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the glass ceiling  
for women in the  
life sciences

the issues of gender bias





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life sciences

*Working together to achieve  
equal representation  
of men and women in science*

The European Molecular Biology Organization (EMBO) has worked to improve the quality of science and scientific training throughout Europe for almost 40 years. EMBO is now addressing another element in the world of scientists: the environment in which science is performed. This includes an analysis of local laboratory practice and how public society accepts our challenges and activities.

In this wider context, EMBO continues to consider the role of women in life science. Current statistics clearly show a lack of adequate female representation, particularly at senior levels. In June 2001, prominent speakers at different career stages came to Heidelberg to discuss this topic. "The Glass Ceiling for Women in the Life Sciences" has been summarised in EMBO reports in August 2001.

Meetings are short lived, and afterwards many of the contributions are forgotten. We realised that something extra was needed to capture the vitality and diversity of the opinions expressed at the meeting. This is the aim of this booklet. While it does not represent EMBO's opinion as such, as this is presented in a separate Position Paper entitled "Working together to achieve equal representation of men and women in the life sciences," it displays the multiple views vividly presented during the meeting. We publish it in the hope that it will trigger further thought and debate, and that full, fair representation of women will be achieved at all levels in the life sciences.



Frank Gannon, 13 December 2001



*We have calculated how much money we lose if a woman has to give up her career in science, and it is nearly one million German marks [approx. 500 000 Euro] of public and personal investment.*

### **Introduction**

The central concern of "The Glass Ceiling for Women in the Life Sciences" meeting is the fact that although both men and women are equally represented in the junior grades, many women quit science after finishing their doctorate. As you go up the rungs of academic promotion, more and more women fall or jump from the career ladder. This im-

**Helga Ebeling, formerly of the Federal Ministry for Education and Research, Germany, now at the European Commission: Women and Science Unit, Brussels, Belgium.**

plies a possible inequality and requires an assurance that both sides are treated fairly. The EMBO meeting allowed open discussion of gender equality in the life sciences, comparing the situation in the USA, and the differing statistics for individual European countries.

Mary Osborn (Max Planck Institute for Biophysical Chemistry, Göttingen, Germany) presented data from the ETAN Report (for reference see p. 26), commissioned by the European Union in 1999. Gender disparity caused by policies and practices is apparent at both the national and international levels, and especially in central Europe, few senior academics are women.

The ETAN Report argues that the status quo is wasteful and unfair. "It does not argue for special treatment for women. It does point out the unjustifiable advantages that some men currently receive because of the way in which science is organised," said Osborn. The waste of resources incurred

when a trained researcher is lost from science is unacceptably high, and some at the meeting called for legal equality and positive action to address the career disadvantages faced by women.

#### **The Explanations**

The complex reasons why women are rare in senior academic positions became clearer at the EMBO meeting. They include problems of motivation, job security, staff relationships, family responsibilities, age limits, obligatory mobility and discrimination.

#### **Mentoring**

Publication is vital in academic career structures. If you want to get a grant, you have to publish papers. When distributing projects, a laboratory leader needs publishable results as soon as possible. Biological research often demands irregular hours, including weekend work, and men traditionally

have more social approval for spending most of their time at work than women do. Some participants felt that women tend to be given less urgent and therefore less important projects. Less important projects are less exciting, and can be difficult to write up. Without publications, a doctoral student cannot apply for postdoctoral fellowships. A Wellcome Trust study showed that of British postgraduate students whose doctoral work was not published, there were twice as many women as men. Even women without children often have more responsibilities apart from experimental activities, which occupy their time.

According to Patricia Chisholm of the Wellcome Trust, UK, young women who encounter poor mentors early in their career may leave research as a result.

**Suitable role models can encourage young women to continue in science.**

*Women are acknowledged, whereas men push to be authors on papers and are supported in that by the male group leaders.*

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**Goga Apic, PhD student,  
Medical Research Council,  
Laboratory of Molecular  
Biology, Cambridge, UK.**



*To be successful in science,  
you need positive feedback  
from your supervisor.*

**Christiane Nüsslein-Volhard,  
Nobel Laureate, Scientific  
Director, Max Planck Institute  
for Developmental Biology,  
Tübingen, Germany.**

*It is important to have a critical  
mass of women in an institution.  
When even 30 percent of staff are  
women, the atmosphere changes  
completely.*

**Eliza Izzauralde, group leader,  
EMBL, Heidelberg, Germany.**

### Staff Relationships

The issue of sexual harassment was one that affected many participants in different ways. Relationships among scientific colleagues are subtly affected by traditional preconceptions, such as potential gossip if two people of different gender travel away together. Exclusion from a subtle bonding network based on traditional male norms of conversation and behaviour can make it more difficult for women to form the contacts necessary for scientific interaction and social acceptance among a predominantly male group of scientists. A thorough knowledge of the season's football results is sometimes a prerequisite for participating in conversations, whereas men are less likely to discuss matters of family life or personal issues.

