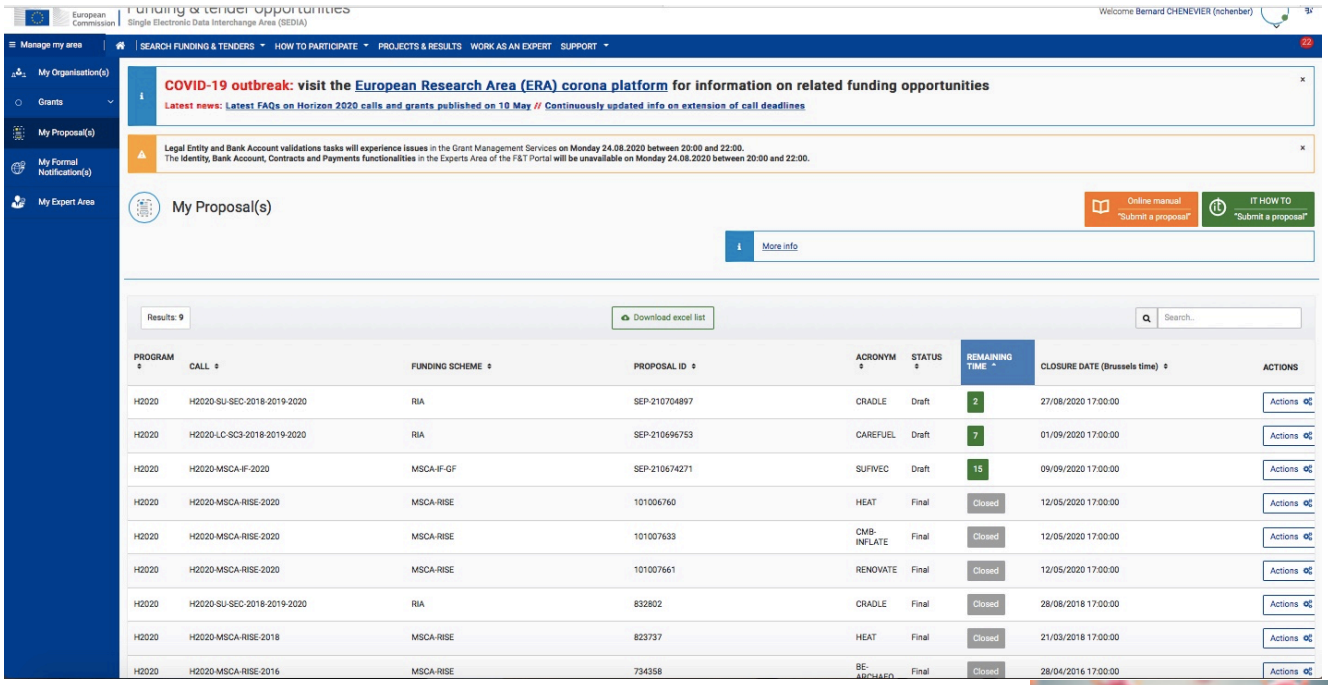
SUFIVEC's outcomes will be largely presented to a broad audience, notably through playful workshops and seminars both in France and Japan. During the outgoing phase, exhibitions will introduce SUFIVEC through a general "medicines of the future" topic, in schools, universities and public space such as museums.

Below are 2 examples of the papers co-authored by Dr. TRAMIS:

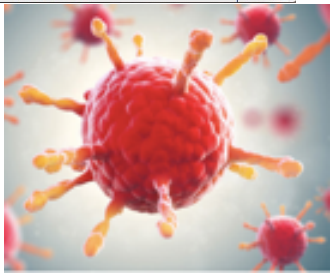




As a result of the EU proposals here is a screen capture of my EU research projects control panel (as for August-25th-2020)



IV - 3 Other large scale research projects



IV - 3 - a Human Frontier Science (HFS) projects

The Human Frontier Science Program (HFSP) is a niche program that promotes international collaboration in basic research focused on the elucidation of the sophisticated and complex mechanisms of living organisms.

History

In 1986 a feasibility study was carried out by leading Japanese scientists under the auspices of the Japanese Prime Minister's Council for Science of Technology, to explore possible means to encourage international collaboration in basic research. Discussion was expanded to include scientists from the G7 summit nations and the European Union, resulting in the "London Wise Men's Conference" in April 1987, which endorsed the suggestion. Prime Minister **Yasuhiro Nakasone** of Japan proposed the Human Frontier Science Program at the Venice Economic Summit in June 1987. The Economic Summit partners and the Chairman of the European Community welcomed the initiative and activities aimed at implementing it were started.
The implementing body, the International Human Frontier Science Program Organization (HFSPO) was established in 1989 and the secretariat was founded in Strasbourg, France. Since 1990, more than 6000 awards have been made to researcher from over 70 countries. Of these, 25 HFSP awardees have gone on to win the Nobel Prize for their scientific work.

A range of HFS proposals at Okayama University
In 2020, the preparation was greatly negatively impacted by the Corona outbreak

3 proposals

HFS-1: Leader at Okayama University: Emilio Satoshi-Hara (Associate professor - Graduate School of Medecine - Rejected in July 2020

HFS-2: Leader at Okayama University: Hisao Moriya (Associate professor - Graduate School of Natural Science and Technology)
To be submitted in january 2021

HFS-3: Leader at Okayama University: Yuta Nisina (Associate professor - Graduate School of Natural Science and Technology)
Co-Leader Kazuyo Igawa
To be submitted in january 2021

IV - 3 - b Okayama University partnership in IMS (Institut du Médicament de Strasbourg)

As a continuation of a visiting professor position performed by Pr. Sylviane MULLER from Strasbourg University at Okayama University in 2018, Okayama University was selected as the Japanese partner of the International consortium promoted by the recently founded " Institut du Médicament de Strasbourg" (IMS). Pr. MULLER will be the head of IMS for 8 years from 2020.

Bernard Chenevier is the Okayama University representative in the Institute. He is in charge of proposing Okayama University participations in new joint research programs

A IMS Kick-Off meeting (on-line) was held in January-27th 2021.

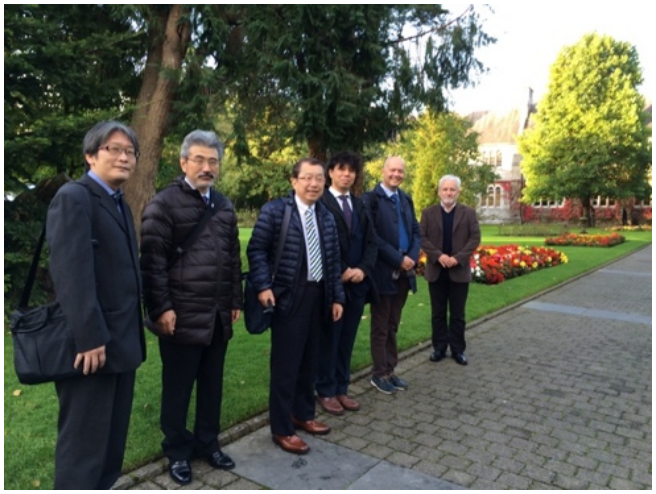
IV - 3 - c The JI-U project: Joint International Unit --- UCC/Tyndall Institute and Okayama University

JIU is organized as a "no wall" and flexible research unit.

JIU objectives are focused on developing joint collaborations in the fields of:

** e-Health, smart tools for tele-medicine
** Next generation of telecommunication 6G
** Secondary batteries for stationary renewable energy storage
** Energy harvesting for next generation autonomous Internet-of-Things
** Smart and eco-friendly agriculture

Funding: One long term objective for JI-U is to secure Japanese funding for the realization of select/focused projects.
Japanese funding (small scale funding typically 10-20,000 euro) should cover the cost of fabrication, characterization and testing of material/devices at Oka-Dai facilities.



At University College Cork and Tyndall (Institute Cork - Ireland) in October 2016

Status of the project in 2020 fall
MoU being considered by UCC - Tyndall

IV - 3 - d Okayama University partnership in a CNRS-IRP (Nishina Group): MULTIDIM
IRP stands for International Research Program - a very few are implemented in Japan

CNRS/UNISTRA - Okayama University collaboration - Starting in late 2020 or early 2021 (depending on "Corona" conditions)

The main goals of MULTIDIM are to **develop 2D materials in the biomedical field**. It has been recently proposed that nanomaterials, alone or in concert with their specific biomolecular conjugates, can be used to directly modulate the immune system, therefore offering new

tools for the enhancement of immune-based therapies against different types of diseases (mainly infectious and cancer diseases). In this context, we will design and prepare multifunctional 2D materials for the treatment of inflammatory diseases, for cancer therapy and dentistry.

Drug delivery, imaging and diagnosis benefit of a constant discovery of novel types of nanomaterials. More and more sophisticated multifunctional systems are designed and proposed to overcome some of the challenges still limiting their translation into valid clinical applications. These challenges are linked to aspects like poor accumulation into the site of the disease, to safety concerns associated to potential toxicity, or to the use of nanomaterials in the context of a personalized medicine. Many classes of organic and inorganic nanomaterials are currently under investigation in various biomedical fields. Within this variety, two-dimensional (2D) materials are promising systems and endowed of several advantages as they offer a wide surface area, the possibility to choose their chemical composition, and the versatility of the strategies for their chemical functionalization, all characteristics allowing to tune their biocompatibility, pharmacokinetics and tissue-specificity.

In addition, these materials possess intrinsic imaging and contrast characteristics that can be exploited in the emerging field of theranostics (combination of specific targeted therapies and diagnosis).

In MULTIDIM project, we want to develop a fundamental research program that brings together three fields at the forefront of chemistry, materials science, and medicine: surface chemistry, nanotechnology, and therapy. The “frontier research” concept behind our proposal is the exploitation of recent advances in chemistry and discovery of 2D materials to design multifunctional conjugates for imaging, diagnosis and therapy.

Breakthroughs:

1. Develop and characterize different types of 2D materials
2. Design multifunctional systems
3. Develop a multidisciplinary research for innovative biomedicine
4. Apply the new multifunctional systems in biomedicine (i.e. dentistry/periodontology, cancer and autoimmune/inflammatory diseases)

IV - 3 - e JST/ANR joint research program (2015 - 2019)
Nishina Group + M. Holzinger group in Grenoble - France

This project was actually initiated prior my arrival at Okayama University. I had been contacted by the URA division to help Pr. Nishina to find a partner in a joint ANR / JST call - Topics: "Enzymatic biofuel cell (EBFC) using enzymes as catalysts"

I could find a group working on that theme at Grenoble University: Dr. M. Holzinger CNRS in the lab head by Dr. Serge Cosnier (Department of Molecular Chemistry)

The proposal was finally accepted for funding and gave rise to several participations in Conferences and papers in International Journals

For instance: “MOLECULAR TECHNOLOGY”, Volume-1; Chapter 10: ""Molecular Design of Glucose Biofuel Cell Electrodes"

Molecular Technology | Wiley Online Books ---- First published:10 December 2018. Online ISBN:9783527823987

Michael Holzinger[1,*], Yuta Nishina[2,*], Alan Le Goff[1], Masato Tominaga[3], Serge Cosnier[1] and Seiya Tsujimura[4]

1 University of Grenoble Alpes – CNRS, Department of Molecular Chemistry (DCM, UMR 5250), rue de la Chimie, F 38000, Grenoble, France
2 Okayama University, Graduate School of Natural Science and Technology, Research Core for Interdisciplinary Sciences, Tsushimanaka, Kita-ku, Okayama-shi, Okayama, 700-8530, Japan
3 Saga University, Graduate School of Science and Engineering, Department of Chemistry and Applied Chemistry, Honjyo-machi, Saga-shi, Saga, 840-8502, Japan
4 University of Tsukuba, Division of Materials Science, Faculty of Pure and Applied Sciences, Tennodai, Tsukuba, Ibaraki, 305-8573, Japan

A few lines of the paper....

