Tackling the postdoc brain drain

European science can no longer afford to lose so many high calibre postdoctoral researchers to the USA. What are the problems that need to be addressed to encourage scientists to stay in the European research area? • *by Niall Dillon*

The problem of the 'brain drain' caused by the migration of European scientists to the USA has been a major point of discussion for many years (Breithaupt, 2000; Butler, 2000; Stone, 2000). Inevitably, the movement of established senior scientists to America has received the most attention because of the high profile of the researchers in question. As a result, the focus has been shifted away from what may be an even more serious problem, namely the continuing exodus of European PhDs who choose to carry out their postdoctoral research in the USA. Postdoctoral researchers are a key part of modern research laboratories and no academic system can afford to have so many of its best and brightest young researchers choosing to work elsewhere. Even if these scientists eventually return to Europe when they start their own groups, a highly

result, few choose to come to Europe. With the continuing increase in biomedical science funding in the USA and the general expansion of biotechnology

move to the USA than to cross national boundaries in Europe, despite the much greater distance and the requirement for permits to work in the USA. It is essential

that the barriers that restrict mobility of scientists in Europe are removed. These include the high level of bureaucracy in some European countries and the extreme heterogeneity of academic organisation and scientific funding arrangements that exist across Europe. It is important to create conditions where postdoctoral fellows will feel

worldwide, a shortage of postdoctoral fellows is already becoming a serious threat to the further growth of biomedical research in Europe.

It hardly needs stating that links between Europe and the USA have been and will continue to be important for science on both sides of the Atlantic. However, if the effectiveness of European

that they can move freely between different European countries and know that they will encounter a European research ethos instead of having to grapple with the idiosyncrasies of different national systems. Greater mobility of senior researchers would also have a positive effect. For example, the fact that very few senior academic appointments in southern European countries are held by foreigners is likely to discourage foreign postdoctoral fellows from applying to work in these countries. Language can also be a problem and young scientists from non-English speaking countries may be drawn to the USA by the prospect of acquiring a good command of English that is now essential for long-term success in science. Many of the larger European laboratories already use English as the working language, and this is certainly a potential solution to this problem.

Funding is another key area that needs to be addressed. Since postdoctoral

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productive part of their careers will have been lost forever to European science. The loss of these researchers would not be such a problem if a similar number of American postdoctoral fellows were migrating in the other direction. However, the reality is that most US scientists believe that leaving the USA will damage their long-term prospects for academic careers in the American system. As a

science is to be maintained, it will be necessary to create conditions that succeed in retaining a higher proportion of our own postdoctoral researchers and also in attracting more American postdoctoral scientists to Europe. I suggest that a programme designed to achieve this goal should deal with the following issues.

Strange though it may seem, European scientists may actually find it easier to

fellows tend to choose a laboratory and then apply for funds to work there, the most effective type of funding is the fellowship, which can be applied for as needed. The high level of competition for many European fellowships, such as the EU Marie Curie Fellowship scheme and the EMBO long-term fellowships, suggests that availability of funding is often a significant factor that influences decisions on where to work. It is worrying, therefore, to see that future plans for EU funding of biomedical science are directed towards large-scale projects instead of funding more postdoctoral fellowships within Europe. Fellowships that are specifically designed to promote a two-way exchange of postdoctoral personnel between European and US laboratories would also be beneficial.

Conditions of employment will also affect decisions on where to work. The days when postdoctoral researchers were prepared to work an 'apprenticeship' on low wages without benefits are almost certainly over. The postdoctoral scientists of today rightly regard themselves as highly qualified professionals and are fully aware of their value. Many have young families to provide for. If we wish to keep them in Europe, then it will be necessary to ensure that they are paid adequately wherever they are working. An arrangement that allowed pension

benefits for scientists to be transferred between European countries would also be a major incentive to remain within the European research area. In addition, it is important that conditions for senior academic appointments that are designed to 'attract back' postdoctoral fellows from the USA do not end up discriminating against those who have stayed in Europe. This will only increase the problem by providing an additional incentive for postdoctoral researchers to leave the European system.

Changing perceptions may prove to be the most important task of all. There is a widespread view among European scientists that the most advantageous career path is to do one's postdoctoral work in the USA and then return to Europe to become a principal investigator. Since laboratories require both postdoctoral fellows and laboratory heads, the logical flaw in this view is obvious. If it were correct, it would also suggest that there is something seriously wrong with European science. In fact, an examination of the track record of European laboratories shows that they can provide a training environment which is every bit as good as that of their American counterparts. The injection of energy and ability that would come from retaining our best postdoctoral scientists can only further enhance the quality of science in Europe. It is time for

European laboratory heads to begin to convey that message to their graduate students when they are considering where to go for their postdoctoral training.

References

- Breithaupt, H. (2000) The flight from European science. *EMBO Rep.*, **1**, 104–105.
Butler, D. (2000) Court young French postdocs, says petition. *Nature*, **408**, 126.
Stone, R. (2000) New Program Supports Facilities, Stipends. *Science*, **289**, 226–227.

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Science and ethics

As research and technology are changing society and the way we live, scientists can no longer claim that science is neutral but must consider the ethical and social aspects of their work • *by Maurizio Iaccarino*

Less than 500 years ago, science was a dangerous business. In 1600, the Italian monk Giordano Bruno was sentenced to death and burned at the stake because he believed in free thinking in philosophy and science. Galileo Galilei narrowly avoided the same fate but only by publicly renouncing his support of Copernicus' heliocentric view. Of course, the days of autodafés are over and modern science has an important influence on the development of society as a whole,

compared with the days of the ill-fated Bruno. But while scientific progress has been rapid and astonishing, it is still dis-

application of science in new technologies and products. Furthermore, as scientific progress becomes increasingly

As scientific progress becomes increasingly fundamental to society, it is constantly challenging, if not completely clashing with, long-held beliefs concerning our ethical values

turbing for those people who feel excluded from the debate surrounding the

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