ANNUAL REPORT
2004-05

Vallabhbhai Patel Chest Institute
University of Delhi, Delhi

CREDIT LINE

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ANNUAL REPORT (2004-05)

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From the Director's Desk

I feel privileged to bring out the Annual Report of the V.P. Chest Institute (VPCI) for the year 2004-05. The Institute continued to play its major role in the spheres of 'education', 'research' and 'patient-care' activities.

The Institute carries out research in various areas of chest diseases and allied fields. These major research studies include; Discovery of new enzyme acetoxy drug, Cytokines - its relation with asthma, Allergic asthma by air pollution, Molecular characterization of clinical isolates of *C. diptheriae* and *M. catarrhalis*, Analysis of isoniazid and rifampicin resistance mutations in the clinical isolates of *M. tuberculosis*, Role of nitric oxide in the regulation of neuro-behavioural and immunological responses during stress, Polyherbal medicines and pulmonary tuberculosis, Effect of severe cold and hypoxia on cardiovascular responses in rats, Vasoactive responses in animal models of non-cirrhotic portal hypertension, Pulmonary vagal sensory receptors during high altitude response, Prevalence of sleep related breathing disorders in Indian adults, Tobacco cessation, Food allergy, Genetic analysis of Influenza virus, Fungal diseases, etc. The vibrancy of these research projects / activities can be well judged from the List of Publications, Guest Lectures delivered, Papers presented in the Conferences by the faculty members of the Institute.

A symposium on "National Update on Smoking Cessation" was organised on 5th April 2004 and the 6th VPCI Oration was delivered by Prof. H.S. Randhawa, Former Director of our Institute on 6th April 2004 as part of the 55th Foundation Day celebrations. The fourth CME: National Update on Bronchial Asthma held on 25th April 2004 was a great success. The Annual Workshop on Respiratory Allergy: Diagnosis and Management was organised from 30th April – 7th May 2004 in which many physicians from all parts of the country participated.

During this year the Institute purchased the digital radiograph and introduced the picture archiving and communication systems (PACS). The Institute has gone online and it can be accessed / available from: <http://www.vpci.org.in>. The Animal House renovation work had completed with a new state-of-the-art facility and it was inaugurated by Prof. P.N. Srivastava, Chairman, Governing Body (VPCI), on 6th April 2004. The construction of the Auditorium-cum-Convention Center is in full swing. The renovation of the Institute buildings and addition of equipments for research / patient care were also done during this period.

The development of Library continued and a web access <http://10.8.2.21> to its catalogue has been uploaded on the Delhi University Campus Wide Network successfully, with a new look and additional features like; most used books, suggestion, member directory, library holdings, etc., since February 2005. The Institute has the privilege of being the first of its kind in the Delhi University network system to make the holdings of Library online.

Towards the end of the year 2004, the Institute had received a great shock, Prof. A.S. Paintal (Padma Vibhushan recipient), former Director of our Institute, passed away on December 21, 2004. Prof. Paintal, who discovered the 'J receptor' from this Institute, was a global figure in the field of Cardio-respiratory Sensory Physiology. He was a man of action with strong sense of devotion and commitment. His absence will be deeply felt. "May his soul rest in peace".

Dr V.K. VIJAYAN
Director

MILESTONES OF VPCI

April 6,	1949	Foundation stone of the Institute was laid down by Sardar Vallabhbhai Patel.
November	1951	Ad-hoc Governing Body was appointed by the Executive Council of University of Delhi for administrative affairs of the Institute.
December	1951	Main building of the Institute was completed.
January 12,	1953	The Institute was formally opened by Rajkumari Amrit Kaur, the Union Minister of Health, Government of India.
		Prof. R. Viswanathan was appointed as the first Director. The grant for 1953-54 was Rs. 2 lakh.
January 21,	1955	A regular Governing Body was constituted by the Executive Council of the University of Delhi for the management and administration of the Institute.
April 4,	1955	The first meeting of the regular Governing Body was held.
	1955	Prof. A.S. Paintal reported the discovery of lung deflation receptors, a historical landmark in understanding the functioning of lung and its diseases.
July 1,	1957	Prof. R. Viswanathan took over as full-time Director of the Institute. Previously, he was the Deputy Director General of Health Services, Govt. of India and Honorary Director of the Institute.
September 24,	1957	Pt. Jawaharlal Nehru said in a message : "It was a brave act of the University of Delhi to start the V.P. Chest Institute".
October 24,	1957	Clinical Research Centre was inaugurated by Dr Rajendra Prasad, President of the Republic of India.
January 24,	1959	Indian Association for Chest Diseases was inaugurated by Sir A.L. Mudaliar. It was rechristened as National College of Chest Physicians (India) in January 1981.
July	1959	*The Indian Journal of Chest Diseases*, a Quarterly Journal, was started under the joint auspices of the V.P. Chest Institute and the Indian Association for Chest Diseases.
July	1959	A ward of 20 beds was opened to admit patients.
	1959	By a resolution of the Governing Body, V.P. Chest Institute was nominated as a "National Institute for Teaching and Research in Chest and Allied Diseases".
January	1960	A Diploma course in Tuberculosis Diseases, which was started in March 1947, was re-designated as "Diploma in Tuberculosis and Chest Diseases" (DTCD) from XIV Course. The XV DTCD Course started from July 1960.
April 6,	1961	Celebration of Foundation Day of the Institute was started.
April 7,	1962	Foundation stone of Patel Niwas, a Post Graduate Hostel, was laid down by Dr C.D. Deshmukh, Vice-Chancellor, University of Delhi.
January 26,	1963	A contingent of V.P. Chest Institute staff participated in the Republic Day parade.
February 20-24,	1963	VII International Congress on Diseases of the Chest was held at Vigyan Bhawan under the auspices of V.P. Chest Institute, Indian Association for Chest Diseases and the University of Delhi.
August 1,	1964	Prof. A.S. Paintal joined as the Director of the Institute after the retirement of Prof. R. Viswanathan.
April 6,	1965	Patel Niwas was inaugurated by Dr C.D. Deshmukh on the XVI Foundation Day of the Institute.

