emcrforum | Australian Academy of Science

Science Pathways 2016
Future Leaders

CONFERENCE REPORT

Contents

Overview and thanks from the convenors

Science Pathways 2016: Future Leaders (SP16) was the EMCR Forum's national meeting which brings together early- and mid-career researchers (EMCRs) from academia, industry and government at a focused professional development meeting. This years' topic, Future Leaders, was chosen due to an identified need of leadership training at all stages of EMCR development. Under the stewardship of the Australian Academy of Science, the EMCR Forum ran this event which compliments its strategic plan of both EMCR development and advocacy within Australia.

This year we had over 200 attendees at *Science Pathways* and 18 different presenters covering a very wide range of topics in the area of leadership. We were fortunate to have heard from some of the most highly regarded leaders in Australia, with each bringing distinct experience to our discussions. At the same time, we had an opportunity to meet EMCRs from across the country and from New Zealand, and discussed our work and our challenges. This report gives an overview of the sessions as a reference to use in your ongoing career.

Following SP16, we circulated a survey to attendees to ask for their feedback on the meeting and how we could improve our future meetings. Overall the feedback was very positive with positive comments on the quality and variety of speakers, length of presentations and content. The management of the conference was viewed well and we received many positive comments that motivation to be a good leader has increased. Increased knowledge of how to better lead teams and how to share work with industry were also strong positive outcomes. As an indicator of the collaborative and broad nature of our attendees, the areas for improvement included wanting greater opportunities for interaction and more time for discussion and questions. We will ensure that we expand time for this in the next *Science Pathways* meeting.

We will hold our next *Science Pathways* meeting in 2018, which we will start working on mid next year. However, you do not need to wait until then to engage with the EMCR Forum. We can be contacted through our website or via email and twitter. Our goal is to improve the future of Australian science and through our interactions with you at *Science Pathways* and in other ways, we hope that this future will be bright.

Finally, we must say a huge thank you to everyone who took the time to join us, support us and help us in running this conference. Our sponsors made this event possible through financial support, our colleagues at UNSW ECAN ensured logistics ran smoothly, and your attendance and contribution ensured that the meeting was a success. We thank you and hope that we will see you in 2018.

Associate Professor Sharath Sriram and **Dr Michael Crichton**

Co-Convenors

Science Pathways 2016: Future Leaders

Contact EMCR Forum

www.science.org.au/emcr-forum emcr@science.org.au @EMCRForum on Twitter

Conference partners

The EMCR Forum recognise that SP16 would not have been possible if not for the support of our sponsors. We thank the following partners for their sponsorship and assistance in running this event.

- Platinum Sponsor
  - Government of South Australia, Department of State Development
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  - University of Queensland
  - University of South Australia
  - Telethon Kids Institute

The EMCR Forum would also like to extend thanks to the UNSW Early Career Network (ECAN), who provided logistical and event support for SP16.

Conference repeated themes

SP16 had speakers from a range of backgrounds including academia, industry, non-commercial research and government. There were some key themes that emerged as recurring which are detailed below:

Communication – Whether communicating the big picture to your team or your passion to the media, if you don't share your perspective, few will follow.

Trust – As scientists we have a trustworthy brand but this has to be maintained to be an effective leader. Your team has to trust that you are working in their interest, your employers need to know you are capable and the general public has to have confidence that your communications are genuine.

Integrity – This is closely aligned to trust. Will people trust you if you don't have core values that you can call on to lead your team?

Vision – No doubt most of us in science have a direction we are working on, but is this a vision? Is the big picture clear? It's important to make sure this is in a form that can be clearly articulated.

Diversity – Greater outcomes come from diversity, both in gender/culture and also in subject area. Work across disciplines, create more impact.

Passion – One of the strongest motivators is a true passion for what we do. If we have passion and vision, then we will drive ourselves to generate outcomes that are beneficial for Australian (and global) science.

Session I – Opening and keynote

Opening Address: Simon McKeon AO (Monash University)

Simon McKeon AO opened SP16 with his overview of where Australian science is, and the challenges in becoming a leader in this field. He highlighted that Australian science is world standard, but EMCRs have challenges in building their careers. With inventions like psychiatric lithium, Wi-Fi, the bionic ear, the cervical cancer vaccine and the first successful scramjet, there are many areas in which Australia can lead the world. But how do we get people talking about these things? How do we get science to be in conversation in the same way that sport teams area? And can we ensure there is enough credibility to maintain it there? He highlighted some key points for leadership in this area:

- We need to celebrate scientific excellence when it happens in Australia.
- We need to lobby/advocate for science nationally – understanding that other areas, such as sport, does this effectively for its gain.
- Australia needs to develop an innovation culture where everyone feels involved
- Get out of the lab and talk to everyone about what they are doing, not just peers
- Everyone needs to make sure that they are enthusiastic, positive and inquisitive.
- And there needs to be more engagement between industry and academia.

