



ICMR BULLETIN

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INDIAN COUNCIL OF MEDICAL RESEARCH : *Extramural Activities*

The primary aim of promoting research in the country in priority areas of biomedical research is achieved by ICMR through intramural as well as extramural research. Over the decades, the scope of extramural research as well as strategies used have been expanded by the Council.

Extramural research is promoted by ICMR through (i) Centres for Advanced Research in identified research areas which are set-up around existing expertise and infrastructure in selected departments of Medical Colleges, Universities and other non-ICMR Research Institutes; (ii) Task Force studies which are national projects, centrally planned and coordinated and usually implemented on a multicentric basis. These projects are time-bound, with a goal-oriented approach and clearly defined targets, specific time frames and standardized and uniform methodologies; (iii) open ended research on the basis of applications for grants-in-aid voluntarily received from scientists in non-ICMR Research Institutes including Medical Colleges, Universities *etc.*, located in different parts of the country.

Financial support is provided by the Council for research in all major areas related to health. Following are the major priority areas for research identified by the ICMR:

- (1) Communicable diseases (including viral diseases, diarrhoeal diseases, tuberculosis, leprosy, malaria, filariasis, kala-azar, vector control *etc.*)
- (2) Reproductive biology and fertility control.
- (3) Maternal and child health.
- (4) Nutrition and major metabolic disorders.
- (5) Health services research including alternative health care systems.
- (6) Non-communicable diseases including degenerative diseases, cancer, mental, gastroenterological, cardiovascular, neurological, ophthalmic disorders, oral health, haematology, pathology *etc.*
- (7) Occupational and environmental health problems.
- (8) Drug research (including medicinal plants and indigenous/or traditional systems of medicine).
- (9) Basic medical research in disciplines like Anatomy, Physiology, Pharmacology, Immunology, Molecular biology, Genetics, *etc.*

Proposals for *ad-hoc* grants are received throughout the year by the Council on a prescribed

format which are carefully designed by the Council (and modified from time to time). The proposals received for extramural funding are reviewed by various Project Review Committees (PRCs) in different disciplines which meet at least twice a year. These projects are also reviewed by subject specialists before they are considered by the PRCs.

Any scientist working in a Medical College, Research Institute, or University located anywhere in the country including Government, semi-Government, private or registered bodies can apply for financial assistance for biomedical research.

The Task Force projects are formulated and sponsored centrally, the areas of research and collaborating scientists being indentified by the Council itself through its Task Forces and other Expert Committees. Peer review is a strong feature of ICMR for both intramural and extramural research (Chart).

virology, oncology, nutrition, occupational health, haematology, endocrinology, clinical pharmacology etc.).

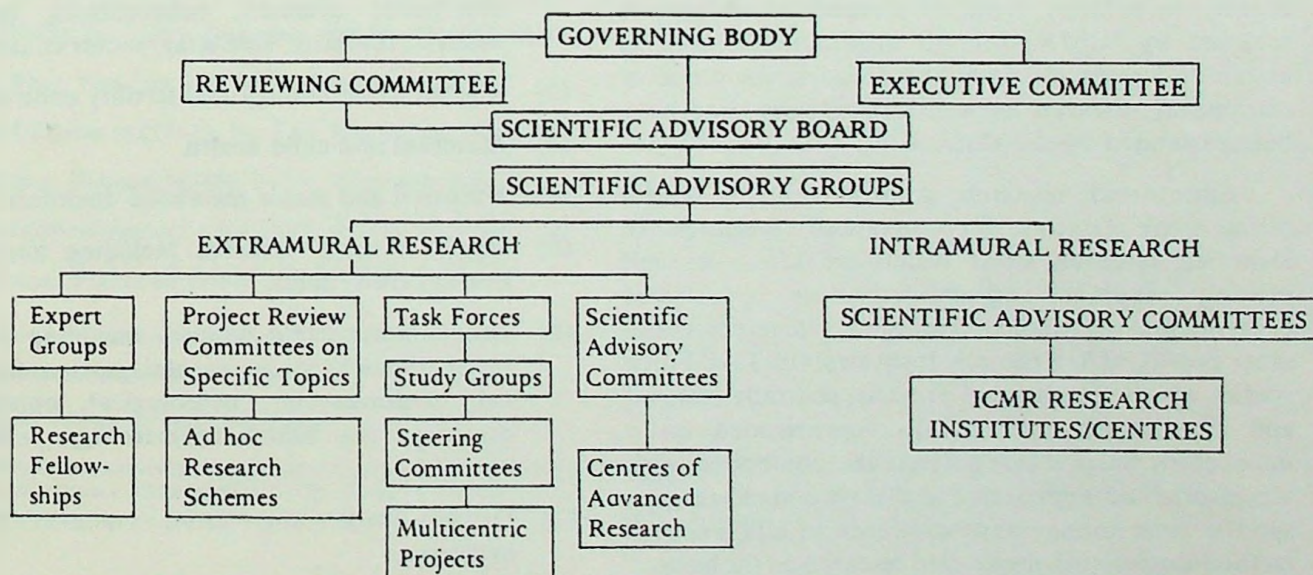
Research Fellowships

Applications on a prescribed form are received throughout the year. In addition to the fellowship stipend, a suitable contingent grant is also provided by the Council. For a Junior Research Fellowship, only candidates with a Masters degree who have cleared the national tests (such as the CSIR/UGC test in the life sciences category) are eligible to submit a proposal.

Short-term Visiting Fellowship

The objective of this scheme is to enable scientists in non-ICMR Institutions and Medical Colleges, engaged in biomedical research to update their skills, learn the latest advanced techniques in the area concerned by visiting a reputed Institute in India. The

PEER REVIEW SYSTEM OF ICMR



Human resource development in biomedical research is promoted by ICMR through various schemes such as (i) Research Fellowships (*ie* Junior & Senior Fellowships and Research Associateships); (ii) Short-term Visiting Fellowships; (iii) Short-term Research Studentships; (iv) Research Sabbatical; and (v) A large number of Training Programmes and Workshops conducted by ICMR Institutes and Headquarters (on medical entomology, medical

tenure of the fellowship is three months. The candidate is provided travel and per diem expenses. Applications are invited by advertisement in newspapers or by issue of a circular to Medical Colleges/Research Institutions.