The first example of an enzymatic biofuel cell (EBFC) using enzymes as catalysts was proposed in 1964. This concept just slowly evolved over two decades until new achievements in enzyme wiring and new nanotechnological approaches, initially developed for biosensing, led to an impressively growing interest in biological energy production in the year 2000.

The principle of EBFCs is similar to that of classic fuel cells, which is based on a catalytic fuel-oxidizing anode and a catalytic oxidizer-reducing cathode. The difference lies in the nature of the catalysts used, which are of biological origin in the case of biofuel cells, contrary to abiotic fuel cells where principally noble-metal-based catalysts or alloys are used. Compared with conventional fuel cells, EBFCs are safe due to the enzyme reactions that can operate under mild conditions such as room temperature, atmospheric pressure, and neutral pH. Additionally, EBFCs can be used for several biologically related reductants (fuels) as electron donors such as sugars, alcohols, amines, organic acids, and hydrogen at the anode side. One promising application of glucose EBFCs is the power supply of implanted medical devices such as pacemakers, sensors, or actuators as actually glucose is the “fuel” and oxygen is the oxidizer in living organisms. There are many reviews about implantable power generators using biological and abiotic catalysts In the highly complex media of body fluids, abiotic catalysts have the disadvantage of insufficient selectivity toward glucose oxidation and oxygen reduction and its inhibition by various compounds, and these catalysts generally show low efficiency at neutral pH. In contrast.

.

V - Achievements in Research related programs

V - 1 International research Internships - Europe and N-America

In the international arena, students' engagement in research has become a central element of their global education. I thus took this opportunity to connect excellent international students with the Okayama University research teams I could select during the database building phase. As a result, I put efforts in developing a program of invitation of high-level students to come at Okayama University and spend internships in research teams **(for a minimum of 3 months).**
This is also a major component of a Humboldtian model of development for a University.

The invitation program: initiation and promotion around the world I used the database elaborated in the first months of my period at Okayama.

How it works basically:

- Flexibility
- Easy to implement
- Excellence of outcomes required

To get started. As I have widely forwarded the Internship topics of the database to a number of Universities around the world, students can select the topics that are most appealing and interesting for them. Then, they contact me (later the contact and management of the Internships will be made via a specific web site) and provide standard materials to support their application: CV, Cover Letter, Track records. Once those documents are properly formatted, I contact the selected professors and start the connection with the students. The final decision of acceptance / refusal is the responsibility of the professor. Once accepted, the administrative process of invitation starts and the student follow the administrative requirements issued from the professor. About 5 months are necessary before the admission at the University can be performed.

Outputs - Students are expected to perform basic research in close connection with their host. Participate in the group meetings, exchange with the other students of the host team. They also have to provide an activity report - before returning to their University of origin -. An oral presentation in English is also required to be given at Okayama University at the end of the internship period.

Over the 6 last years, up to 120 international students came at Okayama University. The success of this initiative has permitted to expect ~ 150 students for 2020. However, the corona pandemic has seriously disturbed these exchanges, which should resume once the pandemic issues are settled.

This internship program comes in addition to the formal Intern program of the IPM - Institute (see http://www.misasa.okayama-u.ac.jp/eng/).

The Okayama University professors who participate in this program have then a range of opportunities of new collaborations with professors of the student's foreign Universities. They can not only continue to welcome other students, but also send Japanese students who can also benefit from lab training, exposure to cultural differences and to daily English practicing.

The Okayama University professors who participate in this program have then a range of opportunities of new collaborations with professors of the origin Universities. They can welcome other students. And Japanese students can also benefit from training to cultural differences and to English practicing.

V - 2 The SAKU program (*SAKU == > flourishing*)

SAKU is a multiannual program supported by Okayama University URA (University Research Administrator) division. The aim is to provide strategic support to young talented researchers to enhance their potential and expertise domestically and globally. This program is open for those who wish to increase their international research profile by building connections with foreign researchers.

Origin and Strategy of SAKU (http://ura.okayama-u.ac.jp/english)

I initiated and implemented SAKU as a substantial section of the global "Humboldtian" method. By promoting their research abroad and taking the opportunity to Introduce the Research of Excellence at Oka-Dai, SAKU laureates consolidates the promotion I achieved during my missions abroad. This gives a huge leverage effect to promote Okayama University.

The objective of the program is to allow the laureates to promote their research to more than 2 overseas institutions during a week to 10 day tour. SAKU program supports missions expenses. Each SAKU laureate conducts a self-designed tour to strengthen and explore the possibilities of international collaboration with best international teams. A great freedom is left the applicants to describe their projects, to express themselves and demonstrate their capabilities to international research during the tours. They may include not only discussions and presentations at institutions, but also participation in scientific events, such as symposiums or seminars.

Research Fields

A) Material Science, including related research field such as modelling, solid state physics
B) Biology, including life sciences and medical fields
C) Environmental Sciences
D) Humanities and Social Sciences

In addition to the Excellence of their research, as SAKU laureates will also play the roles of Ambassadors of Okayama University, their ability in science and strategical negotiations are crucial in the selection process. They are requested to present at each visited site, a significant number of Okayama University high-lights.
Since the beginning of the SAKU program, **25 scientists issued from all fields of research were selected**. I motivated nearly each of the participating scientists to participate in SAKU and took part in the selection process. I also performed a tight follow-up of the missions to make sure that the promotion process remained on track through the whole trip and visiting details.

Up to FY2019, SAKU supported 25 promising young researchers issued from a range of disciplines.

V - 3 International Master Course - Okayama (I-Ma-C)

Implementing an Education program dedicated to high-level Master students in Science fields is a major feature of Humboldtian model based University as it allows to:

** Show the University capability of teaching up to the Research level of the I-Ma-C professors
** Promote high-level Education in mixed class (Japanese and International).
** Invite a pool of International professors to teach in the program.
** Create new opportunities of joint research project as the I-Ma-C professors are also welcomed by their host in a research environment

The "I-Ma-C" program of Okayama University provides students training and education in Physics, Chemistry, Materials Sciences, Biology and related disciplines like Precision Medical drugs and advanced high technology robotics assisted surgery or lung transplant.
In 2021 **more than 30 Professors (including professors from Sorbonne University, Savoie-Mont-Blanc and UCC/Tyndall in Ireland) will teach in the I-Ma-C.**
Sorbonne University sends every year to Okayama University 3 to 5 I-Ma-C students.

Flexibility. This is a major property of the program - Flexibility and light administrative process are keys of attractiveness

The professors are free to compose their own course syllabus
Professors are invited on Research supports by Oka-Dai hosts - In their research period (2 - 3 months minimum) they also teach in the I-Ma-C program
An example: during his I-Ma-C-2020 period, Pr. Sacks lectured and performed research:

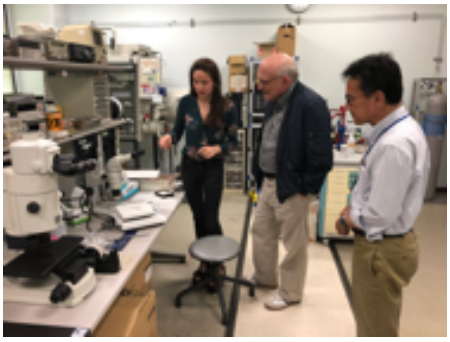
How `pairons' are revealed in the electronic specific heat of cuprates

Yves Noat, Alain Mauger, Minoru Nohara, Hiroshi Eisaki, and William Sacks, Solid State Communications, https://doi.org/10.1016/j.ssc.2020.114109

Highlights:

Compact and straightforward formulation to calculate the entropy of cuprates superconductors based on pairon excitations.
The model captures the essential features of the entropy and specific heat as seen in experiments.
The good agreement with measurements confirm the formation of pairons, bound pairs in their antiferromagnetic local environment.
Pre-formed pairs gradually existing below T explain the unconventional behavior of the entropy with respect to the normal state.*
Thermodynamic properties determined by, pair excitation following Bose-Einstein statistics and quasiparticle excitations, throughout the phase.

Students can select a series of 30 professors - Mainly issued from Okayama University - ACTS/ECTS are available
Students can combine I-Ma-C education with research Internships (section V - 1)
Sorbonne University sends every year to Okayama University 3 to 5 I-Ma-C students combining with lab. training.
Details of I-Ma-C are available at https://www.gnst.okayama-u.ac.jp/en/international/imac_okayama/



Ariane from Sorbonne University engaged for 8 months in a research internship in Pr. Nohara's group. She was also as an ERASMUS student (2019), a member of the I-Ma-C program. In the picture she is detailing her research to Pr. W. Sacks - who has been a I-Ma-C professor from 2020 (see for instance: https://chenevier-ura-okayama-univ.com/latest-news/)

V - 4 Prominent visiting scientists at Okayama University

V - 4 - a Long term visiting Scientists (recent past)

Name	1st Name	Position	Affiliation	FY	Duration	Program	Host	Graduate School	Outcome
MULLER	Sylviane	Pr	UNISTRA / CNRS	2018	3 weeks	Oka-Dai/UNISTRA mobilty	Akiyama/Kuboki	Medical	Collaborations,
SAUERWEIN	Wolfgang	Pr.	Essen Univ / DGBNCT	2019	2 months	Invitation by NTRC (BNCT - Center)	Ichikawa	Medical / NTRC	Collaborations, RENOVATE - EU proposal
WAGNER	Alain	Dr.	CNRS / UNISTRA	2020	2 weeks	Oka-Dai/UNISTRA mobilty	Imamura	Sc. and techno.	Collaborations, SUFIVEC -EU proposal
MODREANU	Mircea	Dr.	UCC / Tyndall	2019	2 months	JSPS Fellowship	Teranishi	Sc. and techno.	Collaborations, papers
SACKS	William	Pr	Sorbonne University	2020	7 months	I-Ma-C --- Research on Supercond.	Nohara	Sc. and techno.	I-Ma-C Teaching - EU proposal,....
POQUET	Anne-Lise	Pr	Sorbonne University	2019	1 months	ERASMUS --	Nishihara	Sc. and techno.	Joint Programs: Sorbonne/Oka-Dai
LOMO Agee - Celestin		Pr.	UNISTRA	2018	2 weeks	Oka-Dai/UNISTRA mobilty	Iwabuchi	Humanities/AGORA	Collaborations
TRAMIS	Olivier	Dr.	Toulouse-InP	2017 ~2020	Sev. Periods		Imamura	Sc. and techno.	Collaborations, EU-SUFIVEC writing
CAMPEON	Benoît	Dr.	Poitiers - ENSIP	2016 ~2020	> 3 years	Internship + Ph-D (3 years)	Teranishi/Nishina	Sc. and techno.	Ph-D (Nishina)
KOEBEL	Michel	Pr.	UNISTRA	2019	2 weeks	Oka-Dai/UNISTRA mobilty	Iwabuchi	Humanities/AGORA	Collaborations
European scientists			University of Turin	2019, 2020....	from 1 to	EU-project: BE-ARCHAEO	Matsumoto	Humanities	RISE - program
about 20 to 30			University of Lisboa		5 weeks				
every year			Greece, Belgium...						

