

AC21 Newsletter

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8th AC21 International Forum 2016 to Be Held at Chemnitz

Mastering Global Challenges through International, Trans-disciplinary, and Cross-sector Networks of Innovation

Upcoming AC21 International Forum 2016 at Technische Universität Chemnitz will deal with different aspects of the overarching theme "Networks of innovation for the transformation of society through science"

Eberhard Alles
Chancellor, Technische Universität Chemnitz

In the globalized world of today, it has become impossible for individual institutions and even countries to deal independently with current societal, economic or natural challenges as they are not limited by geographical, disciplinary or sectoral boundaries anymore. For this reason, promising and future-oriented solutions to these challenges can only be developed through the creation of a novel kind of international, trans-disciplinary and cross-sectoral networks of innovation comprising scientific, commercial, political, and societal partners from different countries bringing in their strengths and joining forces so to master these challenges and to make the world a place worth living also for future generations to come.

Within the overarching theme "Networks of innovation for the transformation of society through science", more than 150 delegates



from AC21 member universities and beyond are expected to meet at Technische Universität Chemnitz for the 8th AC21 International Forum from April 30 to May 3, 2016 in order to discuss different aspects of this theme in keynotes, panels, and workshops. Moreover, they will present and exchange "Best Practices" on how to mobilize

and assemble partners from different countries, disciplines, and sectors providing opportunities to learn from each other and to initiate follow-up projects within the AC21 network.

Besides the plenaries and workshops, the conference program also features meetings of the AC21 Steering Committee on April 30, 2016 and the AC21 General Assembly on May 3, 2016 where strategic decisions for the further development of the network will be made. Furthermore, the participants can engage in an attractive accompanying program consisting of, for example, a guided sightseeing tour through Chemnitz, excursions to industrial partners of Technische Universität Chemnitz as well as visits to cultural and tourist attractions in the city and its surrounding region. As the 8th AC21 International Forum will too be embedded in the celebrations of the 180-year jubilee of Technische Universität Chemnitz, another highlight for the delegates to attend will be the Spring Gala on April 30, 2016.

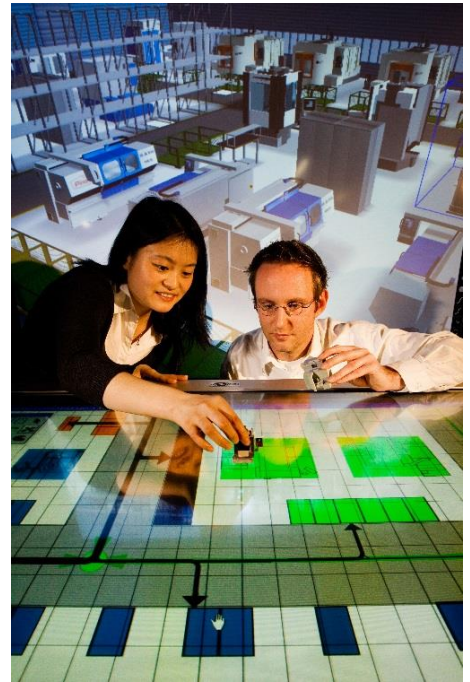


Technische Universität Chemnitz is very much looking forward to welcoming its guests for the 8th AC21 International Forum 2016. All details can be found on the website created for the event, which can be accessed from:

<https://www.tu-chemnitz.de/ac21>

In order to facilitate communication with the organizers in case of queries or need for support, Technische Universität Chemnitz has installed a dedicated email-address (**[if2016@tu-chemnitz](mailto:if2016@tu-chemnitz.de)**) in order to assure a one-stop-service for all participants of the forum.

So let the 8th AC21 International Forum 2016 begin and let us make it a productive and effective as well as unforgettable event for everyone. Welcome to Technische Universität Chemnitz!



AC21 Special Project Fund (SPF) 2015: Reports from Awardees

Workshop: Antimicrobial Peptides in Biomaterials

Burkhard Bechinger

Department of Chemistry, University of Strasbourg



The aim of the AC21 Special Project Fund was to bring together scientists and students from Stellenbosch University, University of Minnesota, University of Freiburg and University of Strasbourg (representative), with the goal to establish collaborations that will allow us to create materials resistant to infections by incorporation of antimicrobial peptides.