	1966	Prof. A.S. Paintal was elected Fellow of the Royal Society of Edinburgh.
	1969	Padma Shree was awarded to Prof. R. Viswanathan.
	1974	Padma Bhushan was awarded to Prof. R. Viswanathan.
	1981	Prof. A.S. Paintal was elected Fellow of the Royal Society of London.
	1984-85	Prof. A.S. Paintal was elected General President of the Indian Science Congress Association.
	1986	Prof. A.S. Paintal was appointed as Director-General of the Indian Council of Medical Research.
	1985-88	Prof. H.S. Randhawa was elected Vice-President of the International Society for Human & Animal Mycology.
	1986	Padma Vibhushan was awarded to Prof. A.S. Paintal.
	1986-88	Prof. A.S. Paintal was elected President of the Indian National Science Academy.
November 10,	1991	Prof. H.S. Randhawa joined as the Director of the Institute.
October 5,	1998	Dr V.K. Vijayan joined as the Director of the Institute.
April 6,	1999	Golden Jubilee Celebrations of the Foundation Day of the Institute.
		1st VPCI Oration by Prof. N.K. Ganguly, Director-General, Indian Council of Medical Research.
June 14,	1999	24-hour Respiratory Emergency Services started.
November 12,	1999	His Excellency, Shri K.R. Narayanan, President of India, received the copy of Compendium of Activities (VPCI) 1949-99.
April 6,	2000	2nd VPCI Oration by Prof. A.S. Paintal, Ex-Director-General, ICMR and Ex-Director, VPCI.
August 30,	2000	A New Ward (with an additional 40 beds) was inaugurated by Dr A.K. Walia, Honourable Minister for Health, Govt. of NCT of Delhi.
	2000-06	Dr V.K. Vijayan was elected International Regent, American College of Chest Physicians, U.S.A.
March	2001	A Respiratory Critical Care Unit was started.
March 15,	2001	CT Scan Centre was inaugurated by Honourable Padma Shree Dr C.P. Thakur, the Union Minister of Health & Family Welfare, Govt. of India.
April 6,	2001	3rd VPCI Oration by Dr S. Lakshminarayanan, University of Washington School of Medicine, Washington, Seattle, U.S.A.
April 21,	2001	1st Refresher (CME) Course in Respiratory Diseases started.
November 21,	2001	Inauguration of Tobacco Cessation Clinic.
April 6,	2002	4th VPCI Oration by Dr S. Padmavati, President, All India Heart Foundation and Director, National Heart Institute, New Delhi.
August 14,	2002	Inauguration of the State-of-the-art Oxygen Plant by Prof. P.N. Srivastava, Chairman, Governing Body, V.P. Chest Institute.
January 12-14,	2003	International Conference on Chest Diseases and Allied Sciences was held at India Habitat Centre, New Delhi, to commemorate the Golden Jubilee of the Inauguration of the Institute.
April 7,	2003	5th VPCI Oration by Prof. J.S. Bajaj, former Professor and Head, Department of Medicine, All India Institute of Medical Sciences, New Delhi & former Member, Planning Commission, Government of India.
May 28,	2003	"Bhoomi Pujan" to start the construction work of the Auditorium.
April 6,	2004	6th VPCI Oration by Prof. H.S. Randhawa, former Director, V.P. Chest Institute, University of Delhi, Delhi.

THE INSTITUTE

The Vallabhbhai Patel Chest Institute (VPCI) is a post-graduate medical Institution devoted to the study of chest diseases. It is ideally located in the Delhi University main campus providing the requisite academic environment in which wide range of scientific facilities are available in various departments along with an excellent Central Science Library.

Objectives

The main objectives of VPCI have been to conduct research on fundamental and clinical aspects of chest diseases, to develop new diagnostic technology and disseminate it to other institutes in the country and provide specialised clinical and laboratory services to patients. The training of post graduates in Pulmonary Medicine and allied subjects is another important objective of VPCI.

Administration

The VPCI is a maintained Institution of University of Delhi and is fully funded by the Grants-in-Aid received from the Ministry of Health and Family Welfare, Government of India. The Institute is governed and administered by its own Governing Body as Constituted under Ordinance XX (2) of the University of Delhi Act. The Director, who is appointed by the Executive Council of University of Delhi, is the Chief Executive of the Institute. The Director of the Institute also functions as Member-Secretary (Ex-Officio) to the Governing Body of the Institute. The composition of the Governing Body follows in the next page. The Institute also has a Standing Finance Committee constituted by the Governing Body to make recommendations about its budgetary requirements.

Organisation and Management

The organisation and management of the Institute is through Departmentation of activities based on various areas of specialisation and functions. The Academic, Scientific and Clinical services are organised under the Departments of Anaesthesiology, Cardiorespiratory Physiology, Respiratory Medicine, Thoracic Surgery, Clinical Research Centre housing Outdoor/Indoor patient care services, and Departments of Biochemistry, Clinical Biochemistry, Biostatistics, Medical Mycology, Microbiology, Pathology, Pharmacology, Physiology, Radiodiagnosis and Imaging, Respiratory Allergy and Applied Immunology and Respiratory Virology. These departments are headed by the Faculty Members in the concerned area. The General and Personnel Management including various maintenance activities required for the Institute are supported by administrative services of the Institute which are available through following three sections controlled by the Deputy Registrar who reports to the Director. These sections are: *1*. Administration–I, *2*. Administration–II, and *3*. Finance and Accounts. The administrative services and its sections are shown in the Administrative Structure chart on page no. 18.

