Biomedical Research Funding in India

India has the third largest pool of researchers in the world, after the USA and the erstwhile USSR.[1] However, the quality of research output does not reflect this numerical strength. When Garfield ranked developing countries by the impact of their authored articles, he found that 27 countries had an impact of 2.5 or more, while India had an impact of only 2.[2] Why does this disparity exist? It is certainly not related to our intellectual capacity or the ability to work hard. Indeed, there are numerous examples of Indians working abroad who have risen to great heights and made important contributions. There are also examples of such Indians who after returning to India have not been able to match their own productivity. All this suggests that conditions in our country have more to do with the quality of research output. These could be due to inadequate research funding and infrastructure and problems of information access and procurement of materials. Lastly, it is the priority that we as a nation lay on research.

The root cause responsible for frustrating our research efforts is the abysmally low levels of research funding in our country. Let us look at some hard facts. The annual budget of the Indian Council of Medical Research (ICMR), the central research funding agency, is Rs 350 million. This is used to pay the salaries and fund the research of 26 institutions under the ICMR as well as about 500 research projects. In contrast, the annual budget of the National Institutes of Health (NIH), the equivalent of ICMR in the USA, is about Rs 610 billion. This amount is used to fund the research activities of 17 NIH institu tions and about 10 000 extramural research projects. If one considers a 40-hour week and 50 working weeks in a year, the NIH spends about Rs 300 million per hour, which is the entire annual budget of the ICMR. While the NIH has a per capita annual spending of Rs 2440 the corresponding figure for the ICMR is Rs 0.35. Similarly, the NIH spending is 0.28% of the gross domestic product (GDP) of USA that of the ICMR is 0.0035% of our GDP.

The situation of other grant-giving agencies is similar. In 1995–96, the Department of Biotechnology spent Rs 260 million and the Council of Scientific and Industrial Research Rs 190 million on biomedical research. Compounding the problem of funding is the inability of some agencies to utilize their budgetary allocation. In 1995–96 the Department of Science and Technology was unable to spend Rs 195 million of its allocated funds for the same year.[3]

In India, the money available to an individual researcher is also small. While an average NIH grant is about Rs 15 million, the usual grants in India range from Rs 0.1 million to Rs 1.5 million for 3 years. I strongly feel that serious researchers must be funded at a realistic level. In a biomedical research laboratory an estimate—based upon my experience and that of my colleagues—is that money allocated for research should be about Rs 350 000 per active worker per year. A research group comprising 5 active workers must get about Rs 1.7 million for consumables per year. At this level of funding researchers would be able to comfortably buy crucial and usually expensive reagents, assay kits, and other disposables, which at present they would not even dream of buying. The current level of funding does not allow any growth in the quality of research output. If we are serious about our research activities, if we wish to do worthwhile research, if we would like to spend our time in pursuing what should be pursued rather what can be pursued within the meagre means, there is no alternative but to have a quantum leap in our research spending.

'Our country cannot afford to spend more on research.' This is a likely response from our policy-makers. In my opinion this is simply not true. The money earmarked for biomedical research at present is ridiculously low. The annual budget of the ICMR is much lower than a single day's increase in the current oil pool deficit of the country (Rs 500 million per day). What is needed is a realization, fresh priorities and a clear understanding. Established market economy countries would not be spending so much on biomedical research if no returns were forthcoming. New drugs, new technologies, new reagents and diagnostic kits, all form a multi-billion dollar world market.

While the lack of infrastructure relates to the meagre funding, there are other problems which stem largely from the existing bureaucratic procedures. Correction of these systems requires little more than an understanding of how research is done. Simplification of these procedures would allow a researcher to spend more of his time in the laboratory than in offices, stores and with files. Such is the financial system in our research institutions that even if funds are available for purchase of materials, it is difficult to procure them in a resonable time. The delay kills the enthusiasm of the researcher who forever chases the elusive frontline of research.

The poor access that researchers have to information compounds these problems. While the 'net' is abuzz with pre-publication information, we wait for scientific journals to arrive by surface mail, several months after their publication. The communication revolution has touched India but its wide availability remains a dream. The necessity for access to information is highlighted by the fact that wherever information access has improved, the productivity and quality of research have improved.[4]

If we don't wake up now, and assert our rightful place as a leader in biomedical research, we shall be left far behind, open to exploitation by those who spend large amounts on research. Corrective measures are needed immediately. A substantial real increase in research funding should be allowed every year till the figure becomes respectable. If this happens, Indian biomedical research will quickly and surely attain heights that the country can be proud of.

REFERENCES

1 Gupta BM, Nattan SS. Scientific and technical journals in the developing countries *ILA Bull* 1979;**15**:11–19.
2 Garfield E. Mapping science in the third world. Part 1. *Science and Public Policy* 1983;**10**:112–27.
3 Anonymous. R & D Lags under the new economic regine. *The Hindu* 4 June 1997:p10.
4 Garfield E. How to boost third world science. *The Scientist* 1987;**1**:9.

R. K. SAXENA
Department of Immunology
School of Life Sciences
Jawaharlal Nehru University
New Delhi