

Advisory Council Report
RIKEN Center for Developmental Biology

February 2012

Meeting Programme

The Advisory Council (AC) of the RIKEN Center for Developmental Biology (CDB) met in Kobe from 27 February – 1 March 2012 to review the Center's progress and activities. The meeting opened with a presentation from RIKEN Executive Director Dr Maki Kawai. Dr Kawai gave an overview of the organization of RIKEN and summarised the discussions and recommendations from the RIKEN Advisory Council (RAC) in October 2011. Dr Kawai also drew attention to the President's terms of reference to Center Advisory Councils.

The CDB Director Dr Takeichi then described the Kobe Institute and presented a scientific and budgetary overview of developments in CDB since the previous AC. Further information was accessible to the AC through the 2012 white paper that had been prepared by CDB and circulated in advance of the meeting. Dr Takeichi concluded by presenting the CDB response to AC recommendations.

The main business of day 2 was the mid-term review of the seven Group Directors. The Group Directors' progress reports and future plans were provided in the written documentation. Each Group Director gave a summary presentation and responded to questions from the AC. A post-doctoral researcher from each group then presented a current project. At the end of the afternoon AC members had the opportunity to meet and discuss with PhD students and post-doctoral researchers during a poster session followed by buffet.

Day 3 began with presentations and discussion of the Director's Strategic Projects, including two new Projects. Recently recruited Team Leaders then introduced their projects. In the afternoon the AC split into three groups to visit laboratories and hear research reports from Team Leaders. Team Leaders had been invited to speak about their most interesting progress rather than attempt to cover all their activities. The AC discussed future career options with several Team Leaders nearing the end of their 10 year term and preparing to leave CDB. The day ended with dinner with CDB Group Directors and Project Leaders.

On the final morning the AC retired for private discussion and to draft the evaluations and report. The AC also considered Dr Kawai's request to nominate candidates to succeed Dr Takeichi as future Director of CDB. Following a closed meeting with the Director and Deputy Directors, the Chair summarized the Advisory Council findings and recommendations to CDB staff. Subsequent to the meeting the AC provided the Director with written evaluations of the Group Directors and Project Leaders plus summary comments on Team Leaders.

Overall Evaluation

RIKEN CDB is accepted as one of the foremost developmental biology institutes worldwide. The Center is headed by an exceptional scientist, Dr Takeichi, supported by strong and distinguished Deputy Directors, Dr Nishikawa and Dr Aizawa. CDB covers the broad field of contemporary developmental biology, spanning from molecular evolution to regenerative medicine. Many CDB investigators are at the international forefront in their subject. This is reflected in the fact that between 2010-11, CDB published 324 research papers, more than one third of which are in the leading international journals, including several in *Nature*, *Science* and *Cell*. Consistent with the high level of research output, CDB investigators have been very successful in external grant competitions.

CDB is recognised for the opportunities it has provided to talented junior researchers. The faculty comprises an excellent mix of senior, mid-career and junior investigators. CDB is deeply engaged with the international developmental biology community; hosting the highly successful annual CDB international symposia, developing partnerships with a range of institutions, holding joint meetings, and having a very full program of visiting seminar speakers. In addition, the CDB Animal Resources and Genetic Engineering Laboratory produces transgenic mice for researchers in Japan and many other countries, a mission that is greatly valued. Finally, CDB is very active in science communication to the wider community.

Overall CDB makes a major contribution to the global visibility and reputation of RIKEN and of Japanese science. It is therefore of paramount importance that the new Director of CDB is an outstanding scientist of broad vision who will build upon the unique foundations laid by Dr Takeichi and maintain CDB at the leading edge of developmental biology research.

Mid-term Reviews of Group Directors and Project Leaders

The AC was pleased to see that resources have been re-deployed as previously recommended and finds that all programs are progressing well. Reports and presentations were of very high quality with several exceptional achievements. Of particular note, the retiring Deputy Directors are bringing their life work to conclusion with contributions that are destined to become textbook material. The impact of their departure in 2013 will be widely felt. Concern for the loss to CDB is reduced, however, by the rising achievements and stature of other GDs. The AC was impressed by the efforts both departing GDs are making to secure positions for their staff when their laboratories close.

The AC endorses the decision to develop the Retinal Regeneration programme led by Dr Takahashi into a Strategic Project. This is important to meet the specific demands of translational research and also recognises the national and international significance of the planned clinical trials in cell therapy for retinal diseases.

New Project and Team Leaders

The AC enjoyed the presentations by new Project Leader and Team Leader recruits. All appear promising and the AC commends the leadership for these appointments. The introduction of mathematical and physical biology as a new dimension in the CDB research portfolio is far-sighted. Mentoring of these scientists will be important to ensure they can: (i) establish clear identities for their individual research by focusing on important and tractable biological problems, (ii) develop productive interactions that leverage excellent experimental research ongoing in CDB.