Benoît CAMPEON (from ENSIP Poitiers) initiated his connections with Okayama University in FY-2016: 6 months research internship in Pr. Teranishi's group. Then as he wished to further stay in Japan, he was recruited in the group of Pr. Nishina for a 3 years Ph-D in the field of Chemistry for Materials Sciences :" Synthesis and functionalization of Carbon materials for electrical devices".

The Ph-D defense took place in late August 2020. Dr. CAMPEON will keep on working in Japan: from fall-2020, he will be on a P-Doc Position in Yokohama.

Dr. CAMPEON is the 1st French student to prepare and defend a Ph-D work (Sciences) at Okayama University

V - 4 - c URA International Seminars: a series

I initiated this series of Seminars given by prominent International speakers, taking opportunity of their visit at Okayama University for developing joint collaborations.

Up to 14th seminars were organized. 2020 and the Corona period put a break in the series. The next one is planned for the visit by Pr. Alain WAGNER "" in late March 2021

A few *URA International Seminars* leaflets of announcement can be found in the APPENDIX section

V - 5 - BRIDGE - JSPS supports

The BRIDGE Fellowship Program is provided exclusively for regular members of officially established JSPS alumni associations who have conducted research activities in Japan under the Postdoctoral Fellowships for Foreign Researchers or other JSPS programs. It gives them an opportunity to create, sustain and/or strengthen research collaborations with Japanese colleagues.
The objective is to build strong networks among researchers in Japan and other countries through a variety of activities.

Dr. Chenevier has been BRIDGE fellow in 2012 - He could visit a range of high-level academic sites:
AIMR - WPI at Sendai (Meeting with KOTANI Tomoko sensei, Head of AIMR)
MANA - WPI in Tsukuba
I-CeMS - WPI in Kyoto
As well as NIMS in Tsukuba and OIST in Okinawa

****

The World Premier International Research Center Initiative (WPI) was launched in 2007 by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) in a drive to build within Japan "globally visible" research centers that boast a very high research standard and outstanding research environment. These centers (see map on the right) are given a high degree of autonomy, allowing them to revolutionize conventional modes of research operation and administration in Japan.

JSPS is commissioned by MEXT to conduct the program's grant selection and project assessment processes and to perform support functions aimed at maximizing the WPI Program's achievements.
****

In the last 4 years, 2 Professors and Doctors applied for the JSPS BRIDGE support including host in Okayama University.

Pr. Anne-Lise POQUET (DHIMANE) -- Sorbonne University -- Paris - Host at Okayama University: Pr. Nishihara

In 2016 Professor Anne-Lise POQUET was awarded a JSPS-BRIDGE support to explore in Japan new path-ways to strengthen the relations between UPMC - prior to Sorbonne University - and Japanese Universities and Research Centers. More specifically in the field of Chemistry.

Professor DHIMANE was hosted at Okayama University by Pr. Y. NISHIHARA from the Graduate school of Natural Science and technology, from March 18th - 2017 for about 40 days. She also visited Osaka Prefecture University and other Universities.
At Okayama University Pr. DHIMANE had several meetings with chemists, physicists and biologists. One of the main outcome is a preliminary project of International Master course focused on Chemistry, Solid State and Material Physics and Biology and relying on the numerous European Master level students visiting each Research teams Okayama University to get exposure to Japanese cutting-edge research outcomes.

NB ==> this preliminary approach finally resulted in the 1st session of I-Ma-C in 2019

Dr. Mircea MODREANU -- Tyndall Institute/UCC -- Cork - Ireland - Host at Okayama University: Pr. Matsuura
Submission of the application: early January - 2021
BRIDGE proposal. Dr. MODREANU is planning to:
i) Develop new programs with Okayama University such as an International Research Center having Tyndall National Institute/ University College Cork and Okayama University as founding partners, and academic research exchange programs;

V - 6 International arena - improved projected image of Okayama University

This section is a simple ultra short fact sheet of the report

---

11 *Missions in Europe and N-America:*

30-40 visited Universities and Research Centers where I introduced Okayama University and the best of the Research -

50-60 presentations of Okayama University activities to Students and Presidency teams as well (for instance University of Torino: presentation to the Dean team in a visit of Torino University I made from October 2nd to 4th - 2018 - see a few moments of the program below -). This resulted in particular in a visit by the Dean team on May 11th - 2019.
****

Meeting with Italian Delegation, chaired by Dr. Chenevier

Database:

200 Interviews of Oka-Dai professors - conducted along CNRS yearly interviews lines - 45 mn each

130 *Research topics (mainly to be proposed to International students)*

SAKU program*: from 2015,* ***25*** *young researchers of Oka-Dai could benefit of university support for missions in N-America, Europe, Australia and Singapore*

Co-Authored papers resulting from my activities -- Rough evaluation -- 20 to 30:

** Difficult to get accurate data from a range of programs

** As publishing is a long process from Research initiation to results, data processing and finally publication (about 3 years), the number of publications is slowly increasing so far. As the number of International connections is on the rise the co-authored papers number will progressively increase in the future (and the POLE project - if actually started in 2022, will even be an additional booster)

** Rough evaluation -- 20 to 30 co-authored papers resulting from:

BE-ARCHAEO that has been running from Feb-2019, the dynamic created by the RENOVATE proposal
SAKU visits and resulting collaborations
Collaborations issued from the program of Internships and extensions such as Dr. CAMPEON Ph-D

Research collaborations from I-Ma-C participations of International professors (Nohara and Sacks)
Direct research collaborations like:
@@ JST/ANR and IRP projects (around Pr. Nishina)
@@ Tyndall Institute: Pr. Teranishi and Modreanu
@@ INRS in Quebec (Canada): Pr. El-Khakani and Teranishi

---

7 submitted EU *large scale research proposals (H2020):*

2 accepted, funded and **running as a "Success Story"** (EU commission evaluation) ==> BE-ARCHAEO **and**"Cosmology" project (CMB-INFLATE)

3 others under evaluation in September 2020:
2 in the Innovation and Research programme (rejected in Dec-2020)
1 in MSCA - Individual fellowship

3 EU large scale research proposals *under construction* ==> ***Horizon Europe****, the new EU programme (from 2021)*

Participation of Oka-Dai as the ***Japanese leader*** *in recently launched joint research* ***labs (3):***
IMS - Strasbourg
JI-U - Tyndall/UCC
IRP (CNRS and Strasbourg University)

International URA seminars ***(14)***

International Research Internship program: from 2015 ***more than 120 students*** *came to Oka-Dai for 3-6 months in research teams; a break in the Mobilities was observed in 2020/2021 as a result of the Covid pandemia.*

---

*ERASMUS grants****: 16 grants from the EU Commission***
2019
5 members of Oka-Dai sent to Sorbonne University
4 from Sorbonne University welcomed to Oka-Dai

2020 and next
4 members of Oka-Dai sent to Savoie*Mont-Blanc University (in the Grenoble Alpes University galaxy)
3 from Savoie*Mont-Blanc University welcomed to Oka-Dai

Initiated the I-Ma-C program (International Master Course) Okayama - Fully in English - 30 Japanese professors
Implementing the I-Ma-C International pool of professors
(1 in 2020, 3 in 2021, 5 in 2022)

In total, those activities permitted **to project in Europe and N-America an image of Excellence of Okayama University: global, highly professional research teams, open to International collaborations, high skills in research project management...**.

It results in many new high-level students and regularly increasing invitations by research and education world leaders to participate in large scale international research consortiums

VI - Rising collaborations

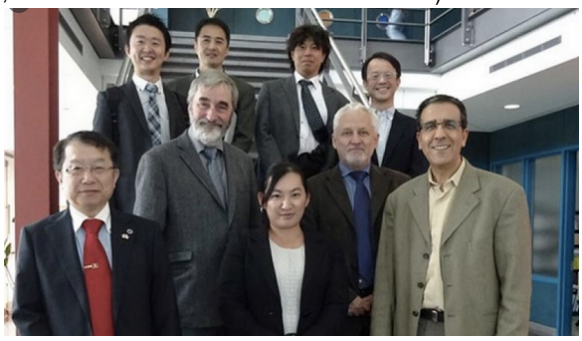
In addition to the collaborations that could experience strong development, a range of preliminary connections could be initiated. Most of the partners are located in North-America. They have great potential and I wish to mention:

INRS - Institut National de La Recherche Scientifique (INRS)– One of the University of Québec constituants.
INRS has 4 different centres located in Montréal and Québec cities (QC,Canada)
Leader: Pr. My Ali El KHAKANI - Materials Sciences – Nanomaterials

It is important to note that INRS is a graduate university which has only MSc and PhD programs. It is a university that focuses more on R&D. over the last ten years, INRS has kept its position of leader in Canada in the top 3 universities that have the highest intensity of research (number of published papers/professor and total amount of grants/professor)

This INRS-Oka-Dai collaboration has been progressing through the following steps:

- First, in early 2015, Pr. My Ali El Khakani (representing the Centre Energy, Materials and Telecommunications of INRS) and I started discussions about possible scientific collaboration and student exchanges between INRS and OU.



- In late 2015, I have led with Prof. Yamamoto a delegation of professors and URAs (10 people) from UO to INRS where we have visited both centres of INRS (Energy, Materials and Telecommunications research centre in Montreal area and Water, Soil and Environment research centre in Quebec city area). Professors from UO were also invited to give invited talks at the International PAEES Conference organized by INRS in Quebec City (October 2015).
- In early 2016, Prof. El Khakani and Prof. Y. Bégin (VP-Research and Academic Affairs of INRS) have visited OU and we signed an official 5-years MOU and an associated agreement for students' exchanges between both institutions.
- The MoU was renewed in early 2021.

- Official and lasting scientific collaborations have started since then between at least three groups from UO and their vis-à-vis at INRS. These are:
    1- Scientific Collaboration and students exchange between the groups of Prof. Kiwa (UO) and Prof. Ozaki (INRS) on THz associated science and technology.
    2- Scientific Collaboration and students exchange between the groups of Prof. El Khakani (INRS) and Prof. Teranishi (UO) on Pulsed laser ablation based synthesis of nanomaterials for photocatalysis and Li-ion batteries.
    3- Intitial contacts and beginning of scientific collaboration between the groups of Prof. Razzari (INRS) and Prof. TAKEYASU (OU) on plasmonics.

- In October-november 2018, INRS has organized an international conference in Montreal (iCAMP-2018) and invited 4-5 professors from UO to participate by giving invited talks and by discussing mutual progress on their common ongoing joint research.

- During summer 2019, I made a north-american tour where I have visited many universities in Canada and USA. I visited INRS and Pr El Khakani who introduced me to other universities in Quebec (such as École polytechnique of Montreal and Univesity Laval in Quebec City). Discussions have started to put in place an efficient students' exchange program between UO and these Canadian universities.

- In December 2019, OU organized the international Opto-X-nano conference where 3 professors from INRS (Ozaki, Sun, and El Khakani have given invited talks). It was also an occasion to discuss the progress of our collaboration between INRS and OU and to figure out its future development.

