

Women in STEM careers

Evidence from the Society for Applied Microbiology to the House of Commons Science and Technology Select Committee

September 2013

The Society for Applied Microbiology (SfAM) is the oldest microbiology society in the UK.

SfAM envisages a future where applied microbiology research and development is strong in the UK and beyond, and the applications of microbiology contribute significantly to all global challenges facing humanity, including infectious diseases; the changing environment; sustainability of energy, food, water, and land resources; and economic growth.

To achieve this vision, SfAM seeks to encourage equality and diversity in microbiology and related disciplines. This, with the express aim of fully utilising the best talents in microbiology and ensuring that the application of microbiology research serves the needs of all citizens.

This response is in addition to our endorsement of the Society of Biology submission to the same inquiry. SfAM is a member organisation of the Society of Biology.

Introduction

We find that equality and diversity issues in STEM are complex and that there is unlikely to be a single approach that is effective to bring parity.

We also take the view that STEM careers provide a magnifying glass on inequality of opportunity in wider society. Academic careers are necessarily elitist because of the requirement for extensive post-16 education and specialist knowledge and skill. As a consequence of this, every inequality experienced by those from low socioeconomic status groups, girls and women, ethnic minorities, and people with disabilities, is likely to take an individual a step further away from STEM as they go through life. Therefore, we believe that interventions that address inequality of opportunity from day one will be magnified in their effects in STEM.

Why do numbers of women in STEM academic careers decline further up the career ladder?

Whilst the under representation of women in senior positions is perhaps less pronounced in microbiology, with several notable female professors among SfAM's membership and two of the past four Society presidents being female, there remains a lack of parity.

Working environment, culture, and career progression

Female PhD graduates and postdocs tell us that they leave academia because they find the male-dominated environment oppressive and unsupportive. They experience an environment that is inconsistent with their principles and values and they lack mentoring and guidance from senior colleagues.

One area of particular concern is the ability of senior scientists in managerial roles to nurture and develop women's talents. As a direct result of conscious or unconscious bias, women scientists are often steered towards administrative and pastoral roles, which are relatively undervalued by academic employers. As a consequence, they do not achieve career

progression in line with male colleagues and so seek alternative careers where their talents and experience may be better appreciated.

Another factor in women STEM graduate career choices is the culture of excessive working hours in academic research. Measurement of success is usually by output, and what can be achieved in a normal working week is not seen as competitive for funding or career progression. Researchers are regularly working six or seven days a week and clocking up hours far in excess of contractual obligations. This particularly impacts women early in their research careers when they may also be taking on additional responsibilities within the family context.

There is also a lack of transparency in recruitment and selection. With researchers often operating in niche areas with a limited pool of recruitment panel members, it is the perception of our members that a degree of nepotism is at play and there is a sense of an 'old boys network'.

Work-life balance

There exists a social expectation that women take primary responsibility for child rearing. This actively excludes women from the practice of science, because of the culture of long working hours and presenteeism.

Our members tell us that they are aware of individuals with negative attitude towards maternity leave and their managers are unaware of effective processes to manage parental leave to the benefit of the individual and the employer. Managers are also facing challenges in funding the cost of maternity leave from research grants. As a consequence, there is a perceived bias in recruiting, against women of child bearing age.

The path to a tenured position generally involves a number of short term, temporary, post-doctoral positions. It is also true that many scientists expect to be nationally or internationally mobile during this phase of their career. Our members tell us that this is discouraging for scientists who also wish to establish a stable home and family. Again, there is still a social expectation that a male partner is primary earner and his career will be prioritised, particularly if it is ahead of an uncertain and risky career path of the female partner.

When women leave academia, what careers do they transition into? What are the consequences of scientifically trained women applying their skills in different employment sectors?

Women transition into a huge range of careers, however, the proportion of women who are not in STEM related jobs or not in employment at all is greater than the proportion of men. This is discussed with data in the Royal Society of Edinburgh's April 2012 report, "Tapping all our talents"¹

What should universities and the higher education sector do to retain women graduates and PhD students in academic careers? Are there examples of good practice?

Affordable, or free at the point of service, childcare is the most commonly requested support. Indeed, SfAM has recently implemented a facility to 'top-up' meeting attendance grants to

¹ http://www.royalsoced.org.uk/cms/files/advice-papers/inquiry/women_in_stem/tapping_talents.pdf

cover childcare if it is necessary to enable a researcher to attend the meeting. Flexible working and job sharing schemes are also valuable.

There is a clear requirement for effective training in equality and diversity at all levels. It may also be useful to use tools to identify and address the impact of implicit social attitudes².

It is also the case that many senior professionals, including scientists, lack the skills and training to be effective managers of people. This should be addressed as a matter of great urgency. In particular, training that encourages managers to value differences in style and, indeed, make use of a diverse team in delivering organisational objectives.

Greater openness and transparency in the recruitment and selection process is vital to address issues of nepotism and the 'old boys network'. HR oversight and involvement in all scientific appointments is absolutely necessary to ensure this.

Every organisation should have a robust personal and professional development review process to ensure matching of individual ambition with organisational objectives and training needs. This should be intrinsic to an ongoing programme aimed at realising the impact of research as opposed to short term fixes, often carried out in the run up to a REF exercise.

Institutions and the scientific community as a whole should institute clear career paths that reward non-research contributions to academic life and consider output rates based on the time each person reasonably chooses to commit beyond their contracted working hours.

Mentoring schemes are useful to support career planning and also to discourage the 'pulling up of ladders' by senior women scientists. And, in addition, career planning workshops that encourage the 'Plan A' academic route over various back-up plans (non-STEM careers, full time parenting, starting own business, etc.), which women are more likely to have in place or in mind than men.

What role should the Government have in encouraging the retention of women in academic STEM careers?

Funding

Following on from the chief medical officer's statement that all NIHR funded departments should achieve Athena SWAN Silver within a reasonable time period, this should be extended to all research council funded departments.

There should be financial provision in all publicly funded PhD and postdoc positions for the possibility of maternity or paternity leave.

The assessment of research track-record by funding panels should take into account periods of part time working, career breaks, or parental leave.

Support and information for complainants and whistle blowers

The government should provide support and information to employees for the pursuance of grievances or whistle blowing in organisations that are not operating in line with existing equal opportunities policies and legislation.

Commission social research

² <https://implicit.harvard.edu/implicit/> for example

The government should commission research that measures the experience of women working in science and those who have left STEM careers, in order to establish qualitative base lines for future improvements in culture and work environment. Such research should be free to question the rational orthodoxy and so present solutions outside of the established political and legal structures, which have so far failed to address the problem for more than 40 years.

Research should seek to re-imagine the problem of the under representation of women in STEM as:

- differences in how men's and women's knowledge, skill, and other contributions to scientific endeavour are valued
- about the experiences of individual women, not a collective experience of all women
- the result of barriers and obstacles to women's career progression
- the gendered origins and practice of science with its masculine methodologies and epistemologies
- a problem for and about the scientific community and wider society, rather than a problem for and about women
- a 'canary in the mine' for wider societal problems of disadvantage to girls and women

The Society for Applied Microbiology is pleased for this report to be publically available. For any queries, please contact Nancy Mendoza, Communications Manager, 01234 326661, nancy@sfam.org.uk