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Australia and Germany: Large Distance, Close Collaborations

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The current issue of *Angewandte Chemie*, which commemorates the 100th anniversary of the Royal Australian Chemical Institute (RACI), brings together contributions of chemists from Australia and Germany, and constitutes an excellent step into forging strong ties between the two chemical communities.

Both Australia and Germany have long traditions in the chemical sciences, including my own research area, macromolecular chemistry: Germany has a rich history of macromolecular discovery based on the findings of Hermann Staudinger and has leading centers such as Bayreuth, Berlin, Dresden, Freiburg, Jena, Karlsruhe, and Mainz. In Australia, which was the first nation to introduce polymer bank notes, high-level polymer research is carried in hubs including Brisbane, Sydney, and Melbourne; reversible addition–fragmentation chain transfer (RAFT) and nitroxide-mediated radical polymerization (NMP) were also both developed here. Herein, I submit that there is consider-

able scope to expand collaborations between the two chemical research communities, an endeavor backed by a recent thrust to strengthen ties between the two countries on the government level by the Australia Germany Advisory Group, which has flagged research as key area of joint activity.

Three areas of activity for increasing the chemical research ties based on existing possibilities can be identified: 1) Taking full advantage of the collaborative funding opportunities that the national research funders, that is, the Australian Research Council (ARC) and the German Research Council (Deutsche Forschungsgemeinschaft; DFG), provide. While some joint grant applications have been successful, the majority of German and Australian chemists are not aware of the fact that both funders allow for the inclusion of partner investigators from either country, enabling a joint project execution, including the vastly underused possibility of running joint PhD programs based on such funding in the context of a “cotutelle” (jointly supervised) setting. In addition, the ARC has a provision for funding travel components for German research partners. Similarly, the DFG operates the Mercator program, which allows the same for Australian researchers. Finally, the Universities Australia (UA) and German Academic Exchange Service (DAAD) have a program supporting the exchange of researchers. International DFG supported graduate schools are a further mechanism to foster links. 2) Government support can help bring the results of fundamental research to industrial application. The ARC operates the very successful Linkage Scheme, which supports projects between industry and eligible Australian

research organizations, including with German companies. Based on my own experience, German industrial partners are largely not aware of the possibilities that the ARC program provides for collaboration with Australia. 3) Furthering the knowledge of each other’s research activities in targeted interactive symposia involving both academia and industry is critical for driving innovation. For example, the European Polymer Federation has introduced Australian–European Symposia. While these events are notable, they are the exception, and more such targeted events must be held in several fields of chemistry, importantly with the participation of industrial researchers.

While collaborative funding instruments do exist, further initiatives are required. Within Europe and partly also with overseas countries, granting agencies such as the DFG issue joint calls for proposals, yet this is critically missing between Australia and Germany on the DFG and ARC level. While the UA–DAAD initiative is a notable program, it is small in scale and does not fund the projects themselves. Ideally, ARC–DFG driven programs should be developed that permit not only a joint grant proposal based on fundamental research, but also industrial involvement, allowing for example, one German and one Australian research team to partner with an industrial player to develop a specific technology. Further, Australian universities have taken a leading role in entering into research partnerships with universities abroad. A prime example is the Monash–Warwick alli-

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ance. To date, there are only limited overarching research-focused alliances of German universities with international partners on the same large encompassing scale and—to the best of my knowledge—none with Australian universities. I believe that the fusion of research strength backed by an overarching agreement will enable research-intensive universities in the field of chemistry to offer a high level of innovation potential to industrial partners. Furthermore, the respective learned chemical societies, and specifically their divisions, are called upon to establish firm ties with each other, facilitating joint symposia as well as highlighting collaborative funding opportunities. Critically, the societies can serve as drivers for policy change and implementation with their respective governments.

Contemporary macromolecular chemistry can serve as an excellent

example for how cooperation between many disciplines brings great value: polymer research fuses organic, inorganic, and physical chemistry as well as materials science, and industrial partners are strongly involved to close the translational gap between fundamental research and application.

Progress within the most challenging areas can only be achieved by bridging the boundaries between chemical disciplines. Unfortunately, a discipline-segregated approach is still practiced in many German universities with the existence of discipline-oriented institutes, which is not conducive to a collaborative environment. Here, the approach that Australian universities take with more encompassing departments may serve as a role model for some German institutions.

In the field of macromolecular chemistry, German–Australian teams are in an ideal position to address the most urgent challenges, with particular synergies to be exploited in the fields of personalized nanomedicines using polymers, soft-matter-driven additive manufacturing,

as well as adaptive and programmable materials, relying on an in-depth understanding of dynamic covalent and non-covalent bonding in macromolecular system as well as self-assembly processes. The development of polymers based on renewable resources to replace as many oil-based polymers as possible is a further area of joint concern, backed by considerable industrial interest.

Finally, on a personal note, the “tyranny of distance” is often cited as a hindrance for active and engaging collaborations between German and Australian researchers, especially by industrial partners. My personal experience suggests that, based on modern communications technology, this is no longer an issue at all and, until now, no German collaboration partner has come back from an Australian visit not wishing they could have stayed longer. I sincerely hope you enjoy reading this issue of *Angewandte Chemie*, and that it helps to bring chemists from both countries even closer together.

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Greeting from Wolfram Koch

It seems that anniversaries are a big issue in 2017. This is already the second time I have the pleasure and honor to write a short contribution for a special issue of the GDCh flagship journal *Angewandte Chemie* on the occasion of such a celebration. While a few weeks ago it was the 100th anniversary of our Canadian friends, this time it is the centennial of the Royal Australian Institute of Chemistry. On behalf of the German Chemical Society (Gesellschaft Deutscher Chemiker; GDCh), which also has a reason to celebrate this year, namely the foundation of its predecessor organization 150 years ago, I congratulate the RACI on this important and memorable event. While Australia and Germany are separated by many thousands of kilometers, our scientific interactions are strong and have the potential to become even stronger, as Christopher Barner-Kowollik describes in his Editorial. As a (former) computational chemist I remember well the wonderful collaboration and friendship with Australian friends and colleagues such as Leo Radom

and Brian Yates. Also for the GDCh, Australia, a country with a powerful and innovative chemistry community, is an important partner. So it is perfectly fitting that the first symposium jointly hosted by ACES (the Asian Chemical Editorial Society, which publishes *Chemistry—An Asian Journal*, supported by the GDCh) and the GDCh will take place during this year's Asian Chemical Congress in Melbourne. The GDCh Lecture will be held by Markus Antonietti from the Max Planck Institute of Colloids and Interfaces. This is just another indication of our strong commitment to further the collaboration with the ACES member organizations, including the RACI. In a slight modification of a famous movie quote let this be not the beginning but the continuation of a beautiful friendship!



Wolfram Koch
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