Colleagues can definitely share more than purely academic interests, as the relatively high incidence of marriage between researchers attests. Defining and regulating the impact of sexuality on professional relationships is a delicate matter. Old prejudices, especially when these remain unrecognised, can still affect professional interactions. Stories about supervisors who scrutinised more than the experimental results still abound, as do implications that personal attributes other than intellectual ability can earn success.

*Often men don't know how to talk  
with a woman other than as  
they would talk with their daughter.*

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**Christiane Nüsslein-Volhard,  
Nobel Laureate, Scientific  
Director, Max Planck Institute for  
Developmental Biology,  
Tübingen, Germany.**

### Job security

In many countries, women are more likely than men to have short-term contracts. This affects their careers in a profound way. For example, according to a Wellcome Trust study in the UK fewer women than men apply for project and programme



grants, even though the chances of success, after submission, are equal. The reasons for this discrepancy were discussed at the meeting. Causes cited were: a lack of confidence on the part of women, fear of rejection and greater self-criticism compared with men. Lack of time to gather information about funding and to write grant applications are further contributory factors.

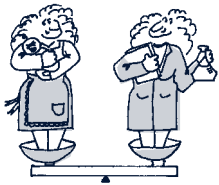
In the UK, many women are simply ineligible to apply for grants because these are not open to short-term contract holders. Age limits for research fellowship applicants also restrict the eligibility of many women for funding and career improvement, particularly those who "lose" years to have a family. Lack of job security particularly affects parents, as although short-term contracts keep people employed, they provide no security.





*Young female scientists  
see the red light ahead and  
just simply opt out.*

**Elizabeth Griffin,  
astronomer, Oxford,  
University, UK.**



**family responsibilities** Many women choose to leave the insecurity of academic career and biological research when they have a family, because long hours and obligatory mobility make academic research a difficult career path for a parent. Often a contract or grant runs out just around the time that little feet come running in. Applying for a new job during pregnancy does not help the chances of success.

Wages for postdoctoral scientists are barely sufficient to pay for domestic childcare. Most postdoctoral fellowships provide limited maternity leave, no allowance to pay replacement staff at the employing institute, and little opportunity for postponement of fellowships during maternity. Very few institutions provide on-site childcare, and many European countries offer inadequate opportunities for child-care, especially for children under three years of age. In this aspect, the US is ahead of Europe in gender equality.

Even in Sweden, where maternity benefits are more generous than elsewhere in Europe, women are disad-

vantaged because they are obliged to take more leave. Time out is an unavoidable part of parenthood, but some would like to limit the duration of leave periods.

Even if childcare is available, young children frequently become ill. This means that one of the parents, usually the mother, has to stay at home to care for the child. The availability of full daycare for children during the school holidays in Europe is close to zero. Mediterranean mothers cope the best in Europe, because grandmothers and grandfathers are more often available to support the family unit.

The reasons for allowing a parent time to look after children are compelling,

and persist beyond the first few months after delivery. Research, however, is competitive. Women senior lecturers in Sweden were found to have lower salaries than their male equivalents, because they had less experience at the same chronological age, had trained fewer students, and attracted less external funding.