In view of a worldwide re-emergence of infectious diseases and a rapid increase in pathogens that are multi-resistant to commercially available antibiotics new strategies to fight such infections have to be developed. Novel agents with completely novel mechanisms of action are desirable where natural compounds such as antimicrobial peptides are effector molecules of innate immunity and provide a first line of defence against a multitude of pathogenic microorganisms. Therefore, naturally occurring antimicrobial peptides have been studied to develop new concepts for novel pharmaceutical compounds with during the ongoing visit of the overseas partners. At the workshop 15 talks were

increased efficiency and these have also been used to biofunctionalize the surfaces of medical devices, implants and other biomaterials. In lipid membranes, antimicrobial peptides form nanopores and channels, or they disrupt the membrane assembly in a different manner.

The goal of the AC21 Special Project Fund

was to establish collaborations that would bring together the fields of peptide and material sciences. The center of events was a full-day workshop on October 22, 2015 with about 60 participants. The good response reflects the need of such a meeting and allowed us to arrange for additional exchange visits between laboratories already presented including



from PhD students, junior and established scientists which allowed to get a comprehensive view on the ongoing research activities at different departments of the four AC21 member institutions. Whereas a number of talks were dedicated to I. The Innate Immune System and New Antimicrobial Peptides, a second series of lectures was about II. Novel Biomaterials, which was concluded by III. Techniques to Investigate Biomaterials and Antimicrobial Peptides.

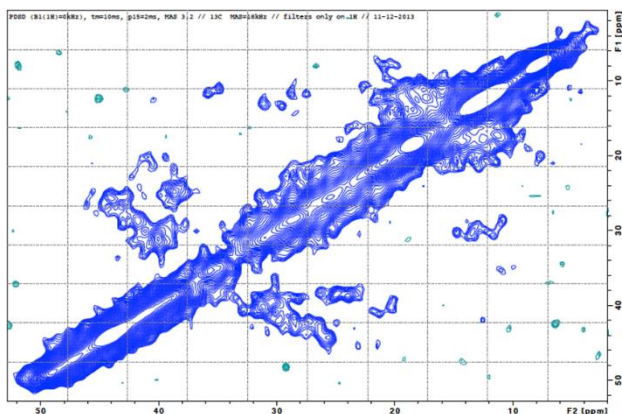
For the first time the data, expertise and instrumental capacities of the participating research teams were presented in a comprehensive manner and links between different teams and research subjects were established. By allowing this global view

on so far unconnected research topics the scientific program turned out highly interesting. The newly established contacts lead to a great number of planned collaborations that promise to extend well beyond this initial stimulus.

It should be emphasized that AC21 Special Project Fund has allowed us to go well beyond this one-day event. The days before and after the workshop were used to investigate a great number of tyrocidine antimicrobial peptides from Stellenbosch at the analytics and NMR centers of the University of Strasbourg as well as at the University of Freiburg. In a related manner, were investigations of the GL13K antimicrobial peptides initially designed in Minnesota conducted in Strasbourg.

In conclusion the meetings funded by the AC21 Special Project Fund much exceeded our best expectations. Having members of the four institutions meet for several days, even weeks, not only allowed exchange of interesting data as would be the goal of the workshop but went well beyond by creating innovative ideas, establishing new collaborations in the much unexplored field of Antimicrobial Peptides in Biomaterials and starting first experiments!

*This report was prepared by Professor Burkhard Bechinger, Strasbourg on November 3, 2015 with feedback from the co-organizers.



AC21 Special Project Fund: Frontiers in Plant Phenomics Workshop

Michael Keller

School of Agriculture, Food & Wine, The University of Adelaide

Rebecca Boston

North Carolina Agricultural Research Service, North Carolina State University

J. José Cisneros

College of Agriculture and Life Sciences, North Carolina State University

North Carolina State University hosted the Frontiers in Plant Phenomics Workshop on 1st-3rd June 2015. It brought together scientists from North Carolina State University, the University of Adelaide, Shanghai Jiao Tong University and the University of Nottingham, as well as selected specialists from collaborating agencies and businesses. This workshop was made possible by a grant from the AC21 Special Project Fund. It offered a special opportunity to examine the current state of plant phenomics research and to conceptually shape the future of this inter-disciplinary field that combines plant biology, various measurement technologies and advanced computational methods.