Short-term Research Studentship

The Short-term Research Studentship Programme was initiated in 1979 in order to promote

interest in and an aptitude for research among medical undergraduates. The main aim of this scheme is to provide an opportunity for medical undergraduates to familiarise themselves with the basic principles of research methodology and techniques, by being actively associated, even for a short time, with the ongoing research programmes. The Studentship is awarded for two months during the summer vacation. The value of the fellowship is Rs.250/ p.m. Applications for a limited number of these studentships are invited annually through a circular to the Medical Colleges.

Research Sabbatical Scheme

The Research Sabbatical Scheme is aimed at enabling senior teachers in Medical Colleges/ Institutions, who are usually over-burdened with routine teaching duties, to devote their time entirely to research for a limited period. This Scheme is intended primarily for experienced scientists who are actively engaged in research in the field of medicine and allied sciences, who have attained some eminence in their field of study and are anxious to devote their entire attention for a limited period, so as to be able to pursue the important leads already attained by them.

Under this Scheme, the salary and allowances which the research worker would have drawn in his/her permanent post will be borne by the Council for the duration of the Scheme which is normally awarded for one year (with provision for extension by one more year). A contingent grant of Rs.5,000/ p.a. is also admissible. To assist the worker in his/her work, one or two Research Fellows can also be provided.

The research worker may elect to work either at the same Institute where he/she is employed or in any other Institution of his/her choice in India where necessary facilities for research in the area concerned are available.

Recently, this Scheme has also been extended to intramural scientists of ICMR, to enable them to work on a topic of their choice and to follow interesting leads obtained in the course of their work.

Emeritus Medical Scientist Scheme

The Council has a limited number of positions of Emeritus Medical Scientists. Senior medical teachers/scientists, who have retired or are about to retire and who have held before their retirement, posts of the status of a Professor/ Associate Professor in a

Medical College or of Director/ Deputy Director in an Institute of national status and have been actively engaged in biomedical research of a high standard are eligible for appointment as Emeritus Medical Scientists. The Scheme is designed to assist those senior scientists who are totally free to continue active research in their own speciality. The duration of the appointment of Emeritus Medical Scientist is for a period of two years, with provision for extension upto a maximum of three years, one year at a time, beyond the first term of appointment. The Council's Emeritus Medical Scientist will be paid an honorarium of Rs.3500/ p.m. A contingent grant subject to a maximum of Rs.10,000/ p.a. is also admissible. This Scheme is not regarded as conferment of an academic distinction, but meant to promote research by capable retired medical scientists. Only active working scientists are selected as Emeritus Medical Scientists.

Applications are called for through advertisements in the newspapers, ICMR Bulletin as also through circulars.

ICMR Awards & Prizes

To provide recognition to medical research of a high order in the country, the Indian Council of Medical Research awards the following prizes/awards each year:

1. Basanti Devi Amir Chand Prize (Value Rs.1000/-) for Research on any subject in Biomedical Sciences.
2. Dr. P.N. Raju Oration Award (Value Rs.1000/-) for Research on any subject in Biomedical Sciences (to be notified each year).
3. Sandoz Oration Award for Research in Cancer (Value Rs.1000/- and a Gold Medal).
4. Dr. Y.S. Narayana Rao Oration Award (Value Rs.1000/-) for Research in the field of Microbiology.
5. Chaturvedi Kalawati Jagmohan Das Memorial Award (Value Rs.1000/- and a Gold Medal) for Research in the field of Cardiovascular Diseases (awarded in alternate years).
6. Dr. Kamala Menon Medical Research Award (Value Rs.5000/-) for Research in the field of Internal Medicine and Paediatrics in alternate years.

7. Kshanika Oration Award (Value Rs.1000/-) for a Woman Scientist for Research in any field of Biomedical Sciences.
 8. Dr. M.K. Seshadri Prize (Value Rs.5000/- and a Gold Medal) for the Practice of Community Medicine.
 9. M.N. Sen Oration Award (Value Rs.1000/-) for the Practice of Medicine.
 10. JALMA Trust Fund Oration Award (Value Rs.5000/- and a Gold Medal) in the field of Leprosy.
 11. Dr. J.B. Srivastav Oration Award (Value Rs.900/-) in the field of Virology (to be awarded in alternate years).
 12. ICMR Prize for Biomedical Research for Scientists belonging to under-privileged communities (Value Rs.5000/-).
 13. ICMR Prize for Biomedical Research in underdeveloped areas (Value Rs.5000/-).
 14. BGRC Silver Jubilee Oration Award (Value Rs.2500/-) for Haematology and Immunohaematology.
 15. Smt. Swaran Kanta Dingley Oration Award (Value Rs.5000/-) in the field of Reproductive Biology.
 16. Dr. M.O.T. Iyenger Memorial award (Value Rs.4000/-) in any of the fields of Malaria, Filariasis, Plague or Medical Entomology.
 17. Prof. B.K. Aikat Oration Award (Value Rs.1000/-) in the field of Tropical Diseases.
 18. Dr. Vidya Sagar Award (Value Rs.5000/-) in the field of Mental Health (to be awarded in alternate years).
 19. Amrut-Mody Unichem Prize (Value Rs.10,000/-) for Research in the field of Cardiology & Neurology and Gastroenterology in alternate years.
 20. Amrut-Mody Unichem Prize (Value Rs.10,000/-) for Research in the field of Maternal & Child Health and Chest Diseases in alternate years.
 21. Chaturvedi Ghanshyam Das Jaigopal Memorial Award (Value Rs.1000/- and a Medal) for Research in the field of Immunology (to be awarded in alternate years).
 22. Lala Ram Chand Kandhari Award (Value Rs.5000/-) for Research in the field of Dermatology and Sexually Transmitted Diseases (to be awarded in alternate years).
 23. Smt. Pushpa Sriramachari Award (Value Rs.2,500/- plus a Silver Medal) in the field of Pathophysiology (clinical or experimental) for scientists above 45 years of age only
 24. Dr. Prem Nath Wahi Award (Value Rs.5,000/-) for Cytology and Preventive Oncology.
- Prizes/Awards for Young Scientists (below 40 years)**
25. Four Shakuntala Amir Chand Prizes (Value Rs.500/- each) for Research on any subject in Medical Sciences.
 26. Raja Ravi Sher Singh of Kalsia Memorial Award (Value Rs.900/-).
 27. Dr. V.N. Patwardhan Prize (Value Rs.1000/-) in Nutritional Sciences.
 28. Tilak Venkoba Rao Award (Value Rs.1000/-) in the fields of Psychological Medicine and Reproductive Physiology in alternate years.
 29. Dr. T. Ramachandra Rao Award (Value Rs.1000/-) in the field of Medical Entomology.
 30. Dr. C.G.S. Iyer Oration Award (Value Rs.1000/-) in the field of Leprosy.
 31. Dr. Dharamvir Datta Memorial Oration Award (Value Rs.1000/-) in the field of Liver Diseases.
 32. Prof. B.C. Srivastava Foundation Award (Value Rs.2000/-) in the field of Community Medicine.
 33. Smt. Kamal Satbir Award (Value Rs.5000/-) in the field of Respiratory Allergy and Chronic Obstructive Lung Disease.
 34. Major General Saheb Singh Sokhey Award (Value Rs.6,000/-) in the field of Communicable Diseases.
 35. Dr. H.B. Dingley Memorial Award (Value Rs.5,000/-) in the field of Paediatrics.
- Foreign Collaboration/Assistance in Bio-medical Research**
- The ICMR coordinates the processing, implementing and monitoring of biomedical research programmes carried out under the auspices of either