These collaborations have been already fruitful in terms of research personnel exchanges, joint publications, and joint workshops:
Exchanges:

- Over these last 4 years, different short mutual visits have been done in both directions by Dr. Chenevier, Pr. Kiwa, Pr. Teranishi, Pr. Ozaki, Pr. Razzari, Pr. Gautier, Pr. Bégin, and Pr. El Khakani.
- 1 INRS PhD student from Pr. El Khakani's group has spent 4 months in Teranishi group in 2017
- 2 students and 2 postdocs from Ozaki and Gautier group have spent xx months in Pr. Kiwa's group (check with Kiwa to give you the exact numbers and who's who)…
- 2 students from Okayama university (Kiwa's group) have also spent 6 months at INRS.

Joint published papers between INRS and UO

1- E. M.Hassan, A. Mohamed, M. C. DeRosa, W.G. Willmore, Y. Hanaoka, T. Kiwa, and T. Ozaki, "High-sensitivity detection of metastatic breast cancer cells via terahertz chemical microscopy using aptamers", Sensors and Actuators B, Vol. 287, 2019, pp. 595-601.
2- N. Delegan, T. Teranishi, and M. A. El Khakani, " High-frequency dielectric characterization of electronic defect states in co-sputtered W-doped TiO2", Journal of Applied Physics 125, 205103 (2019); https://doi.org/10.1063/1.5087061.
3- T. Teranishi, Y. Yoshikawa, A. Kishimoto, J. Leblanc-Lavoie, N. Delegan and M. A. El Khakani, "Pulsed laser deposition based nanodecoration of LCO cathode materials by BaTiO3 nanoparticles for the enhancement of the high rate and capacity retention of Li-ion batteries" in preparation, to be submitted (2020)

Visits at Oka-Dai

- Delegations of INRS at Okayama University
- 2016 - Signature of a MoU (see Apppendix A-8: program of the visit)
- 2018 - Visit by Pr. El Khakani at Okayama University - Meeting with Pr. Teranishi

Participation in Workshop/Conferences

Delegations of Okayama University including 3 speakers at:
* International Meeting on Advanced Materials and Processes for Environment, Energy and Health (PAEES-2015)
October 14 - 16 - 2015 - Quebec - Canada
* International Conference in Montreal in October 2018 (Appendix A-9)

Active collaborative research.
Topics: advanced materials for lithium ion battery

UBC - University of British Columbia - Canada
In the aftermath of a visit of UBC by Dr. Chenevier, it appeared that a good start to strengthen UBC/Okayama University connections would be to the UBC "COOP program" and Internship invitation program of Okayama University.

Preliminary attempts were done in 2019/2020 but the pandemic outbreak put a temporary stop on the efforts

Temple University - USA
Monomolecular chemistry - Eric Borguet
Nanotechnology and Nanoscale Processes at Interfaces, Plasmonics, Nonlinear Optics, Ultrafast Dynamics, Environmental Chemistry, Nanomaterials, Scanning Probe Microscopy, Sensors for Biological and Chemical Agents

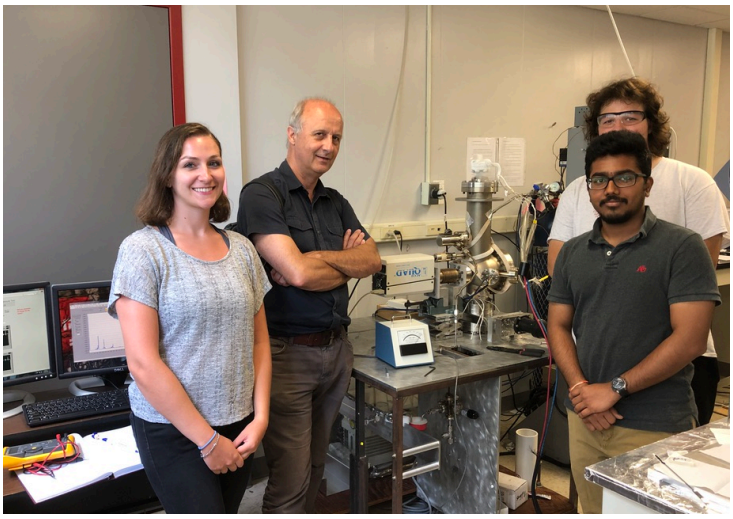
Student exchanges - I progress

Dr. Chenevier met Pr. Borguet at Temple University in a mission in North America in July 2019

Several Meetings were organized by Pr. Borguet:

Visit at Okayama University by Pr. E. Borguet -
Planned in 2020, cancelled (Covid), rescheduled in 2021

Dr. Chenevier at Temple University on July-2019



Pr. E. Borguet and his students

Toulouse ENSIACET - France
Green chemistry - Pr. Carlos Vaca-Garcia

A few students from ENSIACET came to Okayama University
ENSIACET students are preparing to come and attend I-Ma-C in 2021.

1 visit at Okayama University by Pr. C. Vaca-Garcia (
1 visit at ENSIACET - Toulouse by Dr. Uneyama and Chenevier

Saskatoon University - Saskatchewan - Canada
Connection with Pr. J. Tse
Research and Education program supported by European Commission

Research in GeoScience - Experiments at the Synchrotron Radiation facilities of Saskatoon University -
New beam lines developed by Pr. Tse

VII - SWOT analysis, conclusions, recommendations and future perspectives

This section focuses on the relevance of the Humboldtian model as a driving force of development for Okayama University and likely for a number of Universities in Japan where research activities are significant. From the outcomes of the strategy, a SWOT analysis is performed and finally global perspectives are drawn.

The section also contains suggestions to even further amplify the new boom that the University has known for 7 years.

VII-1 - Relevance of the Humboldtian model of development

There is no need to talk much about the relevance of the Humboldt Model within this university: the abundance of results in terms of new international projects where Okayama university partners with the best Universities in Japan and around the world, clearly gives the proposed strategy the strength of evidence.

As a result, the long term "virtuous dynamic" depicted in section III-2 has been triggered. The number of professors visiting Okayama University and the International students from Europe and N-America are increasingly coming at Okayama University.

The University invitations to participate in prestigious events or research projects are on the rise. It will take however another couple of years and significant strengthening of research projects development before this new status can be translated into international rankings.

But a rush to Excellence could be actually started. New hope to stop decline and recovers the early 2003 ranking has raised even accounting for the sharp and competing upwards observed in China, Korea and recently in France (in 2020, Paris Saclay is 14, Grenoble integrates the top 100, Strasbourg in 100-150 best.

Academic Ranking of World Universities 2020 — France

Country Rank	Institution	World Rank
1	Paris-Saclay University	14
2	PSL University	36
3	Sorbonne University	39
4	University of Paris	65
5	Université Grenoble Alpes	99
6-7	Aix Marseille University	101-150
6-7	University of Strasbourg	101-150
8	University of Montpellier	151-200
9-12	Claude Bernard University Lyon 1	201-300
9-12	Paul Sabatier University (Toulouse 3)	201-300

VII-2 - Networking: a major pillar in a Humboldtian approach

Networking: a major pillar for strong development- Nearly all partnerships of Okayama University in EU and other large scale consortiums were initiated from contacts and University introductions during missions abroad (multiple examples are given in the outcomes section)

How International networking gave rise to a lot of large scale research projects and proposals
The International partners started by contacting me as a result of substantial networking

Project Acronym	Status	Coordinator	Networking activity
BE-ARCHAEO	Running	Turin University	Several visits of Torino University - Introductions of Okayama activities
HEAT	Evaluation	Milano Bicocca University	1 visit of Milano Bicocca - Introduction of Oka-Dai research in a large group of M-Bicocca researchers
CRADLE	Evaluation	DST and University of Turin	Invitation related with the reknown of Oka-Dai at Torino University
CAREFUEL	Evaluation	CEA - Grenoble	Participation as a result of the Invitation of the Chairman of MINATEC - Grenoble at a Conference co-organised at Okayama
SUFIVEC	Evaluation	Strasbourg University	The main proposer from France, came 1st to Okayama Univ. as an Internship student
CNRS-MULTIDIM	Running	CNRS + Strasbourg University	Many contact between Nishina sensei and french Universities/ research Institutions
JI-U joint research lab.	Building	UCC/Tyndall and Okayama Univ	Several visits at Tyndall and UCC - Introduction of Okayama University activities
HFS	Eval/Reject	Milano Bicocca University	1 visit of Milano Bicocca - Introduction of Oka-Dai research in a large group of M-Bicocca researchers
SUPER(conductivity)	Building	Sorbonne University	Several visits and Introductions of Okayama University activities to Students and professors - 15 students of SU at Oka -Dai
			every year - 1 SU prof. teaches in the I-Ma-C program == > connections with research ==> EU project in preparation
Conf- Nano-X--2017	Done	Okayama and UCC/Tyndall	Several visits at Tyndall and UCC - Introduction of Okayama University activities
Conf- Nano-X--2019	Done	Okayama and UCC/Tyndall	Several visits at Tyndall and UCC - Introduction of Okayama University activities
Summer School - 2021	Building	Okayama and Sorbonne Univ.	Strong Connections Oka-Dai/Sorbonne (SU) - Several visits and presenttions of Okayama University -
Superconductivity			15 SU students at Oka-Dai every year
Online			

Networking via SAKU: The SAKU program is also a high-level "Networking" tool that not only strengthen the global visibility of a promising young researcher but in addition also plays a significant role in improving the image of Excellence of the University

VII-3 - SWOT analysis

SWOT analysis (or SWOT matrix) is a strategic planning technique used to help a person or organization identify strengths, weaknesses, opportunities, and threats related to business competition or project planning.

As the Humboldt model is relevant for a Japanese University, it is interesting to understand whether Humboldtian outcomes can be considered through a SWOT analysis. And to elaborate recommendations to push further strengthen the new momentum of the University

I propose here a brief analysis of the sector of Research of Okayama University, the core of a University in a Humboldtian approach. Keeping in mind that research is tightly connected with a large number of services: International Relations, Education, Science Communication

To rely on a series of analysis criteria I used a selection of those - research and research related oriented - proposed by California State University in a document published in 2004 (https://www.csustan.edu/sites/default/files/StrategicPlanning/documents/SWOT-Analysis.pdf). Administrators, faculty, and students reviewed the analysis and provided input. Background information on the organization's strengths and weakness in relation to opportunities and threats it faces can be useful in considering strategic issues.

NB: main features of the SWOT analysis are available in the detailed draft of this report (available on demand)

In the SWOT analysis I adapted some of of the criterions to Japanese context. They are evaluated as Low (L), Average (A), high (H) and Trend is either >, 0 <0

The final SWOT analysis results from an International survey (20 participants) including my personal assessment. As a very positive and promising feature, research appears as a strength. Weaknesses relies in the services where professionalism should be improved to reach international standards and actually helps the development of the Universities

VII - 4 - Proposal -- A new "POLE" to Strengthening Oka-Dai Elaboration/Participation and professionalism in large scale International research consortiums

Although the URA division has gained a lot of expertise in building prominent research proposals and implementing the projects once the evaluation process was successful, to reach the volume of proposals usually active in International Universities the Present group of professional project engineers should be considerably strengthened.

