



Australian Government
Australian Research Council

EVALUATION OF THE FUTURE FELLOWSHIPS FUNDING SCHEME 2013





Dr Jane Lydon, Centre for Australian Indigenous Studies Faculty of Arts, Monash University, speaking at the 2010 Future Fellowships announcement.

Photo courtesy: Chris Canham Photography



ARC Future Fellow Professor Boris Baer from the ARC Centre of Excellence for Plant Energy Biology.

Photo courtesy: ARC Centre of Excellence for Plant Energy Biology.



Madeleine Van Oppen, Australian Institute of Marine Science

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Mike Bunce, Murdoch University

Photo courtesy: Professor Mike Bunce



Professor Kathy Belov holding a baby Tasmanian devil.

Photo courtesy: Steve Merenos

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Executive Summary

The *Future Fellowships* scheme is a component funding scheme of the National Competitive Grants Program (NCGP) administered by the Australian Research Council (ARC).

The scheme provides salary and non-salary project funding to Administering Organisations—Australian universities, publicly funded research agencies and medical research institutes—to support mid-career researchers and their research projects.

Funding is allocated competitively on the basis of peer review to ensure that support for capacity building goes only to the most highly innovative and internationally competitive research.

Future Fellowships is a terminating program. The initial funding commitment of \$844.1 million for up to 1000 four-year fellowships commencing over the five-year period 2009 to 2013 was supplemented in the Australian Government's 2013–14 Budget with an additional commitment of \$135.3 million to provide an additional 150 fellowships to commence in 2014.

The scheme was established in 2009 in response to the growing recognition that many highly qualified mid-career researchers were choosing to work overseas to further their careers due to a lack of opportunities in Australia.

Its objectives are to:

- attract and retain outstanding mid-career researchers;
- build collaboration across industry and/or research organisations and/or disciplines;
- support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia; and
- strengthen Australia's research capacity by supporting innovative, internationally competitive research.

The evaluation of Future Fellowships was undertaken to assess the extent to which the funding scheme has been implemented effectively and its objectives are being met. Since the scheme is a terminating program, the evaluation also considered the ongoing relevance of its objectives to the broader Australian Government strategic objectives for innovation, science and research¹, as well as to the needs of the Australian research sector.

The evaluation was informed by a survey of Administering Organisations that host Future Fellows, interviews with Future Fellows themselves, analysis of data collected as part of routine administration of the funding scheme, and a review of policy statements, research reports and administrative documents.

High-level messages from stakeholders

The evaluation elicited key high-level messages from stakeholders. There is almost unanimous agreement among Administering Organisations that the *Future Fellowships* scheme is meeting its objective to attract and retain outstanding mid-career researchers. In total, 97% believe that this objective is being met fully or mostly.

¹ As these strategic objectives were articulated at the time the evaluation was conducted in the first half of 2013.

Administering Organisations are treating Future Fellows as a long-term investment in attracting and retaining research talent. In aggregate, they expect to retain almost all, 93%, of their Future Fellows in their employ following completion of Fellowships.

This outlook is shared by Future Fellows themselves, 86% of those interviewed as part of the evaluation expecting to be employed by their Administering Organisation beyond the term of their Fellowship.

A common sentiment expressed by Future Fellows interviewed was the major impetus that their Fellowship has provided to the ambition, scope and scale of their research—by offering them the opportunity to focus almost exclusively over an extended period of time on their research program, as well as by giving them the profile necessary to expand their collaborative networks, particularly internationally, and attract high-quality students.

These messages from stakeholders suggest that Administering Organisation's processes for nominating proposals for Future Fellowships, and ARC processes for assessing those proposals, are effectively and efficiently identifying a cohort of highly talented mid-career researchers who will play an important part in renewing the Australian research workforce over coming years.

Summary of findings against the terms of reference and evaluation questions

Has the *Future Fellowships* funding scheme been implemented effectively?

Are the various elements of the scheme's program design meeting the needs of stakeholders?

- The funding scheme has been implemented effectively—among Administering Organisations there is a consensus that the various elements of the scheme's program design are meeting their needs.
- There is concern among some Administering Organisations, particularly universities, that in extending beyond the higher education sector the scope of organisational eligibility to apply for and administer Future Fellowships funding is too broad—consideration could be given to identifying the specific nature of these concerns and to assessing their legitimacy.
- The trend of falling demand for Future Fellowships funding over the four funding rounds concluded to date may begin to be reversed as the first and then subsequent cohorts of Discovery Early Career Researcher Award (DECRA) holders conclude the term of their awards, placing upward pressure on the number of fellowship opportunities available to mid-career researchers.
- The overwhelming view among Administering Organisations is that the Future Fellowships salary levels, and the distribution of Fellowships awarded across these, is appropriate.
- There is substantial, although not majority, support among Administering Organisations for lengthening the period of tenure of Future Fellowships from four to five years—consistent with the Government's desire to shift towards more widespread use of research grants of longer duration.
- There is substantial, although not majority, support among Administering Organisations for raising the ceiling on the amount of project funding support available each year to each Future Fellowship, from \$50,000 to at least \$100,000.
- Future Fellowships are highly valued by researchers themselves in allowing them to pursue their mid-career research aspirations—in their comments on ways the funding scheme might be improved, Future Fellows express a desire for more secure ongoing research support, greater

flexibility to tailor project expenditures to their individual needs, and more opportunities to engage in outreach activities.

Are the objectives of the *Future Fellowships* funding scheme being met?

Is the scheme having a positive impact on individual participants, their host institutions and the research sector as a whole?

- The funding scheme has clear and appropriate objectives that are set out in publicly accessible funding rules.
- The objectives of the funding scheme are being met fully or mostly—there is a strong consensus of agreement on this among Administering Organisations.
- There is some concern among Administering Organisations that the objective of attracting Fellowship candidates from overseas is being undermined by overly burdensome application requirements, as well as by the lengthy period of time between application and decision on and announcement of funding. Other factors that seem likely to be important in attracting candidates from overseas are the length of Fellowship tenure, the level of project funding and the strength of institutional commitment to Fellows.
- Administering Organisations are supporting the objective of retaining outstanding mid-career researchers by their adoption of a variety of strategies to integrate their Fellows into a broad range of institutional roles and activities—indications are that about one-third of Fellows have received a promotion by the penultimate or final year of their Fellowship and there is a consistent expectation among Administering Organisations that they will retain almost all of their Fellows in their employ following the conclusion of Fellowships.
- Future Fellows are engaged in substantial collaboration and, in particular, are establishing and maintaining very many strong collaborative links internationally. The vast majority of these links are within the university sector rather than with potential end-users within the private, not for profit and government sectors.
- The targeted areas of research for Future Fellowships funding, by virtue of representing focused priorities, appear to be having a direct and positive effect in encouraging proposals to be brought forward in specific areas of national significance.
- Since none of the Future Fellows have yet concluded the term of their Fellowships, there is limited data available at this point in time to assess the degree to which the funding scheme is supporting innovative, internationally competitive research outcomes. On the other hand, there is an overwhelming consensus among Administering Organisations that their Fellows are engaged in highly innovative research activity and this is borne out by Fellows' descriptions of their research activities.

Is the *Future Fellowships* funding scheme being administered and delivered in an efficient manner and is the burden of compliance costs incurred by stakeholders being kept to a minimum?

- The NCGP, encompassing the *Future Fellowships* funding scheme, is being administered and delivered efficiently—the cost of administration of the NCGP as a percentage of the value of administered grants, at 1.31%, is very low against a mean benchmark for comparable organisations of 4.26%.

- Administration of NCGP funding schemes, including *Future Fellowships*, represents good value for money. Areas in which improvements might be sought are the use of longer term grant funding agreements and better demonstration of the value of grant outcomes.
- Compliance costs for Administering Organisations can be contained by ensuring that: there is certainty of timing and scheduling of grant administration processes year on year, timeframes in which to prepare and submit proposals for funding are not compressed, and decisions on funding are announced in a timely manner.
- Costs of compliance for Administering Organisations could be further lowered by reducing the length and complexity of the *Future Fellowships* application form, particularly in relation to the project description and the budget justification for non-salary project funding. Consideration might also be given to integrating and reducing duplication of administrative procedures across the various ARC fellowships and awards.

Are the *Future Fellowships* funding scheme's objectives of ongoing relevance to the Australian Government's broader strategic policy priorities for innovation, science and research, as well as to the needs of the Australian research sector?

Does the scheme articulate coherently with the wider objectives of the NCGP and related Australian Government programs and activities?

- The funding scheme objectives are consistent with the Australian Government's broader strategic policy priorities for innovation, science and research². The scheme is contributing directly to:
 - enhancing the attractiveness of research careers;
 - creating viable career pathways for Australian researchers;
 - attracting the best minds to conduct world-class research in Australia; and
 - increasing the level of inter-sectoral and international collaboration.
- Future Fellowships is the only source of funding in Australia that supports opportunities specifically for mid-career researchers to undertake basic and applied work in any field of research—in the absence of the scheme, it is unlikely that this work would be funded from the private or not-for-profit sectors.
- Administration of the funding scheme by the ARC is appropriate and delivers a number of benefits by ensuring that:
 - funding is allocated to the highest-quality applicants;
 - support for mid-career researchers is integrated with support for a range of other research activities; and
 - support for mid-career researchers occurs within a context in which it can be linked to the wider policy and program activities of the Government's innovation, science and research agenda.
- The close and cooperative engagement of the ARC with Administering Organisations is an important contributor to efficient and effective program design and delivery.
- The funding scheme objectives articulate coherently with and contribute directly to the broader program objectives of the NCGP.

² As these strategic objectives were articulated at the time the evaluation was conducted in the first half of 2013.

- On the other hand, there are concerns among a majority of Administering Organisations that Future Fellowships could be better aligned with other ARC fellowships and awards and with National Health and Medical Research Council fellowships.

Are arrangements for monitoring the performance of the *Future Fellowships* funding scheme robust?

- Mechanisms are in place or under development to support the assessment of performance and the measurement of outcomes from the funding scheme. These mechanisms are comprehensive and robust and, potentially, can be implemented more widely across NCGP funding schemes.
- Key performance indicators used to monitor high-level, strategic organisational performance take into account the contribution of Future Fellowships.
- Key performance indicators that relate clearly, directly and specifically to the funding scheme objectives could be developed to provide a sharper focus for monitoring and assessing performance at an operational level.
- Data collection methods are embedded in administration of the funding scheme. In developing the final report form for the scheme and reviewing the scheme's application form, consideration could be given to focusing and streamlining data collection in order to help remedy some deficiencies that are apparent.

Introduction

The *Future Fellowships* funding scheme

The *Future Fellowships* scheme is a component funding scheme of the National Competitive Grants Program (NCGP) administered by the Australian Research Council (ARC).

The *Future Fellowships* scheme provides salary and non-salary project funding to Administering Organisations—Australian universities, publicly funded research agencies and medical research institutes—to support researchers and their research projects.

Because the funding scheme was established to provide support for research across all disciplines, including medicine, the ARC designed the scheme in close consultation with the National Health and Medical Research Council (NHMRC).

The objectives of the *Future Fellowships* scheme are to:

- attract and retain outstanding mid-career researchers;
- build collaboration across industry and/or research organisations and/or disciplines;
- support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia; and
- strengthen Australia's research capacity by supporting innovative, internationally competitive research.

In 2008, the then Australian Government announced the creation of the *Future Fellowships* scheme to promote research in areas of critical national importance by giving outstanding researchers incentives to conduct their research in Australia. The primary aim of *Future Fellowships* is to attract and retain the best and brightest mid-career researchers.

The establishment of the *Future Fellowships* scheme was a response to the growing recognition that many highly qualified mid-career researchers were choosing to work overseas to further their careers due to a lack of opportunities in Australia. The *Future Fellowships* scheme aimed to stem that tide.

Although international experience is important for Australian researchers, it is also important that they have the opportunity to return to Australia to continue their work. The *Future Fellowships* scheme aims to encourage outstanding Australian researchers currently based overseas to return to Australia.

The *Future Fellowships* scheme also aims to attract foreign nationals with high-quality expertise to pursue their research careers in Australia. This has an important benefit in facilitating the growth of Australia's international research networks.

The scheme encourages proposals from researchers working in areas of targeted research priority with the aim of building Australia's research and innovation capacity in areas of national importance. Preference is given to those researchers who can demonstrate a capacity to build collaboration across industry, research institutions and research disciplines.

Future Fellowships are allocated competitively on the basis of peer review to ensure that support for capacity building goes only to the most highly innovative and internationally competitive research.

The *Future Fellowships* funding scheme is a terminating program. The initial funding commitment of \$844.1 million for up to 1000 four-year fellowships commencing over the five-year period 2009 to 2013 was supplemented in the Australian Government's 2013–14 Budget with an additional commitment of \$135.3 million to provide an additional 150 fellowships to commence in 2014.

Purpose of the evaluation

The *Future Fellowships* funding scheme was established in 2009 to provide enhanced support to mid-career researchers, superseding the Australian Research Fellowships and Queen Elizabeth II Fellowships. To date, the ARC has concluded four of the five originally planned funding rounds, with 200 Fellowships awarded to commence in each of 2009 and 2010³, 203 awarded to commence in 2011 and 209 awarded to commence in 2012. Under current funding allocations, there will be a further two funding rounds, for up to about 200 Fellowships commencing in 2013 and up to 150 commencing in 2014.

It is therefore timely to assess the extent to which the funding scheme has been implemented effectively and the scheme's objectives are being met. Since the scheme is a terminating program, it is also timely to consider the ongoing relevance of its objectives to the broader objectives of Australian Government policies for innovation, science and research, as well as to the needs of the Australian research sector.

None of the cohorts of Future Fellows has yet reached the conclusion of the term of their Fellowships. The initial cohort commencing in 2009 will begin to conclude their Fellowships towards the end of 2013 and into early 2014, at which point they will be required, within 12 months, to submit a final report to the ARC on achievements and outcomes. As a consequence, the assessment in this evaluation of the extent to which the *Future Fellowships* objectives are being met is, to some degree, preliminary. Analysis of final report achievements and outcomes, as they come to hand, will be necessary if the findings presented in this report are to be confirmed.

Terms of reference

The terms of reference for the evaluation were to assess the extent to which:

- the *Future Fellowships* funding scheme has been implemented effectively;
- the scheme's objectives are being met; and
- the scheme's objectives remain of ongoing relevance to the broader objectives of Australian Government policies for innovation, science and research, as well as to the needs of the Australian research sector.

This assessment has been guided by a number of evaluation questions:

- are the various elements of the scheme's program design meeting the needs of stakeholders?
- is the scheme successfully achieving its objectives and having a positive impact on individual participants, their host institutions and the research sector as a whole?
- is the scheme being administered and delivered in an efficient manner and is the burden of compliance costs incurred by stakeholders being kept to a minimum?

³ An additional 15 Fellowships, as reserves, were awarded to commence in 2010 to supplement the initial allocation of 200 in that funding round. These were not incorporated in the selection report for that round and are therefore not accounted for in analysis in this report where the total Fellowships awarded over the four funding rounds concluded to date is cited as 812.

- do the scheme's objectives remain consistent with the Australian Government's broader strategic policy priorities for innovation, science and research and do they target demonstrated ongoing stakeholder needs?
- does the scheme articulate coherently with the wider objectives of the NCGP and related Australian Government programs and activities?
- are the arrangements for monitoring the performance of the scheme robust?

Methods

The evaluation of Future Fellowships was supported by a number of methods of data collection and analysis.

Survey of Administering Organisations

Using an on-line questionnaire, the ARC conducted a survey of Administering Organisations which are hosting Future Fellows. This was particularly important in gauging the perspectives of stakeholders on the extent to which the scheme is meeting its objectives and their needs, as well as having a positive impact on the Organisations and their researchers.

The survey questions were formulated with the aim of eliciting the views of Administering Organisations about a wide range of aspects of the funding scheme, including its objectives, the number and duration of Fellowships offered, funding support, integration of Fellows within their Organisations, and the ARC's administration of the scheme.

Of the 44 Administering Organisations invited to participate in the survey 32 responded, a response rate of 73%. The respondent Organisations account for 80% of Future Fellowships awarded over the four funding rounds concluded to date. A list of the respondents to the survey of Administering Organisations is included at Appendix A of this report. The survey questionnaire is included at Appendix B of this report.

Interviews with Future Fellows

As part of the on-line survey, Administering Organisations were invited to nominate up to three of their Future Fellows whom the ARC might interview as part of the evaluation. From this sample of 78 Fellows nominated, the ARC interviewed a sub-sample of 15, chosen so as to represent broadly the sectors, institutional groupings and geographical locations of Administering Organisations, as well as the broad disciplinary affiliations and gender of Fellows themselves.

The ARC conducted these interviews by telephone using a structured set of questions aimed at eliciting information about Fellows' research aspirations and achievements, their leadership roles and collaborative activities, institutional support for their development and retention, and their perceptions of the ARC's administration of the funding scheme.

Summaries of these interviews with Future Fellows are presented in Section 6 of this report. The interview questions themselves are included at Appendix C of this report.

Analysis of administrative data sourced from funding proposals and post-award requests to vary funding agreements

A range of data was extracted from Future Fellowships funding proposals to inform assessment of the effectiveness of the funding scheme's implementation and the extent to which the scheme's objectives are being met.

Data was also extracted from Administering Organisation requests to the ARC to vary Future Fellowships funding agreements as input to assessing the extent to which the objective of attracting and retaining mid-career researchers is being met.

Review of policy, research and administrative documents and reports

Policy statements were reviewed to inform assessment of the extent to which the Future Fellowships objectives remain consistent with the Australian Government's broader strategic policy priorities and objectives. Also consulted were research reports on the impact of outputs from ARC-supported research, reports of internal reviews and audits of ARC grants administration, and program documentation that supports administration of the scheme, such as funding rules, funding agreements and application forms.

Final reports on outcomes

Across all NCGP funding schemes, it is a standard requirement under funding agreements that at the conclusion of each and every grant the Administering Organisation submit to the ARC a final report on the project that was funded by the grant. The focus of final reporting is on outputs and outcomes, to enable the ARC to assess the extent to which each project has been successful in achieving its own objectives and contributing to the achievement of the wider objectives of the funding scheme and the NCGP as a whole. However, since none of the grants awarded for Future Fellowships have yet to reach the conclusion of their funding term, no final reports have been submitted upon which such an assessment could be made at this time.

Accountability

The evaluation of the *Future Fellowships* funding scheme was conducted by the Program Evaluation Section within the ARC. Communications staff from within the ARC's Corporate Services Branch assisted generously in preparing summaries of interviews with Future Fellows included in this report.

Section 1: Implementation

A primary purpose of the evaluation of Future Fellowships was to assess the extent to which the funding scheme has been implemented effectively. Broadly, the question guiding this assessment was:

Are the various elements of the scheme's program design meeting the needs of stakeholders?

Program design elements of the scheme and their administration

The *Future Fellowships Funding Rules for funding commencing in 2013*⁴ provide the most recent statement of rules for the scheme and its conduct⁵. In summary, the rules encompass scheme objectives, selection criteria, funding arrangements, requirements for organisational as well as individual researcher eligibility, procedures for administering the submission, selection and approval of funding proposals, reporting requirements for grants awarded, and fundamental principles of conducting research, including ethics and research practices.

In its survey of Administering Organisations, the ARC invited comment on some of the main program design elements of the scheme and the ARC's administration of these.

Organisational eligibility

Australian higher education institutions, other publicly funded organisations that carry out research or which have research-related purposes and objectives, and medical research institutes are eligible to administer Future Fellowships funding.

Under previous comparable scheme support, publicly funded research organisations and medical research institutes were eligible to administer funding for Queen Elizabeth II Fellowships but not Australian Research Fellowships. It was also the case under both of those Fellowships that research encompassing near-term clinical medical (including dental) outcomes was ineligible for funding—this has not been the case under the *Future Fellowships* scheme.

In its survey of Administering Organisations, the ARC invited comment on the appropriateness of the scope of current organisational eligibility.

Question: Is it appropriate that Future Fellowships have been available for tenure within the following types of institutions?			
Answer Options	Yes, appropriate	No, inappropriate	Response Count
Higher education institutions	32	0	32
Publicly funded research agencies	26	6	32
Other publicly funded agencies with research-related purposes and objects (including museums and herbaria)	22	10	32
Medical research institutes	22	10	32
answered question			32

While there is universal acceptance among survey respondents of the eligibility of higher education institutions, this is not the case for the eligibility of other types of organisation. In particular, almost

⁴ http://www.arc.gov.au/pdf/FT13/FT13_Funding_Rules%20-%20final.pdf

⁵ Funding rules for funding commencing in 2014 had not been publicly released at the time of writing of this report.

one in three respondents believes that it is inappropriate that museums, herbaria and medical research institutes are eligible to administer funding.

Higher education institutions account for 23 of the 26 cases in which respondents indicated that it was inappropriate that eligibility encompass non-higher education institutions. In program design for ongoing support for mid-career researchers, consideration could be given to identifying the specific concerns about organisational eligibility that a number of higher education institutions—and some others—have, and to assessing the legitimacy of these as they might relate to considerations such as the balance of funding opportunities across the range of research disciplines, the quality of institutional research environments and institutional support for leadership roles in research training.

The following table presents information about proposals submitted by, and Fellowships awarded to, each type of organisation over the life of the scheme to date.

Type of Administering Organisation—proposals and awards				
Type of organisation	Number of organisations submitting proposals	Number of proposals submitted	Number of proposals funded	Success rate of proposals (%)
Funding commencing in 2009				
Higher education institutions	35	862	176	20.4
Publicly funded research agencies	8	49	6	12.2
Museums and herbaria	0	0	0	-
Medical research institutes	19	64	18	28.1
<i>Sub-total</i>	62	975	200	20.5
Funding commencing in 2010				
Higher education institutions	36	696	181	26.0
Publicly funded research agencies	5	22	4	18.2
Museums and herbaria	1	1	0	0.0
Medical research institutes	10	40	15	37.5
<i>Sub-total</i>	52	759	200	26.4
Funding commencing in 2011				
Higher education institutions	35	617	192	31.1
Publicly funded research agencies	2	11	1	9.1
Museums and herbaria	0	0	0	-
Medical research institutes	11	33	10	30.3
<i>Sub-total</i>	48	661	203	30.7
Funding commencing in 2012				
Higher education institutions	34	558	192	34.4
Publicly funded research agencies	2	12	4	33.3
Museums and herbaria	0	0	0	-
Medical research institutes	12	33	13	39.4
<i>Sub-total</i>	48	603	209	34.7

Overall, the information in the table suggests that institutional expectations of success may have been over-inflated in early funding rounds, moderating and stabilising in later rounds. Between the first and most recent funding rounds:

- the number of organisations submitting proposals fell substantially, by 23%;
- the number of proposals submitted also fell substantially, by 38%; and, as a consequence
- the success rate of proposals rose substantially, from 20.5% to 34.7%.

Other factors that may have contributed to this fall in demand include the scheme's funding rule that allows no more than two applications from an individual candidate over the six funding rounds currently budgeted for, and the introduction of the Discovery Outstanding Researcher Award

(DORA), first offered for funding commencing in 2012 under the *Discovery Projects* funding scheme⁶. It may also be that, as each new cohort of Fellows has taken up their Future Fellowships, the pool of high-quality candidates has decreased in size within Australia.

This trend of falling demand may not continue. Up until 2011, the number of ARC-funded early-career fellowships (Australian Postdoctoral Fellowships) allocated each year was just in excess of 100. Commencing in 2012, the ARC is now offering an increased number of opportunities to early-career researchers in the form of DECRAAs. A total of 277 of these were awarded to commence in 2012 and 200 to commence in 2013. As the recipients of DECRAAs begin to complete their awards, from the end of 2014, in effect almost doubling the number of early-career fellowship completions annually, it can be expected that there will be upward pressure on demand for subsequent mid-career fellowship opportunities.

As a consequence, there may be continuing pressure from higher education institutions to narrow the scope of institutional eligibility for Future Fellowships funding, particularly given that the scope of eligibility for DECRA funding excludes medical research institutes, museums and herbaria as organisations as well as research encompassing near-term clinical medical (including dental) outcomes.

Number of fellowships awarded annually

Over the five-year period 2009 to 2013, the *Future Fellowships* scheme will offer four-year fellowships to up to 1000 mid-career researchers, with about 200 awarded in each funding round. To date 812 Fellowships have been awarded. In its 2013–14 Budget, the Government committed funding to support an additional funding round for 150 Fellowships to commence in 2014.

Administering Organisations were invited to comment on the appropriateness of the number of Fellowships awarded annually.

Question: Given the funding that was allocated to the Future Fellowships scheme, has the target number of Fellowships awarded annually (200) been:		
Answer Options	Response Percent	Response Count
too few	6.3	2
about right	87.5	28
too many	6.3	2
answered question		32

The overwhelming majority of respondents, almost 88%, believe that the number of Fellowships awarded annually is “about right”.

Respondents who answered “too few” or “too many” were invited to indicate what they believe should have been the target number of Fellowships awarded annually. Of the two that answered “too few”, one indicated 240 and the other 250; the two that answered “too many” both indicated 125.

As noted above, demand for Future Fellowships has fallen steadily over the four funding rounds concluded to date. There is, however, no evidence that this has been accompanied by a fall in the quality of successful Fellowship candidates. With demand for mid-career opportunities likely to

⁶ A total of 26 DORAs were awarded funding commencing in 2012 and 37 were awarded funding commencing in 2013.

increase from 2015, there may be growing pressure on the number of fellowship opportunities for mid-career researchers.