bilateral agreements between India and countries such as USA, UK, USSR, France, Germany *etc.* or as assistance from international agencies such as WHO, Ford Foundation, Rockefeller Foundation, UNDP, IDRC *etc.* Proposals are subjected to a peer review process followed by clearance by the Government of India. These programmes are intended to facilitate and promote biomedical research in areas of mutual interest to India and other countries/international agencies, with transfer of technology being one of the prime objectives. The facilities available and the modalities of operation vary according to the country

or agency concerned. Other Departments/Agencies of the Government of India also deal with similar programmes, foremost among them being the Department of Science & Technology, Department of Biotechnology, Council of Scientific and Industrial Research *etc.* The ICMR is consulted by these agencies for the approval of proposals dealing with the biomedical research for implementation. Information on specific procedures for international collaboration/assistance in biomedical research is available with the Indo-Foreign Programme Cell of the ICMR.

REGULATION OF CHORIONIC GONADOTROPIN IN PRIMATE PLACENTA

Chorionic gonadotropin (CG) is a glycoprotein hormone consisting of non-identical alpha and beta subunits held together by non-covalent interaction, produced by syncytiotrophoblasts of the placenta during pregnancy in primates. Although its presence has been shown in the sera of several non-human primates, it has been well characterised only in the case of humans. Available evidence indicates that the main function of CG is to stimulate the steroidogenic function of the corpus luteum of fertile cycle, until this function is taken over completely by the placenta. Human chorionic gonadotropin shares structural and functional homology with pituitary luteinising hormone (LH) which is known to be positively modulated by hypothalamic gonadotropin releasing hormone (GnRH) and negatively by gonadal steroids. In view of the structural and functional homology, it is reasonable to assume that CG synthesis and secretion may also be subject to similar regulation in the placenta. Studies were therefore initiated using both *in vitro* and *in vivo* model systems to examine the possible factor(s) involved in regulation of synthesis and secretion of CG by primate placenta. As a first step, an *in vitro* first trimester human placental villi incubation system was standardised¹. Its viability and functionality was established by monitoring the ³H-thymidine incorporation into DNA and also demonstrating the synthesis of hCG using ³⁵S-methionine and immunoprecipitation of labelled hCG. These studies revealed that the villi could be maintained in a functional state for upto 6-8 h. In addition, a solid phase radioimmunoassay to estimate hCG was also standardized. In order to be able to examine the effect of

addition of GnRH on CG secretion, the pre-requisite is to examine whether placenta has specific receptors for GnRH, as the first step in the action of a hormone is its binding to the specific receptor and accordingly the studies for the presence of GnRH receptors in placental membrane revealed presence of specific binding sites for GnRH though they were of low affinity compared to the pituitary². Using the *in vitro* placental mince system, it was found that addition of GnRH and its analogues to placental villi, incubated at 37°C resulted in a significant increase in the immunoreactive CG in the medium¹ and this could be inhibited by addition of high doses of GnRH or GnRH antagonist. Studies using ³⁵S-methionine to monitor the synthesis of CG revealed that GnRH stimulated synthesis of CG in addition to its secretion. As it is possible that the (observed stimulatory) effects could be due to GnRH of hypothalamic origin acting on the placenta, it was felt essential to examine whether GnRH is present in placenta itself. Accordingly studies were initiated to examine for the presence of GnRH in placenta and in order to monitor the purification of GnRH from placenta, a sensitive radioimmunoassay (RIA) was developed³. Using this RIA, GnRH like material was isolated and characterised as well as its biosynthesis was demonstrated⁴. In view of the fact that the receptors for GnRH in placenta were found to be of low affinity and relatively high concentration of GnRH had to be used to elicit a stimulatory effect on CG secretion, it was felt essential to provide as much evidence as possible to support the conclusion that GnRH has a role in the regulation of CG. In view of this, attempts were made to examine the involvement of calcium in mediating the

action of GnRH in placenta as calcium is known to be a second messenger in GnRH stimulated pituitary LH release. Studies on the role of calcium in GnRH stimulated CG release revealed that in the absence of calcium no stimulatory action could be observed⁵. The requirement for calcium in CG secretion was also established using a variety of calcium mobilisers and blockers⁵. In addition, it was found that following GnRH addition there was a time and dose-dependent ⁴⁵Ca²⁺ uptake as well as mobilization of calcium (Sharma, S.C. and Jagannadha Rao, A; unpublished observation). However, studies to evaluate the involvement of protein kinase C in GnRH action revealed that while basal secretion of CG involved protein kinase C, GnRH action was independent of protein kinase C⁶. In contrast, the use of calmodulin inhibitors revealed that both basal secretion of CG as well as GnRH mediated action involved calmodulin.