GOVERNING BODY

CHAIRMAN	
The Vice-Chancellor, University of Delhi (Ex-Officio) or a person nominated by him	**Prof. P.N. Srivastava** Ex-Vice-Chancellor, J.N.U., New Delhi
MEMBERS	
Treasurer, University of Delhi (Ex-Officio)	**Mrs Janaki Kathpalia** *(15.01.2004 onwards)*
Two members of the Executive Council nominated by the Executive Council	**Prof. P.V. Indiresan** *(07.03.2003 onwards)* **Prof. S.P. Tiwari** *(till August 2004)*
Dean, Faculty of Medical Sciences, University of Delhi	**Prof. B.K. Jain** *(20.10.2001 to 21.05.2004)* **Prof. U.K. Srivastava** *(03.06.2004 to 19.10.2004)* **Prof. P. Kar** *(09.01.2005 onwards)*
Three members nominated by the Ministry of Health and Family Welfare, Government of India, New Delhi	**Mr Arun Sharma** Joint Secretary & Financial Advisor **Mr Sanjiv Misra** Additional Secretary & Financial Advisor
	Smt. Bhawani Thyagarajan Joint Secretary
	Dr S.P. Agarwal Director General of Health Services
One Member, not connected with the University, appointed by the Executive Council	**Prof. J.N. Pande** *(07.03.2003 onwards)* Former Head, Deptt. of Medicine, AIIMS, New Delhi
One Professor of the Institute by rotation according to seniority for a period of one year	**Prof. Ashok Shah** *(till 02.11.2004)* **Prof. M. Bose** *(03.11.2004 onwards)*
One Reader or Lecturer of the Institute by rotation according to seniority for a period of one year	**Dr Madhu Khanna** *(till 02.11.2004)* **Dr Vishwajeet Rohil** *(03.11.2004 onwards)*
MEMBER-SECRETARY	
Director, Vallabhbhai Patel Chest Institute University of Delhi, Delhi (Ex-Officio)	**Dr V.K. Vijayan**

Standing Finance Committee

Mr Sanjiv Misra — *Chairman*
Additional Secretary & Financial Advisor
Ministry of Health & Family Welfare
Government of India
Nirman Bhawan
New Delhi

Dr V.K. Vijayan — *Member-Secretary*
Director
V.P. Chest Institute
University of Delhi
Delhi

Prof. S.N. Gaur — *Member*
Department of Respiratory Medicine
V.P. Chest Institute
University of Delhi
Delhi

Dr Binod Kumar Singh — *Member*
Deputy Registrar
V.P. Chest Institute
University of Delhi
Delhi

Scientific Advisory Committee

Prof. S.K. Jindal Head, Department of Pulmonary Medicine Post Graduate Institute of Medical Education & Research Chandigarh -160 012	*Chairman*
Dr V.K. Vijayan Director V.P. Chest Institute University of Delhi Delhi	*Member-Secretary*
DDG (M) Ministry of Health & Family Welfare Government of India New Delhi	*Member*
Principal University College of Medical Sciences Delhi	*Member*
Prof. M.K. Agarwal Head, Department of Respiratory Allergy and Applied Immunology V.P. Chest Institute University of Delhi Delhi	*Member*
Prof. S.K. Chhabra Head, Department of Cardiorespiratory Physiology V.P. Chest Institute University of Delhi Delhi	*Member*

Ethics Committee

Prof. S.K. Jain — *Chairman*
Senior Consultant (Pulmonology)
Mool Chand Hospital
New Delhi

Dr V.K. Vijayan — *Member-Secretary*
Director
V.P. Chest Institute
University of Delhi
Delhi

Prof. Nomita Aggarwal — *Member*
Dean, Faculty of Law
University of Delhi
Delhi

Prof. Aruna Bharadwaj — *Member*
Head, Department of Social Work
University of Delhi
Delhi

Dr S.K. Agarwal — *Member*
Head, Department of Medicine
Maulana Azad Medical College
B.L. Taneja Block, 1st Floor
New Delhi-110 002

Dr S. Dwivedi — *Member*
Head, Department of Medicine / Preventive Cardiology
University College of Medical Sciences (UCMS)
Shahdara
Delhi-110 095

Dr Ashima Anand — *Member*
Principal Scientific Officer
DST Centre for Visceral Mechanisms
V.P. Chest Institute
University of Delhi
Delhi

Animal Ethics Committee

Prof. M. Fahim — *Chairman*
Head, Department of Physiology
V.P. Chest Institute
University of Delhi, Delhi

Prof. K. Ravi — *Member-Secretary*
Department of Physiology
V.P. Chest Institute
University of Delhi, Delhi

Prof. S.S. Thukral — *Member*
Head, Department of Microbiology
V.P. Chest Institute
University of Delhi, Delhi

Prof. A. Ray — *Member*
Head, Department of Pharmacology
V.P. Chest Institute
University of Delhi, Delhi

Dr Rameshwar Singh — *Member*
Veterinary Surgeon-Incharge
Animal House
Defence Institute of Physiology and Allied Sciences
Lucknow Road, Delhi

Mrs Uma Tyagi — *Member*
Librarian
V.P. Chest Institute
University of Delhi, Delhi

Ms Geeta Seshamani — *Nominee of CPCSEA*
President
Friendicoes -SECA, Shop Nos. 271 & 273
Defence Colony Flyover Market (Jangpura Side)
New Delhi – 110 024

Prof. K. Muralidharan — *Nominee of CPCSEA*
Head, Department of Zoology
University of Delhi, Delhi

Dr Rajinder Bajaj — *Member*
Veterinarian
V.P. Chest Institute
University of Delhi, Delhi

ORGANISATIONAL STRUCTURE

DIRECTOR

V.K. Vijayan, MBBS, DTCD, MD, MAMS, PhD, DSc, FCCP, FNCCP (I), FCAI, FICC, FAMS

Biochemistry

H.G. Raj, MSc, PhD, CChem, FRSC
Professor

S.K. Bansal, MSc, PhD
Professor

Biostatistics

Mujeeb-ur-Rahman, MSc, PhD, PGDCP
Lecturer

Cardiorespiratory Physiology

S.K. Chhabra, MBBS, MD
Professor

Clinical Biochemistry

Vishwajeet Rohil, MBBS, MD
Lecturer

Medical Mycology

(Mrs) Anuradha Chowdhary, MBBS, MD
Lecturer

Microbiology

S.S. Thukral, MSc (Hons), PhD
Professor

(Mrs) Mridula Bose, MBBS, MD
Professor

(Mrs) Malini Shariff, MBBS, MD, PhD
Reader

(Mrs) Mandira Varma, MBBS, MD, DNB
Lecturer (Upto 31.08. 2004)
Reader (w.e.f. 01.09.2004)