Duration of tenure

Future Fellowships are funded for a period of four years. Administering Organisations were invited to comment on the appropriateness of this duration of tenure.

Question: Given the funding that was allocated to the scheme, has the duration of Fellowships awarded (i.e. four years full-time) been:		
Answer Options	Response Percent	Response Count
too short (6 years would have been preferable)	0.0	0
too short (5 years would have been preferable)	25.0	8
about right	75.0	24
too long (3 years would have been preferable)	0.0	0
answered question		32

The majority of respondents, 75%, believe that the four-year duration of the Fellowships is “about right”. None believe that it is too long and should be shortened but a sizeable minority (25%) believe that it is too short and that five years would have been preferable. Among this latter group, a number of respondents commented on benefits that would arise from a fellowship duration of five years, citing:

- a better platform for highly innovative research outcomes;
- greater productivity of Fellows;
- better support for research disciplines that rely on extensive fieldwork or longitudinal data collection;
- better management of the PhD student groups that tend to form around Future Fellows⁷;
- an easing of workforce planning and management pressures on Administering Organisations; and
- a more appropriate period in which to allow Fellows to establish their competitiveness for ongoing support from other funding sources.

Studies of the academic impact of publications arising from ARC-funded research lend some support to the notion that five-year fellowships provide a strong platform for highly innovative research outcomes. While it is too early to judge the impact of *Future Fellowships*, since the first cohort of Fellows is not due to conclude the term of its funding until the end of 2013, studies have shown that the predecessor ARC mid-career research fellowships—Australian Research Fellowships and Queen Elizabeth II Fellowships—both offering a tenure of five years in duration, supported highly innovative and internationally competitive research. The same is true for the former ARC Federation Fellowships for established research leaders, which also offered five-year tenure. These studies are discussed further in Section 2 of this report.

The benefits of a five-year tenure for Future Fellowships identified by Administering Organisations are also consistent with the conclusion recently expressed in the Government’s *2012 National Research Investment Plan* that “...a shift toward more widespread use of grants of longer duration, directed to individuals and teams, would be beneficial as it would also enable more of Australia’s excellent researchers to build strong research teams and focus their effort on longer term programs

⁷ Notwithstanding that PhD stipends are not an eligible cost under *Future Fellowships* funding.

of research”⁸. In pursuit of Action 6 of that Plan, the ARC and NHMRC have been asked to consider options for the more widespread use of research grants of longer duration to individuals and teams. The three salary levels available to Future Fellowships (discussed below) may offer a framework for considering options to extend the duration of funding selectively within the scheme, should that be desirable—for example, by extending to five years the period of tenure of Salary Level 2 and/or Level 3 Fellowships.

Salary levels

Future Fellowships have been made available at three salary levels. For those commencing in 2013, these are:

• Level 1:	Salary: \$108,461	28% On-costs: \$30,369	Total: \$138,830
• Level 2:	Salary: \$131,296	28% On-costs: \$36,764	Total: \$168,060
• Level 3:	Salary: \$154,129	28% On-costs: \$43,157	Total: \$197,286

These three levels are designed to take into account the range of applicants’ prior appointments and salaries, academic achievements and standing, as well as, on the basis of that experience, varying expectations about standard of capability as a prospective Fellow.

Administering Organisations were invited to comment on the usefulness and appropriateness of the three salary levels.

Question: Has the availability of Future Fellowships at the three salary levels been useful and appropriate?			
Answer Options		Response Percent	Response Count
Yes		87.5	28
No		12.5	4
answered question			32

The overwhelming majority of respondents, almost 88%, believe that the salary levels are useful and appropriate.

Two respondents expressed some reservation about Salary Level 3: one commenting that “given ‘mid-career level’ researchers could be argued to more closely align with Steps 1 and 2 of the *Future Fellowships* scheme, there is potential for the Professorial-level Fellowships (existing Future Fellowships Step 3) to be handled separately”; the other that “it is debatable that the highest level is necessary, given the Laureate [Fellowships] option”⁹.

Other comments were that:

“Some institutions appear to have used the scheme to defray existing salary costs rather than increase capacity across the system. This could be alleviated by providing a preferential weighting to candidates coming from institutions outside the administering institution”

“Our institutions have consistently been required to supplement these salaries to retain the staff”

“Prefer to attract people 5-10 years post-PhD, not more”.

⁸ Department of Industry, Innovation, Science, Research and Tertiary Education (2012), *2012 National Research Investment Plan*

⁹ On the other hand, 29 Salary Level 3 Future Fellowships as opposed to only 17 Australian Laureate Fellowships were awarded funding commencing in 2012.

This last comment is referring to the requirement in *Future Fellowships* funding rules that mid-career researchers have between 5 and 15 years research experience since the award of their PhD (or equivalent research qualification) at the closing time for submission of proposals.

The numbers and percentages of Fellowships awarded to date at each of the three salary levels across all Administering Organisations are:

- Level 1: 431 (53%)
- Level 2: 269 (33%)
- Level 3: 112 (14%)
- Total: 812¹⁰

Administering Organisations were invited to comment on the appropriateness of this distribution.

Question: Does the number of Future Fellowships awarded to date at each of the three salary levels across all Administering Organisations represent an appropriate distribution?		
Answer Options	Response Percent	Response Count
Yes	90.6	29
No	9.4	3
answered question		32

The overwhelming majority of respondents, almost 91%, believe that the distribution of Fellowships across the three salary levels has been appropriate. Among this majority, some respondents provided additional comment, in some cases qualifying their support for the distribution:

“The distribution reflects the number of applications submitted for each level and therefore represents where the demand is. It is also consistent with the scheme’s objective of supporting mid-career researchers”

“This distribution has been successful in bringing new researchers into the system, but the spread has the potential to create a disconnect between Future Fellowships and other higher level opportunities, such as Laureate Fellowships, by being focused at the entry level end”

“The distribution of Future Fellows across the funding levels is about right, supporting more Level 1 fellows, and tapering off through Level 2 and Level 3 fellows. And the range of three salary levels is adequate. However, significant salary gaps have to be met by the institution and these increase with annual salary indexation, progression through salary scales and promotions. Ideally, the Commonwealth should commit to the full funding of direct and indirect costs of research associated with Australian Competitive Grants”.

Among the three respondents that indicated that the distribution of Fellowships across the salary levels has not been appropriate, two indicated that their preference would have been to see more awarded at the higher Level 2 and Level 3 salaries, while the other would have preferred to see most, if not all, awarded at the lower salary level:

“If the aim of the Future Fellows scheme is to attract and retain outstanding mid-career researchers, it would seem beneficial to invest in a greater number of Fellowships at Salary Level 3 in order to retain the researchers who are achieving at this very high level”

¹⁰ This distribution is determined simply by the number of proposals that are submitted for funding at each of the three salary levels and the quality of the proposals within the three proposal subsets.

“We would like to see more fellowships awarded across the Level 2 and 3 fellowships. These levels exhibit higher degrees of leadership potential”

“I would like to see more people at Level C [Level 1], I think by the time someone gets to Level E [Level 3] an institution should fund them”¹¹.

Project support

Administering Organisations can receive non-salary project support funding of up to \$50,000 per annum for each Future Fellowship for expenditure on infrastructure, equipment, travel and relocation costs directly related to a Future Fellow's research.

Administering Organisations were invited to comment on the most appropriate maximum level of such project support.

Please indicate what you think would have been the most appropriate amount for research support:		
Answer Options	Response Percent	Response Count
\$50,000 per annum (as currently)	68.8	22
Less than \$50,000 per annum	0.0	0
More than \$50,000 per annum	31.3	10
answered question		32

While a clear majority of respondents believes that the level of project funding support for Future Fellows has been adequate, a sizeable proportion, almost one-third, believes that it has been too low. Among these latter, six specified a level at which they would have preferred to see funding support offered: with one specifying \$75,000, four \$100,000 and one \$150,000. Comments by some Administering Organisations suggest that raising the level of project support would increase substantially the attractiveness of Future Fellowships to potential candidates from overseas.

Proposals to improve the funding scheme

Administering Organisations

Administering Organisations were invited to nominate the most important change they would like to see made to improve the *Future Fellowships* funding scheme. Their responses to this are set out in the table below.

Most important change to improve the scheme—Administering Organisations	
Proposed improvement	Response Count
Increase the Fellowship funding duration to five or six years	5
Increase the upper limit on funding for project support	5
Allow Fellowship holders to apply for a subsequent Fellowship (options include: opening Fellowships at Level 3 salary support to applicants with prior Fellowship support at salary Levels 1 or 2; treating the salary Levels as steps to allow research active progression; and allowing application for a second Fellowship at 15 to 20 years post-PhD)	3
Increase the number of Fellowships awarded annually	2
Exclude or limit ongoing academic staff from eligibility to apply except as part of a move to another institution	2
Allow concurrent applications for Future Fellowships and other ARC and NHMRC Fellowships	2
Offer greater incentives to attract candidates from overseas (including increased funding for start-up support, particularly for infrastructure)	2

¹¹ This is referring to the academic salary levels A to E that are applied within Australian higher education institutions, with A the lowest and E the highest (professorial) level.

Allocate Fellowships for “lower/middle tier” institutions investing in research capacity and capability building	1
Award a greater proportion of Fellowships at salary Level 3	1
Add a salary Level 4 as a step between Future and Laureate Fellowships	1
Combine salary Level 3 Fellowships with DORAs to create a Professorial Fellowship that can be held more than once	1
Narrow the range of research disciplines in which Fellowships can be held	1
Allow greater flexibility for expenditures on project infrastructure (e.g. “front-end” purchase of equipment costing \$150k)	1
Relax restrictions on the number of other grants that can be held concurrently with a Fellowship	1
Integrate Future and NHMRC Fellowships to avoid the potential for hiatuses in employment	1
Exclude from eligibility medical and dental research, as per Discovery Projects	1
Allow extension funding for salary Level 3 Fellowships beyond the fourth year of tenure	1
Provide longer lead times for application and more timely advice to applicants	1
Introduce a substantial level of minimum funding support to be provided for each Fellowship by Administering Organisations	1
Include postgraduate and postdoctoral stipends as eligible budget items under project support	1
Allocate Fellowships among institutions in a more evenly distributed way	1

The most commonly proposed improvements to the scheme would increase the duration of tenure of Fellowships and increase the amount of project funding support available annually to Fellows—this echoes the substantial, albeit minority, support for these changes expressed in response to other survey questions discussed above.

Future Fellows

Section 6 of this report provides personal accounts by Future Fellows of the ways in which Future Fellowships have served as a springboard for them to pursue their mid-career research aspirations—these accounts convey the creative energy that is being supported by the Fellowships. The interviews of 15 Future Fellows included an invitation to comment on ways in which the *Future Fellowships* funding scheme could be improved to provide more effective support to mid-career researchers. Their responses to this are set out in the table below.

Ways the scheme could be improved—Future Fellows	
Proposed improvement	Response Count
Increase the upper limit on funding for project support	2
Provide a career progression step between Future and Laureate Fellowships	2
Introduce as a condition of funding that Administering Organisations commit to funding ongoing positions for Fellows at the conclusion of their Fellowships	2
Increase the Fellowship funding duration to five years	1
Allow Fellows to apply for a second Future Fellowship at the conclusion of their first	1
Provide for formal and strong mentoring arrangements for Fellows	1
Allow PhD supervision to extend beyond the scope of the Fellowship project to allow it to go in other directions	1
To support collaboration, allow project support funding to be expended on travel for personnel other than the Fellow	1
Exclude established professorial level staff from eligibility to apply	1
ARC support to create forums for Future Fellows to broaden their networks to include, for example, leaders in government and business	1
ARC support to increase promotion of Future Fellows' achievements	1
Opportunities for Future Fellows to serve on the ARC College	1
Reduce the length and complexity of the Future Fellowships application form	1

Broadly, these proposed improvements appear to be motivated by a desire on the part of Fellows to:

- have a more secure basis on which to pursue their research;
- be given greater flexibility to tailor budget expenditures to their particular research needs (in areas such as infrastructure, research training and travel); and

- be offered outreach opportunities (for example, to extend their professional networks and serve in wider research management roles).

Summary of findings

- The *Future Fellowships* funding scheme has been implemented effectively—among Administering Organisations there is a consensus that the various elements of the scheme’s program design are meeting their needs.
- There is some concern among Administering Organisations, particularly universities, about the scope of organisational eligibility to apply for and administer Future Fellowships funding—consideration could be given to identifying the specific nature of these concerns and to assessing their legitimacy.
- The trend of falling demand for Future Fellowships funding over the four funding rounds concluded to date may begin to be reversed as the first and then subsequent cohorts of DECRAAs conclude the terms of their awards, placing upward pressure on the number of fellowship opportunities available to mid-career researchers.
- The overwhelming view among Administering Organisations is that the Future Fellowships salary levels, and the distribution of Fellowships awarded across these, is appropriate.
- There is substantial, although not majority, support among Administering Organisations for lengthening the period of tenure of Future Fellowships from four to five years—consistent with the former Government’s desire to shift towards more widespread use of research grants of longer duration.
- There is substantial, although not majority, support among Administering Organisations for raising the ceiling on the amount of project funding support available each year to each Future Fellowship, from \$50,000 to at least \$100,000.
- Future Fellowships are highly valued by researchers themselves in allowing them to pursue their mid-career research aspirations—in their comments on ways the funding scheme might be improved, Future Fellows express a desire for more secure ongoing research support, greater flexibility to tailor project expenditures to their individual needs, and more opportunities to engage in outreach activities.

Section 2: Effectiveness

Assessment of the effectiveness of the *Future Fellowships* funding scheme involves considering to what extent:

- the scheme has clear objectives that are consistent with the Government's initial policy intent; and
- the scheme is achieving its objectives.

As set out in the Introduction to this report, those objectives are to:

- attract and retain outstanding mid-career researchers;
- build collaboration across industry and/or research organisations and/or disciplines;
- support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia; and
- strengthen Australia's research capacity by supporting innovative, internationally competitive research.

Clarity of objectives

The objectives of the *Future Fellowships* funding scheme have remained unchanged over the five funding rounds conducted to date. Section 4 of this report includes a discussion of the strategic policy alignment and appropriateness of the scheme and concludes that it continues to be consistent with the Australian Government's broader strategic policy priorities and objectives for innovation, science and research¹².

A 2012 internal audit conducted for the ARC considered the extent to which the ARC's grants administration practices are consistent with the better practice principles of the Commonwealth Grant Guidelines¹³ and the Australian National Audit Office better practice guidance on grants administration¹⁴, including an analysis of processes and procedures for the assessment and approval of grant proposals and the payment and acquittal (including reporting of outcomes) of grants¹⁵. The *Future Fellowships* funding scheme was a focus of this audit. The audit found that:

- clear and appropriate objectives for the funding scheme are set out in funding rules; and
- the ARC Strategic Plan¹⁶ identifies operational objectives that directly link to the objectives of the funding scheme.

Achievement of objectives

There were two primary sources of information used to assess the extent to which the *Future Fellowships* funding scheme is achieving its objectives: funding proposals, from which, for example, the residence status of candidates can be determined and in which candidates identify collaborative elements of their proposed research and the research priorities to be addressed; and the survey of

¹² As these strategic objectives were articulated at the time the evaluation was conducted in the first half of 2013.

¹³ Department of Finance and Deregulation (2009), *Commonwealth grant guidelines: policies and principles for grants administration*

¹⁴ Australian National Audit Office (2010), *Implementing Better Practice Grants Administration*

¹⁵ KPMG (2012), *Australian Research Council: Internal Audit of Grant Administration* (unpublished)

¹⁶ Australian Research Council (2012), *Strategic Plan 2012–13 to 2014–15* (http://www.arc.gov.au/about_arc/strategic_plan.htm)

Administering Organisations which invited comment on achievement of the scheme's objectives from the perspective of the experience of those organisations administering funding for Future Fellowships.

Objective: Attracting and retaining outstanding mid-career researchers

"I had a permanent position in London and, at the time I was awarded the Future Fellowship, I had a fellowship in Germany which I had to cut short. Without the Future Fellowship I would most likely have submitted proposals to UK or European funding councils and so remained in Europe."

Quentin Stevens, Future Fellow, RMIT University

This objective aligns with National Innovation Priority 2:

"Australia has a strong base of skilled researchers to support the national research effort in both the public and private sectors"¹⁷.

The following table presents information about the citizenship or residency status of applicants for, and recipients of, Future Fellowships in each of the four funding rounds concluded to date.

Citizenship/residency status at time of application—proposals and awards				
Citizenship/Residency Status	Number of proposals considered	% of proposals considered	Number of proposals approved	% of proposals approved
Commencing in 2009				
Resident Australian	761	78.1	159	79.5
Returning Australian	80	8.2	19	9.5
Foreign National	134	13.7	22	11.0
Commencing in 2010				
Resident Australian	603	79.4	168	84.0
Returning Australian	53	7.0	10	5.0
Foreign National	103	13.6	22	11.0
Commencing in 2011				
Resident Australian	516	78.1	169	83.3
Returning Australian	43	6.5	18	8.9
Foreign National	102	15.4	16	7.9
Commencing in 2012				
Resident Australian	463	76.8	174	83.3
Returning Australian	46	7.6	12	5.7
Foreign National	94	15.6	23	11.0

The Fellowships have attracted to Australia a total of 142 researchers, 59 as returning Australians and 83 as foreign nationals. Because of the lack of comparable funding opportunities in Australia, it is unlikely that many, if any, of these researchers would have been attracted in the absence of the Future Fellowships.

Future Fellowships have been awarded to a total of 670 resident Australians. In the absence of those opportunities, these researchers might have pursued other avenues of support, including overseas and, in some cases, outside the research sector.

¹⁷ Department of Innovation, Industry, Science and Research (2009), *Powering Ideas: An Innovation Agenda for the 21st Century*

In short, 17.5% of Future Fellowships have been awarded to date to attract researchers to Australia from overseas (7.3% as returning Australians and 10.2% as foreign nationals) and 82.5% have been awarded to retain researchers within Australia.

Stakeholder perceptions

In its survey of Administering Organisations, the ARC invited comment on the extent to which the Future Fellowships are serving to attract and retain outstanding mid-career researchers. As indicated in the table below, almost 97% of respondents believe that this objective is being met fully or mostly and none believe that it is not being met at all.

Question: Is the <i>Future Fellowships</i> scheme meeting its objective to attract and retain outstanding mid-career researchers?		
Answer Options	Response Percent	Response Count
yes, fully	68.8	22
yes, mostly	28.1	9
yes, but only somewhat	3.1	1
no, not at all	0.0	0
answered question		32

Respondents were invited to provide additional comment if they answered other than “yes, fully” to this question. The one respondent that answered “yes, but only somewhat” commented that “while it does retain outstanding mid-career researchers it is doubtful that the scheme has attracted mid-career researchers. This could be due, in part, to the very long lag time between closing of applications and notification of outcomes. A quality researcher will often have other opportunities and is not going to wait for such a long lag period”.

Two other respondents commented similarly that the scheme has been more effective in retaining rather than attracting mid-career researchers. One of these commented that “the amount of detail required in the applications and the time delay between submission and acceptance is a major turn-off for many would-be applicants”.

Administering Organisation concerns about the time taken to assess proposals for funding and announce funding decisions, and the length and complexity of application forms, are discussed further in Section 3 of this report in the context of compliance costs.

Post-award administrative data for the funding scheme provides some support for the view that the Future Fellowships are more effective in retaining mid-career researchers than attracting them. The table below shows, in aggregate for the four funding rounds concluded to date, the numbers of Fellowships rejected (that is, not taken up) and relinquished (subsequent to take-up), by the residency status of Fellowship candidates at the time of their application.

Fellowships rejected or relinquished by citizenship/residency status at time of application				
Fellowships awarded	Rejected	Relinquished	Total awards foregone	% of total awards
Resident Australian				
670	9	2	11	1.6
Returning Australian				
59	6	0	6	10.2
Foreign National				
83	10	5	15	18.1
Total				
812	25	7	32	3.9

The information in this table does appear to indicate that an offer of a Future Fellowship is much less attractive to candidates located overseas than to those in Australia. Foreign nationals and returning Australians are, respectively, 11 and six times more likely than resident Australians to forego a Fellowship (either through rejection or relinquishment); another way of expressing this is that almost one-in-five foreign nationals and about one-in-ten returning Australians are foregoing their Fellowships, while less than one-in-fifty resident Australians are doing so.

Future Fellowships are rejected or relinquished broadly for two reasons: in order to accept an alternative offer of a position or because of family or other personal circumstances. The table below shows the prevalence of these reasons by the residency status of Fellowship candidates at the time of their application.

Rejection/relinquishment of Fellowships					
Reason for rejection or relinquishment	Residency status at application			Total	%
	Resident Australian	Returning Australian	Foreign National		
Acceptance of alternative position	11	3	7	21	65.6
Family or other personal reason	0	3	8	11	34.4
<i>Total</i>	<i>11</i>	<i>6</i>	<i>15</i>	<i>32</i>	<i>100.0</i>

The information in this table indicates that family or other personal circumstances are no barrier to resident Australians taking up their Fellowships but that they are (of equal importance to offers of an alternative position) to returning Australians and foreign nationals. Almost two-thirds of all Fellowships rejected or relinquished are foregone in order to accept an offer of an alternative position.

As noted above, the suggestion has been made that long lag times between application and announcement of funding may be undermining the scheme's effectiveness in attracting overseas candidates. The table below shows the numbers of Fellowships rejected (that is, not taken up) by returning Australians or foreign nationals in each of the funding rounds concluded to date and, for each of those rounds, the time elapsed between the close of the application period and announcement of decisions on funding.

Fellowships rejected by Returning Australian or Foreign National candidates, by funding round					
Funding round	Fellowships rejected	% of total	Application close	Funding announcement	Elapsed years
Commencing 2009	5	31	26/11/08	09/09/09	0.79
Commencing 2010	5	31	21/04/10	17/11/10	0.58
Commencing 2011	4	25	20/04/11	14/11/11	0.57
Commencing 2012	2	13	30/11/11	25/07/12	0.65
<i>Total</i>	<i>16</i>	<i>100</i>	<i>-</i>	<i>-</i>	<i>-</i>

The information in the table is inconclusive. While the elapsed time between application and announcement of funding may play some part in the rate of take-up of Fellowships, other factors may be as or more important. The fact that the number of rejected Fellowships is lowest in the most recently concluded funding round might indicate that, with experience over time, Administering Organisations are becoming more effective at targeting their efforts to attract candidates from overseas, or are overcoming the 'tyranny of distance' by offering stronger incentives for take-up in the form of more attractive funding and other support—consultations with Administering Organisations might shed light on this. A comparative analysis of the program design of Future Fellowships and that of counterpart fellowships available overseas could shed light on the extent, if any, to which elements such as length of tenure and project funding support might also be a

contributing factor in the rate of take-up. A similar comparative analysis of rates of application from overseas could inform understanding of the relative attractiveness of Future Fellowships internationally.

One respondent to the survey of Administering Organisations commented that “the scheme is certainly attracting outstanding people but retention depends on the commitment of the host institution”. This is an important observation since Future Fellowships are intended to contribute to research workforce planning and succession by assisting in transitioning researchers to continuing positions in universities and other research organisations.

The survey of Administering Organisations sought to explore the extent to which retention strategies are in place—one factor that might contribute to retention of Fellows is the commitment on the part of Administering Organisations to integrating them into institutional activities. Administering Organisations were asked whether or not they had formal policies in place for this.

Question: Does your institution have formal policies for integrating Future Fellows into the ongoing activities of the organisation during and at the conclusion of their Fellowships?		
Answer Options	Response Percent	Response Count
Yes	15.6%	5
No	84.4%	27
answered question		32

At 15.6%, the percentage of Organisations with formal policies in place is low. Nevertheless, when invited in the survey to comment further on the most important strategies that they have adopted in order to integrate Future Fellows into the broader academic life and environment of their organisation, only one indicated that it had no strategies in place. The strategies adopted are set out in the table below.

Most important strategies for integrating Fellows into Administering Organisations	
Strategy category	Response Count
Research leadership roles within laboratories, schools and faculties	10
Participation in mentoring, training and professional development	8
Offer of continuing position upon completion of Fellowship, subject to performance	8
Supplementary project funding	7
Membership of academic and other organisational management committees	7
Provision of teaching opportunities to maintain a balance of academic skills and connection with students	5
Participation by Fellows in promotion schemes	5
Location of Fellows within research centres or networks to provide access to infrastructure and mentoring	5
Scholarship funding for PhD students and postdoctoral research support	4
Creation of a research fellows network	2
Promotion of Fellows' activities and achievements internally and externally	2

In the *Future Fellowships Funding Rules for funding commencing in 2013*, the ceiling on the time Fellows are permitted to spend on teaching activities was raised from 0.05 FTE (full-time equivalent) annually to 0.15 FTE annually. In their survey responses, two Administering Organisations commented specifically that this change was welcome in supporting balanced skills development for Future Fellows.

In commenting on their strategies for integrating Fellows, a number of Administering Organisations referred to internal programs of support for highly promising and high-achieving researchers more broadly. The existence of these broadly based programs, supporting not only Future Fellows but

researchers in a range of other circumstances may, in part at least, account for the low percentage of Organisations which indicated they have formal policies in place specifically to integrate Future Fellows.