Attempts were also made to examine whether the synthesis and secretion of CG is subject to modulation by placental steroids. It is well known that the secretion of pituitary LH is negatively modulated by gonadal steroids. This conclusion has been arrived at by evaluating the effect of gonadectomy or administration of gonadal steroids on the levels of plasma or pituitary LH levels. However, such an approach is not possible in placenta as both CG and steroids are produced by the same cell namely syncytiotrophoblast. Thus it is difficult to study the effect of added steroids in the absence of endogenous steroids which are present in high concentrations. In order to overcome this problem, a novel strategy was used to minimize the influence of endogenous steroids. This was accomplished by use of 1, 4, 6 androstatriene 3-17-dione to block the activity of the aromatase, a key enzyme involved in the biosynthesis of estradiol or tamoxifen to block the action of estradiol or RU486, to block the action of progesterone⁷. Also before the studies on the role of estrogen was undertaken, the presence of specific receptors for estradiol-17 β was also demonstrated⁸. The effect of addition of these compounds on synthesis and secretion of CG was evaluated using three approaches firstly by using specific cDNA probes for alpha and beta CG subunits to monitor the levels of specific mRNA by dot blot hybridization and Northern blot, secondly by isolating total RNA from placental minces incubated in the presence or absence or together with the steroid or antagonist and *in vitro* translation or RNA and immunoprecipitation of the products followed by SDS-

PAGE and autofluorography. Finally, the levels of immunoreactive CG in the medium and tissue were monitored by solid phase RIA after incubating the tissue with steroids or its antagonists. These studies revealed that following decrease in the levels of estradiol or progesterone, there was a significant increase in the levels of alpha and beta CG mRNA, as judged by dot blot hybridization, Northern blot and translation of RNA as well as immunoreactive CG levels. These results suggest that during early pregnancy CG is subject to negative modulation by the placental steroids namely estrogen and progesterone (Sharma, S.C., Prakash, P. and Jagannadha Rao, A; unpublished observation).

In vivo Studies

In order to support the conclusion drawn regarding the positive modulation of CG by GnRH in placenta, *in vivo* studies were carried out using pregnant monkey as a model. As a first step towards this, a sensitive RIA for quantitation of monkey CG and detecting pregnancy was developed¹⁰. This was subsequently modified to a solid phase assay¹¹ and finally into a sensitive and quick micro ELISA^{12,13}. Using these assays the CG levels during early pregnancy in the bonnet monkey were determined. In view of the reports that bonnet monkey is not responsive to GnRH administration, it was essential to verify this as well as to choose the most potent analogue of GnRH for use in pregnant monkeys as studies with pregnant monkeys are time consuming and expensive. In order to choose the right analogue of GnRH to be tested in the monkey during pregnancy, a male monkey model was developed for determining the potency of the GnRH agonists and antagonists¹⁴⁻¹⁶. The method consisted of injection of GnRH or its analogues by intravenous route to adult male monkeys and determining the serum testosterone levels in blood samples collected 2 h after injection. This method is simple, quick, requires only determination of serum testosterone and the monkeys could be reused after a few days of rest. Using this model it was found that of the variety of analogues tested, Buserelin was the most potent one in the male monkey. Administration of Buserelin to pregnant monkeys resulted in a significant increase in serum CG levels and chronic administration resulted in maintenance of elevated levels of CG upto 48 h following chronic infusion, indicating that CG is regulated by GnRH^{17,18}. Also administration of GnRH antiserum resulted in a decrease in serum CG levels. These results obtained using *in vitro* and *in vivo* models

together permit to conclude that the synthesis and secretion of CG is subject to positive modulation by GnRH and negative modulation by placental steroids.

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This write up is based on the Smt. Swaran Kanta Dingley Award (1990) Oration (of ICMR) delivered by Dr. A. Jagannadha Rao on December 31, 1991 at the ICMR, New Delhi, as part of the 80th Anniversary celebrations of the Council.

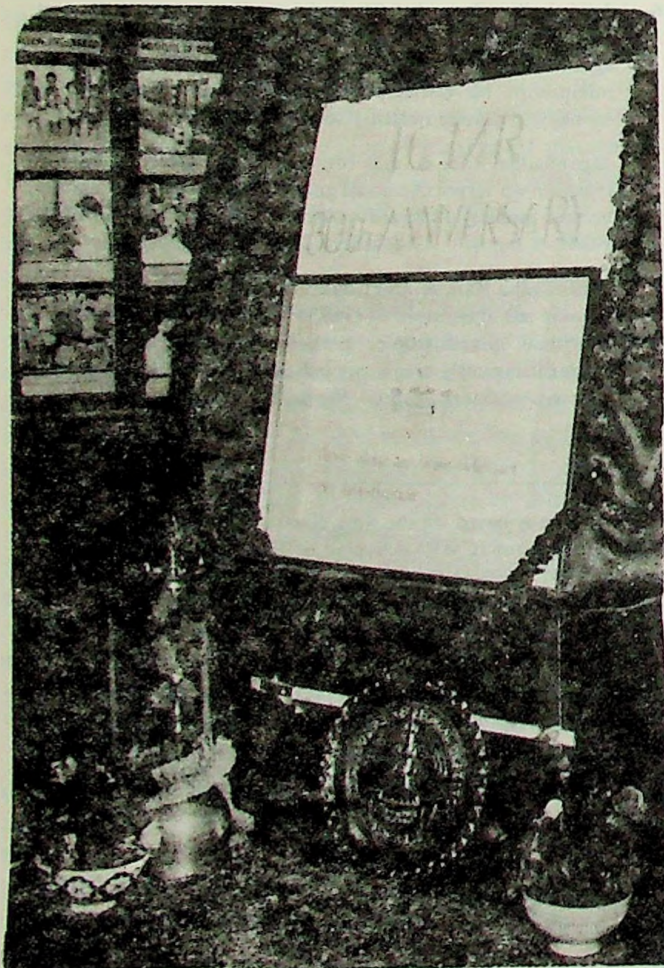
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80TH ANNIVERSARY CELEBRATIONS OF ICMR

The Indian Council of Medical Research completed 80 years of its existence in November 1991. To mark the occasion, the Council and its permanent Institutes/Centres located in different parts of India have planned various scientific programmes spread over a year (*ie* till November 1992) with the aim of disseminating to scientists and the common men, the various contributions of ICMR. The inaugural event of the celebrations was held at the ICMR Headquarters on November 15, 1991. A special issue of the ICMR Bulletin was also brought out by the ICMR Headquarters listing important milestones in the history of ICMR. In addition, several ICMR Institutes/Centres located in different states organized events like exhibitions, open days, seminars, symposia, public lectures *etc.* on this occasion. Other events proposed by the ICMR Headquarters and various Institutes/Centres during the year include the following:

- Organization of symposia, seminars, exhibitions on the contributions of ICMR.
- Publication of pamphlets/booklets highlighting the major contributions of various Institutes/Centres for wide distribution to the media, public and others.
- Organization of open houses for the public as well as the media.
- Screening of audio-visual programmes (films, slide tapes *etc.*) and display of posters, panels.
- Display, distribution and sale of ICMR publications from the ICMR Headquarters as well as Institutes/Centres at discount rates throughout the year.

The various events held by ICMR Headquarters and some of its Institutes/Centres are highlighted here:-



Inauguration of ICMR's 80th Anniversary celebrations by the Director-General.