Keynote: Professor Emma Johnston (UNSW Australia)

Building on these themes, Professor Emma Johnston gave the Ben Chuwen Keynote Address, with her experience growing into leadership roles at UNSW. She highlighted that currently there is a real problem with representation of STEM disciplines in positions of responsibility: Only ~7% of members of parliament and 12% of senators have STEM training. Of those with STEM training background in leadership roles in large business, engineers predominate whilst other disciplines are underrepresented. She contests that many scientists don't understand leadership and find it boring or even 'dirty'. We need to accept that we are parts of teams. We need to change our thinking from a single lab head, boss or leader and instead help build everyone as leaders. She highlights three types of leaders that will work well with those with STEM training:

- Visionary – The inventors, strategists and those that can see patterns in data. They extend their vision to a downstream positive outcome. If scientists can be good communicators, they can become visionary leaders.
- Evidence based – Data analysists, decision makers who use science to support their direction. This is our core training as STEM practitioners.
- Executive/Structure styled – Putting in place methodologies, processes and protocols to ensure that a direction is held to. If we can learn to balance these skills with company board, financial management and policy then we can get large rewards.
- Ability to participate – Hard work with small rewards; empowering teams. This is a key aspect of a post-PhD lifestyle, with acceptance that this will pay off. Being able to participate is a key way to keep teams on a focus, with you.

She highlights that STEM graduates have great potential as leaders and need to train ourselves and step up. Leadership training will give you more time rather than using it up.

Session II – Pathways to research leadership

Panel members: Professor Tamara Davis (University of Queensland), Associate Professor Matthew Hill (Monash University/CSIRO), Associate Professor Kevin Pfleger (University of Western Australia), Associate Professor Sarah Wheeler (University of Adelaide)

Below are some key points from each speaker's personal journey through their career, followed by the points that were raised in the panel discussion.

Tamara Davis: Take what opportunities present, and make them where you see a need (initiative). She highlighted that when she has deviated from a planned direction she has had the greatest and most interesting success. In her role, she acted in the role she wanted, not just where she was. Be an action person and be generous with your expertise and time.

Matthew Hill: Be open minded, courageous and know when to hold your ground or change your mind. If the facts demand it, hold your ground regardless of popularity impact. His tips for success: be Awesome; get great mentors; don't be afraid to translate; build great and collaborative people skills; and build diversity (gender, nationality, discipline!)

Kevin Pfleger: Find your niche and make yourself an expert. Consider what the funding bodies want – NHMRC turned him down one year, then he went on to become the top fellow afterwards (after mentor feedback). ARC were supportive of his industry/tech based work. Show that you are dynamic and take time to talk to people at conferences. He suggests manufacturing opportunities rather than just waiting for them. Finally, he was passionate about the need to build a team with those who challenge you, and to build a positive culture in your team.

Sarah Wheeler: Her work in government and as a consultant helped her build a good network. She elected to have children over taking a lecturer position and notes the challenges that females experience in academia. To get where she was she noted that she needed flexibility, creativity, time/people management, team working, luck and resilience. On top of this she used her mentors and willingness to pass successes to her team as ways to drive better outcomes.

Panel session key points

- With a risk of failure, we need to be resilient for the sake of our team and our self. We should focus on what we can change and try multiple things for positive outcomes.
- If you trust your team, then you can delegate and define admin/manager roles to let others grow, and save yourself this work.
- In teams, good things to look for include enthusiasm, technical ability and passion and resilience.
- There has never been a better time to be female in science; those who have fractional appointments are often more efficient. However, we still need improved support provisions for assessment relative to opportunity.
- If you have someone difficult, speak to them and find out what their expectations are. Get good mentors to guide you in this.
- Look beyond ARC/NHMRC for funding e.g., to defence, UNESCO etc.

