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Funding in research

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Abstract
Various national and international agencies have identified priority areas for funding of collaborative research. In India, not much funding is allotted for carrying out fundamental research in educational institutions, especially graduate level institutions. In this narrative review we tried to explain the details of few funding agencies in detail.

Keywords: funding, research, funding agencies

Introduction

Various national and international agencies have identified priority areas for funding of collaborative research. In India, not much funding is allotted for carrying out fundamental research in educational institutions, especially graduate level institutions [1]. There are certain important considerations which need to be followed by a researcher for successful international collaboration *viz*. presentation of the proposal, justification for foreign collaboration, technology transfer, capacity building, ethical and IPR (intellectual property rights) issues, transfer of human biological material, etc [2]. As a condition of grant support, institutions in receipt of funds are responsible for ensuring that the investigator fully complies with the requirements for the storage, use and transfer of biological materials and any additional provisions to safeguard security that are specified in regulations. Parent institutions of the investigators are also required to accept responsibility for the management, monitoring and control of research work funded by international grants and for ensuring that permanent/temporary staff and students employed to undertake such work receive appropriate training [1, 3]

Funding Pattern of the Government

The projects are classified into eight major subject areas [4].

1. Agricultural Sciences
2. Biological Sciences
3. Chemical Sciences
4. Earth Sciences
5. Engineering and Technology
6. Medical Sciences
7. Physical Sciences

The institutions have been classified into 11 categories [1]

1. Universities
2. Deemed universities
3. Science colleges
4. Engineering colleges
5. Medical/pharmacy colleges
6. Institutes of national importance
7. National laboratories
8. Government departments/State S&T councils
9. Scientific and Industrial Research Organizations
10. Research institutions and voluntary organizations

Some of the Leading Indian Funding Agencies Are As Mentioned Below

Department of Biotechnology (DBT)

A separate Department of Biotechnology (DBT) was finally set up in February, 1986 and the NBTB selected Dr S Ramachandran as the first Secretary of the department. The DBT constituted a ten member Scientific Advisory Committee (SAC) with heads of various scientific agencies and a seven member Standing Advisory Committee for North America SAC (0) to ensure that the Department kept abreast of global developments in the field of Biotechnology [2]. Since it's inception, the Department has promoted and accelerated the pace of development of biotechnology in the country through several R&D projects, demonstrations and creation of infrastructural facilities, a clearly visible impact in this field has been seen [1]. The Department has made significant achievements in the broad areas of agriculture, health care, animal sciences, environment and industry. (DBT) The setting up of a separate Department of Biotechnology (DBT), under the Ministry of Science and Technology in 1986 gave a new impetus to the development of the field of modern biology and biotechnology in India [5, 6].

Indian Council of Medical Research

The Indian Council of Medical Research the apex body in India for the formulation, coordination and promotion of biomedical research, is one of the oldest and largest medical research bodies in the world established in 1911. The ICMR is funded by the Government of India through the Department of Health Research, Ministry of Health and Family Welfare [5, 7].

Department of Science and Technology (DST)

The Department of Science & Technology (DST) was established in May 1971, with the objective of promoting new areas of Science & Technology and to play the role of a nodal department for organising, coordinating and promoting S&T activities in the country under the Ministry

of Science & Technology [5]. The Department has major responsibilities for specific projects and programmes such as formulation of policies relating to science and technology; matters relating to Scientific Advisory Committee of Cabinet (SACC) and promotion of new areas of S&T with special emphasis on emerging areas; coordination and integration of areas of Science and Technology having cross-sectoral linkages in which a number of institutions and departments that have interests and capabilities [5].

Main goal- Promoting new areas of Science & Technology and to play the role of a nodal department for organising, coordinating and promoting S&T activities in the country under the Ministry of Science & Technology.

Responsibilities- [5]

1. Formulation of policies relating to science and technology matters relating to Scientific Advisory Committee of Cabinet (SACC).
2. Promotion of new areas of S&T with special emphasis on emerging areas
3. Coordination and integration of areas of Science and Technology

Major Activities

1. It undertakes or financially sponsors scientific and technological surveys, research design and development.
2. Providing support and grants-in-aid to the scientific research institutions, scientific association or bodies.
3. It plays a key role in matters regarding the interagency/interdepartmental coordination for evolving science and technology missions,
4. Matters concerning domestic technology particularly the promotion of ventures involving the commercialization of such technology other than Council of Scientific and Industrial Research (CSIR).
5. Establishment of new institutions/ infrastructure. It assists in harnessing and application of science and technology for weaker sections, women and other disadvantaged sections of the society [8].

Indian Council of Social Science Research Senior Fellowships

Established in 1969, the Indian Council of Social Science Research aims to boost research activities in social sciences in India. Therefore, it provides scholarships in various areas of social sciences to boost research. It is one among them that is granted to bright social scientists, who meet with all eligibility criteria [5].

