Supporting researchers in an era of team science

Medical science has changed dramatically over the last few decades, giving us the opportunity to address global health challenges by integrating data from a diverse range of international research efforts, including proteomics, genomics, health records, clinical trials, and population-based studies.

To ensure that we transform this rich assortment of information into outputs that have the potential to benefit patients, we need to work closely with colleagues from many different disciplines, countries, and sectors. This new way of working is known as team science and has huge potential to accelerate medical science.

Already team science has played a significant role in landmark projects, including sequencing the human genome, and longitudinal cohort studies such as the UK biobank. Smaller scale team science is also increasing, driven by groups collaborating with those with complementary skills, such as imaging and statistics.

Team science is very different in nature to traditional single discipline research, and the Academy of Medical Sciences recognises it may need different support systems and scientific culture to succeed. In 2013, the Academy established a working group to investigate whether the rapid expansion of team science, with its obvious benefits for delivery of high impact research, was having a positive or negative impact on the career prospects of individual biomedical researchers.

The working group took evidence from a wide range of stakeholders, including researchers, publishers, funders, and employers and its findings and recommendations were published in March, 2016.

Perhaps the most significant finding of the project, one endorsed by all stakeholder groups, was that lack of recognition for the specific contribution of individuals to research outputs, such as publications, datasets, software, and grant income, can have a negative impact on their career progression. Concern was expressed that this can place individuals at a disadvantage compared to those whose skills have come from outside of work.

For the working group’s findings and recommendations see http://www.acmedsci.ac.uk/viewFile/56defebabab91.pdf

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#MedSciLife project, which originated from the Open Space Meeting for Women Fellows, celebrates this outside of work development by encouraging scientists to embrace and be open about their life outside of work.

My message about leadership ends with a note of encouragement—go out and find ways to become self aware, find honest and emotionally intelligent ways to relate to people and get the best from them, and seek all opportunities to hone your skills. When you have these precious attributes avoid underplaying them in your CV—something women in particular can be at risk of doing if their skills have come from outside of work. By celebrating what you have learnt you will have the chance to join the world of leaders and be able to lead truly amazing teams to deliver everything your scientific mind believes in.

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Comment

Professor Catherine Law CBE FMedSci says her love of gardening has parallels with public health, both are long-term projects which require perseverance and planning to bring rewards far into the future.

to peers working in less complex teams when they are being evaluated for grants or promotion. There was particular concern for individuals who discipline-hop or who, because of their unique skillset, tend to work for only short periods on multiple projects—a group often referred to as skills specialists.

The recommendations of the report show that there is much that can be done to improve the way researchers’ contributions are recognised in order to keep up with changes in biomedical research team structures and working practices. The report recognised that any changes should not increase administrative burden and would depend upon a coordinated effort by publishers, funders, and the wider research community.

With these requirements in mind it was fortunate that the Academy was not the only group tussling with the challenge of fair and transparent ways of providing contribution information. Project CRedIT and ORCID are two groundbreaking initiatives that are trying to tackle these issues.

The Academy report recommended that team leaders take responsibility for ensuring contributions to published work are transparent and defensible. Project CRedIT is one resource that makes it easier for researchers to do this. The initiative is led by CASRAI, a global community which is dedicated to the development of standard information agreements and a reduction in the administrative burden on researchers. One of their templates is a new taxonomy that allows authors to specify their contribution to scholarly published work according to one or more of the 12 key contributor roles. This taxonomy has been adopted by the Cell press, and several other publishers are also increasing the amount of information they require from each author/contributor before papers are accepted for publication.

Another pioneering initiative is ORCID (Open Researcher and Contribution ID), which provides individual researchers with a unique numerical identifier. ORCID is a not-for-profit community driven effort to provide a free and easy to use system to track individual's scientific output. There are now over 2·5 million ORCID identifiers being used worldwide. The Academy report recommended that researchers, especially those working...
in team science, should obtain an ORCID identifier and link it to all their research activities including publications, data, and software. They also recommended that publishers include ORCID identifiers in the data they gather from authors when they submit papers.

The Academy report has been well received and there are encouraging signs that it will stimulate change in the way researchers’ contributions are assessed. Funders, including the Wellcome Trust, NIHR, and RCUK, have already recognised the value of digital identifiers as a key step towards reducing the administrative burden of tracking outputs from researchers in receipt of their grants and they require that all applicants have an ORCID identifier. A number of publishers have also incorporated submission of ORCID identifiers—when papers are published, they are automatically uploaded into the author’s ORCID profile. Applicants for Academy grants must have an ORCID identifier and are encouraged to use the CRediT taxonomy to describe the contribution of each author for their top three publications.

While ORCID and CRediT are good examples of how the scientific infrastructure needs to change, there must also be a cultural shift for team science to flourish. There is much that individuals can do throughout their career, drawing on opportunities within and outside of work. Celebrating our differences as researchers is part of this picture—whether it is our diverse scientific backgrounds or our home and cultural lives.

Progress already made to support the career development of those engaging in team science is encouraging. The Academy will promote further adoption of its recommendations in the coming year, and will monitor progress in the field over the next 5 years. In doing this, we hope that team science will continue to play a role in accelerating research to improve human health and wellbeing.

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