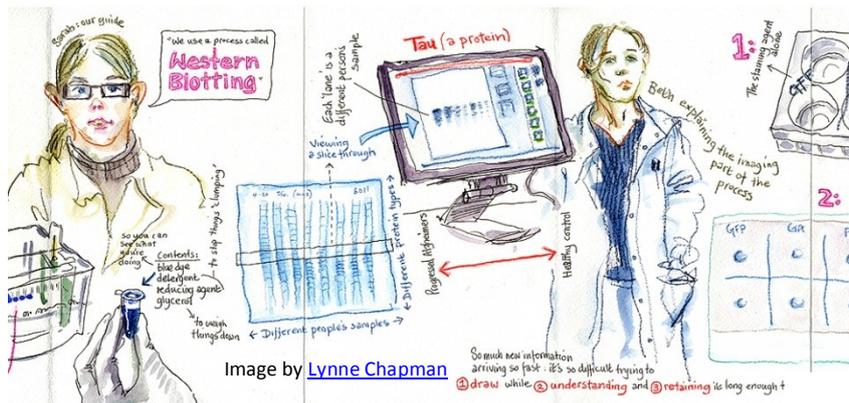


Women in Science: Workshop & Discussion



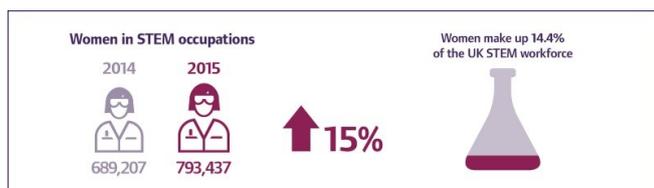
WOMEN IN SCIENCE was the theme of a workshop and discussion facilitated by the **SYNBIOCHEM RESPONSIBLE RESEARCH AND INNOVATION GROUP** at the **Manchester Institute of Biotechnology** on the 27th April, 2016. The workshop considered key challenges involved in bringing about equality for women within science, technology, engineering and medicine, with a focus on industrial biotechnology and synthetic biology. The workshop encouraged the discussion of personal experiences. Workshop participants reflected on some practical changes that participants and others could make to help decrease structural and everyday impediments to equality.

Workshop Speakers

- Dr Rosalind LeFeuvre, Director of Operations for SYNBIOCHEM
- Dr Sally Randles, Senior Research Fellow, Alliance Manchester Business School
- Prof. Perdita Barran, Director of Michael Baber Centre for Collaborative Mass Spectrometry
- Prof. Sophia Ananiadou, Director of the National Centre for Text Mining
- Dr Natalie Gardiner, Lecturer in Life Sciences.

Context and Key Statistics

After a welcome from Prof. Eriko Takano, Co-Director of SYNBIOCHEM, the workshop began with a presentation from Dr Rosalind LeFeuvre, Director of Operations for SYNBIOCHEM. To shape the discussion, Ros drew on information from the WISE campaign to flesh out some national statistics. Women currently make up 14.4% of the UK science, technology, engineering, and maths (STEM) workforce. WISE's target goal is for the UK to reach 30%.



Source: <https://www.wisecampaign.org.uk/resources/2015/09/women-in-the-stem-workforce>

In the Biological Sciences women make up a higher proportion of students obtaining postgraduate qualifications.*

Biological Sciences



In comparison, in the Engineering and Technology, and in Computer Sciences, the proportion is significantly smaller.*

Engineering and Technology



Computer Science



*Figures based on 2013/14 from statistics found in: https://www.wisecampaign.org.uk/uploads/wise/files/WISE_UK_Statistics_2014.pdf

The Manchester Institute of Biotechnology (MIB) is reasonably well balanced in terms of undergraduate (UG), masters (MSc) and PhD education at present, with roughly equal numbers of male to female students in UG and MSc, and only a slight dip at doctoral level, where women represent about 45% of the Institute's PhD cohort.

After postgraduate education, there seems to be a significant bottleneck, with the number of female academics in the Institute being around 15%. Women professors make up 20% of MIB's most senior scientists. This is also a national pattern, known as the 'leaky pipeline', in which the number of women represented in STEM academic roles decreases as seniority increases from postdoc, to lecturer, senior lecturer and professor. As a recent government report concluded:

Although women make up 44.5 per cent of academic staff across higher education institutions (HEIs) in the UK, only 20.5 per cent of professors are women. Women are under-represented at professorial levels across academic research careers in all STEM disciplines (typically 17 per cent although there is variation between disciplines). (HCSTC, 2014: 11)

This is partly reflected in research grant funding, and it has been reported (Boyle et al. 2015: 181) that women submit fewer applications and receive fewer grants than do men:

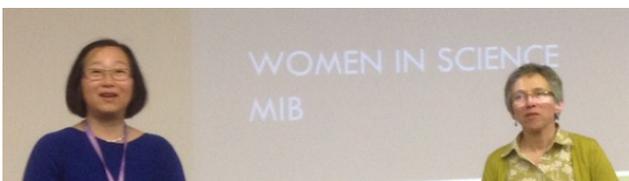
Figures from the European Research Council (ERC) for 2007–13 show that women make only one-quarter of grant applications, and they receive just one-fifth of awards. This pattern is evident at different rates across disciplinary domains: in the physical sciences and engineering, women submit 17% of grant applications and receive 15%; in the life sciences, 30% and 21%; and in the social sciences and humanities, 36% and 31%.