As indicated in the table above, for some Administering Organisations one of the most important strategies for integrating Future Fellows is for the Fellows to participate in promotion schemes. Organisations were invited in the survey to identify the number of their Fellows from the cohorts commencing in 2009 and 2010 who have been promoted since taking up their Fellowship. In aggregate, the 27 respondent Organisations that were awarded Fellowships in the 2009 funding round and that have retained one or more of these¹⁸ indicated that 47 of 127 (or 37% of) Fellows from that round have been promoted. The 23 respondent Organisations that were awarded Fellowships in the 2010 funding round and that have retained one or more of these indicated that 43 of 138 (or 31% of) Fellows from that round have been promoted. In short, about one-third of all Future Fellows have received a promotion by the time of the penultimate or final year of their Fellowship.

Of the 15 Future Fellows who were interviewed, 12 were asked if they had been promoted by their Administering Organisation since taking up their Fellowship; of these, 9 responded “Yes” and three responded “No”.

Lastly, Administering Organisations were asked how many of the Future Fellows who commenced with them in 2009 and 2010 they expect to retain in their employ following completion of their Fellowships. In aggregate, the 29 respondent Organisations that were awarded Fellowships in the 2009 funding round and that have retained one or more of these indicated that they expect to retain 125 of 133 (or 94% of) Fellows from that round. The 26 respondent Organisations that were awarded Fellowships in the 2010 funding round and that have retained one or more of these indicated that they expect to retain 130 of 142 (or 92% of) Fellows from that round. In short, Administering Organisations expect that almost all of their Future Fellows will remain in their employ following completion of their Fellowship.

Of the 15 Future Fellows interviewed, 14 were asked if they expected to remain employed with their Administering Organisation at the conclusion of their Fellowship; of these, 12 responded “Yes”, one responded “No” and one responded “Not sure”.

Objective: Building collaboration

“I work very closely with non-government organisations in cancer control, such as the Cancer Council Queensland and the Prostate Cancer Foundation of Australia, and am deeply committed to their causes.”

Suzanne Chambers, Future Fellow, Griffith University

This objective aligns with National Innovation Priorities 5 and 6:

“The innovation system encourages a culture of collaboration within the research sector and between researchers and industry”; and

¹⁸ For a variety of reasons, a number of Future Fellowships are relinquished by Administering Organisations or transferred from one Organisation to another, post-award. Of the 200 Fellowships awarded to commence in 2009, 15 were either not taken up or relinquished post-award and 15 were transferred; of the 200 awarded to commence in 2010, 11 were either not taken up or relinquished post-award and 22 were transferred.

“Australian researchers and businesses are involved in more international collaborations on research and development”¹⁹.

One measure of collaboration is the number of organisations that are engaged with and contributing to a research project. The *Future Fellowships Funding Rules for funding commencing in 2013* specify that a proposal for funding may involve one Administering Organisation (to administer Fellowship funding under a funding agreement with the ARC) and one or more Host Organisations. Future Fellows may conduct research at Host Organisations for a period or periods of up to one year, in total, over the life of the Fellowship in cases where the Host Organisations are not Eligible Organisations (that is eligible to administer Fellowship funding), or for up to two years in total over the life of the Fellowship at Host Organisations that are Eligible Organisations.

Of the 812 Future Fellowships awarded to date, 193 or almost 24% involve at least one Host Organisation. In total 414 Host Organisations are contributing to those 193 Fellowships. The table below shows the number of Host Organisations associated with funded proposals in each funding round concluded to date.

Number of Host Organisations identified in funded proposals		
Funding commencing	Proposals funded	Host Organisations
2009	200	61
2010	200	124
2011	203	113
2012	209	116
Total	812	414

The vast majority of Host Organisations, 311 or 75%, are universities. The table below shows, in aggregate for all funding rounds concluded to date, the number of different types of Host Organisation associated with funded proposals.

Type of Host Organisation		
Organisation type	Number of organisations	% share of total
University	311	75.1
Publicly funded research agency	56	13.5
Medical research institute	14	3.4
Company	11	2.7
Government organisation*	10	2.4
Hospital	5	1.2
Museum	4	1.0
Not-for-profit organisation*	3	0.7
Total	414	100.0

*Non-research organisations

Although the majority of Host Organisations are universities, only a minority, 78 or 19%, are Eligible Organisations. This is associated with the fact that the majority of Host Organisations, 316 or 76%, are located outside Australia—more than half of these being located within the USA or the UK. The table below shows the distribution of Host Organisations by country.

Country location of Host Organisations			
Country	Number of Host Organisations	% share of total	% share of overseas total
Australia	98	23.7	-
USA	109	26.3	34.5
UK	55	13.3	17.4
Germany	25	6.0	7.9

¹⁹ Department of Innovation, Industry, Science and Research (2009), *Powering Ideas: An Innovation Agenda for the 21st Century*

Canada	21	5.1	6.6
France	11	2.7	3.5
Japan	11	2.7	3.5
Netherlands	9	2.2	2.8
New Zealand	9	2.2	2.8
China	8	1.9	2.5
Other (each with less than 2% share of overseas total)	58	14.0	18.4
Overseas total	316	76.3	100.0
<i>Total</i>	<i>414</i>	<i>100.0</i>	<i>-</i>

Over and above their formal research links with Host Organisations, Future Fellows establish and maintain other less formal collaborative links with researchers and research organisations within Australia and overseas. Candidates for Future Fellowships are asked to foreshadow these in their funding proposals.

In their proposals candidates are asked to respond to the request: 'If the proposed research involves collaboration with other organisations please specify those organisations'. Over the three selection rounds for funding commencing in 2010, 2011 and 2012²⁰, the 612 candidates awarded Fellowships foreshadowed a total of 2044 'other organisations'. The table below shows the number of collaborating organisations other than Host Organisations associated with funded proposals in the three funding rounds for funding commencing 2010 to 2012.

Number of collaborating organisations identified in funded proposals		
Funding commencing	Proposals funded	Collaborating organisations
2010	200	687
2011	203	625
2012	209	732
<i>Total</i>	<i>612</i>	<i>2044</i>

While universities account for the majority, 1313 or 64.2%, of these collaborating organisations, a greater share of these less formal links is accounted for by organisations outside the university sector than is the case with Host Organisations. The table below shows, in aggregate for the three funding rounds for funding commencing 2010 to 2012, the number of different types of collaborating organisations associated with funded proposals.

Type of collaborating organisation		
Organisation type	Number of organisations	% share of total
University	1313	64.2
Publicly funded research agency	267	13.1
Government organisation*	148	7.2
Medical research institute	103	5.0
Not-for-profit organisation*	76	3.7
Company	59	2.9
Hospital	47	2.3
Museum	30	1.5
Unspecified	1	0.0
<i>Total</i>	<i>2044</i>	<i>100.0</i>

*Non-research organisations

As is the case with Host Organisations, the majority of collaborating organisations, 1258 or 62%, are located outside Australia. The table below shows the distribution of collaborating organisations by country—a distribution that is closely similar to that of Host Organisations.

²⁰ The question was not included in the proposal for the initial selection round, for funding commencing in 2009.

Country location of collaborating organisations identified in funded proposals			
Country	Number of collaborating organisations	% share of total	% share of overseas total
Australia	786	38.5	-
USA	404	19.8	32.1
UK	222	10.9	17.6
Germany	78	3.8	6.2
China	58	2.8	4.6
France	44	2.2	3.5
Canada	39	1.9	3.1
Japan	39	1.9	3.1
Netherlands	38	1.9	3.0
New Zealand	36	1.8	2.9
Italy	28	1.4	2.2
Switzerland	26	1.3	2.1
Sweden	25	1.2	2.0
Other (each with less than 2% share of overseas total)	221	10.8	17.6
Overseas total	1258	61.5	100.0
<i>Total</i>	<i>2044</i>	<i>100.0</i>	<i>-</i>

In all four selection rounds concluded to date, candidates were also asked to foreshadow instances of informal international collaboration²¹, whether with individual researchers, research groups or organisations. The 812 proposals approved for funding over those four rounds foreshadowed, in total, 1972 instances of international collaboration. As shown in the table below, the country distribution of these collaborations is similar to that of overseas Host Organisations and other collaborating organisations discussed above.

International collaborative research links of Future Fellows		
Country	Instances of collaboration	% share of collaborations
USA	472	23.9
UK	294	14.9
Germany	158	8.0
Canada	100	5.1
France	94	4.8
China	77	3.9
Japan	69	3.5
The Netherlands	67	3.4
New Zealand	60	3.0
Other	581	29.5
<i>Total</i>	<i>1972</i>	<i>100.0</i>

What seems apparent from this data is that the less formal the links, and when those links are with individual researchers and research groups rather than organisations, the less emphasis there is on collaboration with Australia's traditional research partners, particularly the USA and the UK, which together account for 51.5% of overseas Host Organisations but only 38.8% of informal international collaborations.

What is also apparent is that, as a group, Future Fellows are engaged intensively in establishing and maintaining international collaborative links. The relative intensity of this engagement is shown in the table below, which compares the incidences of international collaborations of Future Fellows with those of Chief Investigators on ARC Discovery Projects.

²¹ Collaborations with individuals and entities that do not need to be identified as named participants in funding proposals.

Intensity of international collaboration: Future Fellowships and Discovery Projects					
	2009	2010	2011	2012	2009-12
Future Fellowships					
Funded proposals	200	200	203	209	812
Incidences of international collaboration	484	533	466	489	1972
Incidences of international collaboration per funded proposal (%)	2.4	2.7	2.3	2.3	2.4
Discovery Projects					
Funded proposals	845	925	931	778	3479
Incidences of international collaboration	1116	1351	1178	933	4578
Incidences of international collaboration per funded proposal (%)	1.3	1.5	1.3	1.2	1.3

On average, there are almost twice as many collaborative links associated with Future Fellowships compared with Discovery Projects. This may be due largely to the fact that, engaged full-time in research, Future Fellows have a greater capacity to maintain such links than project Chief Investigators who, in addition to their research, have a range of academic and other responsibilities. The opportunities for Future Fellows to spend up to half of the period of their Fellowship tenure at Host Organisations are likely to play a part in this also.

Stakeholder perceptions

In its survey of Administering Organisations, the ARC invited comment on the extent to which the Future Fellowships are serving to build collaboration. As indicated in the table below, almost 88% of respondents believe that this objective is being met fully or mostly. On the other hand, almost 13% of respondents believe that the objective is being met only somewhat or not at all.

Question: Is the <i>Future Fellowships</i> scheme meeting its objective to build collaboration across industry, research institutions and disciplines?		
Answer Options	Response Percent	Response Count
yes, fully	46.9	15
yes, mostly	40.6	13
yes, but only somewhat	9.4	3
no, not at all	3.1	1
answered question		32

Respondents were invited to provide additional comment if they answered other than “yes, fully” to this question. The one respondent that answered “no, not at all” commented that “the *Future Fellowships* scheme has been a useful vehicle for building collaboration across research institutions and disciplines but in our experience has not increased the level of engagement with industry”.

A theme taken up in other comments was that the scheme appears to favour academic excellence over collaboration. A suggestion from one respondent was that the scheme should include an industry-specific stream.

Collaboration is the only scheme objective which less than half of respondents believe is being met fully and which more than one-in-ten respondents believe is being achieved only somewhat or not at all. These perceptions may be being driven not by the amount of collaborative activity (since this is quite substantial and strongly international in its reach) but by its apparent narrowness, being largely confined within the university sector—well under 10% of collaborative activities appear to involve organisations from the private and not-for-profit sectors, and the same is true for the involvement of non-research organisations within the government sector. This may indicate a need to consider ways to facilitate a broader spectrum of collaboration in future program design.

Objective: Supporting research in national priorities

"I'd also like to be thought of as someone who tried very hard to mentor and collaborate with Indigenous people. I'd like to draw more Aboriginal people into academia and bring them into the field as researchers of their own past and their own heritage."

Jane Lydon, Future Fellow, The University of Western Australia

This objective aligns with National Innovation Priority 1:

*"Public research funding supports high-quality research that addresses national challenges and opens up new opportunities"*²².

National Research Priorities

Candidates for Future Fellowships funding are invited to indicate in their proposals which, if any, of the Government's National Research Priorities their research will address. The table below shows, in aggregate for the four funding rounds concluded to date, the numbers of all proposals and those funded which address the Priorities.

National Research Priorities—proposals and awards				
National Research Priority	Proposals considered	%	Proposals funded	%
An environmentally sustainable Australia	599	20.0	161	19.8
Promoting and maintaining good health	897	29.9	248	30.5
Frontier technologies for building and transforming Australian industries	1062	35.4	277	34.1
Safeguarding Australia	360	12.0	92	11.3
<i>Subtotal - addressing at least one priority</i>	<i>2918</i>	<i>97.3</i>	<i>778</i>	<i>95.8</i>
No priorities selected	80	2.7	34	4.2
<i>Total</i>	<i>2998</i>	<i>100.0</i>	<i>812</i>	<i>100.0</i>

Of all proposals funded, the largest share, 34 per cent, is addressing the Priority *Frontier technologies for building and transforming Australian industries*. Less than 5% are addressing none of the Priorities.

Targeted discipline areas

In the funding rounds for funding commencing in 2010 and 2011, the Future Fellowships funding rules identified targeted discipline areas in which mid-career researchers could contribute to enhancing national research capacity. The targeted discipline areas for funding commencing in 2010 were: mathematics, earth sciences, history, English, sociology, education and economics. Candidates for funding were invited to identify one or more of the areas that would be addressed by their proposed research. Within the total of 200 proposals approved for funding in that round, there were 84 instances of the targeted discipline areas being addressed. The lowest number of instances of the areas in funded proposals, one only, was in English; the largest number, 24, was in mathematics.

The targeted discipline areas for funding commencing in 2011 were: computer science, economics, education, engineering, English, information science, nursing and allied health, and political science.

²² Department of Innovation, Industry, Science and Research (2009), *Powering Ideas: An Innovation Agenda for the 21st Century*

Within the total of 203 proposals approved for funding in that round, there were 112 instances of the targeted discipline areas being addressed. The lowest number of instances of the areas in funded proposals, two, was in English; the largest number, 44, was in engineering.

Targeted research areas

In the funding rounds for funding commencing in 2010, 2011 and 2012, the Future Fellowships funding rules identified targeted research areas, being areas of disciplinary and interdisciplinary research and areas of national significance. The targeted research areas for funding commencing in 2010 were: Indigenous health and well-being, community and preventative health, environment and climate change, land-based transport systems, immigration, Asian studies, social inclusion and systemic disadvantage, and manufacturing innovation. Candidates for funding were invited to identify one or more of the areas that would be addressed by their proposed research. Within the total of 200 proposals approved for funding in that round, there were 187 instances of the research areas being addressed. The lowest number of instances of the areas in funded proposals, five, were in immigration and land-based transport systems; the largest number, 60, was in environment and climate change.

The targeted research areas for funding commencing in 2011 were: Asian studies, chemical and biological hazards, community and preventative health, computer system security, pattern recognition and data mining, environment and climate change, forensic science, immigration, Indigenous health and well-being, land-based transport systems, manufacturing innovation, safeguarding Australia (especially electronic security, surveillance and detection), and social inclusion and systemic disadvantage. Within the total of 203 proposals approved for funding in that round, there were 207 instances of the research areas being addressed. The lowest number of instances of the areas in funded proposals, one only, was in land-based transport systems; the largest number, 56, was in environment and climate change.

The targeted research areas for funding commencing in 2012 were: bioinformatics, computer system security, Indigenous health and wellbeing, managing innovation and renewable energy and green technology, pattern recognition and data mining, safeguarding Australia (especially electronic security, surveillance and detection), and understanding culture and communities. Within the total of 209 proposals approved for funding in that round, there were 148 instances of the research areas being addressed. The lowest number of instances of the areas in funded proposals, 13, was in Indigenous health and well-being; the largest number, 40, was in understanding culture and communities.

The table below shows, in aggregate for all proposals across all funding rounds concluded to date, the instances of targeted research areas and the success rates of proposals addressing those areas.

Future Fellowships targeted research areas						
Targeted research area	Funding round* (funds commencing)	Instances# in proposals assessed		Instances# in proposals funded		Success rate of proposals
		Count	%	Count	%	%
Asian studies	2010, 2011	84	4.2	20	3.7	23.8
Community and preventative health	2010, 2011	332	16.7	86	15.9	25.9
Environment and climate change	2010, 2011	415	20.8	116	21.4	28.0
Immigration	2010, 2011	41	2.1	9	1.7	22.0
Indigenous health and well-being	2010, 2011, 2012	118	5.9	37	6.8	31.4
Land-based transport systems	2010, 2011	35	1.8	6	1.1	17.1
Manufacturing innovation	2010, 2011	187	9.4	39	7.2	20.9
Social inclusion and systemic disadvantage	2010, 2011	183	9.2	48	8.9	26.2
Chemical and biological hazards	2011	39	2.0	11	2.0	28.2
Computer system security, pattern recognition and data mining	2011, 2012	116	5.8	34	6.3	29.3
Forensic science	2011	10	0.5	5	0.9	50.0
Safeguarding Australia (especially electronic security, surveillance and detection)	2011, 2012	113	5.7	39	7.2	34.5
Bioinformatics	2012	77	3.9	23	4.2	29.9
Managing innovation, renewable energy and green technology	2012	114	5.7	29	5.4	25.4
Understanding culture and communities	2012	127	6.4	40	7.4	31.5
<i>Total targeted research areas</i>	<i>2010, 2011, 2012</i>	<i>1991</i>	<i>100.0</i>	<i>542</i>	<i>100.0</i>	<i>27.2</i>
		Proposals assessed		Proposals funded		
<i>Total Future Fellowships</i>	<i>2010, 2011, 2012</i>	<i>2023</i>		<i>612</i>		<i>30.3</i>

* There were no targeted research areas for funding commencing in 2009.

A single proposal may select more than one targeted research area.

It is not a straightforward matter to interpret these numbers as reflecting the direct operation of an incentive on researchers' behaviour in formulating and submitting specific proposals for research funding. Nonetheless, the fact that in almost all cases the success rate of proposals addressing targeted research areas was lower than that of all proposals (30.3%) may indicate that the targeted research areas are serving to elicit proposals that otherwise would not be forthcoming, in areas possibly characterised by a less well-developed research capability.

The relatively large numbers of proposals in some areas (for example: community and preventative health, environment and climate change, managing innovation and renewable energy and green technology, and understanding culture and communities) may indicate that these areas are overly broad to serve as targeted research areas and more like National Research Priorities.

Stakeholder perceptions

In its survey of Administering Organisations, the ARC invited comment on the extent to which the Future Fellowships are serving to support research in areas of national priority. As indicated in the

table below, almost 94% of respondents believe that this objective is being met fully or mostly and none believe that it is not being met at all.

Question: Is the <i>Future Fellowships</i> scheme meeting its objective to support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia?		
Answer Options	Response Percent	Response Count
yes, fully	68.8	22
yes, mostly	25.0	8
yes, but only somewhat	6.3	2
no, not at all	0.0	0
answered question		32

Respondents were invited to provide additional comment if they answered other than “yes, fully” to this question. Four respondents commented that the National Research Priorities are very broad and some went on to comment that this undermines their usefulness. One respondent who answered “yes, but only somewhat” to the question commented that “it could be better to have more specific targeting of research that needs to be established in the national interest or strengthened” and “emphasis should be moved to reflect changing priorities”.

The sentiment that the National Research Priorities are very broad is supported by the fact that in less than 5% of funded *Future Fellowships* proposals did candidates choose not to indicate that their proposed research would address at least one of the Priorities. Rather than undermining their usefulness, however, this may indicate that the Priorities and their associated goals are performing the function of prompting most researchers to reflect, at the planning stage, on the potential benefits of their research within the context of wider societal priorities. In this regard, the ARC does require all applicants for research funding to include a national benefit statement in their proposals; it also requires all project leaders, at the conclusion of their ARC-funded research projects, to include in their final reports information about the impact of, and outcomes and national benefits arising from, the research.

By contrast, as noted above, the targeted research areas, by virtue of representing more narrowly focused priorities, may be having a direct effect in encouraging proposals to be brought forward in specific areas of national significance, in some cases at least.

Objective: Strengthening Australia’s research capacity by supporting innovative, internationally competitive research

“As my work doesn’t fit easily into categories, the Future Fellowship really has been a unique opportunity to develop a new field—I don’t think anything like the work I am doing existed before.”

Neil Levy, Future Fellow, The Florey Institute of Neuroscience and Mental Health

This objective aligns with National Innovation Priority 1:

“Public research funding supports high-quality research that addresses national challenges and opens up new opportunities”²³.

²³ Department of Innovation, Industry, Science and Research (2009), *Powering Ideas: An Innovation Agenda for the 21st Century*

Stakeholder perceptions

In its survey of Administering Organisations, the ARC invited comment on the extent to which the Future Fellowships are supporting innovative, internationally competitive research. As indicated in the table below, almost 94% of respondents believe that this objective is being met fully or mostly and none believe that it is not being met at all.

Question: Is the <i>Future Fellowships</i> scheme meeting its objective to strengthen Australia's research capacity by supporting innovative, internationally competitive research		
Answer Options	Response Percent	Response Count
yes, fully	84.4	27
yes, mostly	9.4	3
yes, but only somewhat	6.3	2
no, not at all	0.0	0
answered question		32

Respondents were invited to provide additional comment if they answered other than “yes, fully” to this question. One of the two respondents that answered “yes, but only somewhat” questioned whether the scheme “has achieved its aims, in terms of consistently supporting leading research of only the highest quality, which aspires to generate demonstrable benefits to a broad stakeholder base, beyond the more traditional measures of academic success”.

Another respondent commented that “it would be good to do an analysis of the Future Fellowships cohort to benchmark them against international measures to demonstrate that they are indeed the cream of the crop”. One commonly used set of international benchmarks measures the citation performance of journal publication output—at their simplest, these measure the average number of citations worldwide per publication and can be applied, as an indicator of academic research impact, to research funding programs as well as to institutional research sectors, research institutions, research groups and individual researchers.

Studies of the impact of ARC-funded journal output

As noted elsewhere in this report, none of the cohorts of researchers funded over the four Future Fellowships funding rounds concluded to date have yet completed the full term of their grants and, hence, none have yet been required to submit final reports of project outputs and outcomes, including research publications. Nevertheless, past studies have shown that the citation performance of publication output from ARC-funded research fellowships is generally high and above that of comparable institutional sectors and research funding programs in Australia. For publications generated in the five-year period 1996 to 2000, those arising from the then ARC-funded mid-career fellowships (Australian Research Fellowships and Queen Elizabeth II Fellowships) were, along with those of ARC Special Research Centres and ‘Other Research Institutes’ (members of the Australian Association of Medical Research Institutes and the Institute of Advanced Studies at The Australian National University), the most highly cited, on average, across Australian institutional research sectors and research programs²⁴.

²⁴ Australian Research Council (2004), *ARC-supported research: the impact of journal publication output 1996-2000*

Citations per publication: all publications, 1996-2000			
Program/Sector	Number of publications	Citations per publication	'Normalised' citations per publication ²⁵
ARC—Australian Research Fellowships	941	7.62	7.57
ARC—Queen Elizabeth II Fellowships	885	6.52	6.44
ARC—Special Research Centres	1,332	6.85	6.03
Other Research Institutes	11,180	7.65	5.96
ARC—Senior Research Fellowships	1,129	5.08	5.16
ARC Total	12,212	4.83	5.00
ARC—Large Grants	7,977	4.62	4.92
ARC—Key Centres	426	4.65	4.88
Cooperative Research Centres	3,287	4.51	4.70
ARC—Australian Postdoctoral Fellowships	1,105	4.18	4.15
Government Research Institutes	9,179	3.90	4.13
Other Hospital	11,434	4.49	3.53
ARC—Collaborative/SPIRT Grants	364	2.95	3.52
Other University	46,727	3.14	3.39
Other Government	5,711	2.43	2.71
Australia	90,501	3.94	3.98
World average	3,348,128	4.05	4.05

For publications generated in the subsequent five-year period 2001 to 2005, it was those arising from ARC Federation Fellowships (established in 2001), ARC Special Research Centres and, in particular, 'Research Institutes' (members of the Australian Association of Medical Research Institutes and the Commonwealth Scientific and Industrial Research Organisation (CSIRO)) that were, on average, the most highly cited²⁶.

Relative citation impact: all publications, 2001-2005			
Program/Sector	Number of publications	Citations	Relative citation impact ²⁷
Research Institutes	14,199	116,314	1.73
ARC—Federation Fellowships	977	2,694	1.59
ARC—Special Research Centres	1,863	12,902	1.53
ARC—Australian Postdoctoral Fellowships	1,621	7,001	1.36
ARC—Centres of Excellence	574	878	1.35
ARC—Australian Professorial Fellowships	2,178	11,085	1.31
Other Hospital	11,967	74,046	1.30
ARC—Australian Research Fellowships	1,028	5,599	1.27
ARC Total	17,246	88,912	1.19
ARC—Discovery Projects	10,528	57,064	1.17
ARC—Key Centres	402	2,284	1.13
ARC—Queen Elizabeth II Fellowships	1,159	5,473	1.12
Cooperative Research Centres	3,245	15,728	0.99
ARC—Linkage Projects	1,604	5,761	0.92
Other University	58,874	253,521	0.91
Other Government	8,247	31,813	0.81
Australia	104,319	541,243	1.11
World	3,782,695	17,649,566	1.00

²⁵ 'Normalised' to take into account the dispersion of research across disciplines within each program or sector.

