# Nepotism: A handicap in Indian science

Although many letters have been written on various aspects of scientific corruption in India, it seems that nobody is really bothered about the intensity of the dilemma. This prompted me to comment on another aspect of unethical science practice in India. The concept of kin-selection is an interesting topic while studying altruism in animal systems. Though the human being is considered as a masterpiece of evolution, as an animal by instinct, it is not surprising if an average human being shows favouritism towards his/her kin in critical situations. However, favouritism can be a setback in the civilized world of science, where strict ethical values have to be followed.

Possible violation of scientific ethics by scientists in order to gratify their kin may include, giving priority while allotting research fellowships/assistantships[1], giving gift-authorships[2,3] or giving priority in the authorship order as mentioned by Mendki[4]. Others may include giving priority in utilizing laboratory/technical resources, etc. A study on the trends in multi-authored and single-authored publications in neurosurgery research suggests that the increased awarding of 'gift-authorships' can be a possible reason for the drastic decline in single-authored papers in the past 50 years[2].

In science, the 'recommendation letter' given by the respective supervisor/guide plays a predominant role in assessing a student's conduct and in obtaining future employments/postdoctoral fellowships. This dependency leaves great scope for science-bureaucrats to misuse their power to hold invalid authorships and to grab students' genuine ideas for self-glory and to gratify their kin.

Favouritism in science must be a characteristic of mediocre mentality and it is unfortunate that it has the capacity to eclipse blossoming of genuine scientific talent of other students. Though it is obvious that the proportion of such scientific dishonesty is relatively small, its existence is undeniable. However, it is encouraging to have organizations like Society for Scientific Values (http://www.scientificvalues.org), comprising genuine scientists to investigate cases of scientific dishonesty in India. As mentioned by our Honourable Prime Minister, 'debureaucratization' of science is a must if everybody really wishes our nation to become a global competitor[5]. It is also necessary that scientists should always be impartial while recruiting and handling students. Moreover, today's research scholars are the next generation guides/supervisors; they are not only acquiring scientific knowledge, but also learning good manners, science ethics and honesty from their supervisors. Therefore, it would be better if this is always remembered.

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# Bioinformatics: A web of biological information

The term 'bioinformatics' is a relatively recent introduction in the literature (after 1991). Bioinformatics is the field of science in which biology, computer science and information technology merge into a single discipline. The important sub-disciplines included in bioinformatics are: analysis of algorithms, data structure and information retrieval and software engineering. The general belief is that bioinformatics constitutes only genomics and proteomics. Genomics is the study of total molecular sequencing of one set of all genes of an organism, while proteomics is about amino acid sequences, and the three-dimensional structure related to the function of proteins. However, in recent times, chemiformatics (study of low molecular weight compounds), glycomics (study of carbohydrates), metabolics (study of metabolic pathways in organisms) and drug design through bioinformatics are also being projected as legitimate areas of bioinformatics. The field of bioinformatics has much information about biomolecules, available in the form of biological databanks. Two major databanks, namely, coconut biotechnology databases and complete genome of white spot syndrome of shrimp have been released for public use. Other important databanks which have information about biomolecules are archival databanks of biological information, derived databank, bibliographic databank and databank of websites. Databanks without an effective mode of access are merely data graveyard; for better access to these databanks, we need to ask the following questions:

(i) Does the databank contain information of our choice?

(ii) How can one assemble selected information from the databank in a useful form?

(iii) Where can one find some specific piece of information?

The Department of Biotechnology (DBT), New Delhi initiated a programme on bioinformatics way back in 1986–87. The Biotechnological Information System (BTIS) network, a division of DBT, has covered the entire country by connecting to 57 key research centres more than 100 databases on biotechnology that have been developed and several major international databases for application to genomics and proteomics, in the form of mirror sites under the national Jai Vigyan Mission. Now some useful programmes in bioinformatics like EMBOSS, Staden packages, THREADER or PHD, Rasmol and WHATIF are available for biotechnological research. Bioinformatics is crucial for advancement of biotechnology industry, since it can help cut the time-frame that is usually required to develop a product for economic growth of any nation.

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