

Recent challenges of conducting biological research in Pakistan

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Research by definition is production of valid and generalizable knowledge. While it brings immense joy, pleasure and sometimes reward to the researcher, it is not without frustrations due to unforeseen impediments and challenges in a developing country like Pakistan. According to a leading educationist in Pakistan "Research is a means and not an end, a tool or method for developing the critical thinking faculties of an individual, an essential ingredient and stimulant for continuous development of a professional person, a frame of mind and method of approach towards solving problems"¹.

One of the most significant impediments in conducting biological research in Pakistan is due to our culture which does not promote independent and critical thinking². Most scientists rather than embarking on innovative ideas to solve national problems prefer to carry out research that has been done elsewhere. Such a research has a limited novelty and little impact at the international level. What is needed is encouraging the young minds to critically analyze the problem, question the traditional approaches and come forward with innovative ideas for addressing the research question. Such a culture will take time to develop however; a beginning has to be made preferably at the school level.

Lack of critical mass of researchers

Another challenge for conducting quality research in Pakistan is lack of critical mass of biomedical researchers³. In technologically advanced countries help could be available to a researcher in a nearby laboratory or institution, however, in Pakistan good research laboratories are only in a few large cities of the country. Moreover, only a small number of scientists can be found in a particular discipline or a specific field. Although internet has shortened distances between scientists, yet it cannot be the substitute for face to face interaction.

Poor research infrastructure

Poor research infrastructure in Pakistan, especially in biological and biomedical sciences is another impediment in conducting quality research. There is an absence of core-facility in most institutions. Many institutions have laboratories without essential pieces of equipment. Though Higher Education Commission (HEC) has initiated programs to provide essential pieces of equipment to

some of the institutions of higher learning, however, the process is long and cumbersome and requires a very strong justification. Even with the acquisition of essential equipment, the research could suffer because of the lack of proper biomedical engineering units in most research institutions. Moreover, the culture of sharing equipment has not fully evolved in this country. There is a need to engage in collaborative research with pooling of resources and making the best use of whatever is available. For long functional life of expensive pieces of equipment, it is essential that these should be manned by trained technicians.

Lack of research funds in national funding agencies

HEC and Pakistan Science Foundation (PSF) are the major national funding agencies in Pakistan. However, timeline for project approval and disbursement of funds for research can be very long and quite discouraging to many young scientists applying for these grants. Moreover, disbursement of research funds by these granting agencies is dependent upon timely release of funds earmarked for research by the Ministry of Science and Technology. Even on-going research projects often fail to receive installments according to the schedule in the contracts. This could seriously impair the on-going progress of research on a particular project. Institutions and departments must develop a mechanism to support on-going research projects for such brief periods without funding. Moreover, scientific community should make efforts towards impressing upon the leadership in government to increase allocation for research in the annual budget.

Incentives for research

Incentives provided by the Ministry of Science and Technology during the last decade have certainly provided a boost to research in Pakistan, however, the focus has largely been on number of publications in impact factor journals rather than engagement in high quality research geared towards addressing the national problems.³ It is hoped that Ministry of Science and Technology will devise a system of more rewards for translational research within the country. In a study carried out in Karachi, lack of financial incentives was not found to be a major barrier in conducting research amongst junior faculty of Pakistani medical universities.⁴ Incentives such as promotion to the next rank, more facilities and time for research, recognition at the institutional, national

and international levels and invitations to international scientific meetings are considered to be more important in encouraging the researchers to be more productive and passionate about conducting high impact research. However, institutions must be prompt in providing these incentives and rewards to their researchers, because a delayed recognition loses its impact and value.

Lack of mandatory training on research ethics

Perception of scientific misconduct is different among different people. Young researchers must be fully trained about research ethics and responsible conduct of research⁵. Institutional Review Boards (IRBs) have a very important role in ensuring that the research carried out meets the international standards and norms. Continuous preparation of young researchers and graduate students through workshops and short courses is necessary for their sensitization to ethical aspects of research. They must be fully aware of the research misconduct which includes fabrication, falsification or plagiarism in the design and conduct of the study and reporting of results⁵. Most good journals require the approval letter of the study from the IRB or Ethics Review Committee of the institution at the time of submission of the manuscript. Therefore, researchers must have adequate training in writing application for the ethical approval of their project/study from IRB before embarking on the actual research work.

It is also incumbent upon the Research Ethics Committees to provide the necessary feedback to researcher in a timely manner so that the study could

be initiated without any delay. There is also a need to developing an efficient mechanism by which studies requiring no sampling from human subjects or animals are granted exemption without having to go through the long process of IRBs or Ethics Review Committees.

CONCLUSION

Conducting quality research in Pakistan is fraught with a number of difficulties which could easily discourage a young investigator. However, it should be the endeavor of the senior researchers/faculty to work towards removing those complexities. At the same time the young investigators should be fully sensitized to these challenges. It is often said, "A forewarned is forearmed".

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