Pathology

(Mrs) Sonal Sharma, MBBS, MD
Lecturer (Upto 30.06. 2004)

Pharmacology

A. Ray, MBBS, MD, MNAMS, PhD
Professor

Physiology

M. Fahim, MSc, PhD, Av HF (Germany), FAMS
Professor

K. Ravi, MSc, PhD
Professor

Vishal Bansal, MBBS, MD, DNB
Lecturer

Respiratory Allergy and Applied Immunology

M.K. Agarwal, MSc, PhD, FCAI
Professor

Balakrishnan Menon, MBBS, DMRD, MD
Lecturer

Respiratory Medicine

Unit - I

V.K. Vijayan, MBBS, DTCD, MD, MAMS, PhD,
DSc, FCCP, FNCCP (I), FCAI, FICC, FAMS
Director

Ashok Shah, MBBS, DTCD, MD, FNCCP (I), FCAI
Professor

Unit - II

S.N. Gaur, MBBS, MD, FCCP, FNCCP (I), FCAI
Professor

Raj Kumar, MBBS, MD, FNCCP (I), FCAI, MIAOH
Reader

Respiratory Virology

(Mrs) Madhu Khanna, MSc, PhD
Lecturer (Upto 19.10. 2004)
Reader (w.e.f. 20.10.2004)

Clinical Research Centre
Officer-in-Charge
V.K. Vijayan

Library

(Mrs) Uma Tyagi, MPhil (Physics), MLib. Sci.
Librarian

Animal House

Rajinder Bajaj, BVSc & AH
Veterinarian

Administration

Binod Kumar Singh, MA (Publ. Admn), MA (Eng.), PGDPM, LLB, PhD
Deputy Registrar

DST Centre for Visceral Mechanisms

A.S. Paintal, MBBS, MD, PhD (Edin), DSc (Edin), FNA, FRS (Edin), FRS (London), FRCP (London)
Programme Director

(Mrs) Ashima Anand, MSc, PhD
Principal Scientific Officer

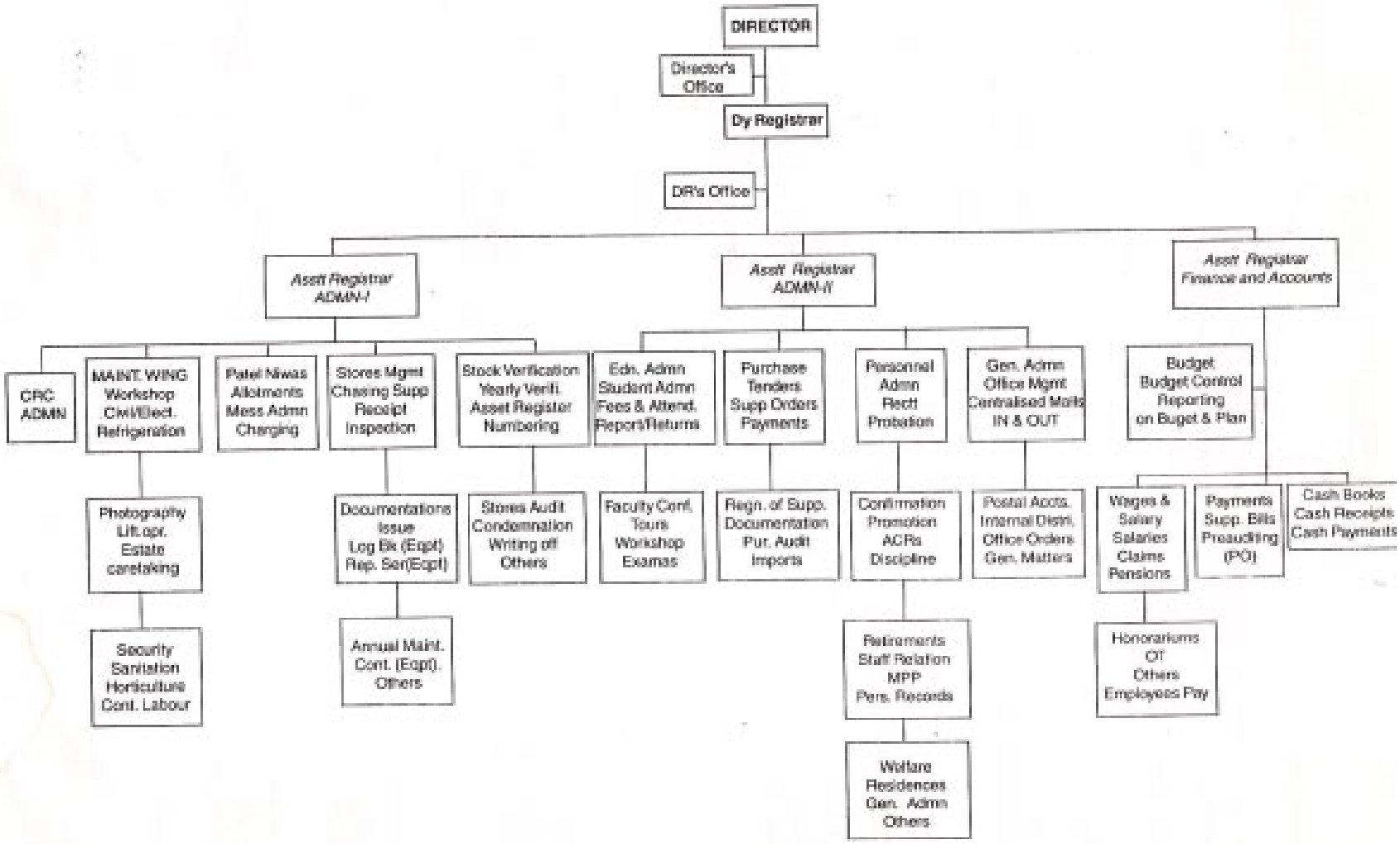
V.K. Singh, MBBS, PhD
Junior Scientific Officer

Hans Raj, MBBS, MD
Scientist (Hon.)