Okayama University research potential is high and can accommodate ambitious objectives. In terms of large scale (EU type) projects number, a prospective target could be around 15-20 in steady regime:

** 5-6 running

** 8 under evaluation

** 4-6 in preparatory phase

As for a research project implementation, various tasks include:

-- Initiating - This also means introducing Okayama University to International Universities - Convincing them to collaborate in joint research and send their students to Japan
-- Constructing
-- Negotiating any detail with International partners
-- Supervising the project unfolding once accepted by the Funding Agency

To reach those goals, additional momentum is required. It might be found in a program such as the "POLE: research project innovators" (Shortened in POLE) project - From April 2022

Okayama University needs to further develop its strong potential in research - The Humboldt model is specifically efficient for a Japanese University. The University also urgently needs to strengthen the connections of Research with Industry - Weak, up to now

This will result in more financial support to research.

The POLE team - limited size ==> professional, powerful and efficient

Only professionals of Research and Research Management - Their position would certainly suitably featured as:

The time line of POLE implementation:

POLE member -1 -- From 2022, up to 2027 ==> Dr. Chenevier - **From 2027, retirement** from Okayama University collaboration
POLE member -2 -- From 2022, a **second** International "Research Partnership Developer" that could take the lead of POLE from 2027.

The candidate(50-55 years old) should have participated / coordinated at least 5/6 large scale international consortiums.

** Extended international network (300-500 connections) including researchers and research management decision makers

** Strong connections with Japan at the period of recruitment.

The candidate should be able to adapt to:

** team work
**** bring his own research proposals.**
Incorporation of Japanese Industrial sector should be significant in particular in initiating joint Oka-Dai/Industry Ph-D thesis, P-Docs....
** secure the extension of POLE beyond 2027.

POLE member -3 and 4 -- From 2025, recruiting 2 Japanese fellows to become "International Partnership developer" and train them

1 high-level assistant - EU Commission systems expert, 3 languages, specialist of International relations

VII-5 - Suggestions of future international consortiums -

Japan and Europe, both have advanced and powerful research institutions. Interactive and complementary relations can be considered and proposals could be submitted to the new Horizon Europe program. I mention below a few areas where Japan and Europe teams could collaborate and find great mutual benefits by bringing together their own skills and competences.

Fields where Japan is world-leader

Energy - High magnetic field for high resolution medical imaging - power motors, high current cables - Superconductivity*:* in the aftermath of the disruptive discovery of the High Tc Superconductors of the 1980', research activities in Europe (and in the USA as well) experienced a loss of interest related with the absence of new breakthrough at higher temperature.
The situation and concepts are dramatically different in Japan where superconductivity is living a flourishing period: lots of Universities, research institutions and industrial companies are supporting substantial groups focused onto the "holly graal": superconducting materials at temperatures close to room temperature that would help Japan to release the pressure on primary energy supply (like oil for instance). And would project Japan as a world-leader in the field of energy saving and convenient use of high-magnetic fields (for high-resolution medical imaging for instance).

Europe could revive the activities by collaborating in joint research projects

Catalysis:

Due to its industrial and economic importance, the development of catalysts is one of the most studied themes in research today. Catalysis, whether heterogeneous or mineral, homogeneous (organometallic, coordination or molecular), nanoparticulate (metallic nanoparticles), or microbiological (enzymatic), plays a key role in the development of **a green and sustainable chemistry by promoting the valorisation of renewable materials** of various origins (plant or animal world), while favoring the use of clean solvents.

Catalysis is a long term field of excellence in Japan and an active field in research and industry (Nippon Shokubai for instance) - In Okayama University about 30 researchers are working on that topics. Japanese teams performed pionnering work in Photo Catalysis (see reference below).
JAPANESE JOURNAL OF APPLIED PHYSICSVol.44, No.12 (2005) pp.8269-8285

Lots to gain from both sides in a joint research program.

Making Societies more resilient to natural disasters -- Human factors, and social, societal, and organisational aspects for disaster-resilient societies

The resilience of societies heavily depends on how their citizens behave individually or collectively, and how governments and civil society organizations design and implement policies for mitigating risks, preparing for, reacting to, overcoming, and learning from disasters. The spread of new technologies and media are inducing dramatic changes in how individuals and communities behave, and they are affecting societies in unpredictable ways. Building the resilience of society and citizens requires a better understanding and implementation of these new technologies, media and tools, and their capacity to raise disaster risk awareness. One must also improve citizen understanding of risks, to build a culture of risks in society, to enable an effective response from affected populations, to improve functional organisation in most fragile and vulnerable environments, and to increase the resilience of health services, social services, education, and governance, in line with the Sendai Framework on critical infrastructure and disruption of basic services.
Prone to typhoons, floods, and earthquakes, Japan has developed unique skills in coping with natural disasters. With deep expertise in everything from physical infrastructure to rapid recovery, the country has made disaster-proofing into an exact science.

Health -- Specific Cancer treatments

Radiotherapy treatment planning, identifies the target by diagnostic procedures. These procedures image different characteristics of the tumor so that size, shape geometry will differ depending on the imaging modality chosen. Inevitably, the target volume defined based on imaging will differ. Another aspect is that the shape and geometric position of the tumor changes with breathing and movement of internal organs. Finally – and this is a very crucial aspect – the radiation oncologist has to define the volume that will be irradiated.
Specific methods like Boron neutron capture therapy (BNCT) have the potential to eradicate single tumor cells without damaging surrounding healthy cells. Successful tumor treatment can be achieved by combining a selective uptake of B-10 in tumor cells and irradiation with epithermal neutrons. For decades, the clinical use was limited by the need of reactor-based neutron sources. Recently, hospital-based accelerators have become available leading to a renewed and now growing interest from the medical community.
In Japan, BNCT treatments of patients has been steadily performed since the 1970s. A substantial body of clinical experience has been collected but reliable proof of efficacy is still missing.
In Europe, there are some strong basic science activities, but limited clinical expertise. There is specifically strong need to advance that specific method in European hospitals by connecting the extensive clinical expertise in Japan with strong basic research activities in Europe.

BNCT is extremely interdisciplinary and requires major breakthroughs in a range of disciplins

Lots to gain from both sides in a joint research program.

Health -- Robotics: soft/flexible robotics

Robots: in Japan, a major concern of the demographic debacle

As the country will lose 40% of its workforce by 2065, Japanese workers are willing to rely on artificial intelligences and robots.

From 2009 to 2012, electroactive polymers and the prospect of being able to create artificial muscle systems (including electroactive hydrogel-based), coupled with the regular improvement in the performance of 3D printers were major tools to boost the development of soft robotics. Advanced soft robots got new skills such as compression, stretching, torsion, swelling, morphing, etc. in ways that would be impossible with rigid elements of classical robotics.

In 2013, during an international conference devoted to artificial intelligence and then in an article summarizing their point of view, Rolf Pfeifer and his colleagues at the University of Zurich present soft and biomimetic robots as the next generation of "intelligent machines ".

Disadvantages

The field of soft robotics is still very emerging. It has only proven itself with a few prototypes. There are few or no spare parts or soft robots on the market, and R&D funding is still preferentially oriented towards classic robotics;
The behavior of soft materials (and flexible structures especially when they are complex) is much more difficult to model than that of hard materials, and consequently more difficult to control and operate;

Some of the soft materials that make them up are vulnerable to external attack, although in some cases the "soft" nature also helps absorb the energy of shocks or "punching" effects and protect the robot.

Assets

Deformable structures allow a soft robot to better adapt to certain circumstances or dynamic tasks, including in an uncertain environment (e.g. movement in a fluid with strong turbulence, locomotion in uneven and unknown terrain, gripping action of a shaped object , unknown weight and fragility) or during contact with a living being or an organ (in the case of a surgical or industrial robot);
Rapid progress in elastomer injection, followed by 3D printing of specific elastomers, makes it possible to mold (and today print) mixtures of elastic polymers of different elasticity, opening up new possibilities; It even seems possible in the near future to combine synthetic polymers with biopolymers, or with living cells;

Some soft and elastic materials are of **energy interest:** for example phase change materials, deformable structures (springs for example) or shape memory or integrating a compressed gas can also theoretically store and then release energy. This energy can be used for the movements and shape changes of the robot and / or be mobilized for other tasks;

Mobile fibers inspired by the tentacles of invertebrates allow fragile and very small objects to be handled without damaging them. They could be used in **microsurgery**.

SOFT. "Most robots use two fingers to grip objects by squeezing them. Our tentacles wrap around them and allow smoother handling," says Jaeyoun (Jay) Kim of the University of Iowa. This innovation described in the journal Scientific Reports perhaps inaugurates a new era, that of soft robotics where robots are no longer made of iron or steel but of flexible or gaseous materials.

Suitable for vascular surgery - The tentacles are appendages suitable for gripping and handling fragile objects.

SURGERY. The tentacles which constitute appendages adapted to the grasping and handling of fragile appendage objects are perfectly suited to microsurgery because they can reach the operating area without damaging the surrounding tissues and preserving the vascular system. They could also be used in endovascular surgery which allows certain operations to be carried out through the veins or arteries, a technique used for example for the treatment of certain aneurysms. This is microrobotics, where people want to build smaller and smaller robots.

Fields where Japan may get strong benefit from Global collaborations

Strategical raw metals: desperate search for alternatives to strategic metals

Brine ponds in the Atacama Desert (Chile). The evaporation of water makes it possible to obtain lithium, essential for the production of batteries for electric cars

The European Union intends to take the lead in the fight against global warming and wants to catch up with digital technology. But this ambitious strategy will come up against a major obstacle: the growing shortages of strategic metals and the growing dependence on third countries.

According to a report on this subject the situation has deteriorated further compared to 2017, the year of the previous study. This time the Commission has identified 30 critical raw materials, compared to 27 three years ago. Still included in this list are titanium, used in the aerospace industry, gallium and indium, which are involved in LED technologies, or borate, a key product for the manufacture of flame retardants and permanent magnets.

While Europeans want to boost the electric car and have joined forces in a European Battery Alliance, two resources will be even more crucial in the years to come: **lithium**, which is making its entry into this disturbing list, and cobalt, which was already there. Europe will need 18 times more lithium and 5 times **more cobalt** by 2030, and almost 60 times more lithium and 15 times more cobalt by 2050, the report points out. Bauxite, crucial for aluminum production, and strontium, necessary for ceramics, are also entering the list of critical resources. **As for rare earths, metals** - light and heavy - used for certain digital technologies and essential in wind and solar energy, they are still a cause for great concern. "Demand could increase tenfold by 2050," said a European official. In the background, the fear of increased dependence on third countries, which some people know are increasingly difficult to manage. The Commission therefore points out that 98% of European imports of rare earths and borate come from China and Turkey respectively. Competition between buyers risks being all the more fierce for Europeans as "China, the United States and Japan have already stepped up their efforts in the race for raw materials by securing agreements with countries rich in resources"

Japan has similar concerns in that field

Lots to gain from both sides in a joint research program.

***Elaborating/evaluating performing Public Policies**:* Japan has a lot to do in the field to reach the International standards.
Cf for instance Mrs. Y. Morita report - (ENA - 2005) - Ms. Morita's report conclusion focuses on:

" In April 2002, revisions of the law dated 29 June 2001 were implemented. They were expected to strengthen the Public Policies Evaluation in Japan.

However, the proposed reforms up to now (2005) are limited to minor changes, they can be even considered marginal. And they have no power to dramatically change the situation."

