Best Practices for Postdoctoral Progress

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Introduction

The role of postdoctoral fellow (PDF) has traditionally been seen as a training position, bridging the gap between newly minted PhDs and a long-term or tenured research role. The PDF role is changing, however. On one hand, many young researchers start as PDFs with no intention of becoming permanent researchers in academic institutes. Rather, they may be seeking to develop technical and other skills with an eye to a career in industry, business or government. On the other hand, many early career scientists keen to progress to more senior academic positions find that opportunities may be limited and suitable, long-term jobs hard to obtain.

The Australian Early and Mid Career Researcher Forum (the Forum), together with the Australian Academy of Science, is conducting an inaugural survey of the current research landscape for Australian PDFs. In particular, we are seeking answers to the following questions:

- What are the career aspirations of PDFs?
- How well are these aspirations being met?
- What examples of 'best practice' can we identify across all aspects of PDF support and training and how can these practices be implemented more widely?

Career development is a critical component of any postdoctoral position. Despite the importance of a PDF for both the researcher and his or her institution, clear guidelines for the management and professional development of PDFs and their future careers are frequently lacking. Access to technical training, mentors, and funding opportunities also varies widely between departments and institutions[1].

The ACOLA Secretariat position paper (2012) outlines three factors that could make any PDF more effective:

1. **Increased job security.** Specifically: requests for tenured positions, grants that last five years instead of three, and a clearly defined career path.
2. **Better delivery of mentoring.** Specifically: individual career advice, access to technical training, support, and time to take the first steps in an independent career.
3. **Reformation of funding bodies.** Specifically: to ensure programs better fit PDF circumstances, including smaller grants, travel grants, support for collaboration, and additional schemes to help women return to research after maternity leave.

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[1] Feedback from early and mid career researchers at the Science Pathways meeting 2012

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This position paper outlines some initial ideas for improving postdoctoral research positions, with a focus on four key areas: 1) networking and integration; 2) technical training; 3) communicating research; and 4) applying for funding. The interrelationship between these factors is illustrated in **Figure 1**.

The Forum is organizing an Australia-wide survey of PDFs, their supervisors, senior researchers and other academic staff. The survey aims to develop a clearer picture of Australia's PDF workforce, their plans and aspirations, successes and disappointments, and to identify examples of best practice in supporting, training and developing young researchers. It is planned to hold this survey annually to provide updated information to both the Forum and the Academy.
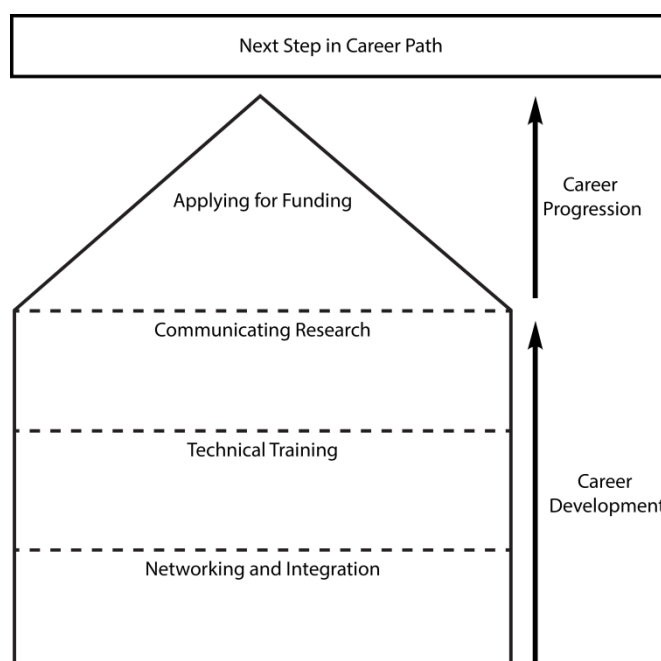
Figure 1. Illustration of key components in postdoctoral training, and how they integrate into a career development pathway.

Examples of Good Practice in PDF support

The following sections provide some examples of good practice in supporting, training and developing PDFs, and recommendations for further improvements at individual, institutional and policy levels.

1) Networking and Integration

A reliable network of colleagues and collaborators lays a solid foundation for a career in research. In addition to overlapping technical interests, an accessible community of researchers has become an essential resource for governance and administrative review, including peer review for publication, funding applications, promotions, policy development and PhD student advisory committees. Expanding this network beyond academic research and into education, business, industry or government would also

facilitate exposure to other professional careers in science, and help PDFs develop future career paths outside of pure research.

Recommended Actions

Personal:

- Develop an explicit postdoctoral training plan for all new PDFs, negotiated with the supervisor on start-up, and regularly reviewed and updated.
- Establish informal mechanisms for regular meetings with other PDFs.
- Where relevant, request participation in meetings between PDF supervisors or senior staff and industry contacts. For example, PDFs should be encouraged to take part in meetings negotiating new projects, presenting research results and visits to client sites.

Institutional:

- Establish regular meetings or informal symposia to allow PDFs to present results to their peers. Encourage attendance from students and senior researchers. For example, many CSIRO divisions organise an annual PDF conference to which senior research staff are also invited.
- Provide all new PDFs with a human-resources manual detailing support and training options provided by their institution.
- Provide an organisation-based support system, consisting of supervisors, human resources contacts, grant and scientific writing review groups.
- Develop career path information packets, including clear guides for career development for government, industry and academic positions.