Session III – Leadership training

Presenter: Mark Douglas (ETHOS Australia PTY Ltd)

EMCRs are at the perfect point to transition from leading researchers to research leaders. This overcomes many hesitancies by academics to lead, or be led – learn to lead before you need to. The key is to be proactive and take responsibility for your own professional development. Mark Douglas's workshop covered several key areas that will help EMCRs build a record in this area. Some important approaches are detailed below.

1. Take initiative and develop yourself; know your strengths and weaknesses and work on them.
2. Make connections across disciplines (consider including diverse study areas in your research program)
3. Ask more questions – understand before you speak
4. Strive for simplicity – make it easier for those outside to access you
5. Think about the value you bring to others
6. Tell a story
    a. Make that story compelling.
    b. Start with 'Imagine…' and lead your audience on a clear, positive, impact-driven story.
    c. Use surprise to grab attention.
    d. Make it a sticky story. Use simplicity, unexpectedness, concreteness, credibility and emotions.
7. The Rule of 3. What 3 things do you want remembered? Focus on conveying them.
8. Be a constructive driver of change.

In developing our research strategy, Mark noted that research could be viewed as a jigsaw puzzle, where we are in control of informing people of the big picture, and helping them understand that as a vision. In developing a vision, we must identify:

- What is my vision for myself?
- How do I want to contribute/disrupt/change my discipline?
- How can I influence government priorities?
- In what way can I work to change industry priorities?

Mark noted that a leader is by no means a complete package in themselves. They need a team around them and need to ensure that their skills are complemented. Beyond this, tools like twitter can increase their profile to help develop networks. To work with government or industry, EMCRs must continue to look outward to identify with whom they wish to engage.

Session IV – Balancing leadership and management

Presenters/panel: Professor Susan Pond AM (University of Sydney), Professor Douglas MacFarlane (Monash University), Professor Julie Cairney (University of Sydney)

Susan Pond: We need you future leaders now! Susan noted that good leadership produces change and good management produces productivity and order – both vital for any organisation. But there are often more managers than leaders – without good leadership talent will leave (they feel undervalued). She notes that leaders communicate a new direction, empower their team and provide strategy, direction and a culture of change. Look at key leaders in different fields – they look to the future, to large endeavours with huge goals and communicate these concisely.

Douglas MacFarlane: Get as much training as you can! He noted that getting a successor for yourself in place is important or you can end up in one place for a long time. You must build a culture of tenacity. In academia he notes the fundamental importance of training the next generation of researchers – try to put together a team that you are proud of. Then make sure you can fund them! Finally, it is important to have a diverse team and set high ethical standards for yourself and your team – expect no less than these standards.

Julie Cairney: Having a specific plan on how to balance genders can help to ensure diversity in a team. Currently there are systemic issues that still need addressing (family, metrics that don't suit those with family commitments), which means we are wasting important talent. Her faculty has instigated a faculty policy requiring at least one of each gender to be interviewed for roles, flexible vacancy options, female representation, mentoring for all, conference carer support, specialised grant writing support and accountable senior leadership.

Panel session key points

- Science in Australia Gender Equity (SAGE) pilot program is progressing the conversation on gender equity. Systemic issues like short-term contracts will fall within their scope.
- Women can feel paranoid in this system, but initiatives are trying to level the playing field.
- 'Superhero' female role models can be excellent inspiration but can be viewed as unlikable or intimidating, making it hard for people to feel they can attain those levels of success.
- If you want to lead from the bottom up, identify what needs to be changed and work on it from where you are. Make the role yours.
- Merit is subjective so make clear what merit relative to opportunity is.
- When panels have 1 or 2 members, they are harsher critics than when there are 3 or more (out of 10).
- So how do we balance leadership and management? Try to provide management roles to your staff and students at early stages so they become part of the team. Take time to understand them and what drives them.

Session V – Communicating vision and outcomes

Presenters/panel: Robyn Williams AM (ABC), Associate Professor Darren Curnoe (UNSW), Rick Baker (Blackbird ventures), Dr Esther Levy (Wiley Publishing), Dr Thomas Barlow (Barlow Advisory)

Robyn Williams: Power comes with position – he has influence, not power. Universities used to operate like orchestras (small groups led by one or two people) now they operate like an army (top down command). Email-based leadership removes personal relationships. We need the following key things from a leader: trust, ability to listen, someone who seeks advice (knows their shortcomings), someone with a diverse team and someone who lets good people get on with what they are good at. What the media is looking for in scientists is a big idea, credibility, simplicity and enthusiasm.