This trend seems reflecting a major concern of Japanese people: as evaluation practises are still recent, they are not suitably mastered by Administration. It would then be legitimate that no significant outcome could be obtain in a short term. Then just wait and see.

This report also shows that the evaluation outcomes are very tiny and are attributable to shortcomings inherent in the current system but also to the presence of multiple obstacles which hinder a proper development. And moving forward seems difficult because these obstacles, often of cultural origin and linked to the historical traditions of the functioning of Japanese institutions, promise to be very difficult to overcome. And the sooner will be the better. Past experience has indeed shown that the more an administrative practice becomes institutionalized in Japan, the more difficult it becomes to reform. It is therefore necessary to act as quickly as possible.

And very firmly."

When I arrived at Okayama University in 2014, those conclusions were still obviously valid. And nothing has been significantly modified since then.....

VII-6 - Administrative and technical staff - Advantages of training opportunities offered by EU-supports

In addition to Faculty members, MSCA-RISE explicitly offers opportunities to Japanese Administrative and Technical to be trained in Europe.
ERASMUS programs (in particular I-C-M ones) also offers funded opportunities to Japanese Administrative and Technical to be trained in Europe.

Administration and Technical services of Japanese universities should be strongly encouraged to take those opportunities that are excellent springboard to get trained to best international practises in terms of:

** International Affairs (promotion of the University)
** Global education in the field of research Internships and high-level education (in English) provided by pools of International Professors
** Training to EU Commission programs for research and education
** Communication in Science

VII-7 - Integrating Education and Research

This is a crucial matter and a driving force of a Humboldtian approach -
In modern Academic institutions where research activities are prominent, integrating Research and Education is actively sought.

This objective is substantially met in a range of new projects:
**** Internship program**

**** I-Ma-C (see section V - 3 for details): participation of International students and professors**

**** Project : Graduate-Student Summer E-School, Japan, August 2021**
Superconducting materials science : Fundamental properties, key experiments and future prospects
Organisers : Sacks William, Sorbonne University, Nohara Minoru, Okayama University
Advisory committee from:

AIST Tsukuba
University of Tokyo
Tokyo University of Science
Sorbonne University

Portrait of Erasmus of Rotterdam (1523)
by Hans Holbein the Younger

EU commission proposes a lot of programmes where Education and research are significantly integrated. Some of them also support non European fellows (ERASMUS - IMC for instance where IMC stands for International Credit Mobility)

VII-8 - ERASMUS

The Erasmus Programme (EuROpean Community Action Scheme for the Mobility of University Students) is a European Union (EU) student exchange programme established in 1987. Erasmus+, or Erasmus Plus, combines education, training, youth from 2014.

The idea of promoting cultural, social, and academic exchanges between European students originated in 1969, with Italian Sofia Corradi (nicknamed "Mamma Erasmus"), an educator and scientific consultant for the permanent conference of Italian University Rectors. Her role allowed her to raise awareness about this idea and make it known in the academic and institutional spheres.

The project was born after an initiative of the EGEE student association (now AEGEE) founded by Franck Biancheri (who later became president of the trans-European movement Newropeans)which in 1986–1987 convinced French president François Mitterrand to support the creation of the Erasmus programme.

Okayama University in ERASMUS

There is a range of "ERASMUS + " (from 2014) subprograms: https://www.erasmuspartnership.com/erasmus-programs-at-a-glance/

This report is not the place of an exhaustive presentation. Instead, Okayama University had in the past a few involvments in ERASMUS networks such as BEAMS and EASED (http://embeam.ccsv.okayama-u.ac.jp/en-home/)

Mobility Exchange program: More recently in the ERASMUS+ ICM (International Credit Mobility), a specific Mobility Exchange program between Okayama University and Sorbonne University was accepted for funding by the EU Commission: the mobilities - all supported by EU funding - took place in 2019.

They included:

5 from Okayama University to Sorbonne

2 Master level students:
TAKEUCHI Yuki, DAIMON Masahiro

1 Ph-D:
SOHAIL Ahmed

2 Professors:
TAKEUCHI Hideki, NOHARA Minoru

4 from Sorbonne to Okayama University

2 Professors:
POQUET (DHIMANE) Anne-Lise,
FENSTERBANK Louis

1 Administrative -
Head of the International Relations of SU

PATEL Rakhee

1 Master Student:
DUPONT Ariane - for 8 months - Ariane also took the I-Ma-C

Pr. POQUET and Ms. PATEL - April-2019 - ERASMUS -day

ERASMUS - days at Okayama University

ERASMUS programs and ERASMUS activities at Okayama Universities were promoted in 2 main events in October 2014 and April 2019 -- See Flyers of announcement in **Appendix section**

VII-9 - Flexibility and Administrative logistics: strong reforms, a prerequisite to recovery

Flexibility of the programs I implemented at Okayama University was a key word in line with one of the major themes of the Top Global University project.

Flexibility in a Japanese University could mean mitigating the Administrative control in domains where the strategical decisions are the responsibility of the scientists in charge of deciding the activities orientations

Flexibility promoted by the Top Global University project : https://tgu.mext.go.jp/en/index.html
(The Top Global University Project is a funding project that aims to enhance the international competitiveness of higher education in Japan. It provides support for world-class and innovative universities that lead the internationalization of Japanese universities.)

VII-10 - University Executive teams -

VII - 9 - a Recruiting International Personalities in Executive and decision makers teams

I have been invited to participate in the Executive teams meetings as VP of researcher (Fuku Riji ==> 副理事) in the period April 2015 to Mars 2017

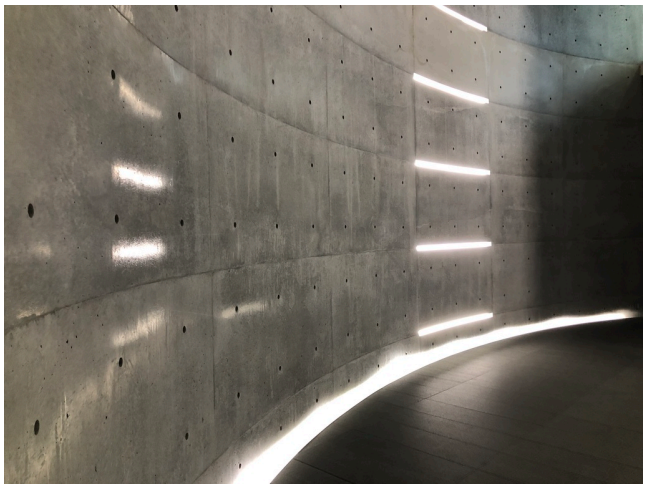
The Top Global University project is expected also to strengthen the participation of International personnalities in Executive Boards. It is clear that for the moment the impact of Top Global University on management teams is very low.

VII - 9 - b Staff management -- 2 years terms - Hindering implementation of substantial reforms policies.

Human resources management intervenes at all stages in the life of employees or Executives officers in the company or the administration, including their entry and departure.

The optimization of the organization, that is to say the scheduling of tasks and their allocation to the most available people, makes it possible to improve the efficiency of execution; by personnel administration.

As an immediate consequence, a good human resource management results, in reliable personnel administration.



Acknowledgements

The author wishes to thank the Presidents of Okayama University (Pr. K. Morita - 2012 ～ 2017 and H Makino - 2017 ～ . . .) who gave him the opportunity to 'test' the Humboldt model. The Vice-Presidents of research (Pr. S-I Yamamoto, Mr. D. Takeuchi and Pr. Y. Nasu) were major supports to implement the International strategy that is now driving many new partnerships features. The URA colleagues have been excellent advisors and the assistants were very efficient. They did their best to get training to best international practices in the field of research management, an area demanding many eclectic skills.

Without the kindness and professionalism of several hundreds of Okayama University professors/researchers, nothing would have been possible: the database of research projects that I built up and then used to implement the whole strategy, would not exist.

As major supports of large-scale research projects, International Institutions like the European Commission (Delegation in Tokyo), the CNRS, etc., are following with great interest the ongoing evolution at Okayama University.

Many privileged connections have been implemented between Okayama University and top-level Academic Institutions around the world. They are very much alive in terms of research and staff/faculty/student mobility. They are abundantly mentioned in the report. I am delighted to see how fruitful are these partnerships have become.

I wish to have here a specific mention to the European Union represented in Brussels and in Tokyo for their concern about the new orientations of Okayama University. And about its specific focus in participating in the Research and Education programs proposed and supported by the EU.

I also wish to thank all partners around the world that I have had the pleasure to work with - There are several hundreds, many of them having visited Okayama University in formal delegations.

Finally I will not forget the hundred European Students who came to Okayama University from 2014 for Research training or for Educational purposes. All of them enjoyed their 3 to 6 months, sometimes longer, stays.

Some of them decided to stay in Japan and find jobs in international companies. And/or try to found their own one in the form of venture project. For the latter, their lives took a new turn as a result of their enjoyable time at the University.

Morikazu KUMAGAI

Appendices
A-1

Dr. Bernard CHENEVIER Short Bio

(Sept-2020)

Nationality : French
Personal Address :
Okayama
Japan

Academic diploma

Master of Physics : Materials Sciences — Grenoble, 1979
D. E. A. : Sciences des Matériaux — Grenoble, 1980
Doctorat d'état de Physique - Laue-Langevin Institute, — Grenoble, defense on 21st November1990
NB -- up to 1990, the doctoral degree in France included 2 steps: a first degree (3 years) similar to the present Ph-D and a second degree leading to a confirmed researcher level (5 to 9 years long): doctorat d'Etat

Professional

** Presently (From April 2014):

Okayama University - Japan
Professor and **University Research Administrator**
Visit : http://ura.okayama-u.ac.jp/english/
https://chenevier-ura-okayama-univ.com

Main job at Okayama University:
International Research Partnership Developer
http://ura.okayama-u.ac.jp/english/
https://chenevier-ura-okayama-univ.com

** CNRS scientist from October 1981 - Member of LMGP -

Laboratoire des Matériaux et du Génie Physique (http://www.lmgp.grenoble-inp.fr/) – Grenoble – France

** Post-Doctoral stay at NRIM (National Research Institute for Metals - Ancestor of NIMS): Tsukuba - Japan -- 1990-1992

** CNRS Director of Research – From 2001

** Head of **LMGP** (http://www.lmgp.grenoble-inp.fr/) – Grenoble – France from January 2007 to 2013

** Deputy Director of **LMGP** from January 2003 to December 2006.

** Deputy director of the FMNT - Micro- and Nano- Technologies Federation – Grenoble – France, from January 2003 to 2013.

