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House of Representatives,  
Industry, Science and Innovation Committee

### **Submission to the Parliamentary Enquiry into International Research Collaboration.**

I wish to make the following submission on behalf of the National Committee for Chemistry of the Australian Academy of Science.

#### Terms of Reference

The House of Representatives Standing Committee on Industry, Science and Innovation shall inquire into and report on Australia's international research engagement, with particular reference to:

1. The nature and extent of existing international research collaborations.
2. The benefits to Australia from engaging in international research collaborations.
3. The key drivers of international research collaboration at the government, institutional and researcher levels.
4. The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.
5. Principles and strategies for supporting international research engagement.

**Summary:** To improve Australia's international collaborative research effort, it is proposed to (i) Create a postdoctoral fellowship program to fund (or at least part-fund) stays of Australian PhD graduates in overseas laboratories for 1-2 years.

(ii) Implement a more general program to bring foreign postdoctoral fellows to Australia.

**• 1. The nature and extent of existing international research collaborations.**

The main sources of funding are DIISR's International Science Linkages Program (94.5 M over 9 years), which is administered by the AAS under its Grants for International Travel programs; ANSTO's Access to Major Research Facilities Program (also supported by DIISR); and ARC's Discovery and Linkage projects (the dedicated Linkage-International program ceased in 2009). The commendable initiatives of the French Embassy in Australia regarding Australia-France collaborations are also of significant value. These are all one-off programs, which will facilitate the visit to an overseas laboratory and the exchange of researchers. The international collaboration efforts will be limited to a large extent to activities that can be funded through these schemes. In addition, much collaborative research is undertaken without any dedicated funding – simply through the initiatives of the researchers involved, who use whatever means are available to fund their research and exchange of students. Several universities have a variety of scholarship/travel stipend programs for sending graduate students overseas for short-term research stays and for the short-term exchange of research scientists; these programs greatly help the international collaborative research effort. There is no program catering specifically for long-term research collaborations.

**• 2. The benefits to Australia from engaging in international research collaborations.**

Access to technology, instrumentation, know-how, and frontline research methods are clear benefits, which help maintain Australia's research effort at an internationally competitive level. The process is two-way: new knowledge is brought to Australia through stays of Australian researchers and postdoctoral fellows overseas, and through bringing foreign researchers and postdoctoral fellows to Australia.

**• 3. The key drivers of international research collaboration at the government, institutional and researcher levels.**

The major funding opportunities are mentioned under 1. above.

Much of the international research collaboration at institutional level is driven by the researchers themselves. It is due largely to personal contacts and knowledge (either directly or through the literature) of the research undertaken and the facilities available in overseas laboratories. The personal initiatives of researchers to initiate collaborations and exchange students and postdoctoral associates are of paramount importance.

• **4. The impediments faced by Australian researchers when initiating and participating in international research collaborations and practical measures for addressing these.**

Although funding opportunities exist (see. 1. above), they are insufficient.

(i) Australia suffers a clear impediment in that we do not have a funding program to send our PhD graduates overseas. The Endeavour and Fulbright fellowships do offer some opportunities, but they are far too few in number, and the time scales are far too short (4-6 months for Endeavour Fellowships and 3-12 months for Fulbright Postdoctoral Scholarships). In Germany the Humboldt Foundation and the Deutsche Forschungsgemeinschaft (DFG) sponsor postdoctoral fellows to get them into the best labs around the world. There are EU programs such as the Marie-Curie Fellowships, and the Spanish, Swiss, and other European Science Foundations also offer postdoctoral support to their PhD graduates. In Denmark it is a requirement that PhD candidates spend a period in a foreign institution (usually ½ year), and this is funded by the government. These programs give the students and postdoctoral fellows invaluable training, and since the majority of postdoctorals from the developed world return to their home country, the ultimate benefit is to bring back new ideas, know-how, experiences and new interactions and linkages.

If Australia wants to foster better overseas links, one of the easiest and best-value approaches is to fund 100-200 competitive postdoctoral fellows overseas each year. In some cases, matching funds from the host institutions might be encouraged (as does the Humboldt Foundation, for example). This provides an excellent platform for setting up robust collaborations, while at the same time enhancing the training of our graduates to the best international levels.

(ii) It is equally important to bring overseas postdoctoral fellows to Australia to work in Australian labs for 1-2 years. Australia has benefited greatly from the foreign postdocs coming ‘for free’ from Germany, Switzerland and other countries, and this has in many cases formed the basis for ongoing collaborations after the postdocs have returned home. However, the majority of these funded foreign postdocs go to the US or other countries, not Australia. There would be enormous value in funding a postdoctoral fellowship program to bring postdocs *to* Australia, on a much larger and wider scale than the Endeavour program. Such a program could include, but should not be limited to, part-fellowships to provide matching

funds for overseas applicants with partial funding, e.g from the Humboldt Foundation and the DFG.

Many Australian universities do have their own, highly prestigious and competitive postdoctoral fellowship programs (usually 1-2 years duration), but they are far too few in number. ARC postdoctoral research associates (PRAs) are extremely valuable for the Nation's research effort and at the same time help to build lasting international collaborations, but the shortage of funds means that this is insufficient for the country's needs. An increase in ARC funding to permit the appointment of larger numbers of PRAs and a realization of the importance of this aspect would help greatly.

(iii) The grants for International travel administered by the AAS (see 1. above) are very valuable and must continue. It is regrettable that the dedicated ARC Linkage-International grants have ceased. It may be mentioned here that there is sometimes poor coordination of the ways we assess applications for international grants. The application forms and criteria can be different for each partner country. Funding for international collaborations needs to be for periods of 1-2 years at a time to allow time to build collaboration through exchanges of students and staff.

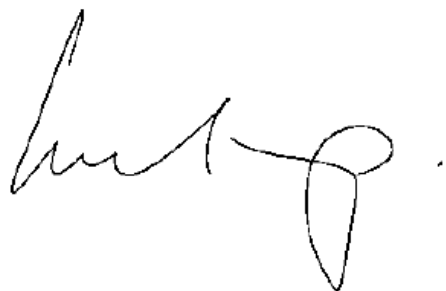
(iv) Infrastructure. In many cases, only established staff can run collaborative programs because infrastructure comes from ARC grants. Many international programs will not support equipment. Funding for, say, one key piece of equipment up to \$50K could be made available to help push a collaboration. This is important for Early Career Researchers who, having returned to Australia, may be trying to maintain or build a collaborative relationship overseas but do not yet have a secure funding base here. Grants should be flexible in how funds are used and assessed on outcomes.

**• 5. Principles and strategies for supporting international research engagement.**

Implementation of measures to rectify the issues that were raised above, in particular

- (i) Creation of a postdoctoral fellowship program to fund (or at least part-fund) stays of Australian PhD graduates in overseas laboratories for 1-2 years.
- (ii) Implementation of a more general program to bring foreign postdoctoral fellows (recent PhD graduates) to Australia for 1-2 years (a wider program than the Endeavour and Fulbright schemes, and wider than the ARC's ARF and QEII fellowships, which are largely aimed at

Australian researchers who will stay in Australia). The major selection criteria would be the quality of the student and of the research proposal.

A handwritten signature in black ink, appearing to read 'Curt Wentrup', with a stylized flourish at the end.

Curt Wentrup

Chair, National Committee for Chemistry of the Australian Academy of Science