INSA Honorary Scientist

H.S. Randhawa, MSc, PhD, FNCCP (I), FCAI

ADMINISTRATIVE STRUCTURE



CENTRAL FACILITIES

Clinical Research Centre

The Clinical Research Centre (CRC) is the hospital wing of the Institute with the following Departments / Facilities:

1. Respiratory Medicine (Two units),
2. Cardiorespiratory Physiology,
3. Respiratory Allergy and Applied Immunology,
4. Radiodiagnosis and Imaging (including CT Scan Unit),
5. Out-patient / In-patient Facilities,
6. 24 Hours Respiratory Emergency,
7. Tobacco Cessation Clinic.

During the year 2004-05, the CRC continued to provide specialised investigations and treatment to patients referred to this Institute.

The detailed data of patients attending CRC are as follows:

Number of new patients attending OPD	:	9166
Number of visits of old patients to OPD	:	42789
Total		**51955**

Total number of indoor patients

General Wards	:	1623
Emergency Wards	:	909
Total		**2532**
Emergency treatment provided	:	15756
Total number of patients treated in ICU	:	32

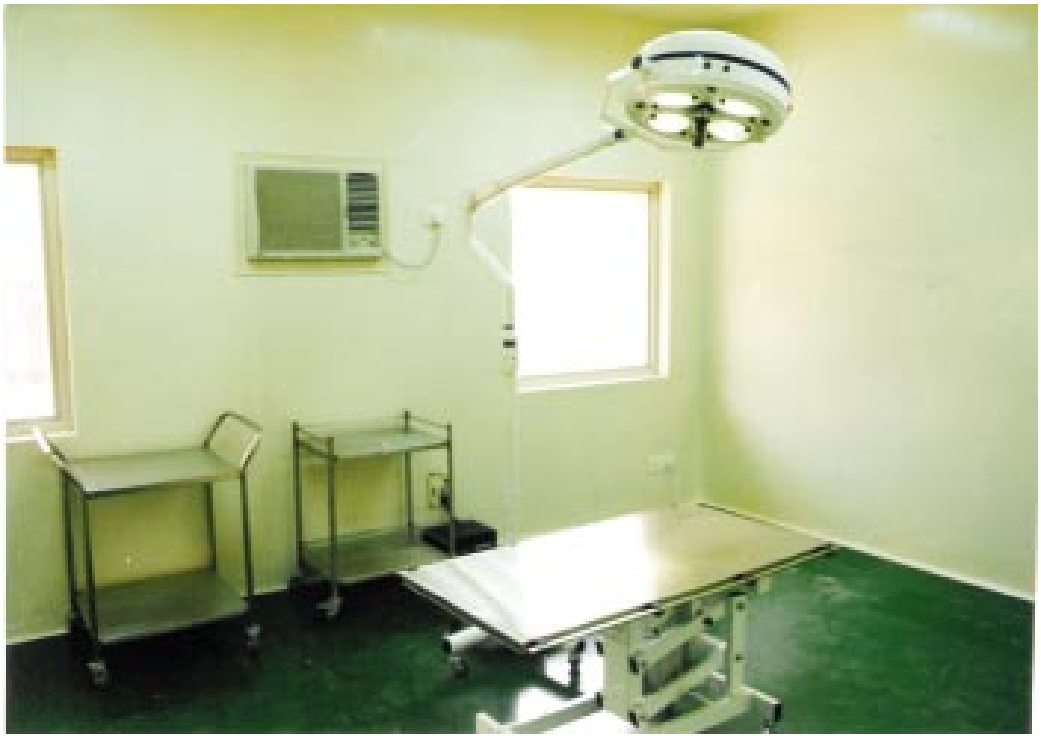
Number of specialised investigations done

Pulmonary function tests	:	20440
Arterial blood gases	:	861
Bronchoscopy	:	279
Bronchoalveolar lavage	:	33
CT scans	:	719
CT guided FNAC	:	109
Ultrasound examinations	:	544
USG guided procedures	:	38
X-rays	:	14834
Electrocardiogram	:	1526
Polysomnograms	:	107
HIV testing	:	72 (4-positive)
Flowcytometry	:	615

Tobacco Cessation Clinic

A Tobacco Cessation Clinic has been running on every Monday and Wednesday from 2:30 – 4:30 P.M.

Professor P.N. Srivastava, Chairman, Governing Body-VPCI and former Member Planning Commission and Ex-Vice-Chancellor, JNU, inaugurating the renovated Animal House.



Inside view of the State-of-the-art Animal House.

Animal House

The institute has one of the best 'state-of-the-art' animal houses in our country. It is fully equipped with the facility of international standards of animal experimental laboratories. It provides optimum environment for experimental and breeding animals. The rooms of the animal house are well maintained, ventilated with filtered air and have climate and lighting control facility.

Institute Animal Ethical Committee (IAEC) keeps a check to promote the humane approach of animal experimentation with the basic objective of providing specifications that will enhance animal care and quality in the pursuit of advancement of scientific knowledge that is relevant to humans and animals.

The Animal House of the Institute is registered for Breeding and Experiments on Animals with Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Animal Welfare Division, Government of India.

The Animal House has compliance (Assurance) with the standards of Public Health Service (PHS) Policy on Human Care and Use of Laboratory Animals, Office of Laboratory Animal Welfare (OLAW), National Institute of Health, Bethesda, U.S.A. Our Animal House is one of the seven institutions in India which has a PHS approved Animal Welfare Assurance.

Library

The Institute has one of the best library in the field of Pulmonary Disease and Allied Sciences having 9,598 Books, 17,211 bound Journals, 110 CD's, 420 Thesis and 75 National and International Reports. A total of 63 Journals (61 International and 02 National) are being subscribed, 24 Journals are being received on an exchange programme with the Institute's Journal and 33 Journals (09 International and 24 National) are being received on complimentary basis. Library is also subscribing, four English and two Hindi newspapers.