Scientific productions

Over 100 scientific papers published in international Journals

Structural Physics - Chemistry

General Keywords :

1 - Materials for nano/micro electronics : interconnection materials
2 - Materials for electrical sensing of bio-molecules or polluting gaseous molecules
3 - Structural characterization methods using X-ray beams and electron microscopy

A few papers

[01] M. Thomas, A. Farcy, C. Perrot et al. M. Gros-Jean, I. Matko, M. Proust, S. Crémer, P. Caubet, B. Chenevier and J. Torres
Impacts of Cu metallization on high density Damascene Cu/TiN/Ta2O5/TiN/CU metal-insulator-metal capacitors
Advanced Metallization Conference 2006 (AMC 2006) Pages: 177-183 - Published: 2007

[02] - M.N. Kham, I. Matko, B. Chenevier and P. Ashburn Reduced boron diffusion under interstitial injection in fluorine implanted silicon
J. Appl. Phys. 102, Issue: 11 (2007), DOI: 10.1063/1.2822465

[03] - C. Merckling, G. Delhaye, M. El-Kazzi, S. Gaillard, Y. Rozier, L. Rapenne, B.Chenevier, O. Marty, G. Grenet, M. Gendry, Y. Robach, G. Hollinger
Epitaxial growth of LaAlO3 on silicon using interface engineering
Microelectronics reliability, Vol 47, Issue: 4-5 (2007) p. 540-543 DOI: 10.1016/j.microrel.2007.01.036

[04] - A. Le Gouil, O. Joubert, G. Gunge, T. Chevolleau, I. Matko and B. Chenevier
Poly Si/TiN/HfO2 gate stack etching in high-density plasmas
J. Vac. Sci. Technol. B 25, (2007) 767

[05] - M. Thomas, A. Farcy, C. Perrot, E. Deloffre, M. Gros-Jean, D. Benoit, C. Richard,P. Caubet, S. Guillaumet, R. Pantel, M. Cordeau, J. Piquet, C. Bermond, B. Fléchet, B. Chenevier and J. Torres
Reliable 3D Damascene MIM architecture embedded into Cu interconnect for a Ta2O5 capacitor record density of 17 fF/µm^2
Symposium on VLSI Technology, Digest of technical papers, p 58-59, Kyoto, 2007

[06] - M. Thomas, A. Farcy, E. Deloffre, M. Gros-Jean, C. Perrot, D. Benoit, C. Richard, P. Caubet, S. Guillaumet, R. Pantel, B. Chenevier and J. Torres
Impact of TaN/Ta copper barrier on full PEALD TiN/Ta2O5/TiN 3D damascene MIM capacitor performance
Proc. of IEEE International Interconnect Technology Conference (IITC), p 158 - 160, San Francisco, 2007

[07] F. Fillot, S. Maîtrejean I. Matko and B. Chenevier
Experimental study of the minimum metal gate thickness required to fix the effective work function in metal-oxide-semiconductors capacitors
Applied Physics Letter, Vol. 92, 2 (2008) p. 23503.

[08] F. Fillot, S. Maîtrejean, F. Pierre and B. Chenevier
Work function tuning of TixSiyNz electrodes using partial saturation of chemisorbing surface during pulsing chemical vapor deposition
Electrochem Solid State Letter, Vol. 12, 7, (2009) H272-274.

A-2

The global decline of Japanese universities

(released in The Japan Times on Jan-18th-2019)

A drastic drop in the number of Japanese enrolled in U.S. graduate schools and a dearth of Japanese research papers written in English are two key factors in the decline of Japanese universities in global rankings.

by Takamitsu Sawa
Takamitsu Sawa is a distinguished professor at Shiga University.
- Jan 18, 2019

HIKONE, SHIGA PREF. – A glance at the World University Rankings, published last September by the Times Higher Education, reveals the following major changes in the rankings compared with the previous year.

Tsinghua University of China moved up to the 22nd position — the highest among institutions of higher education in Asia — surpassing the National University of Singapore, which was the top university in Asia for the previous five years but placed 23rd on the latest list. Ten Asian universities outside Japan — six in China (including Hong Kong), two in Singapore and two in South Korea — were among the global top 100.

As in the past, Japan had only two schools in that range: the University of Tokyo, placing 42nd; and Kyoto University, at 65th. While six Chinese, three South Korean and one Taiwanese universities were ranked between 100 and 200, no Japanese institutions were in that bracket.

The contrast is stark between the big strides made by Chinese universities and the poor performance of Japanese institutions. In 2013, Prime Minister Shinzo Abe declared that he would make 10 Japanese universities rank in the global top 100 within 10 years. Abe placed reform of the nation's university education system among the priorities in his economic growth strategy, and set the numerical target based on the World University Rankings.

Indeed, that goal appeared to be within reach at the time. In the rankings published in October 2013, five Japanese universities ranked among the world's top 200 -- the University of Tokyo placing 23rd, the highest among institutions in Asia, Kyoto University 52nd, the Tokyo Institute of Technology 125th, Osaka University 144th and Tohoku University 150th. In subsequent years, all of these institutions fell to lower rankings, leaving only two of them among the top 200 last year.

Ironically, China has scored a big success in promoting its university education reform — similar to one conceived by Abe. It now appears all but certain that 10 Chinese institutions will be among the world's top 100 schools by the early 2020s. Indeed, three of the six Chinese universities that placed between 100th and 200th last year ranked 110th or higher.

One factor behind the performance gap between Chinese universities and Japanese universities is a huge difference in the number of students from China and Japan undertaking postgraduate studies in the United States. In 2017, 79,580 Chinese were studying the sciences (including natural sciences, psychology and social sciences) at graduate schools in the U.S., far outnumbering the 990 Japanese in the same category. Of those 990 Japanese students, 410 were studying social sciences. The number of Japanese postgraduate students studying natural sciences in the U.S. is a mere 0.8 percent of their Chinese counterparts.

I doubt that the global rankings of Japanese universities will start going up in the future, for the following reasons.

First, even the University of Tokyo and Kyoto University score low in the "citations" category, which has a 30 percent weight in determining the overall ranking. Since the citation frequency of papers written by Japanese university professors, researchers and lecturers is extremely low, it is next to impossible to elevate the score in this category.

Second, the number of Japanese students enrolled at American graduate schools has drastically declined. Because the U.S. leads the world in most of the scientific and academic disciplines, receiving high evaluations in the U.S. has become a decisive factor for global evaluations.

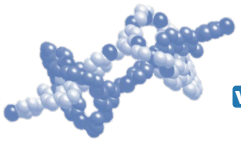
Third, authoritarianism deep-rooted in Japanese academia is damping the motivation of young researchers.

Fourth, the government's budget to support higher education and research programs is too meager.

A-6

URA International Seminars

7th URA International Research Seminar



DATE **Oct. 24, 2016**
TIME From 16:00
VENUE Faculty of Science, Room 24
（理学部本館2階 24講義室）

Title:
Technomimetic nanomachines:
Molecular wheels, vehicles, rotors and motors

Speaker:
Prof. Gwénaël RAPENNE
Professor of Chemistry,
Université Paul Sabatier (Université of Toulouse III)
and NanoScience Group,
CEMES-CNRS, Toulouse, France

CONTACT
異分野基礎科学研究
Takayoshi SUZUKI, RIIS
TEL: 086–251–7900 E

13th URA International Seminar
DATE OCTOBER 31 2018
TIME 14 : 00 - 16:30
VENUE SHIKATA -- MASCUT HALL (MUSCAT CUBE 3F) HTTPS://MUSCATSIM.WIXSITE.COM/MUSCATCUBE

LUPUS: a challenging world-wide disease

II - Autophagy processes,

a new target to treat autoinflammatoty disease

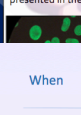
Professor Sylviane Muller, Strasbourg University and CNRS – France

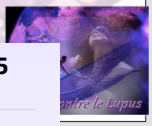
ABSTRACT

Nowadays, pharmacologic treatments of inflammatory and autoimmune diseases are largely palliative rather than curative. Most of them result in non-specific immunosuppression, which can be associated with disruption of natural and induced immunity with significant, sometimes dramatic, adverse effects. Among the novel strategies that are under development, tools that modulate the immune system to restore normal tolerance mechanisms, are central. In these approaches, peptide therapeutics constitute a class of agents that display many physicochemical advantages.

Within this class of potent drugs, the phosphopeptide P140 is very promising for treating patients with SLE, and likely also patients with other chronic inflammatory diseases. In a multicenter, randomized, placebo-controlled phase-IIb study for lupus, P140/LupuzorTM was found to be safe and met its primary efficacy end points, confirming pre-clinical data generated in MRL/lpr lupus-prone mice. Lupuzor is currently evaluated in phase-III clinical trials in the US, Europe and Mauritius.

We discovered that P140 targets autophagy, a finely orchestrated catabolic process, involved in the regulation of inflammation and in the biology of immune cells. P140 acts directly on a particular form of autophagy called chaperone-mediated autophagy, which is hyperactivated in lupus in certain subsets of lymphocytes. The "correcting" effect of P140 on autophagy results in a weaker signaling of autoreactive T cells, leading to a significant improvement of physiopathological status of treated mice. These findings open novel avenues of therapeutic intervention in other pathological conditions in which reduction of autophagy activity would be desired. New data will be presented in the context of neurological autoinflammatory diseases.





5th URA International Research Seminar

When **Monday Dec. 21, 2015**
From 10:00 (about 1 hour)

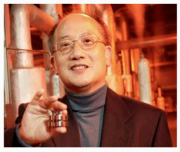
Where **Faculty of Science**
Big Conference Room
理学部棟 1階 大会議室
(Open to all faculty and students)

organized by URA

Speaker

Professor John S. Tse

Department of Physics and Engineering Physics
University of Saskatchewan, Canada



Professor's TSE research focuses on the rationalization of the fundamental principles governing the structure, stability and thermodynamics of materials and the prediction of material behaviour. The objective is to provide the guiding principles for the rational design of novel functional materials. To achieve this goal, new theoretical models have been developed and new computational techniques implemented. In many instances, synchrotron x-ray and neutron experiments are performed to complement the theoretical studies.

Professor TSE has been awarded many prestigious distinctions all along his career.
In Japan he was awarded as Foreign Visiting Scholar of MITI, at the Hokkaido National Industrial Research Institute in 1995. He has been JSPS (Japan) Senior Fellowship, in 1999 and 2006, and he is presently RIKEN Collaborative Researcher.

Abstract

Working under Stress

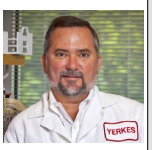
Pressure generated by external compression is a versatile thermodynamic variable to modify the electronic structure of a material. Apart from structural phase transformations, pressure can change the fundamental properties of materials. An example is the recent observation of superconductivity in hydrogen sulphide, a gaseous molecule in the normal state, with a critical temperature higher than dry ice! In this presentation, recent results on our experimental and theoretical studies on the high pressure chemistry and physics on a variety of systems [1,2,3] will be presented. Through a series of examples, I will demonstrate how the properties of simple molecular radicals can be tuned from insulating paramagnets to metals and even to Fermi liquids. Pressure can also be used to enhance the performance of thermoelectric materials increasing the efficiency of energy conversion. Finally, the synergy between advanced electronic structure calculation and experiment is illustrated [4,5].