Policy:

- Increased number of small grants for conferences and travel for collaborations.
- Reserve speaking slots for PDFs at major national symposia.
- Encourage PDFs to organise and convene specific sessions at national meetings.
- Create awards and nominate PDFs for national or international awards.
- Funding for industry secondments or other short-term placements.

2) Technical Training

A constructive postdoctoral fellowship should contain a large degree of technical training, allowing the individual to build on skills developed during his or her PhD and to acquire new knowledge. Access to training opportunities, both locally and internationally, enhances the fellowship, speeds research progress, focuses career goals and maintains the cutting-edge skills learned during a PhD.

Recommended Actions

Personal:

- Request an explicit indication of skills expected for the current project.
- Determine what training needs to be completed for the next career step and request an explicit plan on how these skills will be developed. For example, would the skills be learned by working directly with the supervisor or other senior

researcher, or would the institute support the PDF to attend an internally or externally provided formal course?

Institutional:

- Provide opportunities for skill development during the postdoctoral fellowship.
- Organise appropriate internal training courses.

Policy:

- Create a comprehensive funding system that includes support for training opportunities (for example, workshops to learn a new laboratory technique, NMR analysis or software writing and development classes)

3) Communicating Research

All researchers need to be skilled in presenting to their peers, and also to the media, the public, and potential funders. These skills are generally not explicitly taught during a PhD, and so the PDF phase is an ideal opportunity to introduce training for communicating research and results.

Recommended Actions

Personal:

- Seek meaningful feedback from peers and colleagues on presentations. Consider giving practice talks before presenting at major meetings.
- For PDFs for whom English is not their first language, where appropriate investigate courses in professional speaking and writing.
- Take opportunities to raise your research profile. Explore possibilities for developing stories around your research with your media relations department, or on social media websites.

Institutional:

- Institute internal EMRC working groups to review publications before they are submitted and provide relevant feedback and suggestions.
- Offer workshops on scientific writing and media engagement.
- Encourage cross-disciplinary scientific debate and discussion on a wide range of areas at regular meetings (e.g., departmental or institutional seminar).
- Teach how to identify scam publications that operate on a fee-for-publication basis[2,3], and have a broader discussion of open-source and traditional publishing models.
- Provide facilities for PDFs to build a 'web-profile' and training in how to use them.
- Provide information about using social media to advance PDF career paths and opportunities to put this into practice.
- Encourage public engagement and science communication as part of the PDF's ongoing research and career development

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[2] http://www.theaustralian.com.au/higher-education/opinion/beware-the-scammers-targeting-academics/story-e6frgcko-1226439754177
[3] http://www.theguardian.com/science/grrlscientist/2013/oct/08/1

- Language development opportunities for researchers for whom English is a second language

Policy:

- Provide clear guidelines on scientific ethics and ethical analysis and writing
- Offer workshops on how to appropriately address "hot topics" in particular research contexts (e.g., genetic engineering, the use of animal models, nuclear technology)
- Encourage and fund science communication workshops in the following fields:
  - To the scientific community: good posters, clear presentations, and strong technical writing.
  - To funders: how to give an appropriate pitch for industry, philanthropic organisations and government bodies.
  - To the media: workshops with university journalism departments or professional journalists, writing press releases, writing editorials/blog posts, productive contact with reputable documentary or TV producers.

4) Applying for Funding

Many PDFs find themselves having to think about project funding for the first time. Moving from working as a student to designing and seeking support for their own research program is a major transition. An increasing number of early career researchers also may spend time between paid positions, and need access to a basic level of support to help them return to the bench.

Recommended Actions

Personal:

- Awareness of field-specific opportunities, fellowships, and bursaries.
- Awareness of support for researchers with special circumstances, for example: returning to work, mature age, women, parents and carers and specific ethnic groups.
- Sign up to funding notification email lists as appropriate for your organisation, ARC, NHMRC, etc.
- Explore alternative funding sources apart from the traditional research councils. For example, local and federal funding programs for specific research topics, international grants.

Institutional:

- Create internal working groups to help with editing grants and fellowship applications.
- Provide PDFs with assistance on developing and writing their track records and understanding 'relative to opportunity'.
- Provide PDFs with examples of successful grant and fellowship applications.
- Hold clinical, translational or lab research workshops where EMCRs present their proposal to senior investigators and undergo 'pre-review' and mock interviews.

- Provide PDFs with a senior investigator to mentor their overall approach to funding.

Policy:

- Increased access to funding and library resources for researchers between paid positions, for example the Elsevier [Postdoc Free Access program](#), which provides PDFs with the capacity to maintain connections to their field and write grants.
- Multiple grant rounds each year or an ongoing submission process.
- Provide affordable, short-term visa options.
- Consider offering more short-term funding (6–9 months) to carry between grant cycles.

Future Directions

To coincide with the launch of this position paper, we have established an online survey seeking feedback on the situation, needs and aspirations of Australian PDFs. Much of the previous research in this area has studied American and European PDFs, and the Forum is keen to gather data specific to the unique Australian system and environment. With 80% of ACOLA Secretariat survey respondents rating a career in research as "very" or "reasonably" attractive, it is clear that many people aspire to a long-term research position.

The Forum will use the results of the survey to better identify 'best-practice' in supporting and developing the next generation of Australia's research leaders. A summary of the survey results will be available in 2014.

Acknowledgements

We are grateful to Science Pathways 2012 delegates and the members of the Forum for their contributions. We also appreciate the support of Dr Camille Couralet, Early Career Researcher Policy Officer at the Australian Academy of Science, and ongoing support from Professor Les Field, Secretary for Science Policy at the Australian Academy of Science.

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