The issue of maternity leave was avidly discussed at the meeting:

*Since 1999, all publicly funded research centres in Germany have been allowed to use public money to organise child-care facilities for people who work there.*

**Helga Ebeling, formerly of the Federal Ministry of Education and Research, Bonn, Germany, now at the European Commission, Women and Science Unit, Brussels, Belgium.**

*We plan that in future a group leader will be able to apply for additional money to finish a project and that the person on leave will get the money they would have received for personal use to resume their project.*

**Silke Willems, German Research Organisation (DFG), Bonn.**

*As a lab leader, I am not interested in having my post-doctoral scientists and students take 18 months off from their project to have a baby, because I need the project finished within three years. – If you give people money to spend 18 months away from my lab, I would like the money to recruit someone else in the position.*

**Denise Barlow, Institute of Molecular Biology, Austrian Academy of Sciences, Salzburg.**

*If women want a family and a career they have to make sacrifices that men do not have to make. This is why so many women drop out.*

**Unidentified audience quote.**

*Institutions could subsidise access to affordable childcare. [...] We could also persuade fathers to do their share of child rearing. I know a lot of men whose children have grown up. They say things such as: "My biggest regret as a father was not spending more time with my children".*

**Richard Henderson, Medical Research Council, Director of the Laboratory of Molecular Biology, Cambridge, UK.**

### **Age Limits**

After family leave, scientists may have difficulty returning to work as frequently they become out of touch. Remarking that this also applies to men away from research due to clinical or teaching responsibilities, Julio Celis, Director of the Danish Centre for Human Genome Research, Copenhagen, and President of the European Molecular Biology Conference, advocated catch-up or reentry fellowships for people returning to active research.

Celis also recommended the abolition of age limits for grant applications. The present situation places the most intense pressure on women to achieve academic success when family responsibilities are greatest. As Frank Gannon (EMBO) remarked, the biological clock ticks. Women who undertake clinical training are also disadvantaged by age limits, due to the years required to obtain clinical qualifications.





*We need a mechanism that is really positive. [...] If we get rid of the age limits so that there is no hurdle to jump really quickly at a later age, people could take a break and come back in later."*

**Julio Celis, President of the European Molecular Biology Conference (EMBC) and Director of the Danish Centre for Human Genome Research, Copenhagen, Denmark.**

*there is a position being advertised and there are ten criteria to be met, a woman could only apply if she met eight or nine of them, whereas a man would apply if he met 10 or three. It's a question how you package yourself. ] It is important for women to apply for a fellowship or a grant to know that they have an equal chance of getting one.*

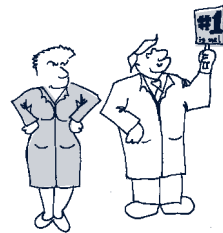
**ary Osborn, group leader,  
Max Planck Institute for  
Physical Chemistry,  
Göttingen, Germany and chair  
person of the ETAN Report  
Committee.**



### **Discrimination or Self-Imposed Barriers**

The low proportion of women at the top in science cannot wholly be attributed to the difficulties of working mothers. As Christiane Nüsslein-Volhard pointed out, 25 percent of German women are child-less. Yet only 3.5 percent of the Directors of Germany's Max Planck Institute's are women.

Discussion at the meeting revealed the difference between a choice in favour of a more convenient occupation and the effects of discrimination operating against even single women scientists without children. Clearly there is still discrimination at some points in the career process. Much of this involves subliminal influences affecting the expectations that people have of themselves and each other. Selfdiscrimination by women may inhibit their readiness to apply for support.



Frank Gannon, EMBO, identified significant differences in the awarding of EMBO fellowships, suggesting that successful female applicants have to have more scientific publications than successful male applicants, whereas successful male applicants have a slightly higher cumulative impact factor as reported in EMBO reports.

*We were struck by the fact that for our standard single grant from the National Institutes of Health [USA], women were asking for 40 percent less money. Until we ask for it, we are not going to get it!*

**Nadia Rosenthal, European Molecular Biology Laboratory (EMBL), Monterotondo, Italy, formerly Harvard University, Cambridge, USA.**

### **Obligatory Mobility**

Leaving your country to work in another country quite often requires changes in personal relationships. Young single people are very mobile, and small children can move comparatively easily for limited periods. As parents progress in their careers, however, their children also become older, have lives of their own, and suffer greatly from having to move because of their parents' jobs. The parents' mobility declines, restricting their scientific careers. A major difficulty for scientists moving to another country is the differing education systems throughout Europe and the USA. The need to move to another country to obtain a promotion discourages scientists with established families.

Louise Ackers, of the University of Lancaster, UK, presented the results of the European Commission's Training and

Mobility of Researchers Scheme, which highlighted the differences between men and women.

Traditional and practical concerns mean that families tend to give male careers priority, and this soon means that the male career develops faster and therefore he earns more.

Once the man in a family earns more than the woman does, the woman's career may seem less important, and suffer long-term consequences. Being a parent appears to be easier for men than for women.