1. D. Tian, S. Winter, A. Mailman, J. Wong, W. Yong, H. Yamaguchi, Y. Jia, J.S. Tse, S. Desgreniers, R. Secco, S. Julian, C.Q. Jin, M. Mito, Masaki, Y. Ohishi and R.T. Oakley, The Metallic State in Neutral Radical Conductors: Dimensionality, Pressure and Multiple Orbital Effects, *J. Amer. Chem. Soc.*, **137**, 14136, 2015.
2. S. Desgreniers, J.S. Tse, T. Matsuoka, Y. Ohishi, J.J. Tse, Mixing unmixables: unexpected formation of Li-Cs alloys at low pressure. *Science Advances*, **1**, e1500669, 2015.
3. J. Zhao, Z. Liu, R.A. Gordon, K. Takarabe and J.S. Tse, Pressure-induced phase transition and electrical properties of thermoelectric Al-doped Mg_2Si, *J. Appl. Phys.*, **118**, 145902, 2015.
4. Y. Li, J. Hao, H. Liu, S. Lu and J.S. Tse, High energy density and superhard nitrogen-rich B-N compounds, *Phys. Rev. Lett.*, **115**, 105502, 2015.
5. M. Wu, J.S. Tse, S. Wang, C-Z Wang, and J.Z. Jiang, Origin of Pressure-Induced Crystallization of $Ce_{75}Al_{25}$ Metallic Glass, *Nature Comm.*, **6**, 6493, 2015.0

■For further information, please contact
-Yoshihiro KUBOZONO, Grad School of Natural Science and Technology, Professor
email: kubozono@cc.okayama-u.ac.jp
or
-Bernard CHENEVIER, Senior URA
email: bernard-chenevier@cc.okayama-u.ac.jp

14th URA International Seminar
DATE MARCH 28th, 2019; TIME 17:30- 19:00
VENUE AT JUNKO FUKUTAKE HALL (J HALL) AT OKAYAMA UNIV. SHIKATA-CAMPUS
HTTP://J-HALL.MED.OKAYAMA-U.AC.JP

The Neural Mechanisms of Social Bonding:
Implications for Novel Therapies for Autism

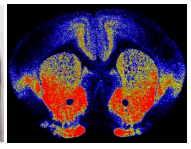


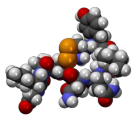
Professor Larry YOUNG,

Emory University (USA) and Tsukuba University (Japan)

ABSTRACT

Studies in monogamous prairie voles have provided considerable insights into the neural mechanisms underlying complex social behaviors, including social bonding and empathy-related behavior. This presentation will discuss the role of oxytocin and oxytocin receptors (OXTR) in enhancing the salience and reinforcing value of social information, leading to the formation of a social bond. In prairie voles, oxytocin links the neural encoding of the social signature of the partner with the rewarding aspects of mating by coordinating communication across a social salience network. Diversity in OXTR expression patterns within the brain contribute to diversity in social behaviors across and within species, providing a mechanism for the evolution of sociality. Genetic polymorphisms robustly predict natural variation in OXTR expression in the striatum, which predict pair bonding behavior and resilience to neonatal social neglect. Oxytocin acting in the anterior cingulate cortex mediates empathy-based consoling behavior toward a distressed partner. The absence of OXTR signaling in the striatum after loss of a partner results in depressive-like "grieving" behavior, which may serve to maintain social bonds. Clinical studies suggest that the role of oxytocin in regulating social cognition is conserved from rodent to man. Thus, pharmacological manipulation of the oxytocin system may represent a means of improving social function in psychiatric disorders such as autism, particularly when combined with behavioral therapies. Drugs that evoke endogenous oxytocin release may represent a next generation approach for improving social function in autism.





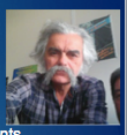
【Inquiry】
Bernard CHENEVIER
Senior URA, Okayama University
bernard-chenevier@cc.okayama-u.ac

Hideaki TAKEUCHI
Associate Professor, Graduate School of Natural Science and Technology
takeuchi@okayama-u.ac.jp
Mari MIYAJI
Assistant Professor, Graduate School of Medicine, Dentistry and Pharmaceutical Sciences
mmiyaji@md.okayama-u.ac.jp

Co-organized by
Okayama University
Graduate School of Natural Science and Technology and Graduate School of Medicine, Dentistry and Pharmaceutical Sciences
Co-sponsored by Tsukuba University

10th URA INTERNATIONAL SEMINAR
DATE: FRIDAY 5th JANUARY 2018
TIME: 14:30-16:30
VENUE: 50th Anniversary Hall CONFERENCE ROOM (2nd Floor)

Understanding the beauty of crystal structures:



The discovery of the origins of minerals and crystals shapes, and ultimately the discovery of their atomic structure, was the result of a long series of experiments and debates. Each of them contributed in improving the initial understanding of X-rays nature, then of the atomic organization within crystals and matter.

In a similar way, in the 17th century, the surprise of the "diamond which evaporates" initiated a multitude of questions and works on diamond and carbon phases. Those efforts ultimately lead to the discovery of the origin of diamond, of its atomic structure and also of its possible synthesis by researchers !

Nowadays, modern crystallography is extended to the study of very small crystals and poorly-ordered materials. It also relates crystal structure to physical-chemical-biological properties. Such developments opened up crystallography to biology, to artificial materials like nanostructures and to materials of the "real world".

All those examples underline the key role of exchanges and controversial discussions between researchers.

NB: The talk will be made accessible to a large audience including students

Co-organised by:
** GSCO program (URL.....)
** Faculty of Science - Contact Prof. Suzuki Takayoshi
** URA Division (URL of the Web site

A-7

ERASMUS days at Okayama University - Flyers

This second Edition of the ERASMUS-Day at Okayama University (1st in Oct-2014) is expected to bring together all students levels, professors, researchers and International Specialists of ERASMUS …. **Let's get together for a joint « ERASMUS future »**

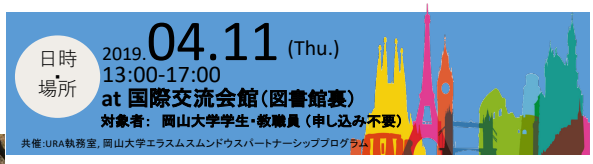
ERASMUS +

On 30 May 2018, the Commission adopted its proposal for the next Erasmus programme, with a doubling of the budget to 30 billions € for the period 2021-2027 (300 億€ = 3.8兆円).

Building on the success of Erasmus+, the next programme will provide learning and mobility opportunities to 12 million people, in comparison to 4 million people in the current programme. Its focus on **"evolution, not revolution"** means that the 'Erasmus' programme will continue to cover schools, vocational education and training, higher education and adult learning - youth and sport, but in a more streamlined manner. The next ERASMUS programme will be substantially strengthened, extended and more inclusive. It will further promote activities which foster knowledge and awareness of the EU, opportunities in forward-looking knowledge fields e.g. climate change, robotics etc. and better outreach and inclusion of people with fewer opportunities. The international dimension of the programme will also be boosted.

Via ERASMUS+ Investing in people, their skills, their knowledge and mutual understanding will help respond to:

Global Challenges, Maintain Social Fairness, Preserve Peace.



Pr. A-L Poquet and Dr. B. Chenevier at Okayama University in May-2017

Research Students mobilities and ERASMUS

Okayama University **ERASMUS** -- Day-- 2nd

PROGRAMME

Co-Chaired by Dr. B. CHENEVIER – URA - and Pr. J. YAMAKAWA – Okayama University

13:30 -- **Opening** - B. CHENEVIER – Senior URA at Okayama University

- 13:35 - 13:50 Richard KELNER Academic Cooperation Officer Delegation of the EU to Japan
  "ERASMUS+ : opportunities for Japanese students and universities" - 15mn
- 13:50 - 14:05 Eva HANADA Associate Professor Kobe University – Inst. for Promoting International Partnerships
  "ERASMUS strategies at Kobe University" - 15mn
- 14:05 - 14:25 Takayoshi SUZUKI Professor Okayama University – *Head of the ERASMUS Committee – GSNST Branch*
  Bernard CHENEVIER Senior URA Okayama University
  "The ERASMUS process at Okayama University" and the "I-Ma-C " program - 20mn
- 14:25 – 14:40 Ahmad SOHAIL Ph-D student Okayama University - ERASMUS Fellow
  "Preparation of my ERASMUS period at Sorbonne University" - 15mn
- 14:40 - 14:55 Ariane DUPONT MASTER Student Sorbonne University – ERASMUS Fellow. --- *I-Ma-C student*
  "My ERASMUS at Okayama University" - 15mn

14:55 – 15:20
Coffee Break

- 15:20 – 15:40 Anne-Lise POQUET Professor Sorbonne University - ERASMUS fellow
  Rakhee PATEL Head of International Projects Sorbonne University - ERASMUS fellow
  "ERASMUS strategies at Sorbonne University" - 20mn
- 15:40 - 15:45 Takuya ASADA MASTER Student Okayama University - ERASMUS fellow
  »As an ERASMUS MASTER students at Sorbonne" - 5mn - Recorded Video Message
- 15:45 - 16:00 Minoru NOHARA Professor Okayama University - ERASMUS fellow
  "My ERASMUS period at Sorbonne: expectations and preparation" - 15mn
- 16:00 - 16:15 Hideaki TAKEUCHI Professor Okayama University - ERASMUS Fellow
  "March-2019 - ERASMUS experience at Sorbonne University and Roscoff Marine Station" - 15mn
- 16:15 - 16:20 Closing
- Break
- 16:30 - 17:30
  "Corner" discussion
  Richard, Takayoshi, Bernard will provide further ERASMUS infos in face to face discussions

A-9

October 31st – November 2nd , 2018
Montreal, QC, Canada

iCAMP2018

The 2nd International Conference on Advanced Materials and Processes for Environment, Energy and Health

Call for contributions

Conference Themes :

- Advanced materials for catalysis, biocatalysis, photocatalysis, photovoltaics, and photosensing
- Advanced processes for the treatment and decontamination of water, air and soil (VOCs, POPs, potable water, wastewater, soil rehabilitation, physical and chemical processing for polluted environment, ...)
- Sustainable energy production and transformation (solar energy, biomass, hydrogen, ...)
- Advanced processes and approaches in Health and environmental sciences
- Industrial applications and prospects of development of these advanced processes

For more information, please visit the conference website :

http://www.icamp.inrs.ca

IMPORTANT DATES

- Deadline for Abstract submission: **July 3rd, 2018**
- Abstract acceptance notification to authors: **July 10th, 2018**
- Deadline for Early-bird registration: **July 31st, 2018**
- Deadline for registration: **October 17th, 2018**
- Deadline for hotel room reservation with a reduced conference rate **September 30th, 2018**

- **Email:** info@icamp2018.inrs.ca

VENUE

Holiday Inn MONTRÉAL CENTRE-VILLE

Holiday Inn-Montreal-Downtown

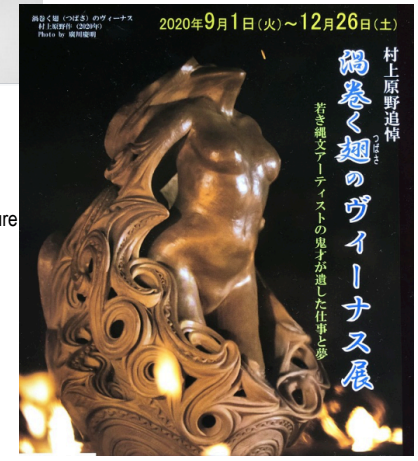
The iCAMP-2018 Conference is organized by the Institut National de la Recherche Scientifique

INRS
www.inrs.ca

"Clin d'Oeil"

Denchu - "Archery" --Tokyo and Ibara (Okayama prefecture)

Bizen pottery --
Sake bottle



I-Furai - Jomon
Okayama prefecture

Ando Tadao - Takahashi // Naoshima

MATSUDA Toshio - Okayama

San-Cho-Mon - Setouchi - from 2019

Japanese cut

ANDO Tadao at Takahashi (Okayama prefecture)

Old (30 years) bonsai