In the inaugural event of the year-long celebrations held at the ICMR Headquarters, New Delhi on November 15, 1991 lecture and panel discussion were organized on AIDS. Dr. S.P. Tripathy, Director-General, ICMR, inaugurated the celebrations and also presided over the function. Professor A.N. Malaviya, Head, Department of Medicine, All India Institute of Medical Sciences, New Delhi, gave the inaugural lecture in which he highlighted the activities undertaken in India and the role of ICMR in AIDS surveillance and control activities at a time when not a single person from India had been found infected (though AIDS had been recognised as a major health hazard in many parts of the world)

The inaugural lecture was followed by a panel discussion on the same topic in which many eminent scientists took part. The panel discussion was moderated by Prof. V.I. Mathan, Christian Medical College (CMC), Vellore. The topics presented were diverse, ranging from entry of AIDS in India to its clinical management. Dr. Shiv Lal of the Directorate-General of Health Services gave a detailed account of the National AIDS Control Programme of the Government of India, while Dr. T. Jacob John, CMC, Vellore, outlined the problem of AIDS in Tamil Nadu and Dr. Gita Bhawe, Seth G.S. Medical College, Bombay, gave a comprehensive picture of the problem in Maharashtra. Prof. V.I. Mathan, CMC, Vellore discussed the hospital policies in the management of AIDS and Dr. P. Ramachandran, Dy. Director-General, ICMR focussed on AIDS in women and children. In the concluding presentation, Prof. A.N. Malaviya outlined the trends in the clinical management of AIDS. There was lively discussion after each presentation which made the panel discussion informative, educative and thought-provoking.

Other Events held at the ICMR Headquarters

Dr. A. Jagannadha Rao, Professor, Department of Biochemistry, Indian Institute of Science, Bangalore, delivered the Smt. Swaran Kanta Dingley Oration (1990) of ICMR on "Regulation of Chorionic Gonadotropin in Human Placenta" on December 31, 1991.

Ms K. Jayant, Scientific Officer, 'SF', Cancer Research Institute, Tata Memorial Centre, Bombay, delivered the Sandoz Oration (1990) of ICMR on "Epidemiological Studies with Implications for Cancer Control Programme", on January 13, 1992.

A panel discussion was also organized on "Cancer Research as Related to Cancer Control" on January 13, 1992. Dr. Usha K. Luthra, Addl. Director-General, ICMR, chaired this session and also gave an overview of the topic. Broadly, the topics covered under the panel discussion included Cancer registration in India; Basic research as related to cancer control, Control of oral cancer, Tobacco economics, Control of cervical cancer, Management of cancer (surgery, radiotherapy, chemotherapy, pain relief), Implementation of research results in cancer control, and Role of non-governmental organizations in research for cancer control.

The National Institute of Nutrition (NIN), Hyderabad organized an 'open day' on November 15, 1991. Peoples from all walks of life including housewives, retired persons, students, journalists and others visited the Institute on the occasion. A novel approach to nutrition education in the form of a street play (*Veedhinatakam*) was organized on the picturesque lawns of the Institute which drew spontaneous applause from the large gathering. The media (including the Press, All India Radio and Doordarshan) covered the event. In addition, a series of video films on various nutritional subjects were screened for the visitors. Scientists of the Institute also delivered popular scientific lectures which elicited very good response from the audience in the form of queries



Street play (*Veedhinatakam*) for nutrition education organized at NIN, Hyderabad.

The Tuberculosis Research Centre (TRC), Madras, organized various events including an exhibition on tuberculosis on November 15-16, 1991. The exhibition was inaugurated by Commissioner and Secretary for Health, Government of Tamil Nadu. The exhibits included multicoloured posters, charts, photopanel, apart from x-ray photographs on tuberculosis, fixed specimens of organs affected with the disease etc. A free health check-up camp was also arranged for the visitors. A puppet show on tuberculosis organized by the Centre on November 15th attracted considerable attention. Both the exhibition and the puppet show were attended by a very large number of visitors who represented diverse groups of community like students from various Colleges, Institutes and University, laymen as also active and retired research scientists from various Institutes. Both these events were recorded by Madras

Doordarshan and subsequently telecast on November 16, 1991. Prior to the organization of the celebration, a press conference was also convened by the Director, TRC, Madras, on November 13, 1991, to highlight the research activities of the Centre over the last 35 years which received a very wide coverage in local as well as national dailies



Puppet show for health education organized at TRC, Madras.

The Vector Control Research Centre (VCRC), Pondicherry, organized a "people's forum" on November 15, 1991 which was inaugurated by Shri P. Ananda Bhaskaran, Hon'ble Minister of Health & Family Welfare, Government of Pondicherry. The forum was attended by a large number of visitors who actively participated in the discussion. The role of the community in reducing mosquitogenic conditions was highlighted. The entire function was covered by the local



People's forum organized by VCRC, Pondicherry.

press media and the Pondicherry station of the All India Radio broadcast a 15 minute coverage of the function on November 17, 1991.

The Institute for Research in Reproduction (IRR), Bombay, organized a workshop on "Techniques in Cell Biology" between November 11-29, 1991, to mark the 80th Anniversary celebration of the Council. Dr. S.K. Mahajan, Head, Molecular Biology and Agriculture Division, Bhabha Atomic Research Centre, Bombay, inaugurated the workshop. Some of the topics covered in the workshop included ELISA for fixed cells, cell separation by Percoll density gradient, *in vitro* fertilization, immuno-fluorescent studies with spermatozoa, hybridoma, flow cytometry, immunoblot, autoradiography for receptor localization, vaginal cytology, pap smear staining *etc.* Faculty members, in the workshop were drawn from IRR, Bombay and various other Institutions including Bhabha Atomic Research Centre, Indian Institute of Technology, Jaslok Hospital, Sofia College of Bombay as well as Poona University, Pune.



Demonstration of laboratory techniques at the workshop on Techniques in cell biology organized by IRR, Bombay.

The Central Jalma Institute for Leprosy, Agra, organized a two day workshop for officers of Leprosy Training Centres in India, in collaboration with the Directorate-General of Health Services, between November 15-16, 1991 to mark the 80th Anniversary celebration of the Council. The deliberations of the workshop were conducted in three groups relating to three different issues *viz.* training of medical officers in relevance to National Leprosy Eradication Programme; training of paramedical workers and non-medical supervisors, and issues related to training of other categories of personnel engaged in the Programme.