*At some point, something clicks and the male career progresses slightly faster.*

**Louise Ackers, Professor at the Law School, University of Lancaster, UK.**

*to achieve gender equality in science, more fundamental changes within society are needed, especially in very early education"*

**Ike Willems, German Research Organisation (DFG), Bonn.**



**Conclusion:** For young scientists, female or male, devotion to making discoveries is the motivation for research. The present pace of scientific progress depends on this. The continuous work regime of postgraduate research is not very compatible with family life. Only with assistance can a scientist succeed in running a lab and a family. Here we see the challenge of gender equality and the desire to make everything fair.

#### **The Way Forward**

Research is a fine occupation for women and men. The freedom to distribute one's own time, the intellectual challenge, and excitement can make it a "dream career".

Following the example of American science, where women must be included among the speakers if meetings are to receive national funding, European scientists are now being urged to make gender representation equal within a reasonable number of years.

Sweden has taken a bold position with the 1989 appointment of the first Gender Equality Administrator, and with the establishment of affirmative action

policies for academic appointments. Swedish government initiatives since the mid-1990s have established academic positions at all levels and reserved them for women only. Possibly as a result, the first female dean of a medical faculty was appointed at the Karolinska Institute in 1999.

*We require clarity of the structure of an organisation from the top down. This would ensure that women have a fair chance to be chosen for leading appointments.*

**Mary Osborn, group leader,  
Max Planck Institute for  
Biophysical Chemistry,  
Göttingen, Germany and  
chairperson of the ETAN  
Report committee.**

Abolition of age limits can improve the career success of women. When career age rather than chronological age is considered, Swedish statistics show that in attaining research success, or handling clinical, teaching or administrative responsibilities, men and women are equally competent. This is not surprising, rather it shows that such analysis has to be based on fair comparisons.

A National Council for Promotion of Women in Science has been established recently in Israel. It represents all relevant groups of society, with the goals of encouraging girls to choose a career in science and technology, promoting the careers of female scientists in both the industry sector and the academic sector.

The German Research Organisation (DFG) has intensified efforts to increase the number of women choosing an academic career. New measures carried out by the

DFG coincided with the EMBO June meeting and include the availability of part-time, postponed and supplemented fellowships during maternity. A new DFG policy, emphatically requested at the meeting, will provide funds for a project to be continued while a scientist is away from the lab for parental leave. A mentoring project will help to create a support network for female scientists.

The EMBO meeting highlighted gender parity in science. Widespread changes in the way research is funded are clearly desirable. So, there is more work to be done.



*We are focusing attention on getting young women into positions where they are managing, they are guiding, they are supervising students, with the hope that they will later occupy tenured posts.*

**Richard Henderson, Medical Research Council, Director of the Laboratory of Molecular Biology, Cambridge, UK**

*If you are hard-headed, you can break through the glass ceiling.*

**Ruth Arnon, group leader, Weizmann Institute of Science, Rehovot, Israel.**

EMBO recommends promoting equal opportunity for men and women in science by:

- ensuring equal treatment for men and women in research
- collecting and maintaining data on the position of women in science
- monitoring data regarding employment, salaries, budgets, grants and laboratory space
- establishing realistic goals to increase the number of qualified women in senior positions
- raising awareness that the representation of women in science is an issue
- drawing to the attention of conferences and course-funding agencies the necessity of adequate female representation
- offering support for younger scientists (women and men) to pursue a career in research while bringing up a family
- promoting family-friendly policies, including flexible employment arrangements and adequate child-care
- supporting and encouraging mentoring programmes
- encouraging women to apply for large competitive research grants and to assume senior positions in science

EMBO supports women in science by:

- establishing a specific restart fellowship programme for women and men who resume their research career in academia after a break for childcare
- monitoring data on all EMBO-related activities to ensure that there is increased awareness of the need to avoid gender-bias
- removing all potential sources of discrimination among its review processes, and making members of its review committees alert to gender biases
- encouraging those organising EMBO courses and workshops to include a reasonable proportion of women among session chairs, speakers, and participants
- ensuring equality of treatment for those applying for EMBO fellowships and other awards
- achieving these goals without the introduction of a quota system or other mechanisms that could undermine the quality standards of the organization

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**Masthead**

**Quotes: from the EMBO meeting**  
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