Over three days, the participants considered the current state of plant phenomics by

visiting facilities, exchanging ideas about current research activities, and discussing current challenges. On the first day, participants visited facilities in the Research Triangle Park at the North Carolina Biotechnology Center, Monsanto's automated greenhouse and phenotyping facility, and the greenhouse for research and development at Bayer Crop Science. They also visited the N. C. State Phytotron on the second day. These visits set the scene by highlighting the current capabilities of plant phenotyping and plant growth facilities, and the scientific and commercial applications of phenotyping. On the second day, participants presented overviews of their research and highlighted the future directions that are needed to advance plant phenotyping from the microscope scale of the cell to the macroscopic scale of the whole plant and the broad scale of the field.

This was followed by small and whole group discussions of the frontiers of plant phenomics that concluded at the end of the third day.

The workshop had several important outcomes. Participants agreed to write a joint paper on plant phenomics that focuses on standards and an integrated plant phenomics framework. Participants also agreed to develop a joint research project. It will quantify the phenome of a model plant species under the influence of various biotic and abiotic factors, and ultimately show how this standardised approach can be used to determine key factors that influence plant yield. Finally, research collaborations among the participants were initiated in plant biology, instrumentation and analytics.



Multifunctional Molecules in the International Focus

Dietrich R. T. Zahn
 Technische Universität Chemnitz

Nature teaches us a variety of application opportunities for porphyrin molecules within photosynthesis or human metabolism. The aesthetics of this molecular class relies on the flexibility of the synthesis of different porphyrin derivatives. The ligands as well as the central metal ions may be varied; thus, one may vary the characteristics of molecules in a targeted manner according to the envisaged application. These fascinating characteristics apply also for another related molecular class – the phthalocyanines – and are of interest for scientists all over the world since decades.

From 22 to 23 October 2015, the workshop "[Future perspectives on applications of porphyrin and phthalocyanine derivatives](https://www.tu-chemnitz.de/physik/HLPH/AC21/index.html)" (<https://www.tu-chemnitz.de/physik/HLPH/AC21/index.html>) took place at the Technische Universität Chemnitz (TUC). The goal of this event was to provide an overview on the current research and on innovative prospective application opportunities of porphyrin and phthalocyanine molecules, explains the organizer of the workshop, Prof. Dr.

Dietrich Zahn, the Head of Semiconductor Physics at TUC. Fascinated by this idea were three other groups of researchers from member universities of the international network "Academic Consortium for the 21st Century" (AC21): North Carolina State University (USA), Chulalongkorn University (Thailand) and University of Strasbourg (France) which contributed to the successful application for funding the workshop within the "Special Project Fund" of AC21. Also other invited scientists from universities and other research institutions beyond the network (Imperial College London, Johannes Kepler University of Linz, University of Tübingen, TU Bergakademie Freiberg, Leibniz Institute for Solid State and Materials Research Dresden, as well as Klinikum Chemnitz) were highly interested in this topical and at the same time future-oriented research field.

The workshop participants were particularly delighted by the presence of a pioneer in the field of porphyrin and phthalocyanine research: in his opening talk, Prof. Dr. Michael Hanack (University of Tübingen) provided an insight regarding the greatest

achievements in phthalocyanine research related to electronic applications but also to exceptional non-linear optical characteristics for optical and optoelectronic applications. Further future-oriented application areas of phthalocyanine and porphyrin molecules were presented by other invited speakers and within a poster session. For instance, the importance of porphyrins for natural photosynthesis and actual endeavors to synthesize novel porphyrin-based molecules for artificial photosynthesis for the production of solar combustibles were mentioned. Furthermore, opportunities to vary molecules of that kind in a targeted manner in order to use them as active media for the decomposition of carbon dioxide, for spintronic components, or even in quantum computers were discussed.

The vivid discussions during the lectures, the poster session, and the conference dinner proved that young but also experienced scientists from different subject areas who normally do not meet each other in scientific conferences, enjoyed the trans-disciplinarity of the workshop.