²⁶ Australian Research Council (2009), *ARC-supported research: the impact of journal publication output 2001-2005*

²⁷ Relative citation impact expresses as a ratio the citation rate of publications within a program or sector compared with the world average.

As indicated by academic research impact then, ARC-funded fellowships have supported innovative and internationally competitive research over a long period of time. Future studies of the impact of ARC-funded journal publication output would allow an assessment of whether or not this continues to be the case, including for the *Future Fellowships* funding scheme.

Future Fellows

The summaries of interviews presented in Section 6 of this report offer a clear indication that Future Fellows are opening up new lines of enquiry and conducting highly innovative research across the sciences, social sciences and humanities.

Their research is characterised by a high degree of collaboration with groups and organisations both nationally and internationally and is addressing important challenges and a broad range of societal needs.

Future Fellows are assuming a wide variety of leadership roles within research teams, centres and networks. They are also serving as mentors and providing research training to the groups of Honours and postgraduate students and postdoctoral researchers that are coalescing around their research programs.

Summary of findings

- The *Future Fellowships* funding scheme has clear and appropriate objectives that are set out in publicly accessible funding rules.
- The objectives of the funding scheme are being met fully or mostly—there is a strong consensus of agreement on this among Administering Organisations.
- There is some concern among Administering Organisations that the objective of attracting Fellowship candidates from overseas is being undermined by overly burdensome application requirements, as well as by the lengthy period of time between application and decision on and announcement of funding. Other factors that seem likely to be important in attracting candidates from overseas are the length of Fellowship tenure, the level of project funding and the strength of institutional commitment to Fellows.
- Administering Organisations are supporting the objective of retaining outstanding mid-career researchers by their adoption of a variety of strategies to integrate their Fellows into a broad range of institutional roles and activities—indications are that about one-third of Fellows have received a promotion by the penultimate or final year of their Fellowship and there is a consistent expectation among Administering Organisations that they will retain almost all of their Fellows in their employ following the conclusion of Fellowships.
- Future Fellows are engaged in substantial collaboration and, in particular, are establishing and maintaining very many strong collaborative links internationally. The vast majority of these links are within the university sector rather than with potential end-users within the private, not for profit and government sectors.
- The targeted areas of research for Future Fellowships funding, by virtue of representing focused priorities, appear to be having a direct and positive effect in encouraging proposals to be brought forward in specific areas of national significance.

Summary of findings (continued)

- Since none of the Future Fellows have yet concluded the term of their Fellowships, there is limited data available at this point in time to assess the degree to which the funding scheme is supporting innovative, internationally competitive research outcomes. On the other hand, there is an overwhelming consensus among Administering Organisations that their Fellows are engaged in highly innovative research activity and this is borne out by Fellows' descriptions of their research activities.

Section 3: Efficiency

Assessment of the efficiency of the *Future Fellowships* funding scheme involves considering to what extent the scheme:

- is administered and delivered in a cost-effective manner;
- represents good value for money; and
- imposes reasonable and not overly burdensome compliance costs on stakeholders.

Administration and delivery

As is the case for all component funding schemes within the NCGP, administration of different aspects of the *Future Fellowships* scheme is distributed across the agency. A team of four is responsible for administering the submission and assessment of proposals for funding under this and the *Discovery Indigenous* funding scheme, and a separate team of six is responsible for administering post-award funding agreement variations and reporting, not only for the *Future Fellowships* scheme but also for most of the other NCGP schemes. These activities are carried out under the policy guidance of an Executive Director²⁸ and standard public service senior management oversight, as well as being supported by a range of in-house corporate and ICT services.

In addition, the ARC undertakes program delivery of the funding scheme in partnership with central administrative offices within the Administering Organisations which host Future Fellows. On behalf of their organisations, these offices are responsible for coordinating the preparation and submission of proposals for funding and reports on project progress and outcomes, as well as administering the scheme's financial assistance and ensuring compliance with funding agreements entered into with the ARC for the provision of that assistance.

To date, there has been no analysis of the cost of all of these distributed administrative inputs for Future Fellowships as a discrete funding scheme. However, in 2011-12 the ARC commissioned a review of its grants administration for the NCGP as a whole, including benchmarking of core processes undertaken by the ARC against four comparable international research organisations (the Research Council of Norway, the Netherlands Organisation for Scientific Research, the Swiss National Science Foundation and the National Sciences and Research Council of Canada) and the NHMRC²⁹.

The benchmarking survey for the review was based on Australian National Audit Office best-practice guidance on grants administration³⁰ using the functional descriptions of core grants processing activities provided in the Commonwealth Grant Guidelines³¹.

While the review did not examine—and, hence, present findings for—the *Future Fellowships* funding scheme in isolation from other NCGP schemes, it is likely that the efficiency of administration of Future Fellowships is on a par with that of the NCGP as whole. Across NCGP funding schemes there is a high degree of consistency in the core grants administration processes (planning and design, selection and decision-making, management of grants and funding agreements, reporting, and

²⁸ ARC Executive Directors are respected researchers in their fields and play a unique role within the agency. They are contracted, usually for between three and five years, to: oversee the assessment of funding proposals through a peer review process, liaise and communicate with the research community and users of research, and identify emerging disciplinary and cross-disciplinary developments and innovative approaches to research.

²⁹ Gray Advantage (2012), *Review of the Australian Research Council Operating Budget* (unpublished)

³⁰ Australian National Audit Office (2010), *Implementing Better Practice Grants Administration*

³¹ Department of Finance and Deregulation (2009), *Commonwealth grant guidelines : policies and principles for grants administration*

review and evaluation). Cost drivers (such as numbers of applications, assessments, grants, grant variations and reports) exert upward pressures under Future Fellowships that are lower than those under other NCGP funding schemes (for example Discovery Projects and Linkage Projects) but higher than those under other schemes (for example *Australian Laureate Fellowships*).

The review found that the ARC compares favourably to the benchmarking partners against each of the headline key performance indicators examined, as set out in the following table.

Efficiency of NCGP administration				
Headline Indicator	Mean Bench mark	ARC	Difference	Variance
Number of applications administered per dedicated administrative FTE (excludes corporate FTE)	46	225	179	Favourable
Direct cost of administration (%)*	2.89	0.78	-2.11	Favourable
Corporate Overhead Cost (%)*	1.36	0.53	-0.83	Favourable
Total administration cost (%)*	4.26	1.31	-2.95	Favourable
Administration costs per application	\$3,259	\$1,572	-\$1,687	Favourable

* Cost of administration as a percentage of the value of grants administered.

Overall, the benchmarking analysis found that the cost of grants administration by the ARC is only 1.31% of the value of the grants that it awards. This compares to an average of 4.26% for the benchmarking partners examined by the study.

The review identified a number of factors that contribute to the relative efficiency of the ARC's operations. In particular, it noted that the ARC:

- makes extensive use of voluntary assessors in its selection and decision-making processes;
- has implemented efficient, effective systems to automate grant registration and assessment processes;
- has implemented efficient selection and decision-making processes that utilise a smaller number of assessment committees compared to benchmarking partners;
- promotes a smaller number of grants with a larger average grants size (larger grants are generally more cost effective to administer due to the fixed nature of the administrative overheads that are deployed in each grant process);
- makes extensive use of collaborative research models that engage relevant tertiary institutions in the evaluation of grants; and
- has implemented robust evaluation procedures evidenced by the relatively low number of appeals against its grant decisions.

Value for Money

For grants administration to provide value for money, there needs to be careful comparison of the costs and benefits of feasible options in all phases of grants administration, particularly when planning and designing grants processes and when selecting grant recipients. The aim is for grants to be deployed in an efficient, effective, economical and ethical manner, while not imposing overly burdensome requirements on grants recipients³².

³² Department of Finance and Deregulation (2013), *Commonwealth Grant Guidelines (2nd edition)*

The ARC's strategies for achieving value for money are applied across all component funding schemes of the NCGP and entail:

- working closely with stakeholders to support continuous improvement in the efficiency of design and delivery of the funding schemes—this is supported, for example, by consulting with Administering Organisations prior to releasing scheme funding rules and funding agreements, undertaking feedback surveys of Administering Organisations at the conclusion of funding application rounds (discussed in Section 5 below), and conducting (in partnership with the NHMRC) an annual Research Administrators Seminar;
- using processes, procedures and requirements that are proportional to risk—for example, progress reporting by exception (discussed in Section 5 below);
- applying effective program design and selection processes, the objective of the appraisal process being to select research proposals for funding that best represent value with public money—a 2012 internal audit of ARC grant administration found that the assessment process is extensive, robust and competitive³³;
- promoting the ethical use of Commonwealth resources—under all ARC funding schemes it is a condition of funding that proposals and funded research projects conform to the principles set out in national codes for the responsible conduct of research and statements on ethical conduct in human research;
- not asserting ownership of intellectual property arising from activities undertaken with ARC funding support; and
- ongoing monitoring and management to ensure that funded research activities are proceeding as planned and that grant money is being appropriately applied—mechanisms that the ARC has in place to monitor and assess performance are discussed in Section 5 below: in addition to those, as a condition of funding under all ARC funding schemes, Administering Organisations submit annual end-of-year grant expenditure reports to the ARC for compliance assessment and reconciliation of expenditures against ARC financial systems information.

As one strategy for achieving value for money, the Commonwealth Grant Guidelines encourage Government agencies to consider the use of longer term grant funding agreements, where circumstances permit, as a way of potentially reducing administrative costs for the agency and grant recipients as well as better achieving government policy objectives. As noted in Section 1 of this report, the Government's *2012 National Research Investment Plan* encourages a shift towards more widespread use of grants of longer duration, noting the substantial resource cost incurred both by researchers and the Government in dealing with unsuccessful applications for funding and the desirability of increasing the overall efficiency of grant allocation processes. As also discussed in Section 1, there is sizeable minority support among Administering Organisations for lengthening the period of tenure of Future Fellowships from four to five years—on the basis that this would deliver greater benefits directly related to the objectives of the funding scheme. Support among some Administering Organisations for allowing Future Fellows to apply for a subsequent Fellowship³⁴ may be motivated by similar considerations.

Achieving value for money also requires a capacity to clearly demonstrate the value of grant outcomes. As discussed in more detail in Section 5 of this report, this is currently undermined by deficiencies that are apparent in current reporting arrangements across ARC funding schemes which can manifest themselves in low rates of compliance with reporting requirements on the part of

³³ KPMG (2012), *Australian Research Council: Internal Audit of Grant Administration* (unpublished)

³⁴ Under current funding rules for Future Fellowships this is not permitted.

Administering Organisations and insufficient attention to assessment of research project outcomes on the part of the ARC.

Compliance Costs

An important contributor to achieving value for money is avoiding imposing overly burdensome requirements on grant recipients. Under the *Future Fellowships* funding scheme, there are compliance costs for Administering Organisations in applying for funding and reporting on grants.

In order to identify areas in which these costs may be felt most sharply, the survey of Administering Organisations invited comment on any aspects of the ARC's administration of the funding scheme that could be done differently to improve the scheme's efficiency and effectiveness. Their responses to this are set out in the table below.

Ways in which the funding scheme could be administered more efficiently and effectively—Administering Organisations	
Response category	Response Count
Conduct new funding rounds according to the same fixed timetable each year	7
Avoid scheduling periods for submission of funding proposals at inappropriate (e.g. "family-unfriendly") times (such as school holidays or at times that clash with other schemes)	4
Lengthen the period of time in which funding proposals may be submitted	3
Shorten the period of time between submission of funding proposals and announcement of decisions on funding	3
Provide earlier advice to applicants of the timing of funding rounds	2
Ensure more timely release of key documents such as funding rules and advice to applicants well ahead of periods for submission of funding proposals	2
Lengthen the period of time provided for submission of funding agreements to better accommodate institutional clearance procedures	1
Reduce the length and complexity of funding proposals	1

The one respondent that proposed reducing the length and complexity of funding proposals also made the suggestion, more specifically, that this could be achieved by: removing the requirement to include a Strategic Statement; reducing budget detail required for institutional contributions; allocating \$50,000 for project support without the need for detailed justification; removing the need to include prior or current ARC funding since this is known to the ARC; making more extensive use of 'drop-down' lists rather than free text entry; simplifying publication lists; and simplifying selection criteria.

Taken together, the responses tabulated above suggest that it is the timing and duration of key aspects of the ARC's administration of the funding scheme that raise the most concerns for Administering Organisations. What they are seeking is certainty of timing and scheduling year on year, longer timeframes in which to prepare and submit proposals for funding and shorter timeframes in which decisions on funding are announced. Comments by Organisations in their responses to the survey indicate that what they wish to avoid most is the potential for wasted effort in proposals not being prepared in time for submission and candidates, particularly those applying from overseas, taking up alternative opportunities while waiting for notification of funding decisions.

Reducing the amount and complexity of information required in Future Fellowships funding proposals could be expected to reduce the burden of application and assessment, shorten processing times and facilitate timelier announcement of funding decisions. Two areas in which the funding proposal form could be simplified are the project description and non-salary project funding. The primary objective of the *Future Fellowships* scheme is to attract and retain outstanding people (mid-career researchers); this is in contrast to the primary objective of the *Discovery Projects* scheme which is to support excellent projects (basic and applied research by individuals and teams). Despite

this clearly differentiated focus of support—people versus projects—the selection criteria for the two schemes give the same weight to people (investigators), 40%, and to the project, 45%. In addition, the eight-page upper limit for the project description in Future Fellowships proposals is not much less than that for Discovery Projects proposals, ten pages. Consideration could be given to reducing the amount and level of detail of project information required of *Future Fellowships* candidates. This, in turn, would obviate the need for a detailed justification (currently of up to four pages in length) of non-salary project funding support, which could instead be allocated to each Fellowship as a post-award variation to the funding agreement.

Upward pressure on compliance costs is also exerted by the number and complexity of funding schemes under which Administering Organisations and their researchers are eligible to apply for support. The Commonwealth Grant Guidelines encourage Government agencies to consider whether an existing granting activity or grant program might be expanded or modified to meet an identified emerging need, rather than establishing an additional granting activity³⁵. This is motivated by a desire to avoid overly burdensome administration and compliance arising from duplication in areas such as: grant guidelines, application and selection processes, grant agreements and payment arrangements, systems and support, and monitoring and performance assessment procedures. The *Future Fellowships* scheme is administered as a distinct funding scheme, as are Australian Laureate Fellowships, DECRA and Super Science Fellowships. DORAs are administered as a component of the *Discovery Projects* funding scheme. Some elements of the administration of these various schemes are undertaken in common—for example, payment arrangements, ICT systems support, and monitoring and reporting—while others are not or only partially so—for example, guidelines, application and selection processes, and grant agreements. Consideration could be given to whether or not more of the administrative elements of the various ARC fellowships and awards could be more closely integrated under something approaching a single fellowships and awards funding scheme, particularly given that many of the objectives are the same or closely similar across the various schemes as a reflection of consistent Government priorities for enhancing careers in research at different career stages.

Summary of findings

- The NCGP, encompassing the *Future Fellowships* funding scheme, is being administered and delivered efficiently—the cost of administration of the NCGP as a percentage of the value of administered grants, at 1.31%, is very low against a mean benchmark for comparable organisations of 4.26%.
- Administration of NCGP funding schemes, including *Future Fellowships*, represents good value for money. Areas in which improvements might be sought are the use of longer term grant funding agreements and better demonstration of the value of grant outcomes.
- Compliance costs for Administering Organisations can be contained by ensuring that: there is certainty of timing and scheduling of grant administration processes year on year, timeframes in which to prepare and submit proposals for funding are not compressed, and decisions on funding are announced in a timely manner.

³⁵ Department of Finance and Deregulation (2013), *Commonwealth Grant Guidelines (2nd edition)*

Summary of findings (continued)

- Costs of compliance for Administering Organisations could be further lowered by reducing the length and complexity of the Future Fellowships application form, particularly in relation to the project description and the budget justification for non-salary project funding. Consideration might also be given to integrating and reducing duplication of administrative procedures across the various ARC fellowships and awards.

Section 4: Strategic policy alignment, appropriateness and integration

Strategic policy alignment

Assessment of the strategic policy alignment of the *Future Fellowships* funding scheme involves considering to what extent the scheme is consistent with the Australian Government's broader strategic policy priorities for innovation, science and research³⁶.

The 2009 innovation statement *Powering Ideas* set out the then Government's ten-year agenda for achieving greater productivity and competitiveness through innovation³⁷. Broadly, the areas identified for reform were: priorities and governance, skills and research capacity, business innovation, public sector innovation, and links and collaboration.

In the area of skills and research capacity, the statement acknowledged that "universities and public research organisations provide knowledge to fuel the innovation system and skilled people to drive it" and committed the Government to creating viable career pathways for Australian researchers. In its 2008 report on research training and research workforce issues in Australian universities³⁸, the House of Representatives Standing Committee on Industry, Science and Innovation concluded that "inadequate funding for research training and research careers remains the fundamental obstacle to building Australia's full research capacity".

Elsewhere, *Powering Ideas* recognised that "collaboration stretches our research dollars further, spreads risk, favours serendipity, propagates skills, and builds critical mass. It is increasingly the engine of innovation". It also recognised that "international collaboration builds capacity in this country and beyond, facilitates access to new knowledge (most of which is created outside this country), attracts foreign investment, and extends Australia's global influence". The statement committed the Government to increasing the level of collaboration between Australian businesses, universities, and publicly-funded research agencies, as well as to increasing international collaboration in research by Australian universities.

Among the Government's five high-level aspirations for the national innovation system by the year 2020, as set out in the statement, was that "universities and research organisations attract the best minds to conduct world-class research, fuelling the innovation system with new knowledge and ideas".

It was in this context that the Government established the *Future Fellowships* funding scheme in 2009. This followed its announcement in 2008 that all ARC fellowships would be progressively opened to greater international competition, including the new *Future Fellowships* scheme.

Powering Ideas foreshadowed that the Government would develop a research workforce strategy to address expected shortfalls in the supply of research-qualified people. It released that strategy, *Research Skills for an Innovative Future*, in 2011³⁹. Among the Government's seven aspirations for the Australian research workforce, as set out in the strategy, were:

³⁶ As these priorities were articulated at the time the evaluation was undertaken in the first half of 2013.

³⁷ Department of Innovation, Industry, Science and Research (2009), *Powering Ideas: An Innovation Agenda for the 21st Century*

³⁸ House of Representatives Standing Committee on Industry, Science and Innovation (2008), *Building Australia's Research Capacity*

³⁹ Department of Innovation, Industry, Science and Research (2011), *Research Skills for an Innovative Future: A Research Workforce Strategy to Cover the Decade to 2020 and Beyond*

“Australian universities, as the major providers of research training in Australia, have sufficient numbers of research-qualified staff to develop the next generation of researchers” and

“Australian research students, researchers and research support staff are provided with clear and equitable pathways for career progression and supported to meet individual career needs and objectives”.

These aspirations reflect the fact that, as the strategy notes, the most pressing research workforce challenge for Australia in future years will be to keep pace with escalating demand for research skills, against the background of an outlook of net shortfalls in the supply of research skills to the workforce over the period to 2020. Future Fellowships make an important contribution to research workforce planning and succession by assisting in transitioning researchers to continuing positions in universities and other research organisations.

The strategy also noted that around 22% of Australia’s annual supply of doctorates to the workforce is sourced through international channels and that Australia’s historic dependence on these will continue to be an important consideration in planning for research workforce resources. As discussed in Section 2 of this report, of the 812 Future Fellowships allocated over the four funding rounds concluded to date, 142 (or 17%) have been awarded to leading researchers attracted to Australia from overseas: 59 as returning Australians and 83 as foreign nationals.

In order to enhance the attractiveness of research careers, *Research Skills for an Innovative Future* identified as a priority ensuring that researchers are adequately supported at all stages of their research careers. As a complement to the establishment of the *Future Fellowships* scheme, and on the basis of a review of the balance of its fellowship support under the NCGP, the ARC established in 2012 DECRAAs, almost doubling the number of new fellowship support opportunities available annually to researchers early in their careers.

To facilitate research workforce mobility, the strategy identified as a priority continued incorporation of supported opportunities for inter-sectoral and international mobility within existing and future funding schemes. As discussed in Section 2 of this report, Future Fellows establish and maintain numerous and strong collaborative links nationally and internationally which support such mobility. The *Future Fellowships* funding scheme provides direct incentives to this in encouraging Fellows to conduct research at Host Organisations (other than their employing Administering Organisation) for a period or periods of up to one to two years, in total, over the life of their Fellowship. As noted in Section 2, about one-quarter of these Host Organisations are organisations other than universities and about three-quarters are located overseas.

There is a long and consistent tradition in Australia of bipartisan political support for the notion that public investment in research skills is crucial to innovation. In its 2001 innovation statement, *Backing Australia’s Ability*, the Government at that time acknowledged that “to be competitive in today’s world, Australia must develop its strong research base and encourage further collaboration with the world’s best. We need to continue to enhance our own local expertise and skills and to attract further overseas interest, talent and investment”⁴⁰.

To attract and retain leading researchers in key positions, the statement included the commitment that a portion of new funds to be provided at that time to double the funding for national competitive research grants administered by the ARC would be used to introduce 25 new Federation Fellowships worth \$225,000 a year for five years, and to double the number of Australian

⁴⁰ Department of Industry, Science and Resources (2001), *Backing Australia’s Ability: an innovation action plan for the future*

Postdoctoral Fellowships awarded annually (from 55 to 110) and improve the remuneration of those positions.

As discussed below, by building on and complementing these earlier initiatives, the establishment of Future Fellowships in 2009 (along with other initiatives, in particular the establishment of DECRAAs and Super Science Fellowships) contributed to a better balance of fellowship support to researchers spanning the different stages of their careers.

Appropriateness

Assessment of the appropriateness of the *Future Fellowships* funding scheme involves considering to what extent:

- it addresses an area of market failure;
- the scheme's original objectives remain relevant to Government priorities and stakeholder needs; and
- the scheme is being administered by the most appropriate jurisdiction.

Market failure

There are many research fellowship opportunities made available each year in Australia from funding sources other than the *Future Fellowships* funding scheme. The most numerous of these are offered by the NHMRC. The NHMRC awards about 300 new fellowships annually to support early- to mid-career as well as established researchers conducting basic and applied research in health and medicine. Elsewhere within the Australian Government, some departments and agencies offer fellowships to address their specific areas of policy priority, for example the Endeavour Research Fellowships offered by the Commonwealth Department of Industry to strengthen bilateral research ties between Australia and the participating countries. State Governments also offer research fellowships, in many cases to address broad regional priorities—for example, the Victorian Postdoctoral Research Fellowships and the South Australian Research Fellowships—and in others to target specific capabilities—for example, Queensland Health's Senior Clinical Research Fellowships.

Within the not-for-profit sector there are many foundations and trusts that fund small numbers of research fellowships, overwhelmingly in specific areas of health and medicine—such as cancer and heart research—and often with a clinical focus. Within the private sector some companies offer small numbers of fellowships for research in areas of their direct or indirect commercial interests—for example, the Pfizer Research Fellowships.

In all cases, these fellowships are made available in order to support research in a relatively narrow range of fields to address the specific priorities of their sponsoring organisations and, with the exception of NHMRC fellowships, are small in number and do not take account of the circumstances and needs of researchers at different points in their careers. Future Fellowships is the only source of funding in Australia that supports opportunities specifically for mid-career researchers to undertake basic and applied work in any field of research. In the absence of the scheme, it is unlikely that this research would be funded from the private sector since the economic benefits that it delivers can rarely be captured by individual firms—as well, there is not the level of philanthropic support for research in Australia that exists in other countries, expressed through not-for-profit trusts and foundations, that might be directed to achieving a broad spectrum of benefits in the social, environmental and cultural spheres.

Ongoing relevance to priorities and needs

The priorities set out in *Powering Ideas* and *Research Skills for an Innovative Future* were advanced further in the Government's *2012 National Research Investment Plan* which provides a roadmap for coordinated investment in innovation, science and research across the whole of government⁴¹. The objectives of the *Future Fellowships* scheme remain relevant to those priorities. Discussion of the scheme's performance in Section 2 and elsewhere in this report indicates that the Fellowships are contributing directly and in tangible and productive ways to:

- enhancing the attractiveness of research careers;
- creating viable career pathways for Australian researchers;
- attracting the best minds to conduct world-class research in Australia; and
- increasing the level of inter-sectoral and international collaboration.

Section 1 of this report examined the extent to which the various elements of the funding scheme's program design are meeting the needs of stakeholders, in particular the Administering Organisations that host Future Fellows but also the Fellows themselves. The overwhelming consensus among these stakeholders is that the scheme is appropriate to their needs—the few areas in which this consensus breaks down to some extent are expressed in a desire among some Organisations and Fellows for:

- a longer period of Fellowship tenure (five years instead of the current four);
- an increase in the amount of project funding support available annually to Fellows (\$100,000 to \$150,000 instead of the current \$50,000), particularly in circumstances in which research projects are dependent on the establishment of relatively large-scale and complex arrays of equipment; and
- Fellows to be eligible to apply for a second Future Fellowship upon completion of their first.