Darren Curnoe: There are many ways to interact with media and be viewed as a trusted science leader. He does this to build the profile of his science and get the next generation interested. Being a scientist brings authority and credibility, with knowledge on how to understand and interpret information. Guiding principles of media engagement: understand your stakeholders/audience; be knowledgeable on your subject; be detached (focus on facts); be passionate and let it show; be genuine; and produce quality writing/speaking. Engaging with the media will bring benefits such as increasing your profile and network, but be careful not to lose sight of your core business, or lose too much time on media.

Rick Baker: In Australia an 'outrageous mission' is hard to find, but these are the ones that venture capitalists are looking for (and often easier to get off the ground). Bold, unusual, shocking ideas are the most likely to be stellar successes (e.g. Uber, Air BnB). Execution is the key – a good idea pushed forward by a strong team is necessary. Big bold missions attract people to work with you, and if they have strong foundations then they will attract capital.

Esther Levy: Peer review helps to improve quality, assess findings, identify originality and detect any plagiarism. High profile research leaders often had a track record of prolific publishing. Key tips from George Whitesides' success include starting with an outline of the paper and using it to guide the research, developing good writing habits, thinking and communicating the bigger picture and being ambitious. Building a network through seeking mentorship, building a network and publishing good papers should help you to become a reviewer. Contacting journals also may be a good path to becoming a reviewer and ultimately an editor.

Thomas Barlow: Advocacy is lobbying, and is a long hard slog. Opportunity costs tend to be understood by lobbyists. Overall, politicians are trying to do the right thing but are balancing many conflicting requirements. Hypotheses and theories are no good as they stand to represent constituencies, not ideas. So convincing a politician is about seeking to convince them that their values align with our science agenda and then that the evidence supports this. Politicians will spend a lot of time every day listening to people, evaluating options and making decisions on who to support so they have to feel that our work fits their values. A key aspect is that scientists have in their favour is that they are viewed as being trustworthy – we should use this asset!

Panel session key points

- Experience in TV/radio can be built up by mock interviewing yourself and recording it, to identify strengths and weaknesses. Identify what can be said effectively in 3 mins. Practice!
- Spending about 20% of your time on media is ideal to build profiles
- Open access publishing helps to gain media attention, or through press releases.
- Senior researchers can get junior researchers involved in media to help raise their profiles.
- Engaging with politics can start by contacting your MP. But, build your credibility and reputation on your science and you'll start to get heard.
- Always be sympathetic to other points of view, even if they seem extreme, as it will allow better engagement with them.
- Will a venture capitalist take on an idea that is altruistic rather than profitable? No, but discussions with them may help find profit potential.
- Focus on conveying a narrative to the media, with data supporting it. Don't worry if the data isn't complete as it's still telling the story.

Session VI – Setting your leadership agenda

This session provided an overview of the 180 Seconds of Science (detailed later in the report) and the outcomes of the breakout sessions that were undertaken during the meeting. Below are the key outcomes from the breakout session questions.

Breakout session 1

What makes a great research leader? What makes a poor research leader? Think about your own experiences.

- Great leaders consistently display positive attributes
- Being human (empathy, flexibility, open-mindedness, self-awareness)
- Builds trust, common goals
- Strong communication (2-way, clear and concise)
- Empowers, supports, encourages self-direction and leadership
- Makes tough decisions based on evidence with transparency and clear communication

Poor leaders don't do the above.

How do we recognise and reward great EMCR leadership?

- Given more leadership roles and responsibilities
- Promotions, fellowships, and awards
- Support them with reference letters, nominations, mentorship, committee representations, invited talks, etc.

How should we recognise great EMCR leadership?

- Provide discretionary funding, time, and resources to pursue bold ideas
- Provide targeted training to develop leadership
- Awards and recognition from peers

How to build a research group? Dealing with universities and funding agencies when building a research group. What mechanisms would encourage and support this?

- Having a statement of purpose (vision)
    - Find and promote your niche
- Establishing a group culture
- Engage with potential end-users
    - Allowing them to shape your research
    - Opportunity to diversify funding sources

How do I establish lasting and productive collaborations?

- Be prepared to do research relevant to collaborators (or industry)
- Network
- Learn to speak the same language

How do I lead teams from diverse disciplines or with industry partners?