The Institute of Pathology, New Delhi, organized an exhibition featuring display of charts, posters, photographs *etc.* on various diseases such as leprosy, vitiligo, AIDS *etc.* Posters, charts depicting various

activities/programmes of the Institute were also displayed. The exhibits evoked good response from the visitors. Apart from this, display and sale of ICMR publications was also arranged.

The Regional Medical Research Centre for Tribal Health, Jabalpur, organized an exhibition featuring display/demonstration of posters, charts, photographs *etc* highlighting the Centres research activities and also for health education of the general public regarding various health problems prevalent in the region. The exhibition was inaugurated by Shri Shravan Patel, Hon'ble Member of Parliament. The local media organised a wide and sustained publicity campaign for the exhibition, and approximately 3000 persons from all over the city visited the exhibition. A free health check-up camp was also arranged for the benefit of the general public, in the form of general medical examination as also blood test and ECG examination. The event received highly encouraging feedback and there were requests from eminent personalities to organize similar events in other cities and even in villages of the State.



View of exhibitions organized at RMRC, Jabalpur and GRC, Bombay.

The Regional Medical Research Centre (RMRC), Bhubaneswar, celebrated the 80th Anniversary of ICMR on November 15-16, 1991 which was inaugurated by Dr. Prasanna Patsani, Hon'ble Minister for Public Grievance, Pension and Administration, Orissa Government. The inaugural ceremony was followed by a scientific symposium on "An intersectorial approach to health care delivery in Orissa—Integrated approach concepts. Participants of the workshop included representatives/scientists from the RMRC Bhubaneswar, local Medical College, UNICEF, British Council, State department of Health & Family Welfare *etc*.

Scientific programmes/activities of the Centre were outlined on November 16, 1991 in another seminar and open house organized by the scientists of the Centre.

The ICMR Genetic Research Centre, (GRC) Bombay, organized an 'open house' on November 15, 1991 to make the public aware of the various genetic disorders prevalent in India, their prevention as well as treatment. Posters and charts on various genetic disorders were displayed and demonstration of various laboratory techniques was done on this occasion. The function was well attended by doctors, scientists, social workers, psychologists and general public.

The National Institute of Virology (NIV), Pune, arranged 3 scientific lectures for the staff of NIV and visitors on November 15, 1991 on (i) KFD: an ecological imperative; (ii) The problem of prostitution in Pune; and (iii) counselling of HIV seropositive persons.

The Institute of Immunohaematology, Bombay, organized 'open houses' for the public on November 14 and 19, 1991 during which visitors were taken around



different departments and informed regarding various activities of the Institute by the scientists. The visitors could get first hand knowledge regarding various research activities and diseases with particular reference to gene rearrangements in diseases, AIDS, red cell serology, autoimmune disorders, complement, population genetics *etc*.

The Institute for Research in Medical Statistics, Madras, is organizing a series of lectures to illustrate the role of statistical methods in medicine and public health. The first lecture of the series was held on November 15, 1991 for students from various local educational institutions.

ABSTRACTS

Some Research Projects Completed Recently

Glucocorticoid receptors in bronchoalveolar cells in sarcoidosis and idiopathic pulmonary fibrosis and their relevance to steroid therapy

Analysis of bronchoalveolar lavage fluid (BALF) was done in 25 patients with sarcoidosis and 12 patients with idiopathic pulmonary fibrosis (before and after therapy with prednisolone) and 20 normal healthy subjects (control) to study the glucocorticoid receptor (GR) content in bronchoalveolar lavage cells and the relation (if any) between the receptor content and clinical efficacy of glucocorticoid therapy. Patients on corticosteroids prior to the study were excluded. The parameters studied in BALF included per cent fluid recovered, total and differential cell counts and GR estimation using ^3H triamcinolone acetonide.

Patients with idiopathic pulmonary fibrosis (IPF) as well as sarcoidosis had significantly higher pretreatment total cell count in BALF as compared to normal healthy volunteers, but the fluid recovery was significantly higher in sarcoidosis patients only. Though patients with IPF had significantly higher lymphocytes (%) as compared to healthy volunteers, the levels were significantly lower than those in sarcoidosis patients. Polymorphs and eosinophils in patients with IPF were significantly higher as compared to sarcoidosis patients and controls. GR contents in BAL cells were significantly higher in patients with sarcoidosis as compared to patients with IPF and control subjects. A significantly negative correlation was found between lymphocytes and alveolar macrophages in sarcoidosis patients. Both sarcoidosis and IPF patients showed a significantly positive correlation between carbon monoxide diffusing capacity (DLCO) and forced vital capacity (FVC).

Seven patients with sarcoidosis had frequent relapses and the pretreatment lymphocytes, GR contents and FVC of these patients were significantly lower as compared to the patients who did not have frequent relapses.

Prednisolone treatment of sarcoidosis patients resulted in a significant fall in total cell count, lymphocytes (%), neutrophils (%), and GR content of BAL cells and in a significant increase in FVC and DLCO. Eight of 12 patients with IPF deteriorated despite treatment with prednisolone. Pretreatment

lymphocytes (%) and GR content of these patients were lower, but the polymorphs and eosinophils were higher as compared to responders. Prednisolone treatment resulted in a significant fall in the BALF total cell count, and GR content in IPF patients.

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Publications:

1. Sharma, S.K., Verma, U., Pande, J.N., Murugesan, K., Verma, K. and Guleria, J.S. Glucocorticoid receptors in bronchoalveolar cells in sarcoidosis. A preliminary report. *Chest* 93: 577, 1988.
2. Sharma, S.K., Rao, D.N., Pande, J.N. and Guleria, J.S. Serum angiotensin-converting enzyme activity in sarcoidosis. *Indian J Med Res* 85: 638, 1987.
3. Sharma, S.K., Pande, J.N. and Verma, K. Bronchoalveolar lavage (BAL) in miliary tuberculosis. *Tubercle* 69: 175, 1988.
4. Sharma, S.K., Pande, J.N. and Verma, K. Bronchoalveolar lavage (BAL) in miliary tuberculosis. *Respir Digest* 4: 3, 1989.
5. Sharma, S.K., Pande, J.N., Verma, K. and Guleria, J.S. Interrelationship between bronchoalveolar lavage cellular constituents and pulmonary functions in sarcoidosis. *Indian J Chest Dis All Sci* 31: 77, 1989.
6. Sharma, S.K. Glucocorticoid receptors in bronchoalveolar cells from patients with idiopathic pulmonary fibrosis (Abstract). *Am Rev Respir Dis* 135: A307, 1987.
7. Sharma, S.K., Verma, K. and Pande, J.N. Interrelationship between bronchoalveolar lavage fluid cellular constituents and pulmonary function tests in patients with silicosis (Abstract). *Am Rev Respir Dis* 139: A549, 1989.
8. Sharma, S.K., Pande, J.N., Verma, K. and Guleria, J.S. Bronchoalveolar lavage fluid (BALF) analysis in interstitial lung disease: A 7-year experience. *Indian J Chest Dis All Sci* 31: 187, 1989.