Gadjah Mada Welcomes AC21 International Graduate School (IGS) 2017

Community and Indigenous-based Technology for Sustainable Development towards Resilience Society

Dwikorita Karnawati
Rector
Gadjah Mada University

Greetings from Yogyakarta!

The city of Yogyakarta is where Gadjah Mada University (Universitas Gadjah Mada or UGM in Indonesian) is located and where the AC21 International Graduate School 2017 will be held. UGM is well known in its commitment to actively deliver the product of education, research and community service to drive social, economic, and environmental development of Indonesia. These deliverables can happen, given UGM is the oldest and largest university in our country. Located in Yogyakarta, Indonesia, the 360 acre university comprises of 18 faculties and 2 schools, 68 undergraduate study programs, 23 diploma study programs, 104 master and specialist study programs, and 43 doctorate study programs.

UGM is proud to be a center of excellence for community empowerment where students from various regions in Indonesia and overseas come to learn. The international students are admitted through various programs and projects such as student mobility, double degree, joint supervision, credit earning, and international collaboration and research publications. This creates the learning setting at UGM to have Indonesian as well as international atmosphere. Many of the study programs have been certified and accredited in various international boards, such as AACSB for Faculty of Economic and Business, iChemE for Department of Chemical Engineering, and AUN-AQA for 21 study programmes. Several indigenous community empowerment programs are



embedded within the learning activities in UGM. Some are student community services – community empowerment, partnership-based Education for Sustainable Development (ESD) and Community Resilience and Economic Development (CaRED) program. In 2015, over a hundred international students from Japan, Australia, Malaysia, U.S.A and Germany participated in the student community services – community empowerment program. ESD program has involved many partnership with villages and farther communities to increase the awareness for triple bottom of Sustainable Development (Economic, Environment and Social). Through CaRED Program, UGM has been collaborating with several New Zealand institutions to achieve community resilience and economic development in eastern part of Indonesia.

The topic of AC21 International Graduate School 2017 is "Community and Indigenous-based Technology for Sustainable Development towards Resilience Society."

The curriculum supports five learning components, which include Seminars, Internship, Workshops, Community Services, and Excursions. Invited speakers are national and international experts and professionals including those from AC21 members. These variety of activities will cover four clusters of studies that represents UGM, which are agriculture, health and medical science, science and technology, and social-humanities.

After participating in the program, participants are expected to gain understanding and to have the ability to manifest the knowledge into practical solutions of daily challenges in the form of community services. Furthermore, the participants are expected to be able to implement indigenous-based technology in local industries and to learn local wisdom through cultural visits to selected communities. We are convinced that the IGS 2017 will attract many participants from around the world.





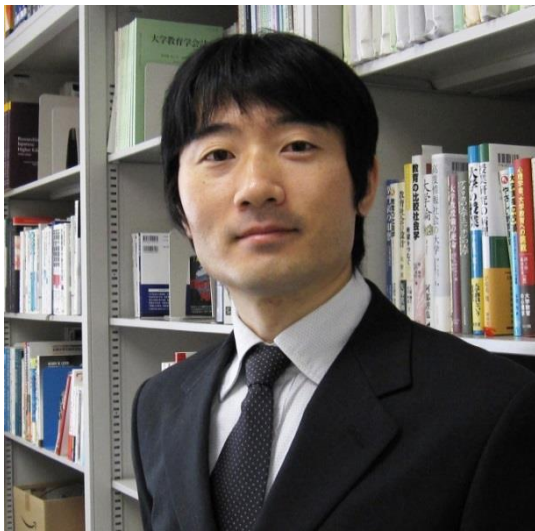
From the AC21 General Secretariat

Expectations towards the International Exchange of Higher Education Professionals

Hidehiro Nakajima

Associate Professor, AC21 General Secretariat Member

Center for the Studies of Higher Education, Nagoya University



Starting this year, I have become a member of the AC21 General Secretariat. Since being assigned to the Center for the Studies of Higher Education in 2014, I have been engaging in work related to research and services concerning the improvement of teaching and learning. Beginning this year, I have been attending various meetings throughout the university. In the process, while being involved in various efforts being made by Nagoya University and looking at the depth of the staff and faculty in charge of those efforts, I am rediscovering the strengths of the region's flagship university that other universities do not possess. The AC21 General Secretariat is one of them, and watching a large scale consortium project moving forward through the efforts of its enthusiastic faculty gives me great motivation.