Jurisdiction

Administration of the *Future Fellowships* funding scheme by the ARC delivers a number of benefits, including:

- the peer review system managed by the ARC ensures that funding support is allocated competitively to the highest-quality mid-career applicants and their research proposals;
- program design and funding to support mid-career researchers is integrated with NCGP support for a range of other research activities—including fellowship support for researchers at other stages in their careers, support for centres of research excellence within which many Future Fellows are located and have leadership roles, and project funding support that is accessible to Future Fellows for fundamental and industry-linked research; and
- support for mid-career researchers occurs within a context in which it can be linked to wider Government research policy and program activities.

A further consideration that is important to jurisdiction is the extent to which an administering agency and stakeholders can work in partnership to achieve program objectives and deliver desired outcomes. 'Engagement with government, universities, research agencies, business and the wider community nationally and internationally' is one of four organisational principles adopted by the ARC to inform all of its strategic activities and objectives⁴². The ARC has a long tradition of engaging

⁴¹ Department of Industry, Innovation, Science, Research and Tertiary Education (2012), *2012 National Research Investment Plan*

⁴² Australian Research Council (2012), *Strategic Plan 2012–13 to 2014–15* (http://www.arc.gov.au/about_arc/strategic_plan.htm)

collaboratively and productively with research sector stakeholders in a way that contributes to high-quality advice to Government and program design and delivery that is responsive to Government priorities and objectives and stakeholder needs. Of particular importance to the quality of this engagement are the mechanisms that the ARC has in place to facilitate communication with Administering Organisations and their researchers that are discussed in Section 5 of this report.

Integration

Assessment of the integration of the *Future Fellowships* funding scheme involves considering to what extent:

- the scheme's objectives articulate coherently with the wider objectives of the NCGP; and
- the scheme is coordinated with related Australian Government programs and activities.

Contribution to over-arching NCGP objectives

The *Future Fellowships* scheme objectives contribute directly to the broader program objectives of the NCGP to support excellence in research and build Australia's research capacity. The Future Fellowships play an important part in strategies that the ARC pursues to achieve those objectives by:

- supporting excellent researchers through competitive funding schemes;
- encouraging collaboration among researchers and research teams, and between researchers and end-users of research outcomes, including industry;
- encouraging international collaboration and mobility;
- fostering interdisciplinary research that will address some of the complex challenges facing society;
- supporting excellent researchers at strategic points in their careers; and
- helping Australia to attract and retain world-class researchers.

As noted above, the scheme's establishment in 2009 built on previous Government funding initiatives to expand and enhance Australia's research skills base. As a complement to those initiatives, the *Future Fellowships* scheme, by filling a gap that had opened up in support for mid-career researchers, contributed to a better balanced and integrated suite of opportunities for Australian researchers to receive research fellowship support early in their careers, at mid-career and upon establishing themselves as research leaders of international standing. This was consolidated with the establishment of Super Science Fellowships in 2010 and DECRA's in 2012.

This spread of opportunities across NCGP fellowships and awards is fundamentally important to attracting and retaining the highest quality researchers. Any gap or other imbalance in support at particular career development points provides a disincentive to attracting and retaining leading researchers, not only at that career point but at others as well. For example, any shortfall in mid-career opportunities will serve as a disincentive to early-career researchers looking to their longer-term prospects, as well as to established research leaders seeking to engage the best mid-career researchers in their widening research programs and groups. It will also diminish the pool of talent from which Australia's future research leaders can be drawn.

Integration with other types of fellowship

In its survey of Administering Organisations, the ARC invited comment on the extent of alignment of Future Fellowships with other fellowships.

Question: Could Future Fellowships have been better aligned in any way with other fellowships, Commonwealth-funded or otherwise?		
Answer Options	Response Percent	Response Count
Yes	59.4%	19
No	40.6%	13
answered question		32

A majority of respondents, almost 60%, believe that the Future Fellowships could be better aligned with other fellowships. Additional comment provided by 18 of these respondents indicates that, broadly, what is sought is:

- improved alignment of Future Fellowships with other ARC-funded awards and fellowships: DECRA, DORAs and Laureate Fellowships (nine respondents); and
- better alignment of Future Fellowships with fellowships funded by the NHMRC (eight respondents).

Comment on improved alignment with other ARC-funded awards and fellowships included:

"The ARC should provide a research career pathway similar to the NHMRC, with fellowship schemes for early-career, mid-career, senior and elite researchers (ARC Laureate Fellowships). Potentially Future Fellowships represent the link in the chain but there need to be additional schemes post Future Fellowships for senior researchers. The DORAs are too focused on the individual Discovery project and are too few to fill the gap between the Future Fellowships and the Laureate Fellowships"

"The duplication of funding to top-level researchers through the Laureate Fellowships scheme could be removed"

"There have been occasions when some researchers fell in a crack between the DECRA eligibility conditions and dates and the Future Fellowships. Closing dates and rules needed to be better aligned"

"The link between Future Fellowships and DORAs needs to be articulated to allow alignment"

"With the exception of the DORA (which has more restricted access requirements) the *Future Fellowships* scheme is the only one which bridges the early-career researcher to senior awards. There is perhaps a case to reduce the number of available [salary] levels within Future Fellowships and have a separate 'senior award' category, which would then bridge the gap from Future Fellowships to Laureate Fellowships"

"Better alignment and opportunity for progression from DECRA awards to ARC Future Fellowships"

"They [Future Fellowships] should form part of a more general fellowship scheme, which captures all ARC fellows".

Comment on improved alignment with NHMRC-funded fellowships included:

"Given that the NHMRC has an effective and comprehensive set of fellowship schemes for researchers in the biomedical sciences, it is debatable that the *Future Fellowships* scheme should have encompassed those same disciplines. For the scheme to have been most effective, it could have complemented, rather than overlapped, the NHMRC's awards"

"Integrate with the NHMRC's Career Development Fellowship scheme to maximise progression to senior fellowships. The *Future Fellowships* scheme is great but where do they go after that? The

ARC desperately needs a follow-on scheme that can select the very best of the Future Fellows and mirror the NHMRC process...or even better, integrate”

“Additional work could be done to ensure that there is no gap, or the gap is very narrow, between eligibility for ARC fellowships and NHMRC fellowships. Especially where medical-related research does not fit within the narrow categories of focus that can occur from time to time within the NHMRC schemes”

“A five-year [Future] Fellowship would be comparable to the NHMRC Career Development and Senior Fellowships”

“The inclusion of medical and dental research into the scope of eligible research and the eligibility of Medical Research Institutes were atypical for the ARC and led to some confusion and multiplicity of applications. Hence it might have been better to have clearer separation”

“Further integration between these [Future Fellowships] and the NHMRC fellowships would enable greater cross-disciplinary development”.

Some of these comments appear to imply an expectation that ARC awards and fellowships should, to some degree at least, offer an uninterrupted ‘cradle to grave’ career pathway for the best researchers. This has never been the intention; rather, they are designed to offer options to undertake periods devoted exclusively, or almost exclusively, to research at different points in a researcher’s broader career within and beyond academia. This may be a point of difference with NHMRC fellowships that precludes some of the closer integration sought by respondents.

Nevertheless, there does appear to be a sentiment held by a number of Administering Organisations that the gap is too wide for optimal progression from a DECRA to a Future Fellowship, and from a Future Fellowship to a Laureate Fellowship.

Similar sentiments were expressed by some of the 15 Future Fellows interviewed. When asked how Future Fellowships could be improved to provide more effective support to mid-career researchers, two Fellows nominated provision of a career step between Future and Laureate Fellowships and one nominated that Fellows be eligible to apply for a second Future Fellowship at the conclusion of their first. In addition, two Fellows nominated that it be a condition of funding that Administering Organisations commit to funding an ongoing position for Fellows at the conclusion of their Fellowship⁴³.

Summary of findings

- The *Future Fellowships* funding scheme objectives are consistent with the Australian Government’s broader strategic policy priorities for innovation, science and research⁴⁴. It is contributing directly to:
 - enhancing the attractiveness of research careers;
 - creating viable career pathways for Australian researchers;

⁴³ The *Future Fellowships Funding Rules for funding commencing in 2013* required that, as part of the strategic statement to be submitted as a component of each proposal, Administering Organisations outline plans for integration of the Future Fellowship candidate into the ongoing activities of the organisation at the end of the Fellowship.

⁴⁴ As these strategic objectives were articulated at the time the evaluation was conducted in the first half of 2013.

- attracting the best minds to conduct world-class research in Australia; and
- increasing the level of inter-sectoral and international collaboration.

Summary of findings (continued)

- Future Fellowships is the only source of funding in Australia that supports opportunities specifically for mid-career researchers to undertake basic and applied work in any field of research—in the absence of the scheme, it is unlikely that this work would be funded from the private or not-for-profit sectors.
- Administration of the funding scheme by the ARC is appropriate and delivers a number of benefits by ensuring that:
 - funding is allocated to the highest-quality applicants;
 - support for mid-career researchers is integrated with support for a range of other research activities; and
 - support for mid-career researchers occurs within a context in which it can be linked to the wider policy and program activities of the Government’s innovation, science and research agenda.
- The close and cooperative engagement of the ARC with Administering Organisations is an important contributor to efficient and effective program design and delivery.
- The funding scheme objectives articulate coherently with and contribute directly to the broader program objectives of the NCGP.
- On the other hand, there are concerns among a majority of Administering Organisations that Future Fellowships could be better aligned with other ARC fellowships and awards and with NHMRC fellowships.

Section 5: Performance assessment

An appraisal of the performance assessment arrangements for the *Future Fellowships* funding scheme involves considering to what extent:

- there are mechanisms in place to support assessment of performance and measurement of outcomes;
- key performance indicators for the funding scheme are appropriate and relate clearly to the scheme's objectives; and
- sound data collection methods are embedded in the scheme's administration.

Mechanisms to support performance assessment

The ARC has a range of formal and informal mechanisms in place to support assessment of the performance of the *Future Fellowships* funding scheme. These are common to all component funding schemes of the NCGP. Formal mechanisms comprise:

- key performance indicators for monitoring the performance of grant-funded activity at a whole of program (NCGP) level (these are discussed separately below);
- reporting of progress of grant-funded research activity against research management plans on a project by project basis;
- reporting of research outputs and outcomes in final reports following the conclusion of grant-funded activities on a project by project basis;
- internal audits of compliance and performance of funding schemes; and
- scheme-based stakeholder surveys to monitor the effectiveness of ARC program administration.

Administering Organisations report project by project on the progress of grant-funded research activity and on research outputs and outcomes as a mandatory requirement under funding agreements entered into with the ARC. Reporting of progress occurs on an 'exceptions' basis⁴⁵, according to which a progress report is submitted only if significant issues are affecting the progress of a research project. The report must specify the impact of the issues on the project, actions taken to rectify or mitigate the impact, and any ongoing residual impact on the project as a result of the issues.

Reporting of research outputs and outcomes is required of all projects and must occur within 12 months of the conclusion of a project grant. Information from such reports is used in a variety of contexts including annual reporting on performance to the Parliament, as input to periodic monitoring and evaluation of research excellence and impact, and to promote research outcomes in case study form to the wider public. The form for reporting outputs and outcomes from Future Fellowships is currently being developed in anticipation of the first cohort of Fellows (commencing in 2009) concluding their Fellowships towards the end of 2013 and into early 2014. This represents an opportunity to address some deficiencies that are apparent in current reporting arrangements across ARC funding schemes which can manifest themselves in low rates of compliance with reporting requirements on the part of Administering Organisations⁴⁶ and insufficient attention to assessment of research project outcomes on the part of the ARC due, in part, to the volume of

⁴⁵ This was introduced in 2013 for reporting on progress during the 2012 calendar year.

⁴⁶ At the end of 2012, the ARC took action to encourage the submission of around 2000 reports that were outstanding.

reporting⁴⁷. Improvements to data collection which could play a part in remediating these deficiencies are discussed below.

Through its Audit Committee and with the assistance of an independent auditor, the ARC conducts periodic compliance and performance audits of NCGP funding schemes. As noted in Section 2 of this report, a 2012 audit considered the extent to which the ARC's grants administration practices are consistent with the better practice principles of the Commonwealth Grant Guidelines⁴⁸ and the Australian National Audit Office better practice guidance on grants administration^{49 50}. The *Future Fellowships* funding scheme was a focus of this audit. While recommending a number of business improvements, the audit concluded that the ARC follows good grant administration practices.

A 2013 audit considered the design and operation of business processes in place for post-award grant management and monitoring⁵¹. Its scope was the NCGP as a whole, rather than individual funding schemes. The findings of the audit were positive overall but did include the observation that ARC compliance activities focus on inputs, rather than outcomes and outputs, and noted the reporting deficiencies identified above.

The ARC undertakes periodic surveys of Administering Organisations' research offices at the conclusion of funding application rounds⁵². The purpose of these is to obtain feedback from those offices, which coordinate Organisations' submission of research funding proposals, on the efficiency and responsiveness of ARC administrative procedures. The surveys are important in informing continuous improvement and one was conducted in 2013 at the conclusion of the *Future Fellowships* application round for funding commencing in early 2013. Feedback from the survey was consistent with suggestions from Administering Organisations discussed in Section 3 of this report on ways in which the funding scheme could be administered more efficiently and effectively. Common to both were the expressed desire to:

- be provided with earlier advice of the timing of funding rounds;
- see more timely release of key documents (such as funding rules and advice to applicants) well ahead of periods for submission of funding proposals; and
- have a longer period of time available for submission of funding proposals.

The primary informal mechanism that contributes to performance assessment is the close and regular communication with Administering Organisations and their researchers that is embedded within program administration, including that of the *Future Fellowships* funding scheme, across the ARC. Administrative staff in functional areas of the ARC that have responsibility, variously, for administering the submission and assessment of funding proposals and post-award grants management are in daily contact with Administering Organisations' research offices. Corporate support areas have contacts within those Organisations and some maintain 'help lines' to facilitate efficient, effective and responsive ICT systems support, communications and financial management. At a strategic level, the ARC CEO and senior ARC executives liaise closely and extensively with organisations and individuals across the research sector—in particular, it is a formal role and

⁴⁷ Between 2001 and the present, the number of new ARC-funded grants awarded annually has more than doubled and, at any given time, the ARC is administering in the order of 5000 individual research grants.

⁴⁸ Department of Finance and Deregulation (2009), *Commonwealth grant guidelines: policies and principles for grants administration*

⁴⁹ Australian National Audit Office (2010), *Implementing Better Practice Grants Administration*

⁵⁰ KPMG (2012), *Australian Research Council: Internal Audit of Grant Administration* (unpublished)

⁵¹ KPMG (2013), *Australian Research Council: Internal Audit of Post-award Grant Management and Monitoring* (unpublished)

⁵² These surveys were introduced in 2013.

responsibility of ARC Executive Directors to liaise and communicate with the research community and users of research. These channels of communication provide an important means of monitoring in real-time stakeholder perceptions of the performance of ARC funding schemes.

Key performance indicators

Key performance indicators are identified in the ARC Strategic Plan and Portfolio Budget Statements. The ARC reports on performance against these in its annual report to the Parliament. These indicators are broad in scope, having been developed to support monitoring and assessment of the high-level, strategic performance of the organisation as a whole. This is appropriate in focusing attention on outcomes that are relatively wide in their impact and which rely on complementary inputs and activities across individual funding schemes. The measures and targets which are used to assess performance against the indicators are tailored to specific funding schemes.

On the other hand, the absence of indicators that relate clearly and directly to scheme-specific objectives runs the risk that monitoring and assessment of some of these objectives may be neglected. It might also constrain assessment of the relative performance of individual funding schemes in contributing to the achievement of higher-level NCGP-wide objectives.

Key performance indicators that relate directly to funding scheme objectives would provide a sharper focus for monitoring and assessing performance at the operational level as a complement to the high-level strategic focus of indicators currently in place. Development of these could be piloted for the *Future Fellowships* funding scheme—and this might be timely given that the form for reporting outputs and outcomes from Future Fellowships is currently being developed. Such indicators could serve as a guide to more focused and precise specification of data to be collected in final reports, as well as in funding proposals which are also an important source of data for performance monitoring and assessment.

Data collection

Administration of the *Future Fellowships* funding scheme entails the collection of a substantial quantity of data. At the current stage in the scheme's life-cycle most of that data has been collected in proposals for funding submitted by Administering Organisations. The primary purpose in collecting that data is, of course, to support the assessment and approval of proposals for research funding but much of it is useful to monitoring and performance assessment. To this point, data has also been collected in Fellowship progress reports. Data on outputs and outcomes will begin to be collected as cohorts of Fellows conclude the period of their Fellowship tenure, commencing at the end of 2013. All of this data collection is an embedded aspect of the scheme's administration.

There are some deficiencies apparent in data collected in proposals for funding. In some cases there is an absence of data to support monitoring and assessment of achievement of specific objectives—for example, data is not collected that would allow consideration of the extent to which proposed research would build collaboration across disciplines. In other cases data that is collected that does relate directly to scheme objectives is collected in a form that is difficult and time-consuming to analyse—for example data on collaborating organisations is collected as free text.

As noted above, there are also some deficiencies in data collection in final reports of project outcomes across NCGP funding schemes. These are associated with the large amounts of data collected, the form in which it is collected—much of it as free text—and the fact that there is underdeveloped functionality in current ICT systems to allow data already extant in sources elsewhere—for example research outputs such as publications—to be captured precisely.

In developing the final report form for *Future Fellowships*, consideration could be given to:

- ensuring that, to the greatest extent possible, information is collected that bears directly and efficiently on the achievement of project, funding scheme and wider NCGP objectives;
- streamlining the information collected to focus more clearly on data that is of the highest value in assessing project and program outcomes;
- collecting data in a more discrete form that lends itself more easily to timely and responsive analysis, and reducing reliance on free text data that can be difficult and time-consuming to analyse; and
- examining the scope to facilitate entry and capture of data from extant sources.

Similar considerations to these could inform a review of the Future Fellowships funding proposal form to address the data collection deficiencies noted above.

Summary of findings

- Mechanisms are in place or under development to support the assessment of performance and the measurement of outcomes from the *Future Fellowships* funding scheme. These mechanisms are comprehensive and robust and, potentially, can be implemented more widely across NCGP funding schemes.
- Key performance indicators used to monitor high-level, strategic organisational performance take into account the contribution of the funding scheme.
- Key performance indicators that relate clearly, directly and specifically to the funding scheme objectives could be developed to provide a sharper focus for monitoring and assessing performance at an operational level.
- Data collection methods are embedded in administration of the funding scheme. In developing the final report form for the scheme and reviewing the scheme's application form, consideration could be given to focusing and streamlining data collection in order to help remedy some deficiencies that are apparent.

Section 6: In their own words—Future Fellows

BORIS BAER

Zoology—The University of Western Australia

LIBBY ROUGHHEAD

Public Health and Health Services—University of South Australia

QUENTIN STEVENS

Architecture and Urban Environment—RMIT University

SUZANNE CHAMBERS

Oncology and Carcinogenesis—Griffith University

NEIL LEVY

Philosophy—The Florey Institute of Neuroscience and Mental Health

KATHERINE BELOV

Genetics—The University of Sydney

MATTHEW RIMMER

Law—The Australian National University

JANE LYDON

Historical Studies—The University of Western Australia

JAMES CHON

Nanotechnology—Swinburne University of Technology

ANJA SCHEFFERS

Geology—Southern Cross University

RANJITH PATHEGAMA GAMAGE

Resources Engineering—Monash University

SARAH SPENCER

Nutrition and Dietetics—RMIT University

DMITRI FURSA

Atomic, Molecular, Nuclear, Particle and Plasma Physics—Curtin University

MADELEINE VAN OPPEN

Microbiology—Australian Institute of Marine Science

MIKE BUNCE

Ecology and Evolution—Murdoch University

BORIS BAER

The University of Western Australia

Zoology



“Bees provide the essential ecosystem service of pollination, securing human food supplies. But bee populations are in decline worldwide due to disease and parasites. I hope my work contributes to increased biosecurity for Australian bee populations and resilience of ecosystems facilitated by bees.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

Honeybee populations are declining globally but their pollination services are of central importance for food production. My work is in studying honeybee proteins that influence both fertility and immunity and their effects in vivo. This knowledge is important for the bee breeding industry to avoid or combat bee declines in managed Australian bees.

My research runs along two axes. The first is in the molecular field—proteomics and genetic sequencing—as well as classic behavioural ecology—host-parasite interactions—pushing forward basic research to increase our understanding of the bee immune system and contributing to a field which is developing really fast all around the globe.

The second is dealing with the worldwide problem of serious declines in honeybee populations, which has huge implications for farmers everywhere. In this work we are asking the question: how can we support beekeepers through this crisis? And what advice can we give the government in developing policy, for example on the use of certain pesticides in agriculture?

I'm also heavily involved in the national discussion on industry issues. I sit on committees such as the Rural Industries Research and Development Corporation's Honeybee Board and on the scientific Advisory Board dealing with the recent incursion of Asian Honey Bees into far-north Queensland.

Much of what we do is promotional activity—just thinking of ways to make bees more popular and to increase the awareness among a broader public of the importance of bees for food production!

My vision—and I still have links to Europe, to my native country Switzerland—is to build in Australia something that every other first-world country has—an institution specifically dedicated to bee research. Australia is a big country so such a centre would have to be networked, with multiple cells. We have good infrastructure in Australia already, top-class research is going on and we have really healthy bees, so there is a great opportunity.

Where does the Future Fellowship come into this? It gives me the freedom I need to concentrate on this vision of an Australian centre for bee research and the time to participate in all the activities I have mentioned. It gives me some space outside of the regular university structures to focus on these things. There is no way I would be sitting where I am now if I hadn't been awarded a QEII Fellowship earlier in my career, and the Future Fellowship is building on that. The value of the ARC fellowship schemes cannot be overrated.

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The Future Fellowship has allowed me to build my own research centre at The University of Western Australia, known as CIBER (Centre for Integrative Bee Research). The Centre maintains its own website and Facebook page. It has attracted a large number of students—running a centre with 20 to 25 people provides me with ample opportunities for research leadership.

There are opportunities for bee experts all around the world now with the current crises—however there is no question that Perth is the place to bee! It has healthy bees, bee research can be conducted throughout the entire year and we have built a very good relationship with the local industry.

Photo courtesy: Professor Boris Baer

LIBBY ROUGHEAD
University of South Australia
Public Health and Health Services



“We have gone from a very simple idea that is now translating into practice around the world.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My research is examining ways we might measure the effectiveness or the safety of pharmaceuticals, whether they are being used in high-risk groups, and how well the product is being used.

Some new medicines produce only a small improvement in health but have considerable costs. When these medicines are trialled on only small numbers of people, uncertainty results about the value of the medicine, which can create problems for decision makers. Funding medicines where there is uncertainty may lead to harm when medicines are later found to be unsafe, or waste millions of dollars when they are overpriced relative to effectiveness. Not funding medicines may disadvantage patients in whom the medicines are effective. Methods to enable access to medicines while reducing uncertainty will offer significant benefits to patients, clinicians and taxpayers.

A long-term goal of mine is to support global surveillance of medicine safety—to keep supporting the development of the federated inter-country analytic system and keep building its potential to collectively analyse and share information about adverse events of medicines.

What have been your most important achievements to date as a Fellow?

The Future Fellowship has enabled all sorts of things to happen that I never dreamed would happen. My team and I have validated a method known as prescription symmetry analysis. We showed it can

effectively identify potentially adverse medicine events and, importantly, it is a rapid method which means we may be able to identify events earlier than with current systems.

We did the preliminary work in Australia. I then went to Taiwan and found that researchers there, along with researchers in Japan and Korea, were interested in establishing a regional network to monitor medicine use, particularly the adverse events. We employed the method that we had validated and had made simple for use in the first regional study. Other countries also came on-board. So now we have Korea, Taiwan, Japan, North America and Sweden all part of this integrated analytics system that can track and share information about adverse medicine events. Importantly, this enables large studies to be undertaken and we can see if problems are occurring in multiple countries. Our first study enabled analysis of over 200 million people from six different countries.

The work has also translated into practice. Health Canada is using the tool, as is the Korean Institute of Drug Safety and Risk Management. We have gone from a very simple idea that is now translating into practice around the world. The method is now giving these countries the opportunity to identify potential adverse effects of medicines a lot faster.

All this work contributed to me and my team obtaining a centre of research excellence in post-marketing surveillance of medicines and medical devices. Other countries are now asking if they can be part of the system. If we can get a lot of other countries doing the same thing and results are consistent across countries then there is huge potential in tracking adverse events of medicines and identifying previously unrecognised events or quantifying the extent of harm.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

I hope to see the adverse drug method implemented by regulatory agencies. That would be more than enough!

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I now lead a group of about 30 people. This includes postdoctoral fellows and PhD students—there are professional staff to manage too.

My publication rate increased dramatically after receiving the Future Fellowship. This is simply a matter of having the time and space to write the papers and do research-only tasks. Being in the research-only space you really have the opportunity to fly. I think it would have just been harder and longer if it was the other way around.

I think the Fellowship is really going to pay off in the next year or two. I can see that the team and I are really going to have a lot of opportunity with the adverse event research—it is so important to have the research time to be able to develop the work. The positive chain reaction that has occurred as a result of the work is encouraging and will lead to more opportunities.

