

## Cultural differences reduce Japanese researchers' visibility on the Web

SIR — As scientists, we are keenly aware that the world is developing into a single 'laboratory without walls', in which information passes as easily to the other side of the world as to the person working in a neighbouring institute. Although some people may be uneasy with this, to the brightest minds it is an enormous opportunity for progress, particularly in fundamental research. Yet information-sharing is not necessarily symmetrical, and depends on the tools that each contributor has available.

Our experience in managing the international research projects sponsored by the Human Frontier Science Program (HFSP) illustrates the problem.

This organization — of which we are president (M. I.) and secretary general (T. W.) — was established more than 15 years ago by Japan as an international programme for research into fundamental life processes. The HFSP secretariat, which is based in Strasbourg, selects postdoctoral fellows and research projects via international review committees.

Publication databases and powerful search engines allow the secretariat to update information regularly and to find it readily. However, it has become obvious that not all institutes and countries are on an equal footing in this respect (see [www.hfsp.org/pubs/HFSP\\_articles/websites-scol.php](http://www.hfsp.org/pubs/HFSP_articles/websites-scol.php)).

In the case of Japan, it has become apparent that many scientists suffer from a lack of international visibility, in that they are very difficult to find by search engines and indeed in publication databases.

As a consequence, Japanese scientists are less likely to be invited to participate in collaborative projects or to become reviewers, which deprives them of a full international experience. Three main issues need to be addressed.

First, internationally comprehensible web pages must be constructed, to make a scientist's research interests, research group and publications immediately clear to anyone who visits the site. Many traditional Japanese-language scientists' websites start with a description of their philosophy and artistic interests, which in Japan are recognized as important in a potential mentor. Although this is culturally appropriate for Japanese students and postdocs, its relevance is, unfortunately, lost on the international visitor, who is accustomed to the succinct presentations typical of Western research institutes and universities. One simple remedy would be for Japanese researchers to have a Western-style page within their website, easily accessible and clearly

signposted, in English, on the homepage.

Second, many academic institutions have websites based on their curricula, which are appropriate for Japanese students, but are of limited interest for international visitors. It is important that the homepage of such institutional websites provides a clear option headed 'research', in the English language, that leads to a page summarizing the research in a style that is familiar to international visitors.

Third, in many regions of the world, numerous scientists have similar or identical family names and initials, making literature searches in PubMed very difficult or impossible. This is certainly an issue in some Asian countries, including Japan. Some concerted effort is necessary to resolve this problem — perhaps by the addition of laboratory codes, or a 'zip code' for the initials of individual scientists — to allow these scientists to compete fairly on the international level.

All of these are pressing issues in global science communication. Frontier-level international research is becoming concentrated in those institutions and laboratories that have the maximum visibility on the World Wide Web.

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## Real-space solution to the problem of full disclosure

SIR — As discussed in Editorials in *Nature* and *Nature Structural Biology*<sup>1,2</sup>, authors submitting research papers that describe molecular structures to *Nature* journals are required upon request to provide structural coordinates for reviewers to assess the quality of the work. But in the competitive field of structural biology, full disclosure of coordinates to anonymous peer review does raise serious concerns.

Nonetheless, the local nature of structure model quality — about which commonly provided global indicators such as  $R$  and  $R_{free}$  reveal no detail<sup>3</sup> — in fact requires reviewers to be able to access and assess the quality in relevant areas of the structure (in particular around sites with bound ligands), which is not possible without disclosure of coordinates and structure factors.

A solution to the conflict is the real-space correlation coefficient (RSCC) plot, introduced in 1990 (ref. 4). Such plots depict, residue by residue, the fit of the model and

ligands to the electron density. Weak correlation indicates poor fit to electron density, suggesting genuine absence of ordered regions or building errors. Low real-space correlation is thus a general indication of lack of reliable information in that part of the structure.

RSCC plots for validation of deposited and released structures are available through the Electron Density Server EDS (<http://eds.bmc.uu.se/>). In addition, EDS plots are automatically generated as a part of the validation procedure during coordinate submission to the Protein Data Bank (PDB) at the European Bioinformatics Institute (EBI-MSD). Similar RSCC plots are returned by the program SPCHECK upon deposition to the US-based RCSB-PDB site.

We suggest that RSCC plots should be submitted with manuscripts to help the reviewers and users to assess the quality of structure models. Generated as a part of validation during structure deposition, these plots can be produced without any additional work by authors. The plots can be provided with the manuscript or as supplemental material to convince reviewers of the model quality in critical areas, without forcing authors to reveal coordinates and structure factors prematurely.

In view of the increasing frequency of publication of exciting and important structures of protein–ligand complexes, which depend crucially on the validity of the interpretation of ligand–protein interactions, the time is now appropriate to consider our proposal for mandatory provision of RSCC plots when submitting manuscripts to journals. Inspection of real-space correlation plots substantially lowers the risk of over-interpretation of poor local electron density, enhances information available for review, and provides authors with a strong means to demonstrate the quality of their structures without compromising their original data.

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