Library renders its services not only to the scientists / research scholars of the Institute, but also to other Colleges and Institute's of the University of Delhi. Library is also affliliated with British Council Division and DELNET (Developing Library Network) to access various databases like Union Catalogue of Books / Periodicals for providing timely and current information. Much emphasis is also laid on to provide abstracts, references, CAS and SDI services. Apart from this, online searches are being carried out for providing instant access of Information Resources to the desktop of researchers through LAN (Local Area Network). The INTERNET surfing and access to MEDLINE databases (1966+) has been provided right on the desktop of each Faculty Member through LAN and CD Mirror Server. Library also provides inter-library loan facilities and reprographic services on demand.

The concept of library is changing from 'library within wall' to 'library without wall', *i.e.* "Digital Library". Thus, in order to achieve the goal of establishing a "Electronic Library" in this digital era of Internet age using state-of-the-art Information Technology, the Library has successfully launched the web access to its catalogue. The newly designed webpage of "Online Public Access Catalogue" can be accessed right on the desktop through LAN in the Institute using the URL " http://opac/index.htm" for searching the database for Books, Journals & Serials available in the library and also for checking the account(s) status by entering the respective membeship code.

In continuation to put a further step in the ongoing progress of library development, a new add-on feature has been incorporated and the web access to the Catalouge of VPCI Library has now been uploaded on the Delhi University Campus Wide Network since March 2004. The catalogue can be accessed using the URL "http://10.8.2.21" by the users from within as well as outside the Institute (Over Delhi University LAN), thus enabling the users to search the holdings of VPCI Library. This Institute holds the privilege of being first of its kind in the Delhi University Network System to make the holdings of Library online. The OPAC not only ensured powerful search and query facilities due to minimal data entry requirements and maximum possible integration of modules, but also increases the efficiency of the library staff and better management control.

The Web OPAC has now been upgraded with new look and additional features like most used books, suggestion, member directory, library holdings, etc, since February 2005.

The Library facilities are available to Members / Users of Delhi University from Monday to Friday {8.30 A.M. to 7.00 P.M}.

PUBLICATION DIVISION

The Publication Division of the Institute has been publishing a quarterly periodical, ***the Indian Journal of Chest Diseases and Allied Sciences***, jointly with the National College of Chest Physicians (NCCP), India. The Journal was started in 1959 by (late) Prof. R. Viswanathan, Founder-Director of VPCI. It has a wide national and international circulation and is indexed in Index Medicus, Medline, etc. Full text articles published in the Journal (July-September 2003 onwards) can be accessed online through the following sites;

V.P. Chest Institute's site : **<http://www.vpci.org.in>**

Indmed's site : **<http://medind.nic.in>**.

Moreover, the Division is also responsible for documentation and dissemination of research output through Annual Reports and other publications of the Institute.

DEPARTMENTAL ACTIVITIES

Biochemistry

Research

1. Studies on acetoxy drug: Protein transacetylase: Characterisation and biological applications

Our laboratory has been credited with the discovery of the novel enzyme – Acetoxy drug: Protein transacetylase (TAase) that mediates the transfer of acetyl group from polyphenolic per acetates (PA) to functional proteins. We had earlier documented the TAase related biological effects such as activation of nitric oxide synthase (NOS) in human platelets and rat tracheal smooth muscle cells. Efforts were made to isolate and purify TAase from the microsomes of rat liver and human placenta. TAase was purified to homogeneity from these tissues. The molecular weight of rat liver TAase was found to be 55KDa while TAase in placenta was of molecular weight 60KDa. TAase catalysed acetylation of various proteins like NOS, cytochrome P-450 reductase, glutathione S-transferase mediated by polyphenolic acetates was demonstrated by the use of anti-acetyl lysine and during the studies it was found out that TAase undergoes autoacetylation as evident from the appearance of immunoreactive bands of molecular weight 55KDa and 60KDa with rat liver TAase and placental TAase respectively. The N-terminal sequence of rat liver TAase was found to be: DPAIYFKEQFLD. The sequence obtained when aligned with non-redundant Swiss Prot Database Sequences revealed a perfect match with the N-terminal of mature calreticulin (CRT), a multifunctional protein localised in endoplasmic reticulum (ER). An effort was made to probe whether the TAase exhibits the properties of CRT with a view to establish the identity of TAase. It was observed that the purified TAase from both sources were found to react avidly with a sequence specific anti-calreticulin commercially procured from upstate cell signalling, Beverly MA, USA. Thus, it was concluded that CRT, a multifunctional protein was found to possess an additional function of performing TAase activity. Efforts were made to examine whether TAase exhibited the properties of CRT. Accordingly, TAase showed the properties of TAase such as phosphorylation of CRT by protein kinase, autophosphorylation, calcium binding. Also complete inhibition of TAase activity at 3μM concentration of Ca^{2+} was observed.

These studies for the first time have revealed the identity of TAase with CRT. We have also identified TAase in *Mycobacterium smegmatis*. TAase was purified from *M. smegmatis* to homogeneity and the molecular weight of TAase was found to be 50KDa. *M. smegmatis* TAase (MsTAase) exhibited the specificity to various classes of PA as observed in the case of mammalian tissues. The N-terminal sequence of MsTAase: MAEKTSDDIFKLI revealed 100% homology with glutamine synthetase. An effort was made to examine the activity of glutamine synthetase in the preparation of purified TAase. MsTAase indeed exhibited the activity of glutamine synthetase. Also the glutamine synthetase activity of TAase was confirmed by the inhibition of the activity by methionine sulfoximine, a well-known inhibitor of glutamine synthetase. Further studies are in progress to discern the structural features of MsTAase with a view to substantiate the transacetylase activity of glutamine synthetase.

Our earlier studies had revealed the TAase catalysed inhibition of microsomal cytochrome P-450 linked mixed function oxidases (MFO) by PA. Since *mycobacterium* is known to possess cytochrome P-450 enzymes specific for the synthesis of sterols we thought it interesting to examine the action of PA on the growth of *M. smegmatis*. Among various PA examined, 7,8-diacetoxy-4-methyl coumarin (DAMC) was found to have considerable potential to inhibit the growth of *M. smegmatis*. Further studies are in progress to evaluate the inhibition potential of various classes of PA to inhibit the growth of mycobacteria.

