

## /CORRESPONDENCE

**Forces in nanotechnology***To the editor:*

The article "Nanotechnology's Many Disciplines" (*BioTechnology* 13:439-443, May), by Daniel Thomas, highlights a popular and fruitful theme of recent years, namely the interface of biology, chemistry, and physics at the nanoscale and its many potential applications. While the industrial products resulting from this type of research are still concentrated in the "physical" industries, a number of fundamental insights into the behavior and control of biomolecular processes have been made in recent years. One of these breakthroughs that I feel should have been brought more clearly to the reader's attention is the advent of force measurements between individual molecules using adapted force microscopes. The most notable work in this area is by Richard Colton's group at the Naval Research Laboratories in Washington and Hermann Gaub's group at Munich University. For example, the force required to break individual Crick and Watson base pairs has recently been measured (*Science* 226:711, 1995), and the ability to detect antibody-antigen interactions is surely to follow. Based upon this and similar results one can perhaps envisage biosensors sensitive to literally a few molecules, and when combined with combinatorial strategies and nanopatterning techniques, new methodologies for drug discovery.

As the collaboration between the biologist and the physical scientist becomes ever deeper and the appropriate technology become more widespread and routine, there is no doubt that many fundamental advances and new products await to be made by the "bionanoengineers" of today and tomorrow.

*Clive J. Roberts*  
Laboratory of Biophysics and  
Surface Analysis  
The University of Nottingham  
Nottingham, NG7 2RD, U.K.

**First to invent?***To the editor:*

The profound impact of changes in the General Agreement on Tariffs and Trade (GATT) to intellectual property management have been discussed in excellent articles by Kevin McGough (*BioTechnology* 13:116-117, February) and Elizabeth Enayati (*BioTechnology* 13:460-462, May). In particular, we would like to offer some practical advice to non-U.S. inventors regarding the change in the otherwise protectionist U.S. patent law that relates to "first to invent." As of December 8, 1995 a date of invention may be established by inventive activity in any World Trade Organization (WTO) country, thus allowing data from non-U.S. WTO countries to be admissible as evidence in patent ownership proceedings in the U.S. This could open the route for non-U.S. inventors to otherwise unobtainable patents in perhaps the world's largest and most progressive biotechnology market.

However, in order to substantiate your claim in

the U.S. court, you must be able to prove when (and who) first made the inventive step and subsequently reduced it to practice. Here are some simple guidelines which may at first seem laborious, but that could perhaps pay dividends or prevent a difficult situation in the future: (1) Record the details of the experiment in such a manner as to make your experiments easy to repeat by someone with a reasonable degree of skill in your field of interest, remembering to include sources of reagents used, details of buffers, methods, etc. Conclusions should be written clearly and concisely while also recording ideas, hypotheses or, for example, projected plasmid constructs. Abbreviations, code names, or coded samples that you alone understand should be avoided. (2) Every page of the notebook should be dated and signed when finished, witnessed as your work by a second person who is not a coinventor but is in a position to understand the work. Try to keep full details and witnesses in case these are required for court proceedings or royalty distribution. (3) Computerized data storage and electronic notebooks are not acceptable. (4) Permanent records that from time to time arise (e.g., computer printouts, gel photographs, cell photographs, protein purification profiles, Western blots, etc.) should be permanently affixed into a notebook, preferably with numbered pages, avoiding the use of loose leaf pages and without deletions. Indelible ink should be used throughout with cross-outs being dated and initialed; erasure may invalidate the evidence. For clarity, try to keep a separate series of numbered notebooks for each project. (5) Copies of notebooks should be stored in multiple places to avoid possible fire damage, etc. If you are the head of a laboratory, try to ensure notebook discipline with regard to writing up, signatories, and retention of notebooks upon departure.

The GATT amendments are a significant step towards the international harmonization of patent law and will help redress the otherwise privileged position of the U.S. inventor with regard to inventive activity outside the U.S. The opportunity to participate in the "first to invent" system means that notebook discipline will become highly important and we advise researchers to review their practices in this regard. There are real implications from GATT for inventors in non-U.S. WTO countries that must now be embraced: It is profoundly important that such changes enter the theater of science thereby to be enacted.

*Neil Sullivan*  
Nuventures Ltd.  
18 Windsor Terrace  
Newcastle upon Tyne, NE2 4HE, U.K.

*Julie Fyles*  
William Jones Patent and  
Trademark Agents  
54 Blossom Street  
York, YO2 2AP, U.K.