Identification and purification of antigens of diagnostic and protective potentials from leishmania parasite

The study was carried out for development of specific immunodiagnostic test for leishmaniasis and identification of antigens involved in immunoprotection in experimental leishmaniasis.

Leishmania donovani promastigotes maintained in NNN medium were cultivated on a large scale at 26°C in

Leibovitz L-15 medium supplemented with 10 per cent tryptose phosphate broth, 0.1 per cent gentamycin and 10 per cent foetal calf serum. Amastigotes were isolated from heavily infected spleen of male golden hamster with more than two months infection and a count of more than 100 amastigotes per 100 spleen cell nuclei.

Enzyme linked immunosorbent assay (ELISA) and immunofluorescent antibody (IFA) test were employed using antigens from *L. donovani* promastigotes and amastigotes. ELISA carried out with the promastigote soluble antigens revealed elevated values in leishmaniasis patients (confirmed by bone marrow biopsy or on the basis of clinical findings) as compared to contacts of patients of endemic areas and non-endemic healthy controls. However, the contacts showed slightly higher ELISA values as compared to non-endemic controls but values remained within the normal range.

Though the ELISA values of sera from patients of malaria, filariasis, tuberculosis, amoebiasis and leprosy were slightly higher than those for sera from non-endemic controls, they were lower than the values for endemic controls and far lower than the lowest level among kala-azar patients. This confirmed that there was no cross reactivity with amoebiasis, malaria, filariasis, tuberculosis or leprosy.

IFA test was positive in all clinically and parasitologically diagnosed patients of kala-azar. Amastigote antigen proved to be better than promastigote antigen and was able to differentiate between endemic and non-endemic controls. None of the sera from non-endemic controls and from cases of malaria, filariasis, amoebiasis or tuberculosis showed a detectable titre.

A study on immune status was conducted in hamsters to identify the antigens of *L. donovani* having protective potentials, during the course of infection using macrophage migration area (MMA) and delayed hypersensitivity response to sheep red blood cells as parameters for cell mediated immune response and plaque forming cell count and haemagglutinating antibody titre as parameter for hormonal response. A progressive suppression in all the parameters was observed when monitored from day 7 onwards to day

45. MMA appeared to be the most sensitive as it was affected as early as 7 days post-infection.

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Publication:

Chaudhry, A., Guru, P.Y., Saxena, R.P., Tandon, A. and Saxena, K.C. Enzyme-linked immunosorbent assay in the diagnosis of kala-azar in Bhadohi (Varanasi), India. *Trans R Soc Trop Med Hyg* 84 363, 1990.

Effect of antibodies to glycolipids on the morphology and physiology of *Mycobacterium tuberculosis*

The study was carried out to examine the mechanism of inhibitory action of antibodies to glycolipids on *Mycobacterium tuberculosis* H₃₇Rv. *M. tuberculosis* H₃₇Rv were grown on modified Youman's medium, cells were harvested in their lag phase, glycolipid antigens isolated and rabbits were injected weekly with mannoside-MBSA complexes for 3 weeks.

Immunisation of rabbits with mannoside-MBSA complexes resulted in production of specific antibodies as checked by gel diffusion, counter current immunoelectrophoresis and kaolin agglutination tests. Antibodies to mannosides of mycobacteria when supplemented into growth medium, inhibited the growth of *M. tuberculosis* H₃₇Rv as indicated by the prolonged lag phase of tubercle bacilli. There was a decreased biosynthesis of different macromolecules viz. DNA, RNA, proteins and phospholipids (maximum inhibition being in DNA biosynthesis) of *M. tuberculosis* H₃₇Rv in the presence of decomplexed (by heating at 46°C for 30 minutes) and decomplexed lysozyme free (by absorption with bentonite particles) antisera to mannosides, as studied by incorporation of radioactive precursors into their respective macromolecules. Among individual phospholipids, the maximum inhibition of cardiolipin biosynthesis was observed with decomplexed antiserum, while decomplexed lysozyme free antiserum inhibited mannoside biosynthesis. Antiserum to sulpholipids and cord factors also inhibited the macromolecules biosynthesis as evidenced by decreased

incorporation of labelled precursors in the presence of antibodies.

Pre-incubation of tubercle bacilli with mannosides antibodies for 90 minutes did not alter the virulence of *M. Tuberculosis* H₃₇Rv when tested in mice and examined by using various parameters to monitor the extent of infection. This bacteriostatic action of mannoside antibodies seems to be through their direct interaction with cell surface receptors which was documented by the specific binding of affinity purified

antibodies to mannosides with the cell surface receptors of *M. tuberculosis* H₃₇Rv.

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Postgraduate Institute of
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Publications

Mehta, P.K. and Khuller, G.K. Suppression of macromolecular biosynthesis in *M. Tuberculosis* H₃₇Rv by antimannophosphoinositides. *FEMS Microbiol Lett* 51: 61, 1988.

COUNCIL'S TRAINING PROGRAMMES FOR 1992-93

Leprosy

At the Central Jalma Institute for Leprosy, Agra:

- ... Multidrug Therapy for Leprosy: Orientation Courses for Medical Officers (January 27 to February 7; March 9 to 20; August 17 to 28; and September 14 to 25, 1992).

Virology

At the National Institute of Virology, Pune:

- ... Workshop on Counselling for HIV (February 10 to 12, 1992).
- ... Diploma in Medical Virology (June 1992 to May 1993).

Reproductive Biology

At the Institute for Research in Reproduction, Bombay:

- ... Training Course in Techniques for Isolation, Detection and Analysis of Proteins (October 1992).
- ... Training Course in Immunological Techniques with special reference to Hybridoma (December 1992)
- ... Training Course in Development of Non-isotopic Immunoassays (January 1993).

Endocrinology

At the National Institute of Nutrition, Hyderabad:

- ... Annual Training Course on Endocrinological Techniques and their Application (August/September, 1992).