2. Studies on mechanism of signal transduction during release of proinflammatory cytokines IL-1β and TNF-α by alveolar macrophages in asthma

Earlier we examined the kinetics of expression of IL-1β and TNF-α in alveolar macrophages (AM) of asthmatic patients *in vitro* induced by various stimuli *viz.* lipopolysaccharide (LPS), phorbol myristate acetate (PMA), sphingosine and histamine. In addition to the expression studied at mRNA level by gene specific RT-PCR, expression at protein level was also studied by ELISA. Bronchoalveolar lavage fluid was collected

from 19 asthmatic patients and five healthy subjects. Our results are concurrent with the previous findings, which showed that the pattern in AM of asthmatics markedly differed from that observed in the AM of healthy subjects where no cytokine was expressed immediately. These results suggest that AM of asthmatic patients remain in an active state and the exposure to an endotoxin (LPS) or tumor promoter (PMA) may lead to immediate expression of IL-1β and TNF-α, which may initiate and perpetuate the airway inflammation in the disease. To identify the target proteins of PKC involved in signalling mechanism in AM in asthma, protein phosphorylation studies were carried out. In healthy subjects, the proteins of molecular weights of 60, 54 and 47 KDa were found to be phosphorylated by PKC in AM of healthy human subjects. The experiments in asthmatics are in progress.

3. Signalling mechanism during macrophage-stimulus interaction in rats

For signal transduction studies, the peritoneal macrophages (PM) collected from rat were incubated with the stimuli followed by measurement of total PKC activity by Histone IIIs phosphorylation method and ligand binding method using [^{3}H] PDBu. The effect of LPS was optimum at 15μg/ml with 15 min of incubation. The maximum effect of PMA was found at 100 n*M* with preincubation time of 10 min. With sphingosine, we observed maximum inhibition at 100 n*M* with 15 min of incubation. Histamine did not show any significant changes at any concentration and time of incubation upto 30 min.

4. Acetoxy drug: Protein transacetylase mediated inhibition of activity of PKC obtained from peripheral blood lymphocytes of the patients of bronchial asthma

The acetylation of cellular proteins is mediated by the novel enzyme acetoxy drug: Protein transacetylase (TAase) identified for the first time in our Department utilising polyphenolic per acetates (PAs) as the acetyl donor. We have observed increase in PKC activity in bronchial asthma, which has significant correlation with the severity of the disease, suggesting its role in the pathophysiology of the disease. In the present study, we incubated peripheral blood lymphocytes (PBL) obtained from the patients of bronchial asthma with various PAs and the changes in the activity of PKC were recorded. These results revealed inhibition of PKC activity by PAs. This inhibition was in tune with the substrate specificity of these PAs to TAase. DAMC (7,8-diacetoxy-4-methyl coumarin) a model PA exhibited significant inhibition of PKC. These results proved that PKC is a target for acetylation by TAase and PA.

5. Lipid rafts in bronchial asthma: A study on membrane lipid metabolism in asthmatic patients using erythrocyte membrane as the model

Membrane lipids domains, containing sphingolipids and cholesterol, are referred to as lipid rafts. They are present in the exoplasmic leaflet of the lipid bilayer. Rafts are involved in signalling events and intracellular trafficking of proteins (including bacterial toxins) and lipids as well as being preferential sites for host-pathogen/toxin interactions. Thus, changes in the composition of the lipid rafts may lead to changes in the signal transduction in plasma membrane of erythrocytes, the pathophysiology and the ultimate manifestation of the bronchial asthma. The initial studies have shown that in asthma, the total contents of the proteins of the erythrocyte membrane are marginally increased while total phospholipids are decreased. The resolution of all these phospholipids involved in lipid rafts and in signalling mechanisms is being studied further.

Biostatistics

The Department provides statistical assistance in planning, designing, analyses and execution for the research work of various departments of the Institute. It also conducts regular teaching programmes for the Postgraduate students. Besides this, the Department also takes care of in-and out-patients' records.

Research

Continuation of the studies pertaining to (*1*) the correlation between nutritional status and incidence of airway disorders in adults and (*2*) seasonal pattern of various respiratory diseases among the patients attending the out-patient department (OPD) of the institute.

Cardiorespiratory Physiology

Research

1. Role of oxidant-antioxidant imbalance in pathogenesis of bronchial hyperreactivity in guinea pigs

Modulation of airway reactivity, after sensitisation and after *in vivo* generation of reactive oxygen species in the airways by inhalation of xanthine and xanthine oxidase was studied. Both increased airway reactivity accompanied by development of an oxidant-antioxidant imbalance. The response to salbutamol was decreased by *in vivo* generation of reactive oxygen species. These observations show that increased oxidative stress may play an important role in the pathogenesis of bronchial hyperreactivity.

2. Development and validation of a questionnaire to measure clinical control of asthma based on current management guidelines

Several tools are used to assess the outcomes of treatment of asthma. Among these, evaluation of the degree of control is an important measure. We developed an asthma control questionnaire (ACQ) based on current management guidelines. Its properties were tested in asthmatics attending the outpatient clinic at the Institute. The study on cross-sectional validity has been completed. The instrument was found to be sufficiently reliable and compares well with the available instruments developed in other countries.

3. Validation of a specific quality of life instrument for Indian patients with bronchial asthma

Measurement of quality of life is now considered to be an important assessment parameter in chronic conditions such as asthma. An asthma quality of life questionnaire (AQLQ) for Indian patients was developed and a study carried out to test its measurement properties. The instrument will be a useful tool both for clinical and research studies in asthma.