Efforts are underway to change the experiences of women in higher education. During the workshop, Dr Natalie Gardiner reported on the work being done by the Women in Life Sciences group at the University of Manchester to improve the equality of women in the Faculty and to understand what kinds of support they would like. Many of these initiatives are directly targeted at women's own behaviours and ways of thinking, to help them develop more confidence, be resilient, seek support from mentors, challenge inappropriate behaviours, take opportunities, be strategic, and to aspire towards positions and funding for which they are well-qualified.

As Colette Fagan (2015) argues, however, it is vital that this kind of work is supplemented with real structural changes at universities and in other organisations to ensure that practices and routines are changes as well as women's own behaviours:

The focus of many policy initiatives on inspiring and supporting girls and young women to study STEM subjects is an important but insufficient intervention. There is a risk that the problem is seen to be 'women' – that it is women who need to change and women who need to adapt – rather than challenging and reforming cultural and organizational structural barriers. Change requires ongoing commitment from university leadership teams and ensuring that this stated commitment is translated into action to review and reform those organisational procedures and processes, thus creating a level playing field.

Workshop Discussion



The workshop discussion periods ranged over a number of topics and involved a productive sharing of personal experiences and reflection on what kinds of barriers to equality still exist.

Several speakers and participants discussed their personal narratives and experiences. Strong support from supervisors and mentors was highlighted by some successful women scientists, although examples of bias were noted. The challenges of balancing career obligations with personal and family life were raised – with the lack of nursery provision, openness to children at work, and age

limits on fellowships being among the barriers faced. The importance of developing confidence and determination among women scientists was further discussed. As well as making better use of existing provision, more could be done through workshops and other support for female PhDs and PDRAs to apply for academic career track positions in science.

Male scientists, workplace managers and the university also had key roles in facilitating an open, supportive and flexible environment



that would benefit both female and male staff and students. This included encouraging men as well as women to take parental leave. In discussion of how to improve practices and attitudes, it was suggested that more open meeting styles would be helpful – to ensure that everyone is encouraged to contribute to scientific and management discussions.

References

- Boyle, P.J., Smith, L.K., Cooper, N.J. Williams, K.S. and O'Connor, H. (2015) [Gender balance: Women are funded more fairly in social science](#), *Nature* 525: 181-183
- Fagan, C. (2015) [Positions of Power: closing the gender gap in academic leadership](#), *International Innovation*, December 1st 2015
- House of Commons Science and Technology Committee Report (2014) '[Women in Scientific Careers](#)'.

Manchester Groups

- Women in Science, Engineering and Technology
<http://www.wiset.eps.manchester.ac.uk/>
- Women in Life Sciences
<http://www.ls.manchester.ac.uk/equality/wils/>
- Manchester Girl Geeks Events
<https://manchestergirlgeeks.com/>

Other Resources

- WISE Women in Science and Engineering Campaign Website
<https://www.wisecampaign.org.uk/>
- WISE Report '[Women in Science, Technology, Engineering and Mathematics: The Talent Pipeline from Classroom to Boardroom - UK Statistics 2014](#)'
- Women in Science BBSRC Blog post
<http://blogs.bbsrc.ac.uk/index.php/2014/05/women-in-science/>

SYNBIOCHEM Responsible Research and Innovation (RRI) Group Research Brief 16/01. Eriko Takano championed the event, and the workshop was co-organised by Eriko Takano and Rosalind Le Feuvre (SYNBIOCHEM and MIB), Andrew Balmer (Sociology), and Sally Randles (Manchester Institute of Innovation Research). The Manchester Synthetic Biology Research Centre for Fine and Speciality Chemicals (SYNBIOCHEM) (www.synbiochem.manchester.ac.uk) is supported by the Biotechnology and Biological Sciences Research Council (Award BB/M017702/1). The workshop was hosted at the Manchester Institute of Biotechnology (MIB). This brief is authored by Andrew Balmer (andrew.balmer@manchester.ac.uk), Sally Randles (sally.randles@manchester.ac.uk) and Philip Shapira (pshapira@manchester.ac.uk).