Life Sciences Research Board

The purpose of Life Sciences Research Board (LSRB) is to expand and deepen the knowledge base of life sciences in the country through strengthening and use of national resources. The research supported by the LSRB is to enhance the core competence in the fields of knowledge (and their application) germane to development, manufacture and use of biomedical and biotechnological products as also preventive and curative procedures [10]. The boards provide grants-in-aid for collaborative defence-related futuristic frontline research having application in the new world class systems to be developed by DRDO [1]. The purpose of Life Sciences Research Board (LSRB) is to expand and deepen the knowledgebase of life sciences in the country through strengthening and use of national resources of knowledge, know-how, experience, facilities and infrastructure [9].

Defence Research and Development Organisation (DRDO)

The Defence Research and Development Organisation working under the Ministry of Defense.

Objectives-

1. Formulation and execution of programmes of scientific research
2. Design and development, testing and evaluation leading to induction of state-of-art weapons and equipment.
3. Supports a substantial amount of extramural research in academic institutions and other laboratories on defense related problems through various grants-in-aid schemes and other sponsored projects.
4. The organization encourages and supports basic research in academic institutions through a scheme of extramural research and four Research [1].

Boards Devoted to

1. Aeronautics,
2. Naval Research,
3. Life Sciences,
4. Armaments.

The Defence Research and Development Organisation under the Ministry of Defence is dedicatedly engaged in the formulation and execution of programmes of scientific research, design and development, testing and evaluation leading to induction of state-of-art weapons and equipment which would compete and compare favorably with its contemporary systems available elsewhere in the world [5].

It consists of a chain of laboratories/establishments situated all over the country, pursuing assigned scientific goals with delegated powers under the policy direction provided by the headquarters in New Delhi. The organization encourages and supports basic research in academic institutions through a scheme of extramural research and four Research Boards devoted to Aeronautics, Naval Research, Life Sciences, and Armaments [5].

Council of Scientific and Industrial Research (CSIR)

The CSIR was established in 1942 as autonomous, non-profit organization with a wide ranging charter of functions [2].

Objective- This national level test is conducted to determine the eligibility of Indian nationals for the award of Junior Research Fellowships (JRF)-NET and eligibility for appointment of Lecturers (NET) in certain subject areas falling under the Faculty of Science [1].

Eligibility Criteria- Educational Qualification: M. Sc., or equivalent degree, with minimum 55% marks

Age Limit- The upper age limit for JRF shall be 28 years, which is relaxed upto 5 years in the case of candidates belonging to Schedule Castes/Schedule Tribes, Women, Physically Handicapped and OBC applicants [1].

The Council provides financial assistance to promote research work in the fields of Science & Technology, including agriculture, engineering and medicine. The assistance is provided by way of grants to Professors/Experts in regular employment, in the universities, IITs, postgraduate institutions, recognized

R&D laboratories both in public and private sectors [5].

Indian National Science Academy (INSA)
For conducting advanced research or undergoing specialized training in Indian Research Institutes/Laboratories
Criteria for selection- Scientific contributions and the purpose of the visit

Eligibility details of Award
1. The applicant should be a scientist and hold a regular position in any R&D organization including Universities or Affiliated Colleges in India.
2. These Fellowships will be awarded on a competitive basis to the scientists for furtherance of their research and/or research capabilities for carrying out collaborative research, undergoing training in specific techniques, or utilizing facilities not available in their own institutions.
3. The Indian National Science Academy encompasses promotion of science in India including its application to national welfare, safeguarding the interests of the scientists, establishing linkages with international bodies to foster collaboration and expressing considered opinion on national issues.
4. The Academy also felicitates through properly constituted National Committees, in which other learned academics and societies may be associated, for undertaking scientific work of national and international importance which the Academy may be called upon to perform by the public and by the Government.
5. The main objectives of the Indian National Science Academy are promotion of scientific knowledge in India including its practical application to problems of national welfare.
6. It also aims to coordinate among Scientific Academies, Societies, Institutions, Government Scientific Departments and Services.
7. It also acts as a body of scientists of eminence for the promotion and safeguarding of the interests of scientists in India through properly constituted National Committees, for undertaking scientific work of national and international importance.
8. It seeks to promote and maintain liaison between Science and Humanities, while attempting resource mobilization for the promotion of Science.
9. The Academy also dons advisory role to the government on critical issues in science and technology. Importantly, it serves as a forum for interaction among scientists within and outside the country [1].

Objectives- Promotion of scientific knowledge in India including its practical application to problems of national welfare. It seeks to promote and maintain liaison between Science and Humanities, while attempting resource mobilization for the promotion of Science. The Academy also dons advisory role to the government on critical issues in science and technology [5].

Department for Scientific and Industrial Research
The Department of Scientific and Industrial Research (DSIR) is a part of the Ministry of Science and Technology. The primary endeavor of DSIR is-

1. To promote R&D by the industries, support a larger cross section of small and medium industrial units
2. To develop state-of-the art globally competitive technologies of high commercial potential,
3. Catalyze faster commercialization of lab-scale R&D, enhance the share of technology intensive exports in overall exports,
4. Strengthen industrial consultancy & technology management capabilities and
5. Establish user friendly information network to facilitate scientific and industrial research in the country. It also provides a link between scientific laboratories and industrial establishments for transfer of technologies through National Research Development Corporation (NRDC) and facilitates investment in R&D through Central Electronics Limited (CEL) [1].

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