Photo courtesy: Professor Libby Roughead

QUENTIN STEVENS
RMIT University
Architecture and Urban Environment



“The Fellowship has given me the chance to follow a new path—as I wasn’t then an expert on meaning—and make a genuinely new contribution.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My Future Fellowship has allowed me to expand in a new direction and given me the scope to undertake a much larger study that would have been too ambitious to bring to fruition without it. Much public money is invested in public art and memorials. My research explores critical questions of value: what the public enjoys about such artworks, if and how artworks contribute amenity to public spaces, and whether recent artworks engage effectively with social memory, identity and politics.

The research aims to situate local practice within international trends, so as to inform Australian designers, policymakers, art patrons and public space managers about recent innovations in technology, craft, creativity and critique, so that they can create and choose public artworks and memorials which engage with the potentials of contemporary arts practice, the complexities of contemporary culture, and the diversity of social behaviour in public spaces.

About the time I was first framing my proposal and thinking about what I would do, I visited the Memorial to the Murdered Jews of Europe in Berlin and, in Kensington Park in London, a fountain memorial to Diana, Princess of Wales. I noticed what people were doing at these memorials, the playful uses that people made of these public settings, and this mystified me. What I found mysterious was that these public ‘meaningful’ sites were being used in a more playful way. So the Fellowship has allowed me to explore this further and think about how the work I’d already done on play in public spaces might extend and connect to issues of meaning in the built environment.

The Fellowship has given me the chance to follow a new path—as I wasn’t then an expert on meaning—and make a genuinely new contribution. And, you know, it’s still a mystery. All the previous research done with memorials has been linked to their subject matter: that is, what is being memorialised, issues of national identity reflected in memorials, and so on. I’m taking a more objective, empirical view, setting issues of meaning to one side and focusing on what people actually do at memorials.

Mine is a comparative analysis that rises above any particular subject matter. How memorials came about and how their designs and their public use have changed—other research hasn’t touched on that, except perhaps that of art historians. But that’s a design perspective with limited connection to users.

It’s something more or less unique about my publications on memorials that there are people in all the pictures!

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My Future Fellowship is really the fruit of collaboration with RMIT University, my host, and my School’s Director of Research, who is herself very engaged in this area—she has worked on designing public memorials. The Fellowship has brought me back from London, in part to really build this collaboration. I have had the time to prepare joint papers with other scholars in diverse fields. Because I’m able to concentrate on research, I’ve had the scope to really build these networks.

At the start of this year I organised a workshop at The Australian National University’s Humanities Research Centre as part of their thematic-focused annual seminars—which this year was *Cities, Imaginaries, Publics*, about the creation of urban spaces and the role of public imagination in configuring them as sites of value.

My colleagues at RMIT and a collaborator from Germany, along with a postdoctoral researcher at The ANU and other leading scholars, held a workshop and we are preparing material to publish following that. We then had a symposium at RMIT about public art at which some speakers were artists—we’ve helped to enhance connections with the RMIT School of Art—while others were scholars. The focus and question was: how do people use artworks once installed? We have also run a symposium in Germany on this question. We’re exploring—for instance, at the Memorial to the Murdered Jews of Europe—the questions: what sort of behaviour is intended and why don’t the public just stand back and reflect? We explore not what the piece was supposed to be but how it actually is.

Through this Fellowship I have also been building a very valuable collaboration with a colleague in the US with whom I’ve written *Loose Space—Possibility and Diversity in Urban Life*—she also participated in our symposium at RMIT. There is much more to be done and, most importantly, the Fellowship gives me the time to cultivate these collaborations.

I had a permanent position in London and, at the time I was awarded the Future Fellowship, I had a fellowship in Germany which I had to cut short. Without the Future Fellowship I would most likely have submitted proposals to UK or European funding councils and so remained in Europe.

Photo courtesy: Eden Platell and the Asia Pacific Design Library

SUZANNE CHAMBERS
Griffith University
Oncology and Carcinogenesis



“Chronic diseases such as cancer have long-term negative effects on the quality of life of patients and their carers. I hope to develop effective ways to support individuals and their carers to achieve positive quality of life outcomes and wellbeing in the face of serious illness.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

I’m a psychologist and my specialist research area is psycho-oncology. The overall aim of my research is to help families and individuals better manage the stress that comes with the diagnosis and treatment of cancer. Ultimately, the goal is for people affected by cancer to achieve the best possible quality of life and psychological wellbeing, not just in the short-term but as they go on through life.

I worked in service provision for most of my career before completing my PhD in 2004. My passion is to make research translatable and my service background provides me with valuable insights into how to really make a difference.

My goal is to build a sustainable research program that outlives me and the Future Fellowship really has given me the resources to focus full-time on that. The trials which I have developed and am running have to be sensitive and broad-reaching so as to target the high-needs groups which we seek to help. These trials address key issues in Australian society such as couple support and sexuality, lifestyle and unmet supportive care needs, and psychological distress in men with prostate cancer.

What have been your most important achievements to date as a Fellow?

I have been working closely with the Prostate Cancer Foundation of Australia and this year we released an evidence-based self-help book, *Facing the Tiger*, to take what we have learned and move it into the mainstream. The book is for men with prostate cancer and the people close to them, and we hope that it will help us to get the message out into the community where it can produce the most benefit. Rugby League legend Ron Coote AM launched it—he’s been very active in community development through the Men of League and in the public eye, giving really welcome exposure to prostate cancer, which men normally don’t like to discuss.

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I work very closely with non-government organisations in cancer control, such as the Cancer Council Queensland and the Prostate Cancer Foundation of Australia, and am deeply committed to their causes. I also work across health and research institutions nationally and internationally. As one example, I am currently leading a partnership research project on e-health that works with Cancer Council Queensland and the University of Virginia. Being a Future Fellow has been crucial in supporting this work.

I have four postdoctoral fellows who are working closely with me in the psycho-oncology space. I’m providing mentorship and they are providing power to my research program. With these people I’m now winning grants and publishing. I can share with them my experience of applying for grants and help them to negotiate the funding landscape.

Having a Future Fellowship gives me the time and focus, and validation of what I do. So when I go to an industry partner and say “I’d like to do this”, showing that I am supported by the ARC gives them a sense of confidence. It is because of this that I profile that I’m a Future Fellow everywhere I go.

Photo courtesy: Professor Suzanne Chambers

NEIL LEVY

The Florey Institute of Neuroscience and Mental Health
Philosophy



"I hope my project succeeds in developing a philosophically and scientifically sophisticated account of the nature of self-control. This would provide tools for allocating responsibility for failures of self-control and contribute to developing means for enhancing it, thereby aiding in addressing major social problems."

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My work is in exploring the intersection between philosophy and neuroscience, as it relates in particular to free will and self-control. This is very much a new research area and I am breaking a lot of new ground. As much as the research itself, which is trying to understand the neurological limits of free will and self-control, my work is about crossing boundaries and helping people from science backgrounds and philosophical backgrounds to talk to each other and trust each other.

I'm trying to turn philosophers away from the question of indeterminism and to look at how the mind actually works, given the best research coming out of neuroscience, and to ask how our philosophical theories look in the light of that science. My Future Fellowship has enabled me to

create some links between scientists and philosophers, and to nurture a rapidly evolving new field. I actually go to science conferences and say how what scientists say about free will doesn't connect to the problems of free will as philosophers understand them, and people listen.

I am also doing some experimental work on free will beliefs, for example on whether people's beliefs in their own free will predict the amount they will donate to charities.

What have been your most important achievements to date as a Future Fellow?

The Fellowship has given me the time to write a book, which has just been accepted—a heavily interdisciplinary book. Actually writing this book gave me a chance to get into the laboratories. When I go into the laboratory I am often met with distrust initially—maybe they think I'm an ethicist! But I can help them see where their assumptions about free will might be wrong. There is an increasing amount of interdisciplinary work in this area—I find that postdoctoral researchers in particular are aware of and open to that. In some cases we've been able to work up very productive relationships—for instance with Associate Professor Rob Hester at the Melbourne School of Psychological Sciences within The University of Melbourne, another Future Fellow.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

Ultimately I'm trying to build a research program. An outcome of that will be that I have a set of tools and questions and results, as well as a network of people who are interested in these questions and willing to continue research into them. I want to be able to say 'I think this is an experiment that should be done' or they could come and say 'look at these results what do you think of this?'.

As my work doesn't fit easily into categories, the Future Fellowship really has been a unique opportunity to develop a new field—I don't think anything like the work I am doing existed before. And yet so much of the humanities these days is trying to overcome the gap between itself and the sciences—I went to a talk in art history recently and to my surprise they were talking about neuroscience.

I hope my Fellowship project succeeds in developing a philosophically and scientifically sophisticated account of the nature of self-control. This would provide tools for allocating responsibility for failures of self-control and contribute to developing means for enhancing it, thereby aiding in addressing major social problems.

Photo courtesy: Professor Neil Levy

KATHERINE BELOV
The University of Sydney
Genetics



"I'm quite passionate about trying to understand this cancer and trying to help the Tasmanian devil—and I think we're making really good progress towards that. It's been really important to have financial support to be able to do that—the Future Fellowship plus a number of other grants has made it possible to do this research properly."

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My ultimate research goal is to use the research I conduct to improve our understanding of both the health and disease of our native animals—but also of humans through comparative studies.

What have been your most important achievements to date as a Fellow?

The Future Fellowship has been really important for my research as it has given me time to establish myself. During that period, I was also successful in obtaining two other *Discovery Projects* grants and two *Linkage Projects* grants. This has really given me time to build my team and I have a very strong team that is working on a range of things—not just research into the Tasmanian devil, which is what I received the Future Fellowship for. We have research in progress on the platypus, the tammar wallaby and a range of different reptiles, frogs and toads. The Future Fellowship has definitely helped me to get where I want to go.

My team has produced some really important papers on understanding the Devil Facial Tumour Disease. That has been quite important to me because I'm quite passionate about trying to understand this cancer and help the devil—and I think we're making really good progress towards

that. It's been really important to have financial support to be able to do that—the Future Fellowship plus a number of other grants have made it possible to do this research properly.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

We want to save the Tasmanian devil from extinction, so all of this work is going towards that.

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As part of my Future Fellowship research, I travelled to the Benaroya Research Institute in the US to construct two Tasmanian devil BAC libraries—these are genetic libraries that hold large fragments of Tasmanian devil DNA. I have also received a huge number of invitations to speak at both national and international conferences. Last year I was invited onto the Governance Board of the Allan Wilson Centre for Molecular Ecology and Evolution, one of New Zealand's Centres of Research Excellence. I believe that these opportunities would not have occurred had it not been for the Future Fellowship.

The Fellowship has definitely expanded my opportunities for research leadership—I get a lot of requests for students to come and work in my laboratory. This year I've had five early-career researchers apply for fellowships to come and work in my lab next year—so straight away I've got that visibility and reputation, which is a direct result of the Future Fellowship.

In terms of leadership, I'm now Sub-Dean of Research Development in my faculty, I sit on the Divisional Science Research Committee and I'm a member of the ARC College—I've had all of these amazing opportunities in the research space in Australia. If I was in a traditional teaching role, I don't think I would have been asked to take on all of these great responsibilities.

My Fellowship funding ends in late-2013 and I'm not scared to admit that there is a small sense of fear of returning to a traditional academic appointment and struggling to keep up. When you're research-only it's a very different ball game from being a traditional teaching academic. I've thoroughly enjoyed being research-only and benefiting from the time to advance my research—and I've enjoyed and am appreciative of the successes that have come from that.

It's scary to now step back and think: how am I going to juggle all of that? I've got a lab of around 20 people so I do wonder: how am I going to continue doing all of that and teach? I think I'll be fine; most academics around Australia do just that.

Photo courtesy: Steve Merenos

MATTHEW RIMMER
The Australian National University
Law



“My Future Fellowship is allowing me to build an academic community from scratch which is international in its reach.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My work is in the area of intellectual property (IP) law—patents, trademarks, consumer law and copyright—as it applies to the development of clean technologies to mitigate and adapt to the effects of climate change.

Questions arise such as: should there be international agreements on IP, clean technologies and climate change? What is the role of international institutions—such as the United Nations Framework Convention on Climate Change, the World Trade Organisation (WTO), the World Intellectual Property Organisation (WIPO), and the United Nations Environment Programme? How do we encourage the private sector to invest in research and development into cleaner technologies? How can poorer nations access cleaner technologies if they are IP-protected?

As well, how do clean technology companies overcome the ‘valley of death’ in respect of investment and commercialisation of renewable energy? Do renewable energy companies need incentives under patent law? Can governments, public research institutions and the private sector collaborate and cooperate on renewable energy projects? There are lots of questions for IP raised by an eco-conscious society—should some of these initiatives be fast tracked for example? In the US there is a modest start with the “Patents for Humanity” scheme.

And there's a need to ensure the honesty of 'green' brands and protect them from potential misuse through 'green-washing' and carbon scams. There are also questions of the legality under consumer law of 'astro-turfing' or campaigns of misinformation about climate change.

All of this is of interest to me, my research is bringing it all together and I am active in providing advice to the Federal Government. My Future Fellowship not only gives me the time to do this but it also provides the academic freedom to address the topic in its pure form.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

In law it is really important for there to be emphasis on empirically-based research—and you need time for this. I hadn't done any large-scale data analysis before. The Future Fellowship is essential for conducting fieldwork—interviewing the most innovative practitioners in a particular space and engaging in data analysis of IP registries. I've visited key international institutions—including the WTO and WIPO. I've been following the establishment of the Climate Technology Centre and Network and I'm keen to visit its host, the UN Environment Programme, when it is operational.

I've also mapped clean technology and trademark activity across the world. The Scandinavian Nordic Swan Eco Label, for example, is one of the world's oldest eco-labels and is a fascinating case study. New mothers in Norway get a baby bag full of eco-products from Nordic Swan. They have promoted a regional label through the Rio+20 summit and I interviewed their nodes in Norway and Finland.

Vestas in Denmark is another innovative clean technology company, which established and promoted a WindMade label. I've interviewed a marketing member of Vestas about this and attended the launch by Vestas and Bloomberg of their Energy Transparency initiative in Sydney. In Vancouver in the US, Big Room Inc has established an Eco Label Index and has submitted a bid to run the new generic top level domain name Dot Eco.

I've also investigated best practices in IP management. I visited CERN in Geneva and heard how the Big Science Project has managed IP and access to everything from the World Wide Web and the Large Hadron Collider.

There are questions for public policy which my work will inform and is already informing through, for instance, my appearing in Parliament to speak on the *Intellectual Property Laws Amendment Bill*. My work on IP and climate change was cited in a recent report by the Productivity Commission. I'm also writing two books and editing another at the moment. My task is not only to do research but to disseminate it through media op-eds, at conferences and in public policy submissions.

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I've supervised a number of research students working in the field of IP, the environment and climate change: a Summer Research Scholar from New Zealand undertook research on 'Footprints to the Future: The Carbon Trust and The Carbon Reduction Label'; an Honours student researched the topic 'The US Dolphin-Safe Label: Trade, Environment and Sustainable Development'; and a PhD student submitted his thesis on *Marine Bioprospecting: International Law, Indonesia and Sustainable Development* under my supervision.

The Australian National University has set up a new centre on climate law and policy, so this is a very fertile place to be. Its College of Law is in some ways actually changing as a direct response to the Future Fellowships it now hosts.

Photo courtesy: ANU media

JANE LYDON

The University of Western Australia Historical Studies



"I'd like to be thought of as someone who tried very hard to mentor and collaborate with Indigenous people. I'd like to draw more Aboriginal people into academia and bring them into the field as researchers of their own past and their own heritage."

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

I have two long-term research goals. The first is to establish visual history as a legitimate and important aspect of Australian historiography. This means understanding the way visual imagery has been part of our history and having that acknowledged as an important aspect of the Australian past: to look at archival images as sources, to develop methods to analyse them and bring them into how we understand the past.

My second goal is to integrate this intellectual approach towards historic photographs with their status as an Indigenous heritage resource. This means making them accessible to communities, relatives and descendants of Aboriginal people in the photographs. To do this we need to return those images—which are often in museum collections held overseas in Europe, having been collected by European explorers from the mid-nineteenth century—to Australia and to the descendants of the people in the photographs. Today they are very much valued as family portraits, they also document a colonial past that isn't otherwise available through documented images, and they document cultural heritage and cultural traditions that may not have been remembered or recorded in other ways.

What have been your most important achievements to date as a Future Fellow?

I published a book in December of last year, *The Flash of Recognition: Photography and the Emergence of Indigenous Rights*. It presents a new way of looking at the relations between Aboriginal people and settler society in the past through visual imagery. What I've argued in that book is that images were an important way of campaigning on behalf of Aboriginal people, both up until the 1930s as used by white activists and then from the 1930s on as used very much by Aboriginal people themselves to argue for their rights. The book puts forward an innovative argument and brought together a lot of these images for the first time.

Another achievement has been putting together a database that brings together images from four overseas collections (in the UK, Netherlands and France), and that is going to be a resource that will be of great benefit in actually establishing which images held overseas relate to which communities here in Australia. It will serve as an important tool for returning those images.

A third project that I am working on, which I hope will be an important achievement, is a book looking at how photographs have played a role in shaping ideas of what it is to be human. The book will be international in its scope, but very much through the lens of race relations in Australia and the way that Aboriginal people have been represented by photographers and have represented themselves. It will also be greatly developed and supported by a six-month visiting fellowship to Cambridge University next year, which was enabled by the Future Fellowship.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

In a broad sense I'm hoping that a research outcome of my Future Fellowship will be establishing visual history as an important field of research and visual archives and photographs as an important heritage resource, particularly for Indigenous communities. I want to help the Australian public to become more conscious of the legacies of the past in the present. I'm hoping the books will also have an impact on Australian history and heritage.

We all want to be acknowledged for our intellectual contribution to research, but I'd also like to be thought of as someone who tried very hard to mentor and collaborate with Indigenous people. I'd like to draw more Aboriginal people into academia and bring them into the field as researchers of their own past and their own heritage.

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Built into my project is a collaboration with four European museums—it has been wonderful to work with them.

The Future Fellowship has raised my international profile. I've been able to attend overseas events—for example, I was invited to present the results of my research at the University of Durham earlier in the year, which was an exciting and valuable experience. I've also been given the opportunity to present a number of keynote addresses—the launch of the University of Otago's new Centre for Research on Colonial Culture, and the Post-Graduate Collective LIMINA—I think in part as a result of my Fellowship. It has definitely raised my profile within the academic community and the invitations flow from that, which is great.

As a result of greater awareness of my work, more students are approaching me about supervision, most notably an excellent student who is based in Adelaide doing an extremely exciting project about the visibility of Aboriginal heritage in pastoral landscapes—it will make an important impact in our field of research.

Photo courtesy: Chris Canham Photography

JAMES CHON
Swinburne University of Technology
Nanotechnology



“Optical storage devices have huge data capacity potential and, because of the longevity and stability of optical storage—some claim that it can last 1000 years—it has real potential as a solution to the storage needs of the future.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My primary research interest is a special kind of metallic nanoparticle with remarkable optical properties. You have probably never thought about why metal is shiny but it is because of ‘plasmons’—special oscillatory waves of electrons in metal which have optical effects. Nanoparticles have been found to affect plasmons in special ways. These are called ‘plasmonic’ nanoparticles and I work with individual particles as well as studying their collective behaviours.

First I shape them—at 10 to 100 nanometres (billionths of a meter)—into spherical shapes and rod shapes, and for each of these shapes they have distinctive properties. Then we mix them, maybe in a polymer or a glass, to see what their random collective properties are. We look at their aggregation states, how we could optically resolve those states and maximise their properties for particular applications.

What have been your most important achievements to date as a Fellow?

My big coup as a researcher was a front cover article in *Nature* magazine in 2009. This published a breakthrough storage method that my team pioneered using gold nanorods to increase data density in optical storage beyond 1 Terabits/cm³.

Ironically, the *Nature* article came just at the moment when I ran out of funding. My work had been supported by an ARC *Discovery Projects* grant. When this expired I had to survive on my own for two years—and think about how the field was progressing and where to go next. I didn’t feel lost, the break gave me a chance to stand back and plan the next step. Getting this Future Fellowship in 2011

has really kick-started the next level of my work. Interestingly, the biggest catch-up period has been during the first year of my Fellowship as I needed to accumulate equipment. It has taken me all year to set up the laboratory—we are nearly there—and once it's fully set up the output will shoot-out like a laser.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

There are three primary applications for this technology that we can see at the moment. The first is in the extension of the work that was published in *Nature* on optical storage devices. Optical storage devices have huge data capacity potential and, because of the longevity and stability of optical storage—some claim that it can last 1000 years—it has real potential as a solution to the storage needs of the future. There are also huge advances possible in energy conservation. Cloud centres in the US, for instance Google, consume huge amounts of power just to cool down their hard drives. Most of the power consumption of these server farms is by the air conditioning (up to 95%). The optical storage methods that we are trying to develop wouldn't need cooling down like this and they would hold more data.

The second application is biomedical. There is potential for plasmonic nanoparticles and their random structures to be used as bio-labellers, as well as in cancer therapy materials. For example, you could label a particle as an antibody and the cell would let it in (because the cell membrane recognises it) and the information in the biomarker would be carried in. There are huge questions in medicine about the exact activities of small molecules like antibodies in cells and this kind of labelling could help us to visualise their behaviour—by light scattering approaches, for example.

The third application is in telecommunications. Plasmonic nanoparticles could be used for fast switching, just like a transistor but in a photonic chip—which is basically a switch—but with enormous improvements in scale and speed over silicon transistors. So there are many potential fruits from these three fields.

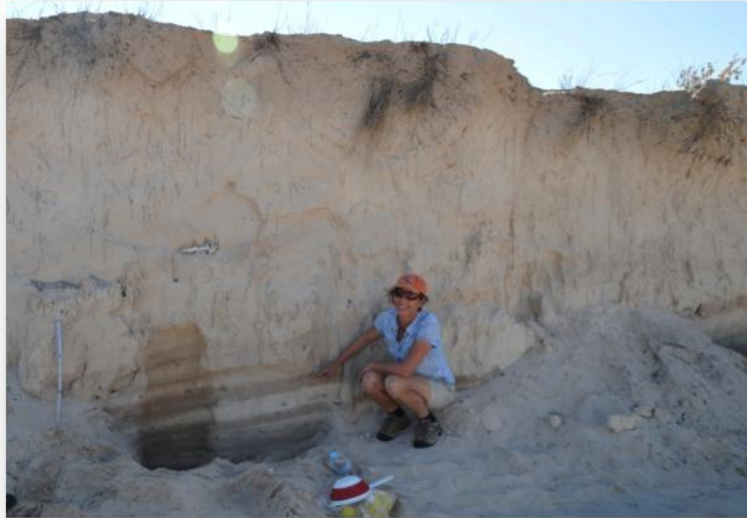
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I have six PhD students and we all work together setting up experiments. I am also supported by my colleagues around me, great team leaders and professors who provide invaluable interactions.

Swinburne University was really encouraging of my application and helped me after I received the Fellowship with lots of internal funding to match. That helped me a lot because my research requires a lot of expensive equipment. The Future Fellowship was such a blessing. With the project funding I could purchase the equipment I needed—just in the last month we have installed this fantastic laser which is critical to my work, an ultrafast laser which has varying degrees of power and wavelength. We're just setting up other equipment around it—a spectroscopy/microscopy set-up that can detect down to single nanoparticles and molecules. As well as the money for purchasing equipment it is the relief from teaching which allows me the time to do all this.

Photo courtesy: Associate Professor James Chon

ANJA SCHEFFERS
Southern Cross University
Geology



“My work is reconstructing the history of storms and cyclones using sedimentary signatures in Western Australia over the past 7000 years—this will help to assess storm and cyclone risks under changing future climates in a regional context.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My longer term research goal is to understand marine climates of the past. I have worked extensively on storm chronologies and tsunami chronologies—in the Mediterranean, the Caribbean, South East Asia and Australia—putting together a history of these events over the last few thousand years. Extreme events in particular leave a record in the sediments deposited along shorelines, and these sediment records can be used to reconstruct the past climate. My previous work helped to establish the importance of extreme storms and tsunamis in shaping the coastal landscape, an importance which is still being challenged and refined as new data comes in.

For the Future Fellowship, my focus has been on Western Australia. Our area of research focus has been between Exmouth and Broome. This is the area with statistically the most cyclones making landfall. We are trying to capture the last 10 000 years of events since the onset of rising sea levels at the end of the last Ice Age. That’s around nine to eleven metres of sea level rise in Western Australia due to the melting of ice sheets during that time. We have looked at lots of different locations, at specific coastal features like the over-wash of sediment beyond beachfronts caused by big storm surges or tsunamis, and the formation of ridges or dunes from these events. Areas within floodplains are great sediment traps—they are like a library, each sediment layer a page in the earth’s diary. During the study period, we studied the impacts of a major cyclone from 2009 and could see the immediate impact in fresh sediment deposits.

What have been your most important achievements to date as a Fellow?

My great finding during the course of the Future Fellowship has been that sediment records are much, much more complex than we could initially have imagined. And the area of coastline in Western Australia has particular difficulties associated with it—the oceanographic conditions, because of the huge tidal range, and also difficulty with dating has made it hard to recover the Holocene history of this region. Instead of uncovering a big regional climatic history, we have looked at more localised chronologies first. The next task is to bind these together to get the regional signal. As is often the case in science, we have more questions now than when we first started.

