
Dr Jens Meiler

NADINE BRACHT

Europe's brain drain

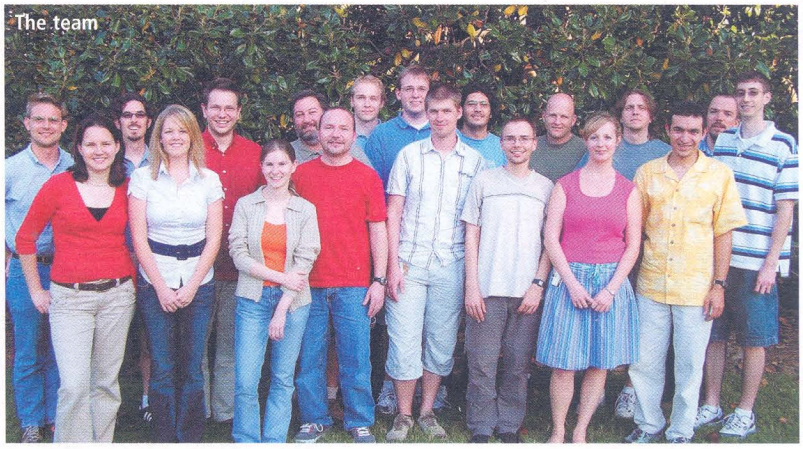
THE IRRESISTIBILITY OF US UNIVERSITIES

Biotechnologist **Dr Jens Meiler** explains his reasons for emigration to America

By *Meike Lerner*

Better research opportunities, defined career paths, greater job security and higher salaries: these attractions inevitably lure young, talented scientists away from their own countries to work in the USA. Among them is German biotechnologist **Jens Meiler PhD**. Four years ago he became Assistant Professor for Protein Structures in the Departments of Chemistry, Pharmacology and Biomedical Informatics at the Centre for Structural Biology, Vanderbilt University, Nashville, where opportunities for research into computer-assisted determination of protein structures have proved worlds apart from those on offer in his homeland.

'After my doctoral thesis at Johann Wolfgang Goethe-University, Frankfurt, I really wanted to go to the USA, although I always intended to return home after a few years. However, during my interviews for assistant professorships, two of which took place in the US, I realised that the differences between the two countries are so enormous that, from a career point of view, it was going to be impossible to return to Germany,' he explained. Job insecurity in his homeland was one of the deciding factors: 'When you take a job there, you already know that the contract will end in five years and that you will have to start looking elsewhere. There is a danger that somewhere between the ages of 35 and 40 your career gets stuck. In particular since we are so specialised that it's becoming increasingly difficult to find the right job at the right time in your career, and when the right job becomes available you compete with applicants returning from the US – who are often better qualified because they have been able to carry out better research using their larger "start-up packages", in laboratories with better facilities and in the security of a tenure-tack position.


The team

'In the USA, assistant professor posts are designed to lead to a full professorship. Continued employment as a professor in the US is only performance-related, so to some extent you have a better control of your own destiny,' he added.

The financial situation for starting scientists is also more favourable which facilitate research at a higher level. 'When compared to Germany a larger part of the US research funds goes directly and competitively to the researchers, less goes to the University administration. This gives young scientists higher chances to receive independent funding. It also prompts American universities to provide their assistant professors with substantial start-up finances to make them competitive. In turn American universities profit directly when their young investigators are successful, since they receive a bonus for every dollar I receive from a research foundation.' Dr Meiler pointed out. However, although US universities also pay higher salaries, he said this was not a crucial factor in his decision to remain in the US.

Aged 33 and married, with a young son, he sees his mid-term future in the US: 'If an institute in Germany was to lure me away, I would return, but these job offers are rare – there are maybe only a dozen full professorships in Germany that match my research profile. It's important that a job description fits 100%. That's why I am using all my opportunities here; after all, I have only just started my research projects and built up my staff. Our research into the computer-assisted determination of protein structures is only in at an early stage, but it's very promising and carries considerable potential. This is the challenge that I'm focusing on at the moment.'

Computer-assisted protein determination

Fishing in a sea of opportunities

The field of research in which Jens Meiler and his team of 20 at Vanderbilt University in Nashville USA specialise covers the relatively new, computer-assisted determination of proteins, their structure and interactions; their aim is to determine the underlying causes of certain diseases then develop appropriate therapies.

Due to increased computer capabilities in recent years, it is now possible to carry out precise simulations of proteins and examine their structure and function. Once the functions are known, they can be manipulated through changes to their structure and proteins can be turned into therapeutics. Additionally, it is possible to determine the interactions between a drug and a protein or, vice versa, to select a drug that will bind with the protein in the best possible way, based on detailed knowledge of its structure. One of the best-known examples of this is the structure elucidation of the HIV-1 protease protein, which led to therapeutics that are part of the drug cocktail now widely used to treat patients.

Opportunities to design a protein, or find the right drug for a certain protein, are almost unlimited; currently it is difficult to determine at exactly what stage science is at. In principle, research in this field is always as good as the programs scientists develop and the computers used to carry out the research. Further developments are therefore strongly dependent on the enhancement of computing power and the development of new algorithms. Research is now at a stage in which various possibilities to design a protein can be trialled. However, with computing power at its current level, proteins can be folded only up to a certain size; larger proteins require higher computing power.

As technical prerequisites and the different scientific areas go hand in hand, the interdisciplinary approach of the research team is important. Dr Meiler's team includes computer programmers, mathematicians, physicists, chemists, biologists and medics – i.e. those who know what problems need to be solved and those able to programme the computer to do so.

On the whole, the approach to protein research provides a significant opportunity for a new approach to drug development that, in turn, may solve problems such as multi-resistance to antibiotics.