

## OPINION

### What should India be doing in the human genome?

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A learned British scientist was speaking to me recently on why India should take a conscious policy decision to participate in genome analysis programmes of the kind that are in progress elsewhere in the world, that is, in the molecular mapping and sequencing of the genetic material in human and other organisms. He also mentioned that he had emphasized this point, among others, in his meeting in New Delhi with the Hon'ble Minister of State for Science. I have my own reservations on this issue of a national genome initiative [although I understand that the Department of Biotechnology (DBT) is already actively considering it], and lest we be carried away by the opinions of those who are not entirely familiar with the ways in which science operates and is funded in India, I thought I would use these columns to initiate a debate amongst ourselves as to what could and should be done.

My position on the matter can be summarized in two statements: I am all for research ventures that seek to understand the structure and function of the human and other genomes; however, I do not see any reason why this should be carried out in the mission-mode, that is, with earmarked funds.

Our British friend was extolling to me the wonderful projects that are being undertaken around the world under the aegis of the various national Genome Programmes, upon which I asked him: would these same projects *not* have been supported in the absence of any special initiative, that is, were they not novel enough to be supported on their

own merits under existing basic research funding schemes? And he admitted that I had a point.

The problem with Indian science, relative to science in countries where the genome programmes have taken root, is that we are so thinly spread out here with very few internationally competitive groups in any one field. I see no fault in this arrangement *per se*; indeed, I believe this is the only way science in this country can develop as we bootstrap ourselves, supporting with the limited funds available projects arranged in an hierarchical list of excellence (based on peer review), in whatever branch of science they be.

The problem with earmarking of funds is that in the Indian context, I believe it would lead to support of not-so-good science: because the money that is so earmarked is not then available in the general science budget kitty it would generate its own hierarchical list of funding, which by definition cannot be better than the consolidated list itself. Some people argue that earmarked funds should represent an *additional* appropriation, and not merely a slice of an already-existing cake, but this is a naive, if not specious, argument. In the words of a senior technologist (spoken I am sure in a vein of cynical witticism), the purchase of one or two less Mirage aircraft by the Government would more than compensate for the entire annual budget of the CSIR; do such arguments get us anywhere?

In my opinion, the genome projects represent one set amongst many of good basic research—several unans-

wered questions, much to be learnt, and a potential for application of the new knowledge that is gained. Similar examples in other areas of science might include high-temperature superconductivity, room-temperature fusion, fullerenes research and so on. For each of such and other areas which are considered to be of strategic importance (into which investigators must be encouraged to enter), I suggest that we could have separate Project Advisory Committees (PACs) under the Department of Science and Technology or the DBT, but no separate earmarked funds.

Earmarking is to science what subsidies and protection measures are to the general economy—justified only when there are pressing national or social concerns. Defence needs, atomic energy, the Bhopal gas disaster are some areas where earmarked funds for research are perhaps justified. In all other areas of research, be it in studies on the social behaviour of the orangutan, on the *top* quark, or on the organization of the *ixl* locus on chromosome 2, let a hierarchical list be prepared and may the best projects be supported. And the Hon'ble Finance Minister will then be pleased that his philosophy of liberalization of the economy (from the top-down management approaches of the past) has found its parallel in science funding policies as well!

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