In this issue

Counting citations

Citation counting has become a popular pastime in the more advanced of our scientific institutions. Thanks to the availability of the Science Citation Index (SCI) in CD-ROM versions, the growing net of 'informatics' centres and a general inability to develop robust procedures for evaluation of science and scientists, 'citation analysis' is now increasingly used as a quantitative index for assessing scientific performance. Many government agencies have encouraged the uncritical use of SCI and journal impact factors as indicators of scientific quality. Not surprisingly, impact factors are uppermost in the minds of many publishing scientists. The paucity of citations to even good and relevant work emanating from India is often the subject of discussion, as is the limited contribution of Indian scientists to 'high impact journals'. It is truly amazing that a highly successful commercial organization in Philadelphia, the Institute of Scientific Information, should have such an overwhelming influence on scientists and managers of science. Are the results of citation analyses useful and meaningful? Is there science beyond the citation index? Száva-Kováts raises the bogey of non-indexed citedness (**page 705**). While the failure to consider eponymal references (no one, I suspect, refers to C. V. Raman's original papers when talking about the Raman effect) may cause less harm, given the wide impact of the work, there may be a greater problem in neglecting many sources not indexed by SCI. Ironically, in stating that 'non-indexed eponymal citedness' (NIEC) is a special case of Garfield's well-known 'uncitedness', the author fails to cite Eugene Garfield. To the many publishing scientists, who worry that diminishing citation counts may put careers in jeopardy, the author's conclusion – 'the meaning and value of quantified citation data of the Citation Indexes must be reduced, especially in the cases of the (mis) use of the data for the purpose of evaluating scientists as scientists' – must be comforting.

Quinoproteins

The tongue twisting pyrrolo-quinoline quinone (PQQ) prosthetic group was first identified in the mid-1960s in the enzymes methanol dehydrogenase and glucose dehydrogenase. The structure of the organic cofactor was established in 1979 and more recently, detailed three-dimensional structures of quinoproteins have been determined. C. Anthony and M. Ghosh (**page 716**) review the wealth of structural and mechanistic information available on PQQ-containing quinoproteins. A great deal remains to be clarified, particularly in understanding the precise routes and mechanism of electron transfer. As with most protein structures, there are always some surprises. In the case of methanol dehydrogenase, the stereochemical purists will be aghast to see two adjacent cysteine residues linked by a disulphide bond, with the intervening peptide unit deviating from planarity by 45°. Even Pauling's dictum that peptide bonds must be planar (or nearly so) can be violated.

P. Balaram

Transgenic plants

Improvement of plants using the sexu and asexual means has had a lon history. Usually the transfer of geneti information is dictated by taxonomi barriers. Trespassing results in incom patibility, sterility or similar problems Transgenic technology hinges on th ability to construct novel gene combi nations and deliver them across taxo nomic barriers. The communicatior by Sane *et al.* (**page 741**) is a case study.

The engineered gene has a 35S promoter from the cauliflower mosaic virus (CaMV 35S), the nopaline terminator (NOS) and cowpea trypsin inhibitor (*CpTI*) gene. The gene construct has been engineered into a plasmid of *Agrobacterium* and transformation effected by co-cultivation. *NPTII* has been used as a repeater gene in the study.

These protocols developed in an 'ideal plant – tobacco' can be used in engineering crop plants at a later date. The whole idea is to design genes with the ideal combination of constituent 'parts' borrowed from different organisms if required. The gene construct should be able, when incorporated into the plant, to produce the gene product at the right time, in the right tissue, in the desired quantity and in response to the external stimuli.

Sane *et al.* have transformed tobacco and incorporated insect resistance, shown the effectiveness of the gene by feeding trials. The segregation of the *NPTII* gene has been followed for a few generations in a stable manner. It will be interesting to see the segregation pattern of the *CpTI*, the candidate gene at a later stage.

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