Having said that, from looking at sediment cores we have identified clearly distinguishable events. For instance the Krakatoa tsunami of 1883 can be identified and dated clearly, as can the more recent 1994 Java tsunami, and also events from millennia ago. But generally speaking the archives are more complex and diverse than previously expected. This is the first time we have opened up the record to examination and we really need to use caution before making claims.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

My early work in this field has been controversial. There is now an interesting scientific debate going on about the significance of these extreme events in forming coastal landscapes, and about re-interpreting coastal features and sediment records in light of this new understanding. As with any new discipline, there has been a reaction against it. In fact, Australia is really leading this new area of science by virtue of its enormous and largely undisturbed coastline. Along with the US it is Australian scientists who are trying to establish a new paradigm—and this is hard—sometimes it feels like you cross into enemy territory when you try to explore a new section of coastline here.

My research has really uncovered the complexities and difficulties inherent in this field. Without the Future Fellowship the challenges for me would have been overwhelming. The regional setting I chose—in Western Australia—is itself very difficult. We wanted to go further north but all the challenges of the remoteness of that location made it unfeasible. You need to bring all the equipment and organise charter flights. Fortunately, the Future Fellowship funding has enabled us to focus our research on some choice locations and look at them in detail.

Another challenge has been in building the trusting relationship with traditional owners. Before us, it is typically gas mining companies who have been working in these areas. This has established in some ways a difficult precedent for as soon as you talk about digging in the ground there is an expectation that we can afford to pay high daily rates. This might suit the budgets of mining companies but not a research budget! There are other sensitivities as well, with working near burial sites for instance, and these have to be understood before research can proceed.

Finally, I have been challenged with new technical difficulties in dating these sediments. If you want to get a better grip on the deposit you need a high resolution dating campaign and this comes with high costs. For example, we dated some storm surges and it becomes clear that you need several numerical dates per event layer to achieve a sound approximation to the “true” age of the event and as these dates cost \$300 each you soon reach the financial constraint of your grant. There is always a challenge in identifying sediment markers—the difference between tsunamis and storms isn’t necessarily clear. You need high-resolution data for that. Pure sedimentary characteristics don’t reveal the difference every time. Fortunately we have obtained an ARC LIEF grant for instruments to measure this, and I think the Future Fellowship has enabled me to develop a new interdisciplinary approach to these problems from a geochemical perspective.

Photo courtesy: Associate Professor Anja Scheffers

RANJITH PATHEGAMA GAMAGE

Monash University

Resources Engineering



“The most important and lasting outcome of my research would be to develop new technology for green and affordable energy from deep in the earth. That is what I would really like to contribute to society.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My ultimate research goal is to provide innovative research solutions to the problems caused by climate change and global warming. My research will lead to greater understanding of storage capacity of sedimentary basins and identification of optimum injection conditions for geo-sequestration in such aquifers, and any potential mechanisms that could lead to migration of CO₂ from the source rock back to the atmosphere. This will contribute to national efforts to reduce global warming, safeguard the Australian economy, and enable the transition to new green energy production technologies.

My primary research focus is the assessment of the carbon dioxide storage capacity of water-bearing sedimentary basins: specifically, the feasibility of CO₂ storage in deep saline aquifers. My work uses a combination of experimental and modelling approaches to understand the storage and transport properties of sandstone and the effects of carbon storage on the mechanical properties of aquifers. The data will be used to develop new storage models and to identify suitable aquifers for large scale sequestration of CO₂.

I also have a long-term goal to pioneer innovative and technical solutions for energy production. This includes shale gas, coal-seam gas, geothermal energy and carbon sequestration initiatives that utilise the deep earth. My Future Fellowship has given me a very strong foundation and focus to be able to achieve this goal.

What have been your most important achievements to date as a Future Fellow?

I've been able to develop very strong international research collaborations in the area of deep earth energy and carbon sequestration. The Future Fellowship has enabled me to coordinate my research with researchers from North America, Europe, China and India. This collaboration has recently culminated in a grant from the European Commission involving my international colleagues.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

The most important and lasting outcome of my research would be to develop new technology for green and affordable energy from deep in the earth. That is what I would really like to contribute to society.

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The Future Fellowship has supported me in developing strong research leadership. The laboratory that I supervise at Monash University is now considered to be a leader in the world in utilising advanced macro scale modelling at very high pressures and temperatures.

The Fellowship has given me a lot of opportunities, especially with international collaboration. It has given me extra time to plan and give my PhD students the opportunity to do wonderful, wonderful projects and, much to my delight, they are now receiving prestigious awards.

I currently have 12 PhD students under my supervision, and something that I am very proud of is the recognition they are receiving—one of my PhD students who graduated last year was recently awarded a DECRA (one of only three in the discipline of resources engineering nationally). This would have to be one of the happiest moments for me. This student was also awarded the Vice-Chancellor's Mollie Holman Medal for best PhD thesis awarded in 2013. And last year I was awarded the Australia Leadership Award in 2012 from the Australian Davos Connection Forum.

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The Future Fellowship has helped me to build very strong international collaborations with China, North America, Europe and India. I received the Australia-China Young Scientist Award in 2012. This led to me collaborating with six universities in China. In 2013 I received the Australia-China Group Mission Award to collaborate with 12 Chinese universities on technology relating to sustainable, alternative energy from the deep earth.

My aim is to establish an Australia-China Energy Centre to coordinate research activities between the two countries to accelerate finding solutions to some key technical challenges faced by the energy industry.

Photo courtesy: Associate Professor Ranjith Pathegama Gamage

SARAH SPENCER
RMIT University
Nutrition and Dietetics



"I hope these findings will have a lasting impact in highlighting the importance of early life diet in contributing to adult physiology and for determining some of the mechanisms involved."

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My long-term goals are to run a successful laboratory and become internationally recognised as an important researcher in my field. This has started to happen since I received the Future Fellowship. I have a lab with four students and staff. I was recently invited to speak in New Zealand and I am always traveling around Australia to talk about my work.

What have been your most important achievements to date as a Fellow?

Moving to RMIT University to set up my laboratory and being awarded an ARC *Discovery Project* grant last year for the period of 2013 to 2015 have been really important achievements for me.

I've been publishing some really interesting work of late as well. In particular, my favourite publications have been one on the role of ghrelin in stress, published in *Biological Psychiatry*, and one on the role of early life overfeeding in programming immune function long-term, published in the *Journal of Neuroendocrinology*. I've published several other studies but these would be among

my favourite career publications. Being invited to speak at national meetings—of the Australian Society for Medical Research, for example—national symposia and international meetings are also career highlights for me.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

My work on the perinatal programming of stress and obesity is yielding some incredibly interesting results and I hope these findings will be remembered for highlighting the importance of early life diet in contributing to adult physiology and for determining some of the mechanisms involved.

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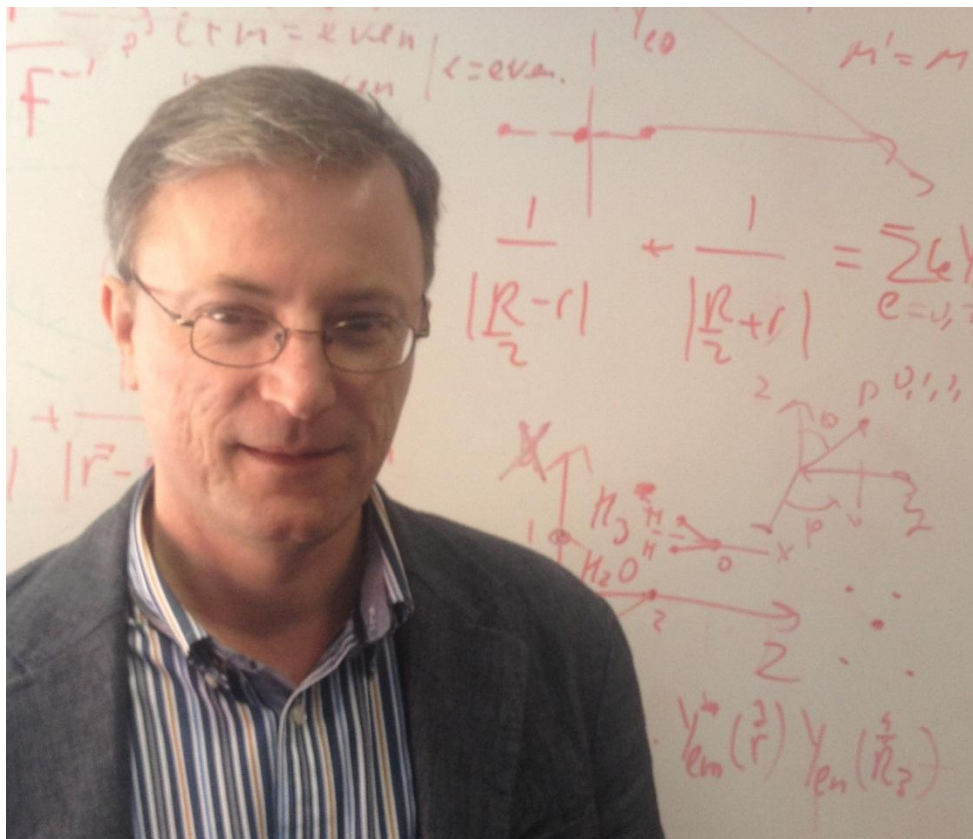
I've been given the opportunity to coordinate the Honours program for the School of Health Sciences and to be a community outreach representative for the Health Innovations Research Institute, which are both significant opportunities. The most important professional development opportunity that the Future Fellowship has led to is an ongoing position at RMIT that allows me to concentrate on my research.

Photo courtesy: Luisa Mirabillio

DMITRI FURSA

Curtin University

Atomic, Molecular, Nuclear, Particle and Plasma Physics



“My research is applying advanced fundamental science techniques to applications that I hope will have a highly positive impact on the environment—improving the energy efficiency of fluorescent lamps, developing new mercury-free designs and contributing to the international multi-billion dollar fusion energy program.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My research is applying and further developing the state-of-the-art Convergent Close Coupling method for calculating atomic and molecular collision processes that are important in plasma physics applications. My group’s aim is to contribute to improving the energy efficiency of existing fluorescent light sources and developing new mercury-free sources. We are also working to advance the field of atomic collisions in hot, dense plasmas—these are of great importance to fusion energy research and understanding astrophysical plasmas.

I started my research career nearly 20 years ago when I came to Australia to do my PhD. That was in electron scattering of atoms. It became clear to me about five or six years ago that I really needed to diversify into another important but complex area—electron-positron scattering from molecules. This is extremely important in many applications—for instance designing better light sources and in

fusion research. There is a need for molecular data in these areas but it is a huge task to move from atoms to molecules. At major research centres this is done in relatively large research groups. It would be impractical for me to embark on such a large research task without security of funding.

Although the Future Fellowship is for four years, the research period I envisage is much longer. It was very important for me to secure ongoing support and the Fellowship gave me the high profile to attract that commitment.

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The Future Fellowship has given me plentiful opportunities for collaboration. In electron-atom scattering we are working with experimental groups at the University of Manitoba in Canada, the Institut für Atom-und Molekülphysik in Germany, the Max-Planck-Institute for Nuclear Physics, also in Germany, and the Nicolaus Copernicus University in Poland. As well, we have a long-term collaboration with an experimental group at the Jet Propulsion Laboratory in the US.

A very important part of my research is collaborations with researchers at the ARC Centre of Excellence for Antimatter-Matter Studies and, in particular, with experimental groups at The Australian National University, Flinders University, The University of Western Australia, and the University of Trento in Italy.

Also, we work with a number of theoretical groups—at Drake University in the US, York University in Canada, the Indian Institute of Technology at Roorkee in India, and the Universidad Nacional del Sur in Argentina. We have long standing collaborations with the Theoretical Division of the Los Alamos National Laboratory in the US, where we work with a number of researchers—at the moment we are preparing a joint publication with them on the scattering of high-energy electrons from atoms—this is important to modelling the stellar environment and inertial confinement fusion.

We also have a long standing involvement with the International Atomic Energy Agency where, over the years, we have been participating in a number of meetings and a project aimed at improving the accuracy of atomic data required for modelling fusion plasma.

There are many more joint research projects that my research group is involved in—it is a very active field.

The Future Fellowship allows me to travel, to speak with people and present at conferences. As a result of the Fellowship I have a support group of postdoctoral researchers and PhD students who work on projects I am interested in and collaborate in research projects with our colleagues worldwide. If it was just me I wouldn't have the time to be involved in so many interesting projects.

I have good support from Curtin University for building up a strong research group—the Future Fellowship came with a support grant from the University for a postdoctoral and two PhD scholarships. Because of the Fellowship, I can bring in support from PhD students and postdoctoral researchers that make it possible to embark on really difficult tasks.

I have three PhD students now. There is also a larger group—I work within the Institute of Theoretical Physics—within which I am taking on a more and more senior role in attracting PhD students and postdocs—the Future Fellowship means that they pay more attention than they might have before!

Photo courtesy: Professor Dmitri Fursa

MADELEINE VAN OPPEN
Australian Institute of Marine Science
Microbiology



“The Future Fellowship has made a difference in terms of linking me with virologists from around the world with whom I would otherwise not have made contact.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

My research over the past ten to twelve years has focused on the mechanisms of adaptation and acclimatisation that corals have to cope with as part of environmental change. The Future Fellowship has allowed me to focus on a virtually unstudied aspect of reef corals—the role of viruses in coral health, disease and adaptive capacity. In the long-term, I would like to take this research a step further and use my knowledge to examine the feasibility, risks and benefits of assisted evolution in corals as a means to enhance the success of coral reef restoration efforts.

What have been your most important achievements to date as a Fellow?

My team and I discovered that the already published methods for studying coral-associated viruses were inadequate. We have spent considerable effort in developing more appropriate methodologies and are now confident we have achieved this.

We have established a functional virus laboratory at the Australian Institute of Marine Science and are acquiring data to assess the spatial and temporal distribution of viruses in corals and the possible roles they play in coral bleaching and disease.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

I anticipate that the outcomes from my Fellowship will provide a starting point for virus research on the Great Barrier Reef and other coral reef systems around the world. I hope that my research will provide novel scientific information on coral health, bleaching tolerance and adaptive capacity through the identification of the viruses associated with corals and a better understanding of the roles that viruses play in coral ecology and evolution.

I also hope that the work will inspire other research laboratories to commence research programs in this field and that our work will provide the basis for such studies.

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Later this year, my team and I will be attending three conferences where we intend to present results gained from the research conducted since receiving the Future Fellowship funding. I hope that sharing this information will expand the network of research amongst our colleagues.

I already had collaborative international links related to other aspects of my coral research. However, the Future Fellowship funding has made a difference in terms of linking me with virologists from around the world with whom I would otherwise not have made contact.

I have definitely been able to expand my research leadership experience since receiving the Fellowship. I've established a research program that focuses on viruses, AIMS contributed a postdoctoral position to the Fellowship and this was subsequently expanded when AIMS was successful in receiving ARC Super Science Fellowship funding that supports one postdoctoral researcher to work in the research program. Mentoring scientists at this stage in their career has been an exciting experience for me.

I was reluctant to take on students until I felt confident the virology research program was up and running, and took on a PhD student earlier this year.

Photo courtesy: James Woodford

MIKE BUNCE
Murdoch University
Ecology and Evolution



“My aim is to understand past biodiversity and extinction processes. We study DNA decay kinetics—how DNA breaks down over time—and work with international teams who are reconstructing ancient human genomes.”

Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?

I specialise in extracting ancient and degraded DNA—from all sorts of biological material, such as fossil bone, eggshell, skin, hair and soils. My aim is to understand past biodiversity and extinction processes. We study DNA decay kinetics (how DNA breaks down over time) and work with international teams who are reconstructing ancient human genomes—for instance, with the University of Copenhagen who sequenced the first Aboriginal genome and were the first team to construct an ‘ancient’ genome—of a Paleo-Eskimo—from hair preserved in permafrost in Greenland.

My goal is to be at the cutting edge of my research field. New DNA sequencing technologies have transformed every area of genetics and in a field that moves as fast as this one it is essential to have the freedom to be able to react quickly to emerging methodologies and new data as things open up.

To do this you need the latest equipment, which is changing all the time. The funding provided by my Future Fellowship has allowed me to hire a lab technician to operate next generation DNA sequencing equipment. This equipment has changed everything in my line of research—these machines can sequence an entire genome in a day and we now have three of them on campus—I couldn't have predicted that when I wrote my grant application in 2009. You can't anticipate all the developments in a research field that might occur over the tenure of a fellowship but you can be ready for them.

The Future Fellowship has also given me time to really get PhD projects going. Before I was awarded my Fellowship, I was spending half my time teaching—naturally it is not easy to teach well and stay productive in research. Teaching relief, a brief two-year respite from grant proposal writing and the headspace to do experiments and supervise means that our lab is able to crank out the research.

Future Fellowships aren't too prescriptive—you are trusted to work outside the remit a little, and this is what allows me to explore new areas as they unfold. For example, we did some pilot work in 2012 on characterising the ingredients contained within traditional Chinese medicines using DNA. The results showed up some quite serious inaccuracies in current labelling practices which have potentially serious implications for human health and the trade in endangered species. This work was published in *PLoS-Genetics* and has now taken on a life of its own, in auditing a variety of foods and medicines, and we have applied for NHMRC grants to follow new leads in this area.

What do you hope will be the most important and lasting research outcomes from your Fellowship?

The lasting outcome I hope for is ongoing cutting-edge research coming out of the laboratory I've established. The research freedom afforded by my Future Fellowship means that the lab will kick on even when I've finished because the space has been created, the collaborations have started and the research themes will develop a life of their own.

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The Future Fellowship has built my capacity for research leadership enormously. At the beginning I had just two PhD students—now, three and a half years later I have three PhD completions and five more doctoral students on the books and I've supervised more than ten honours students. The Fellowship has enabled me to build a critical mass of research students in the laboratory.

Photo courtesy: Professor Mike Bunce

Appendix A

Respondents to the Survey of Administering Organisations

Australian Institute of Marine Science
Baker IDI Heart and Diabetes Institute
Burnet Institute
Charles Darwin University
Commonwealth Scientific and Industrial research Organisation
Curtin University
Flinders University
Griffith University
James Cook University
Ludwig Institute for Cancer Research
Macquarie University
Monash University
Murdoch Childrens Research Institute
Murdoch University
Queensland Institute of Medical Research
Queensland University of Technology
RMIT University
Southern Cross University
Swinburne University
The Australian National University
The Florey Institute of Neuroscience and Mental Health
The University of Newcastle
The University of New South Wales
The University of Queensland
The University of Sydney
The University of Western Australia
University of South Australia
University of Southern Queensland
University of Tasmania
University of Technology Sydney
University of Western Sydney
University of Wollongong

Appendix B

Summary listing of proposed changes to the funding scheme and its administration

Duration of Fellowship tenure

Extend the period of tenure from four to five years—either for Fellowships at all salary levels or, selectively, for Fellowships at higher salary levels.

Selective extension of the period of tenure for Fellowships at higher salary levels would open up the option to allow candidates, upon completion of a Fellowship at lower salary levels, to apply for a subsequent Fellowship at higher salary levels.

Project funding support

Increase the amount of non-salary project funding available annually to each Fellowship, from \$50,000 to \$100,000.

Allow Fellows greater flexibility to tailor project expenditures to their particular research needs (in areas such as infrastructure, research training and travel).

Compliance costs borne by Administering Organisations

Provide greater certainty by conducting new funding rounds according to the same fixed timetable each year.

Allow longer timeframes in which to prepare and submit proposals for funding and shorten the timeframes within which proposals are assessed and decisions on funding announced.

Reduce the amount and complexity of information required in funding proposals, including by:

- pre-populating data held by the ARC;
- greater use of drop-down menus;
- simplifying publication listings;
- simplifying selection criteria;
- reducing the upper limit on the number of project description pages; and
- allocating non-salary project funding as a post-award variation to the funding agreement.

Performance monitoring

Introduce key performance indicators that relate directly to funding scheme objectives to provide a sharper focus for monitoring and assessing performance at the operational level, as a complement to the high-level strategic focus of indicators currently in place.

Reporting

Facilitate final reporting that is streamlined and sharply focused on project outcomes, including by:

- ensuring that information is collected that bears directly and efficiently on demonstrating the extent of achievement of project, funding scheme and wider NCGP objectives;
- collecting data in a more discrete form that lends itself more easily than free text to timely and responsive analysis; and
- supporting entry and capture of data—for example on publications—from extant sources.

Appendix C

Administering Organisation survey questionnaire

PURPOSE

The Australian Research Council (ARC) is consulting with stakeholders about its administration and the performance of the Future Fellowships funding scheme. This is to support accountability for the scheme's administration and review of its operation as a basis for planning and policy for ongoing support for excellent researchers mid-way through their careers.

BACKGROUND

Future Fellowships is a component funding scheme within the National Competitive Grants Program administered by the ARC.

In 2008, the Australian Government announced the establishment of the scheme as a means of promoting research in areas of critical national importance by giving outstanding researchers incentives to conduct their research in Australia. A primary consideration in establishing the scheme was to attract and retain the best and brightest mid-career researchers.

The objectives of the Future Fellowships scheme are to:

- attract and retain outstanding mid-career researchers;
- build collaboration across industry, research institutions and disciplines;
- support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia; and
- strengthen Australia's research capacity by supporting innovative, internationally competitive research.

Objectives: see Questions 1, 2 and 3

Australian higher education institutions, other publicly funded organisations that carry out research or which have research-related purposes and objectives, and medical research institutes are eligible to administer funding for Future Fellowships.

Eligible Organisations: see Question 4

Over the five-year period 2009 to 2013, the Future Fellowships scheme will offer four-year fellowships to up to 1,000 outstanding Australian and international mid-career researchers.

Number and duration of Fellowships: see Questions 5 and 6

Future Fellowships have been made available at three salary levels. For those commencing in 2013, these are:

<u>Level1:</u>	Salary: \$108,461	28%	On-costs: \$30,369	Total: \$138,830
<u>Level2:</u>	Salary: \$131,296	28%	On-costs: \$36,764	Total: \$168,060
<u>Level3:</u>	Salary: \$154,129	28%	On-costs: \$43,157	Total: \$197,286

These three levels are designed to take into account the range of applicants' prior appointments and salaries, academic achievements and standing, as well as, on the basis of that experience, varying expectations about standard of capability as a prospective Fellow.

The numbers and percentages of Fellowships awarded to date at each of these salary levels across all Administering Organisations are:

<u>Level1:</u>	431 (53%)
<u>Level2:</u>	269 (33%)
<u>Level3:</u>	112 (14%)
<u>Total:</u>	812

Administering Organisations can receive funding of up to \$50,000 per annum for each Fellowship for infrastructure, equipment, travel and relocation costs directly related to a Future Fellow's research.

Funding support for Fellows: see Questions 7, 8 and 9

CONSULTATION

To assist the ARC to assess its administration and the performance of the Future Fellowships scheme, Administering Organisations are being invited to complete this online questionnaire. Future Fellows are being invited to complete a separate questionnaire.

The ARC welcomes any and all comments you may wish to make about the Future Fellowships scheme. Please complete and submit your questionnaire to the ARC by: **COBFriday,15March,2013.**

Your responses will be treated in-confidence and are for internal use by the ARC as part of this consultation only. Should the ARC decide to disseminate or publish information obtained from responses to the questionnaire, it will only do so in a way that does not allow attribution of responses to individual respondents.

The ARC will provide feedback to respondents, in summary form, about the outcomes from this consultation.

ENQUIRIES

Questions about the consultation process or the questionnaire can be directed to:

Simon Sedgley
Director, Program Evaluation & Reporting
Australian Research Council
Email: simon.sedgley@arc.gov.au
Telephone: (02) 6287 6630

To discuss in detail any aspects of the administration of the Future Fellowships funding scheme, please contact:

Professor Brian Yates
Executive Director, Engineering, Mathematical and Information Sciences
Australian Research Council
Email: brian.yates@arc.gov.au
Telephone: (02) 6287 6648

Objectives of the scheme

*Question 1

Is the Future Fellowships scheme meeting its objectives?

Objective 1: attract and retain outstanding mid-career researchers

- ☐ yes, fully
- ☐ yes, mostly
- ☐ yes but only somewhat
- ☐ no, not at all

If you answered other than 'yes, fully', please indicate why.