Nutrition

At the National Institute of Nutrition, Hyderabad:

- ... M.Sc. in Applied Nutrition (June 1, 1992 to February 28, 1993).
- ... Annual Certificate Course in Nutrition (December 1, 1992 to February 28, 1993).

Occupational Health

At the National Institute of Occupational Health, Ahmedabad:

- ... Training Course on Environmental and Industrial Hygiene Practice (December 3 to 9, 1992).
- ... Orientation Course on Occupational Health for Industrial Medical Officers (December 14 to 19, 1992).

Haematology

At the Institute of Immunohaematology, Bombay:

- ... Training Course in Blood Group Serology and Blood Bank Methodology for Medical Officers (August 11 to October 10, 1992).
- ... Training Course in Blood Group Serology and Blood Bank Methodology for Technicians (August 11 to September 10, 1992).
- ... Training Course in Advanced Immunohaematology (September 21 to October 10, 1992).

Cytology

At the Institute of Cytology and Preventive Oncology, New Delhi:

- ... Workshop on Oligo DNA Synthesis and Polymerase Chain Reaction (January/February, 1992).

Medical Entomology

At the Vector Control Research Centre, Pondicherry:

... M.Sc. in Medical Entomology (From July, 1992 for two years).

Clinical Pharmacology

At the Seth G.S. Medical College, Bombay:

... Training Course in Clinical Pharmacology (March/April, 1991).

Laboratory Animal Technology

At the Laboratory Animal Information Service Centre, National Institute of Nutrition, Hyderabad:

... Training Course for Laboratory Animal Technicians (June 1 to July 15, 1992).

... Training Course for Laboratory Animal Supervisors (September 1 to November 30, 1992).

ICMR NEWS

The 50th meeting of the Scientific Advisory Board of the ICMR was held on January 7-8, 1992, at the ICMR Headquarters, New Delhi.

A meeting of the Directors of Permanent Institutes/Centres of the ICMR was held on January 9, 1992, at the ICMR Headquarters, New Delhi.

Other Meetings of the Council, held during the Month:

Meeting of the second Review Committee on studies related to the Bhopal Gas Disaster. January 17, 1992 (at New Delhi)

Meeting on Schedule of Formulation and Manufacturing of Traditional Remedies for Clinical Trials. January 27, 1992 (at New Delhi)

Participation of ICMR Scientists in Scientific Events:

Dr. G.V. Satyavati, Senior Dy. Director-General, ICMR, participated in the first Group Monitoring Workshop on Immunology and Medical Biology of the Department of Science & Technology (January 22-23, 1992), followed by meeting of the Project Advisory Committee on the same subject (January 24, 1992) held at the National Institute of Oceanography, Goa.

Dr. Usha K. Luthra, Addl. Director-General, ICMR, participated in the fifth National Cancer Congress and delivered a talk on "Cancer Control" at Madras (January 22-25, 1992).

Appointment of Directors of ICMR Institutes/Centres:

The following scientists of ICMR have taken over as Directors of the respective Institutes/Centres of the Council, as indicated below:-

Dr. K.A.V.R. Krishnamachari, Regional Medical Research Centre, Bhubaneswar.

Dr. R. Reuben, Centre for Research in Medical Entomology, Madurai.

Dr. V. Dhanda, Vector Control Research Centre, Pondicherry.

Dr. Bhanu Iyengar, Institute of Pathology, New Delhi.

Dr. K. Satyanarayana, Regional Medical Research Centre, Dibrugarh.

Honours/Awards

Dr. Usha K. Luthra, Addl. Director-General, ICMR and Dr. V.P. Sharma, Director, Malaria Research Centre, Delhi, have been awarded "Padma Shree" by the Government of India for 1992.

Dr. V.P. Bharadwaj, Deputy Director and Officer-in-charge, Central Jalma Institute for Leprosy, Agra, has been elected First Vice-President of the Indian Association of Leprologist for a period of two years (1992-1993).

SOME AVAILABLE ICMR PUBLICATIONS

Nutritive Value of Indian Foods (1971), Reprinted 1985, by C. Gopalan, B.V. Ramasastri and S.C. Balasubramaniam, Revised and Updated (1989), by B.S. Narasinga Rao, K.C. Pant and Y.G. Deosthale

Price
Rs.

18.00

Growth & Physical Development of Indian Infants and Children (1972), Reprinted 1989	10.00
Studies on Weaning & Supplementary Foods (1974), Reprinted 1984	6.00
Studies on Pre-School Children (1974), Reprinted 1984	6.00
A Manual of Nutrition (1973), Second Edition 1974, Reprinted 1990	4.50
Low Cost Nutritious Supplements (1972), Second Edition 1975, Reprinted 1990	3.00
Menus for Low Cost Balanced Diets and School Lunch Programmes Suitable for North India (1959), Third Edition 1977, Reprinted 1984	2.00
Some Common Indian Recipes and their Nutritive Value (1964), Fourth Edition 1977, Reprinted 1991, by Swaran Pasricha and L.M. Rebello	10.00
Japanese Encephalitis in India (Revised Edition) 1980	5.00
Some Therapeutic Diets (1969), Fourth Edition 1981, Reprinted 1983, Revised 1988, by Swaran Pasricha	4.00
Nutrient Requirements and Recommended Dietary Allowances for Indians (1990)	11.50
Lathyrism: A Preventable Paralysis (Revised Edition) 1983	1.50
A Manual of Laboratory Techniques (1983), Edited by N. Raghuramulu, K. Madhavan Nair and S. Kalyanasundaram	30.00
Fruits (1983), by Indira Gopalan and M. Mohan Ram	6.00
Count What You Eat (1989), by Swaran Pasricha	5.50
Diet and Diabetes (1991), by T.C. Raghuram, Swaran Pasricha and R.D. Sharma	15.00
*Depressive Disease (1986), by A. Venkoba Rao	58.00
**The Anophelines of India (Revised Edition) 1984, by T. Ramachandra Rao	150.00
**Medicinal Plants of India, Vol.2 (1987)	136.00

* 10 per cent discount allowed to individuals.

** 25 per cent discount allowed to individuals.

These publications are available on prepayment of cost by cheque or postal order (bank and postal charges will be extra) drawn in favour of the Director-General, Indian Council of Medical Research, New Delhi. Money orders are not acceptable. All correspondence in this regard should be addressed to the Chief, Division of Publication and Information, Indian Council of Medical Research, Post Box No.4508, Ansari Nagar, New Delhi-110029.

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