I am currently also in charge of the Higher

Educational Management program (Joint Lecture) in the Graduate School of Education and Human Development. The Graduate School of Education and Human Development is one of the few graduate schools in Japan that offers night programs for adult students, where they can learn about higher education management. The time spent with staff from neighboring institutions who are motivated to study is very fulfilling, and more often than not I am also learning from them.

Generally, graduate programs for adult students focus not only on research and education, but also serve an important role in establishing and expanding human networks. Networks with fellow students in which honest discussions based on different perspectives stemming from various backgrounds and experiences can be held seem to have become an incredible asset to current students and alumni alike.

This is no different overseas, as I found out when I visited the US and the UK, where networking is considered as one of the fundamental values of the graduate education process. Especially in the US, where many students in the program come from outside of the country, it appears that the global human network is of great assistance in exchanging ideas regarding work, or discovering implicit rules in the workplace.

Regardless of whether domestic or overseas,

because universities as workplaces are divided by expertise in academic affairs, finance, facilities, research support, international exchange, information infrastructures, learning support, libraries etc., they are prone to departmental optimization. Therefore, comparison with other workplaces is a simple and effective method of recognizing the implicit values and cultures of one's own workplace, and to stimulate learning therein.

AC21 has been actively engaged in research exchange and student exchange. While AC21's activities are mainly focused around research and education, I sometimes ponder if it would not be possible to add to that list the exchange of staff who work at member universities. While the cultivation of a wide international human network of not only faculty and students but also other staff may not result in easily observable achievements, I believe that it would serve as a basis upon which member universities could grow stronger together as universities.

Upcoming AC21 Activities and Events

YEAR	DATES	EVENT/ACTIVITY	LOCATION
2016	April 30 - May 3	8th AC21 International Forum 2016	Technische Universität Chemnitz (Germany)
		14th AC21 Steering Committee Meeting	Technische Universität Chemnitz (Germany)
		8th AC21 General Assembly	Technische Universität Chemnitz (Germany)
2017	TBA	2nd AC21 International Graduate School	Gadjah Mada University (Indonesia)
		15th AC21 Steering Committee Meeting	Gadjah Mada University (Indonesia)
2018	TBA	9th AC21 International Forum 2018	Jilin University (China)
		16th AC21 Steering Committee Meeting	Jilin University (China)
		9th AC21 General Assembly	Jilin University (China)

AC21 General Secretariat Activities (Oct 2015 – Mar 2016)

YEAR	DATES	EVENT/ACTIVITY	LOCATION
2015	October 27	140th AC21 General Secretariat Meeting	Nagoya University (Japan)
	November 19	141st AC21 General Secretariat Meeting	Nagoya University (Japan)
	December 16	142nd AC21 General Secretariat Meeting	Nagoya University (Japan)
2016	January 22	143rd AC21 General Secretariat Meeting	Nagoya University (Japan)
	February 24	144th AC21 General Secretariat Meeting	Nagoya University (Japan)
	February 29 - March 3	Attendance at APAIE 2016	Melbourne (Australia)
	March 28	145th AC21 General Secretariat Meeting	Nagoya University (Japan)

AC21 Members

Australia The University of Adelaide

China Jilin University
Nanjing University
Northeastern University
Peking University
Shanghai Jiao Tong University
Tongji University

France University of Strasbourg

Germany Technische Universität Chemnitz
University of Freiburg

Indonesia Gadjah Mada University

Japan Nagoya University

Laos National University of Laos

New Zealand University of Canterbury

South Africa Stellenbosch University

Thailand Chulalongkorn University

Kasetsart University

USA North Carolina State University

University of Minnesota

What is AC21?

AC21 Website: <http://www.ac21.org/english/index>

AC21 is an international academic consortium comprised of higher education institutions from around the world. It was established in 2002 at the initiative of Nagoya University, with the aim of creating an academic network that transcends borders to address global issues by sharing knowledge and expertise. The network is managed by the AC21 General Secretariat located at Nagoya University.

AC21 General Secretariat



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