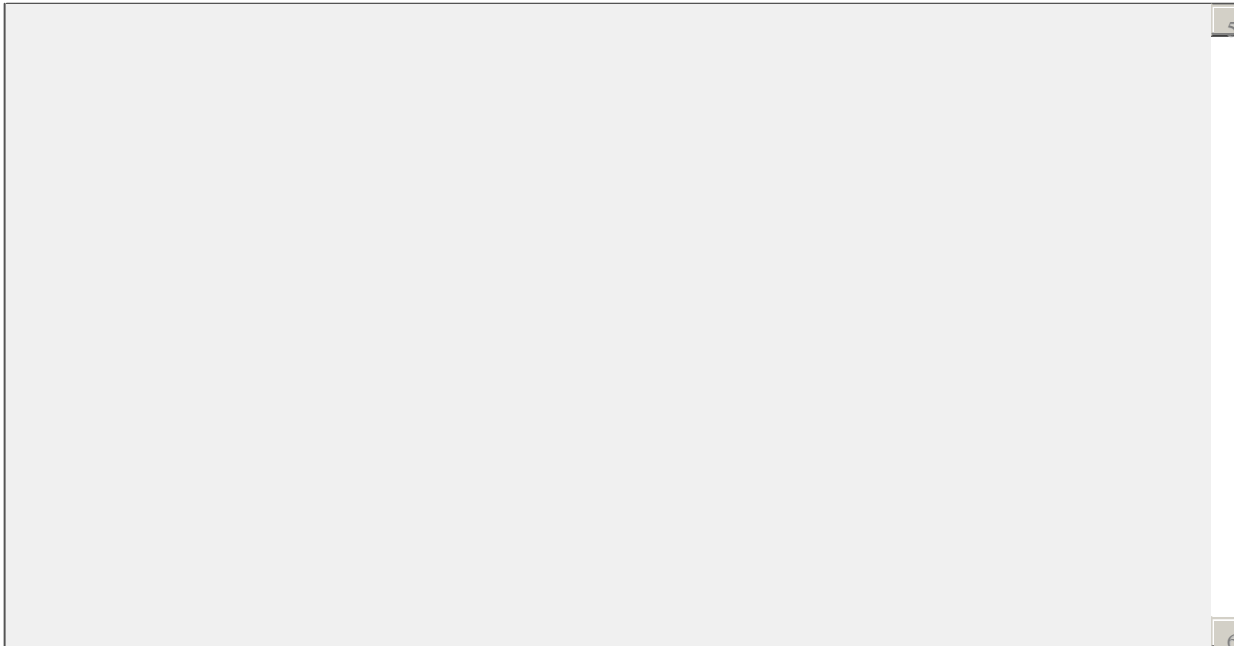
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***Objective 2: build collaboration across industry, research institutions and disciplines**

- ☐ yes, fully
- ☐ yes, mostly
- ☐ yes but only somewhat
- ☐ no, not at all

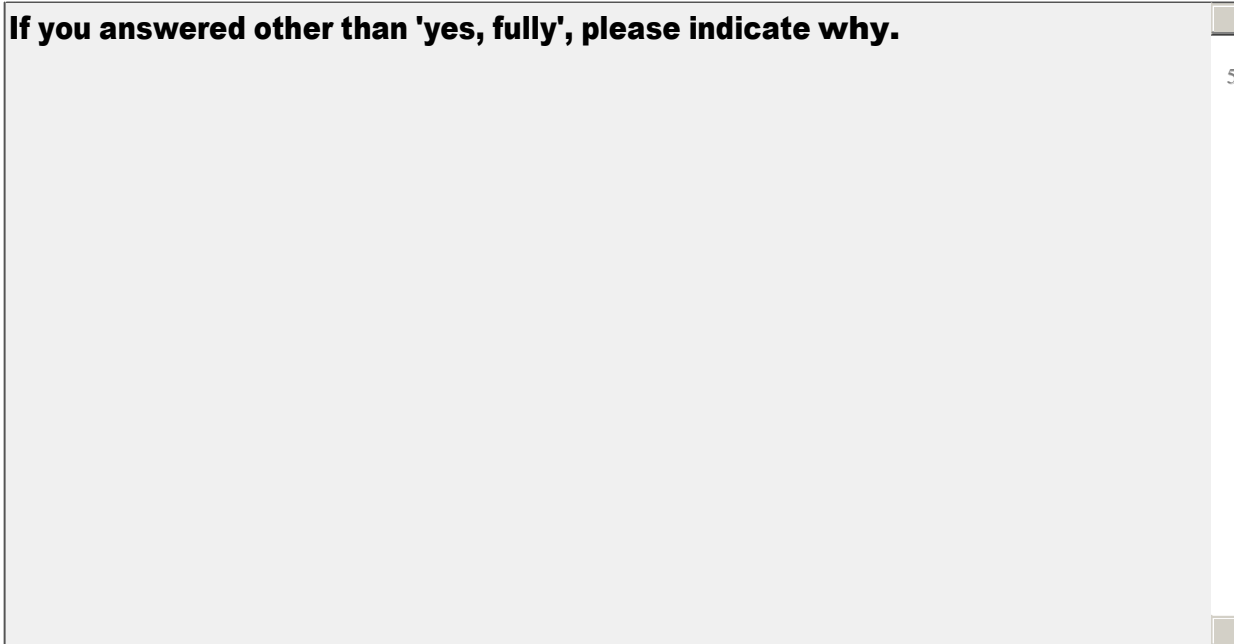
If you answered other than 'yes, fully', please indicate why.



***Objective 3: support research in national priorities across all disciplines that will result in economic, environmental, social, health and/or cultural benefits for Australia**

- ☐ yes, fully
- ☐ yes, mostly
- ☐ yes but only somewhat
- ☐ no, not at all

If you answered other than 'yes, fully', please indicate why.



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***Objective 4: strengthen Australia's research capacity by supporting innovative, internationally competitive research**

- ☐ yes, fully
- ☐ yes, mostly
- ☐ yes but only somewhat
- ☐ no, not at all

If you answered other than 'yes, fully', please indicate why.

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*Question 2

A primary consideration in establishing the Future Fellowships scheme was to retain mid-career researchers. Of the cohorts of Future Fellows that commenced at your institution in 2009 and 2010, how many do you expect will remain employed by your institution following completion of their Fellowship?

Note: Please contact the ARC if there is any uncertainty as to the numbers of your Fellows in each cohort and category.

Cohort commencing in 2009: of those employed, at the time of award, by your or another Australian institution
(Or please indicate if none were in this category)

Cohort commencing in 2009: of those employed, at the time of award, by an overseas institution (Or please indicate if none were in this category)

Cohort commencing in 2010: of those employed, at the time of award, by your or another Australian institution
(Or please indicate if none were in this category)

Cohort commencing in 2010: of those employed, at the time of award, by an overseas institution (Or please indicate if none were in this category)

*Question 3

How many Future Fellows hosted by your institution have successfully gone through a promotions process during their tenure as a Fellow?

Note: Please contact the ARC if there is any uncertainty as to the numbers of your Fellows in each cohort.

from the cohort commencing in 2009 (Or please indicate if none were in this category)

from the cohort commencing in 2010 (Or please indicate if none were in this category)

from the cohort commencing in 2011 (Or please indicate if none were in this category)

from the cohort commencing in 2012 (Or please indicate if none were in this category)

Eligible Organisations

*Question 4

Is it appropriate that Future Fellowships have been available for tenure within the following types of institutions?

	Yes, appropriate	No, inappropriate
Higher education institutions	<input type="checkbox"/>	<input type="checkbox"/>
Publicly funded research agencies	<input type="checkbox"/>	<input type="checkbox"/>
Other publicly funded agencies with research-related purposes and objects (including museums and herbaria)	<input type="checkbox"/>	<input type="checkbox"/>
Medical research institutes	<input type="checkbox"/>	<input type="checkbox"/>

Number and duration of Fellowships

In responding to Questions 5 and 6 which follow, please bear in mind that they encompass the possibility that a 'trade-off' between the number of Fellowships that were awarded in each round and the duration of Fellowship tenure might have provided a better balance between these, i.e. fewer but longer or more but shorter Fellowships.

*Question 5

Given the funding that was allocated to the Future Fellowships scheme, has the target number of Fellowships awarded annually (200) been:

- ☐ too few
- ☐ about right
- ☐ too many

If you answered 'too few' or 'too many', please indicate what you think should have been the target number of Fellowships awarded annually.

*Question 6

Given the funding that was allocated to the scheme, has the duration of Fellowships awarded (i.e. four years full-time) been:

- ☐ too short (6 years would have been preferable)
- ☐ too short (5 years would have been preferable)
- ☐ about right
- ☐ too long (3 years would have been preferable)

If you don't believe that the duration of Future Fellowships has been 'about right', please comment on the reasons why.

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*Question 7

Does the number of Future Fellowships awarded to date at each of the three salary levels across all Administering Organisations represent an appropriate distribution?

☐ Yes

☐ No

If you answered, 'No', please indicate what you think would make for a better distribution and why.

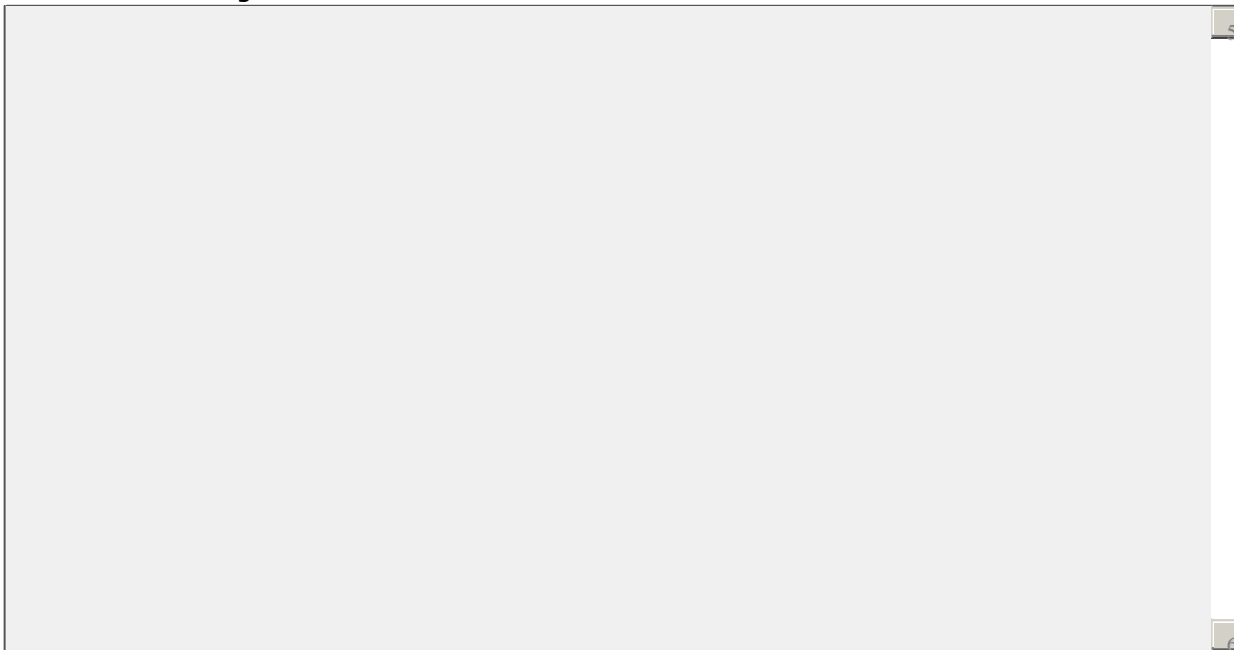
*Question 8

Has the availability of Future Fellowships at the three salary levels been useful and appropriate?

☐ Yes

☐ No


If you answered 'No', please indicate what arrangement for salaries would have been better and why.




***Question 9**

Should the Future Fellowship salary have been supplemented by funding for research support?

 Yes

 No, not at all

If you answered 'Yes', please indicate what you think would have been the most appropriate amount for that research support:

 \$50,000 per annum (as currently)

 Less than \$50,000 per annum

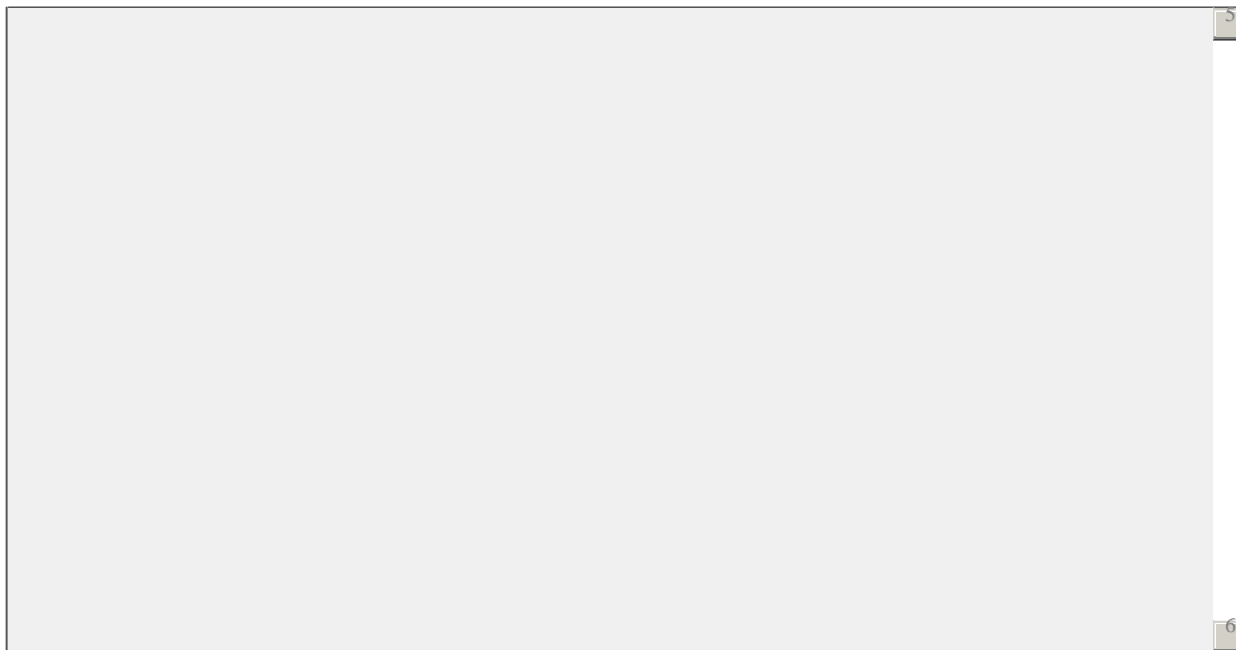
 More than \$50,000 per annum

If you selected either 'less' or 'more' per annum please specify the most appropriate amount for research support per annum.

Integration of Fellows within institutions

Question 10

Please identify the most important strategies that your institution has adopted in order to integrate Future Fellows into the broader academic life and environment of the organisation.



*Question 11

Does your institution have formal policies for integrating Future Fellows into the ongoing activities of the organisation during and at the conclusion of their Fellowships?

 Yes

 No

If you can, please indicate the website address where the ARC can access your institution's policies for integrating Future Fellows into the broader environment and academic life of the organisation.

http://www

Or provide a contact who can supply the ARC with a copy.

Name

Email

address

Question 12

The ARC would like to develop case studies to demonstrate the impact that the Future Fellowships scheme has had to date, in terms of benefits to your institution, academic research generally and outcomes felt within the wider community.

Please provide the names of up to three Future Fellows at your institution whom the ARC might contact in order to gather information about those benefits.

Future Fellow name:

Future Fellow name:

Future Fellow name:

***Question 13**

Could Future Fellowships have been better aligned in any way with other fellowships, Commonwealth-funded or otherwise?

 Yes

 No

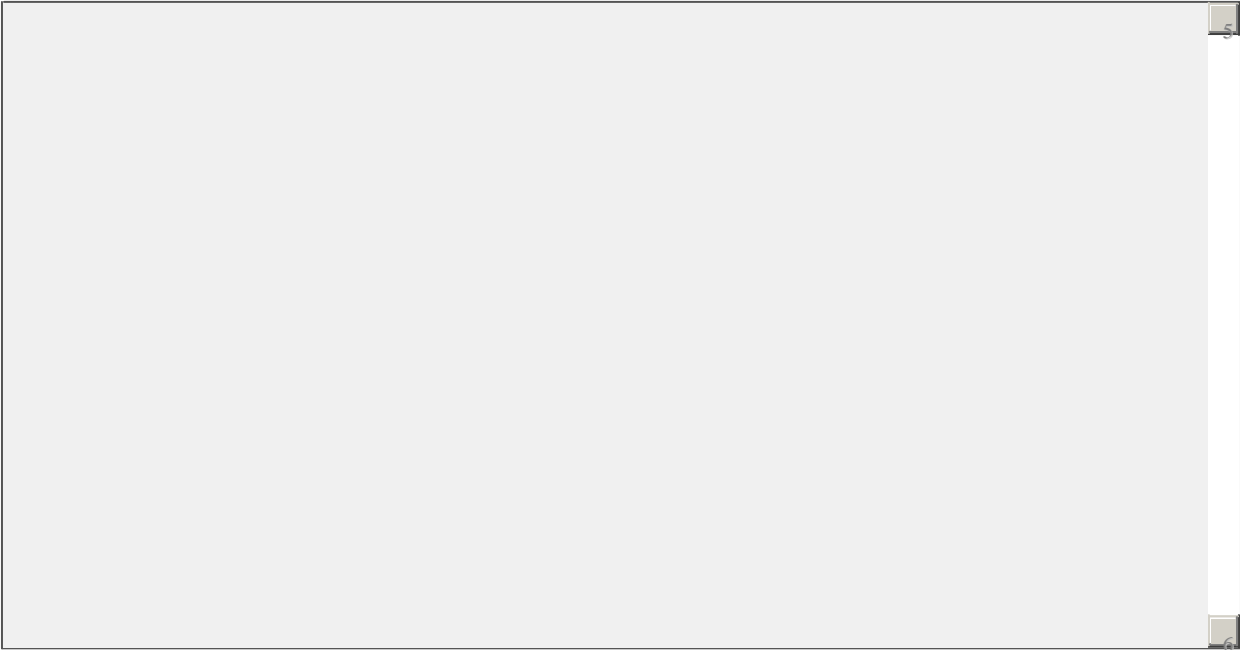
If you answered 'Yes', please indicate how better alignment might have been achieved and which fellowships you may have had in mind.

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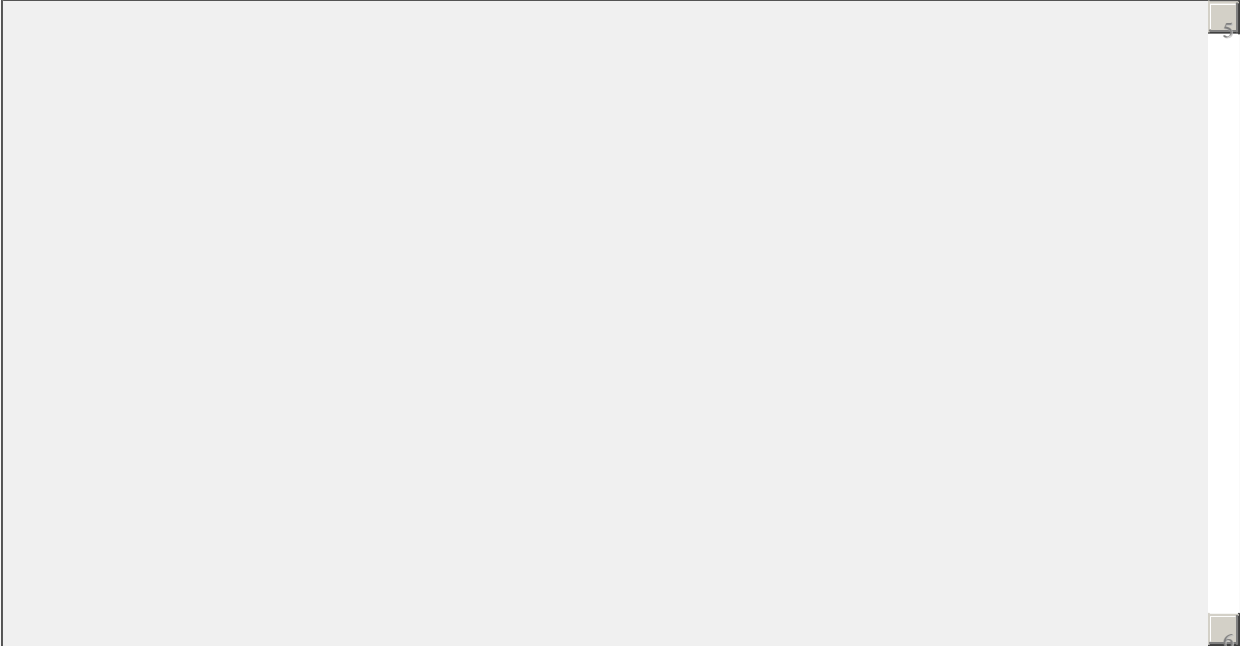
Question 14

Please comment on any aspects of the ARC's administration of Future Fellowships scheme could have been done differently to improve the scheme's efficiency and effectiveness.



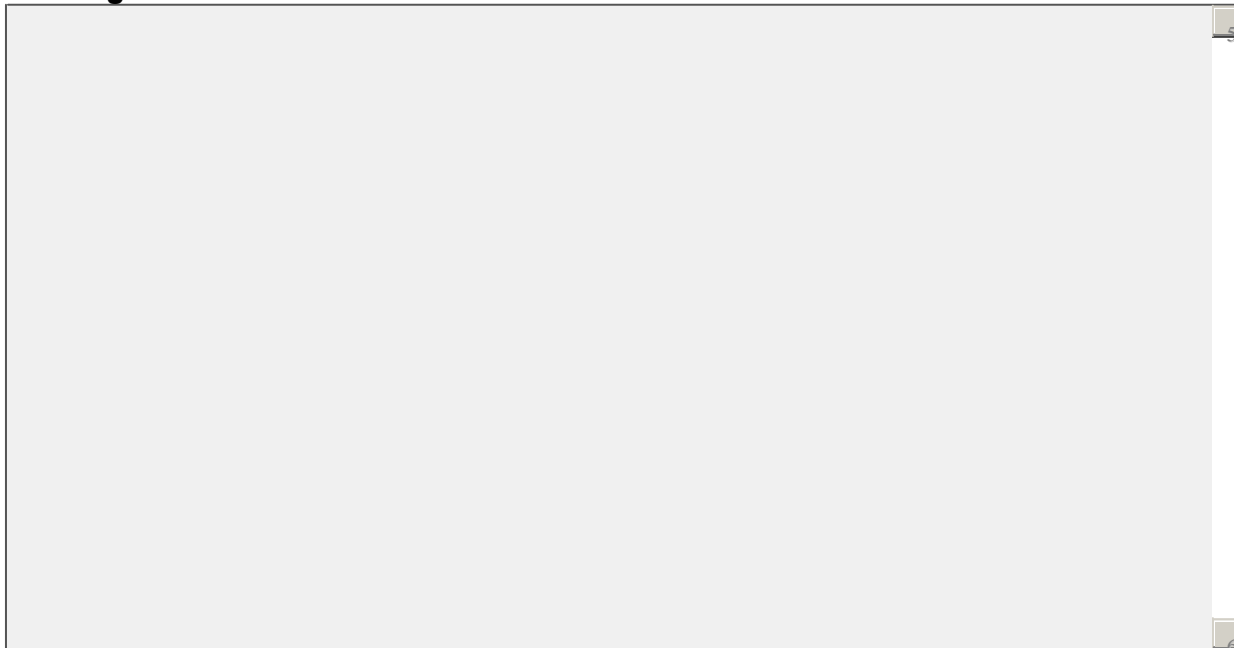
Question 15

Should funding be made available to offer Future Fellowships commencing beyond 2013, what is the most important change you would like to see made to the scheme?



Question 16

Please comment on any other aspect of the Future Fellowships scheme that you wish to bring to the ARC's attention.



Respondent details

***Please enter the following details. This information is required for validating responses.**

Name:

Position:

Institution:

Appendix D

Questions used to guide interviews with Future Fellows

Introductory remarks

As part of a review of the Future Fellowships funding scheme, the ARC is hoping to put together a series of case studies to highlight the research that is being undertaken by Fellows such as you

Your institution has nominated you as a candidate for such a case study.

If you are happy to be interviewed for this purpose, I would like to ask some questions of you that go to your experience as a Future Fellow.

I would also like to ask some questions of you that go to certain aspects of your experience as a Fellow that we might not include, or which you might not wish included, in a case study—but we would be interested in your answers to these as an aid to future program design. I will identify these as such as we proceed (marked as !).

About your research

- Do you have a long-term research goal and, if so, how has the Fellowship helped you to pursue that?
- What have been your most important achievements to date as a Fellow?
- What do you hope will be the most important and lasting research outcomes from your Fellowship?

One objective of the Future Fellowships has been to help researchers build their collaborative networks, across industry, research institutions and research disciplines.

- Has the Fellowship allowed you to build such networks?
 - Has it made a difference to your ability to build collaborative links internationally?

About your professional development and career

- Has your Fellowship expanded your opportunities for research leadership, including student supervision?
- ! What, if any, professional development opportunities has your institution offered you during your Fellowship?
 - (If there have been any) Do you think you would have had such opportunities without the Fellowship?
- ! Have you successfully gone through a promotion process during your Fellowship?
 - If so, do you think this would have occurred without the Fellowship?
- ! Do you expect to remain employed by your institution following completion of your Fellowship?
- What do you imagine you would be doing now if you had not won your Fellowship?
 - Do you think it has made a big difference, or only a small to moderate one, to your research career to date and prospects for the future?

About the Future Fellowships funding scheme

- In what, if any, ways do you think the Future Fellowships could be improved to provide more effective support to mid-career researchers?
 - Do you think the level and scope of project funding has been about right or would you like to see those changed? (currently up to \$50,000 per annum)

Abbreviations

ARC	Australian Research Council
CIBER	Centre for Integrative Bee Research
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DECRA	Discovery Early Career Researcher Award
DORA	Discovery Outstanding Researcher Award
DNA	Deoxyribonucleic acid
FTE	Full-time equivalent
ICT	Information and Communications Technology
IP	Intellectual property
NCGP	National Competitive Grants Program
NHMRC	National Health and Medical Research Council
PhD	Doctor of Philosophy
RMIT	Royal Melbourne Institute of Technology
UK	United Kingdom
USA	United States of America
WIPO	World Intellectual Property Organisation
WTO	World Trade Authority

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