Team Leader Career Progression

Following previous recommendations by the AC, CDB has implemented a 10 year policy for Team Leaders. The AC was pleased to learn that most TLs are succeeding in securing University faculty appointments at the end of their period in CDB. This has been critical to enable the new recruitments that can renew and refresh the Center. In a few cases, TLs are experiencing some difficulty. The AC senses that some TLs may have procrastinated over job applications and are not well prepared for the requirement of appointments in the University system. While recognising the current good mentoring efforts of the CDB Director and Group Directors, the AC suggests there is scope for a more proactive role in preparing individual TLs and promoting them for appropriate career opportunities. There may also be an insufficient appreciation by Japanese Universities of the unique model of turnover of TL appointments in CDB. Furthermore, few TLs appear to consider opportunities outside of Japan. Recruitment of some TLs to positions overseas would further enhance the international standing of CDB. In such cases individuals might in future return to Japan at a senior level.

The AC offers the following suggestions:

- Invite selected former TLs to a round table discussion with current TLs to share experience on research, teaching, and general aspects of working conditions in the University system
- Invite University Professors to assist in preparing TLs for job application and interview
- In the first year of TL renewal, encourage TLs to start planning for the future career move and begin formal mentoring in this regard
- Make better contacts with Universities beyond the Kansai area and arrange opportunities for TLs to enhance their professional profiles, e.g. by contacting the institutions or conference organizers on their behalf to offer research seminars
- Actively promote the value of the TL turnover system, including the opportunity for the Universities to recruit outstanding researchers (for example, at EMBL, the Universities and other institutions have to compete to attract departing Group Leaders).
- Promote career opportunities outside of Japan and invite overseas speakers to discuss how and where to apply for positions.

Group leader turnover can be challenging but is essential for the long term vitality of a research institute by ensuring that opportunities are available to upcoming generations. Throughput of group leaders can also contribute to good relationships with Japanese Universities. ***The AC recommends that CDB leadership and RIKEN actively promote within the Japanese scientific and academic community the value of the Team Leader turnover system practised in CDB.***

PhD Training

As noted at the previous AC, high quality PhD training should be considered a key component of a centre of excellence. Moreover, a vibrant PhD student group contributes greatly to the positive atmosphere and the international outlook of a research institute. The AC reiterates the view that around 50 PhD students would be commensurate with the number of research teams in CDB. The complexities of making workable arrangements with Japanese Universities are noted. Nonetheless, it is disappointing that some CDB groups do not have a PhD student.

The AC recommends that consideration is given to initiating an international PhD Program. This could follow the EMBL model. Like CDB, EMBL is not a degree granting institution. EMBL recruits students directly into its program and works in partnership with Universities where the students register for their degree. This PhD Program model has spread throughout European research institutes in recent years and been adopted by Pasteur, IMP, EPFL, Sanger, LMB, Max Planck, and others. Students are admitted to these programs only by competitive entry to ensure high quality. The first year often comprises lab rotations before the students finalise the choice of laboratory for their PhD. A key ingredient in a successful PhD Program is appointment of a designated Director of Graduate Studies to oversee recruitment, induction, project placement, ongoing evaluation and mentoring.

The reputation and resources of CDB are a means to attract excellent non-Japanese PhD students. Students may be funded from intra-mural or external funding (e.g. the RIKEN funds for International Program Associate), or by scholarships from the home country. Depending on individual circumstances, students may enrol for the PhD with a University in their home country or with local partner Universities. Although some discussion will be required, AC members are of the opinion that bringing foreign PhD students into CDB who then enroll with a Japanese University should be attractive to, rather than competitive with, the University system.

The AC further recommends that the opportunity for international PhD training in CDB should be actively promoted via the WEB, international Developmental Biology Societies, and advertising in leading journals. In addition to the breadth and quality of science, it should be emphasised that CDB is an English-speaking institute, and that Kobe offers a multi-cultural lifestyle.

Intellectual Property

The report provided data on numbers of patent filings but not their subjects and no information was given on licensing or other forms of commercialisation. The AC notes the comments on IP in the recent RAC report and considers that this issue will attract increasing attention as a measure of the impact of the scientific achievements of RIKEN Institutes. It would therefore be helpful for the AC to have more complete information in future reports.

On discussing IP issues with CDB scientists, the AC was surprised to learn that IP matters are not handled locally but are referred to the office at WAKO and that the bureaucratic processes involved can discourage scientists from proceeding with the patenting process. One example was given of an invention that was apparently declined by RIKEN and subsequently patented by Olympus who is now commercialising the technology.

The AC recommends that IP issues should be monitored locally and that all patents and commercialisation arrangements are documented in future reports, including cases where the patent has been filed by another party but has a CDB inventor.