- Communicate well
    - Meet regularly to ensure everyone is clear about objectives and milestones
    - Constantly ensure all stakeholders are happy
- Create trust to empower teams and ensure transparency

Breakout session 2

My vision for the type of leader I want to be

- Be inspiring and engaging
- Be human, credible and trustworthy
- Be strong and be prepared to break 'rules'

A detailed action plan for my work based on this SP16 meeting

- Define core leadership skills to lead by example
- Engage with the public, by having a media strategy
- Network, and all the way up the 'food chain' – take issues to leaders (such as Vice Chancellors) but with potential solutions

What are the biggest risks to our path to leadership as EMCRs? How will we get over them?

- Lack of support and self-confidence
- Timing: balancing leadership vs. core research, family commitments, etc.

Creating a culture of leadership and innovation in our teams

- Tailor leadership to suit individual working styles
- Create a team culture: celebrate success and diversity
- Avoid micromanaging

180 Seconds of Science

We know that EMCRs are the future of science. The *180 Seconds of Science* video competition (#180Science) provided EMCRs with a unique opportunity to share their passion for innovative research with the public. With help from our award partners, and in conjunction with our colleagues at the Royal Society of New Zealand Early Career Researcher Forum (the RSNZ ECR Forum), we provided support for three category winners to join us at SP16. The competition videos had more than 50,000 views and 2,600 votes, which highlights the high level of engagement that can be attracted to science outreach.

The EMCR Forum and the RSNZ ECR Forum extend thanks to the major sponsors of this event: the Royal Society of New Zealand, the Ministry of Business Innovation and Employment NZ, CSIRO SME Connect, CSL Limited, the Garvan Institute of Medical Research and John Morris Group.

Reflections on *180 Seconds of Science* by the winners:

- This is a great type of competition to help understand and articulate your message (concise but clear)
- Making videos for public engagement makes you think about the big picture of your work
- Universities generally have support to help make videos like these
- Each competitor said the process was quite rushed – which is often common in the media.

EMCR Forum –
Goals to help secure the future of Australian science

In addition to providing a targeting professional development and networking opportunity for EMCRs, our *Science Pathways* meetings serve as an opportunity to engage with our constituents (EMCRs). Under our remit of securing the future of Australian science through support and advocacy for EMCRs, we seek to identify what goals should be the focus of our activities. Below are short-, medium- and long-term goals that were identified for the EMCR Forum at SP16.

Short-term

- Advocating for different funding streams for EMCRs in major funding rounds (ongoing)
- Raising the profiles for EMCRs
- Identifying and providing resources for EMCRs to cover a wide range of research aspects
- Advising ARC/NHMRC of different career development needs
- Providing better tools to start discussions within research organisations
- Support SAGE Pilot – ongoing contributions/feedback
- Collating alternative funding sources and resources (i.e. not ARC/NHMRC)
- Seeking more engagements at VC/DVC level
- Pushing for unconscious bias training for all grant reviewers

Medium term

- Developing merit relative to opportunity guidelines – look at what should be rewarded relative to resources available
- Introducing state Forum ambassadors
- Producing a guide to best practice for training PhD students
- Improving voice for STEM disciplines – investigate why our voice is disproportionally quiet
- Pushing for ARC double-blind reviews
- Advocating for training in leadership for higher level current leaders
- Providing government training for PhD students and supporting EMCRs for supervision
- Collating capabilities across disciplines and diverse areas

Long term

- Supporting more effective 'rock star' scientist promotion to the general public
- Organising *Science Pathways* April 2018
    - Ensure greater cultural diversity panel inclusion
    - Potential topic: Inter-/trans-disciplinary/diversity science
- Establishing leadership training resources

About the EMCR Forum

The Australian Early- and Mid-Career Researcher Forum is the national voice of Australia's emerging scientists, representing researchers who are up to 15 years post-PhD (or other research higher degree), irrespective of their professional appointment.

It examines critical issues including career structure, job security, funding, education, training and gender equity. The Forum engages with early- and mid-career researchers (EMCRs) from around Australia and advises the Academy on issues relevant to EMCRs, to help inform its policy recommendations to government and develop its EMCR activities. It also liaises with other national organisations to positively contribute to both Australia's scientific research and the future careers of emerging research experts. The Forum provides a vital connection between Australia's most eminent scientists and tomorrow's future scientific leaders.

The Forum's mission is to serve as the voice of Australia's early- and mid-career researchers, championing improvement in the national research environment through advocacy. We focus on sustainable and transparent career structures, gender equity, stable funding policies, career development opportunities, and raising awareness of issues facing the future of science.

More information about the EMCR Forum and its activities