Collaborations within CDB

Following previous critical comments, the AC was pleased to see good evidence of growing interaction and collaboration between groups in CDB. This should increase further with the new TL recruits. The AC note that evidence of an open collaborative environment can be particularly important in attracting potential recruits from outside Japan. Increasing collaborations with other RIKEN institutes, notably QBiC, are also noted.

Engagement of CDB in iPS Cell Research and Translation

The AC reiterates our previous suggestion that CDB should develop and articulate a strategy for iPS cell research that will bring significant added value to the national effort. ***The AC recommends establishing a harmonious relationship with Dr Yamanaka and CiRA.*** CDB can make a unique long-term contribution by elucidating fundamental principles of pluripotency and developmental biology. This is an essential complement to studies in CiRA and other Japanese centres with a more translational mission. In this light, the pioneering studies of Drs Niwa and Sasai should be promoted as part of the national campaign. The importance of Dr Takahashi's translational program, which does involve collaboration with CiRA, is also noted. Further opportunities should be explored for productive engagement and cooperation with CiRA. Friendly competition will also be inevitable in certain areas but this can also be constructive in the context of a common strategic plan.

Recruitment Strategy

CDB has made several promising appointments in the past two years. In addition to new Team Leaders, the appointment of Dr Furuta to take over running of the Animal Resources and Genetic Engineering Laboratory was welcomed by the AC. This solves a possible problem by providing a suitable successor to Dr Aizawa in overseeing this world-class facility.

Although some TLs are due to leave and Drs Aizawa and Nishikawa will close their laboratories in 2013, *the AC recommends that further recruitments should be deferred until the new Director is appointed.* This is important to provide the incoming Director with the opportunity to initiate new research directions as well as to reinforce existing programs.

Future Director and Deputy Directors

The AC was pleased to learn that an open search for a new Director has now been initiated with a nomination committee including two non-Japanese members (Austin Smith and Janet Rossant). The AC was reassured that the position will be advertised and that the role description will specify an exceptional scientist with a broad vision of the future of fundamental developmental biology. The new Director should be admired and respected by both his/her peers and by the younger generation. He/she should have proven leadership skills and be responsive to the consensual approach that has been the foundation of CDB success. The AC recognises that there are excellent scientists among current GDs but remains firmly of the opinion that an external appointment through an open application process is critical for international perception and credibility. Indeed there are few scientists worldwide with the requisite stature and character to succeed Dr Masatoshi Takeichi. It is therefore important to extend the search outside of Japan. Moreover, as stated previously, the AC considers that appointment of a non-Japanese Director would be highly symbolic and bring the international aspirations of CDB to full fruition.

The AC has been asked by the Nomination Committee to propose candidates. After discussion, several names were put for consideration to the Director and Deputy Directors. The AC considers that CDB GD should independently discuss the candidature of the new Director and make their own nominations.

The AC recommends that the system of Director and two Deputy Directors, which has served CDB extremely well, should be retained under the new Director.

Closing Remarks

The AC has always been impressed by the outstanding level of science in CDB, the open manner in which issues are presented and discussed, and the considered responses to our recommendations and suggestions. Consequently AC members feel closely connected to CDB. This sense was particularly

strong during the present visit due to the warm welcome and the obvious efforts that had been made in preparing documentation and presentations. Presentations by post-docs and the poster session were excellent additions to the programme and the AC wishes to thank all those involved and to commend the quality throughout.

Finally, the AC membership should be renewed periodically, as has happened to date. At the present juncture, however, the AC respectfully suggests that it would be appropriate to defer any change until the new Director is appointed in order that he/she can decide on the membership.

Summary of Recommendations

- Actively promote within the Japanese scientific and academic community the value of the system of Team Leader turnover practised in CDB.
- Establish an international PhD Program and promote the opportunity for high level PhD training in CDB.
- Monitor intellectual property issues locally and document all patent filings and commercialisation arrangements in future reports
- Seek to establish a harmonious and constructive relationship with Dr Yamanaka and CiRA with respect to iPS cell research
- Defer further group director or team leader recruitments until the new Director is appointed.
- Retain the system of Director and two Deputy Directors, which has served CDB extremely well.



Austin Smith

Cambridge

18 May 2012

Membership of the Advisory Council

Professor Austin Smith, University of Cambridge (Chair)

Professor Margaret Buckingham, Institut Pasteur, Paris

Professor Toshio Suda, Keio University

Professor Chris Wylie, Cincinnati Children's Hospital

Professor Stephen Cohen, Institute of Molecular Cell Biology, Singapore

Professor Hiroshi Hamada, Osaka University

Professor Haifan Lin, Yale University

Professor Patrick Tam, University of Sydney

Professor Ryoichiro Kageyama, Kyoto University