4. Potentiation of allergic asthma by air pollution: The ozone-allergen interaction and its modulation by dietary antioxidants, alpha-tocopherol and ascorbic acid

Ozone air pollution has received recent attention especially in developed countries where particulate air pollution is less of a concern now. It is also thought to contribute to increasing prevalence of asthma in developed countries. As ozone acts through the generation of reactive oxygen species in the airways, ozone-allergen interaction may be synergistic and facilitate the induction of asthma. A study was carried out to investigate this hypothesis in a guinea-pig model in which allergen-induced asthma is being developed in association with a daily exposure to ambient concentrations of ozone. A successful model of allergen-induced asthma in guinea pigs was developed. Increased oxidative stress was shown in these animals. The data shows that ozone may increase the inflammatory response in the airways accompanied by increased oxidative stress. Dietary supplementation with antioxidants, vitamin E and C offered a protective effect against the ozone-enhanced response to allergens.

5. Lung function abnormalities and bronchodilator responsiveness in asthma and chronic obstructive pulmonary disease: A comparative assessment

A study to compare the qualitative and quantitative differences in lung function abnormalities and bronchodilator responsiveness in asthma and chronic obstructive pulmonary disease (COPD) is continuing. It was observed that the pattern of lung function abnormalities and bronchodilator responsiveness is both qualitatively and quantitatively different in asthma and COPD. A substantial proportion of patients with COPD show a response to bronchodilators when the changes in forced vital capacity and inspiratory capacity are considered along with those in FEV_1.

6. Gender differences in asthma

Evidence is accumulating that there may be gender differences in several aspects of asthma. A comprehensive study was undertaken to look at gender differences in several aspects of morbidity in asthma, namely, the occurrence of breathlessness, abnormalities of lung function and bronchodilator responsiveness, and quality of life. It showed that female asthmatics perceive greater dyspnoea and have a poorer quality of

life even though males had greater airways obstruction. These gender differences were irrespective of the asthma severity. The pattern of lung function abnormalities appeared to be similar with major changes being in spirometry. Changes in static lung volumes were small in stable asthmatics. Response to bronchodilator appeared to be greater in males. The observed differences are unlikely to be due to medication or the technique of inhalation as both these were similar. The observed gender differences in asthma are likely to be due to differences in response to disease but may also indicate real differences in disease.

Clinical Biochemistry

Diagnostic Services

The Department provided diagnostic services for the indoor and outdoor patients of the Clinical Research Center of the Institute. A total of 74 clinical samples were processed during the year, details are given below:

Nature of Investigation	**No.**
24 hour urine calcium	30
24 hour urine protein	01
Pleural fluid protein	20
Pleural fluid sugar	20
Ascitic fluid protein	00
Ascitic fluid sugar	00
Others	03
Total	**74**

Medical Mycology

Research

1. Comparison of multilocus sequence typing (MLST) and Ca3 fingerprinting for molecular subtyping of epidemiologically-related and geographically-distinct clinical isolates of *Candida albicans*

Southern hybridization with the complex probe Ca3 is a well established tool for molecular subtyping of *Candida albicans*. Multilocus sequence typing (MLST) is a DNA sequence-based subtyping method recently applied to *C. albicans* and shown to have a high degree of intraspecies discriminatory power. However, its utility for studying the molecular epidemiology of sequential isolates from recurrent disease has not been established. We compared Ca3 Southern hybridisation and MLST using seven housekeeping genes (*AAT1a, ACC1, ADP1, MPIb, SYA1, VPS13, ZWF1b*) for their ability to discriminate among 37 *C. albicans* isolates from recurrent cases of oropharyngeal candidiasis (OPC) in HIV-positive patients from India and the United States. Among the 37 isolates, MLST identified 22 distinct genotypes (index of diversity = 97%); Ca3 Southern hybridisation identified 21 distinct genotypes (index of diversity = 95%). Both methods clustered isolates into seven genetically-related groups and, with one exception, isolates that were indistinguishable by MLST were indistinguishable or highly related by Ca3 Southern hybridisation. Both methods differentiated between the geographically-distinct isolates at the individual genotype level. These results demonstrate that MLST performs equally well compared to Ca3 Southern hybridisation for defining genetic-relatedness of sequential *C. albicans* isolates from recurrent cases of OPC in patients from two distinct geographical locations.

2. Molecular epidemiology and azole susceptibility of *Candida albicans* causing recurrent OPC in AIDS patients not receiving fluconazole prophylaxis

Oropharyngeal candidiasis (OPC) is the most common opportunistic fungal infection in AIDS patients in India. Fluconazole (FCZ) is the treatment choice but prolonged use has led to increased resistance in *C. albicans*. To date, in India, little is known about the epidemiology of OPC and the incidence of azole resistance in these cases. Also, strain transmission between patients in close proximity is unclear. Thus, recurrent OPC due to *C. albicans* in AIDS patients not receiving highly active anti-retroviral therapy (HAART) and treated at the same hospital during the same time frame was studied. Twenty *C. albicans* isolates causing OPC were obtained from the oropharynx of eight AIDS patients treated over a period of one year at the Rajan Babu Tuberculosis Hospital, Delhi. Six patients had 2, one patient had 3 and one patient had 5 OPC episodes. Patients were treated with 150 mg FCZ per day for 14 days for each episode. Identification of isolates as *C. albicans* was confirmed by API20C. PCR amplification for *Candida dubliniensis* was negative for all isolates. Minimum inhibitory concentrations (MICs) of FCZ, itraconazole, and voriconazole were determined by NCCLS microbroth dilution and confirmed using sterol quantitation method. Molecular strain typing was done by multi locus sequence typing (MLST) using 7 housekeeping genes (*AAT1a, ACC1, ADP1, MPIb, SYA1, VPS13, ZWF1b*). Based on allelic polymorphisms, a matrix of similarity was built using the Kimura two-parameter model with a transition/transversion ratio equal to 2 and dendrograms were based on UPGMA. Clinical resistance to FCZ was not observed in any case and azole MICs were susceptible for all isolates. MLST of 20 isolates revealed 10 unique diploid sequence types. Recurrent OPC in a given patient was due to the same strain in four of the eight patients. Out of these four patients, one patient showed 5 episodes and three episodes each and the remaining two showed two episodes of OPC. The patient with 5 episodes had three times identical strain in 3 episodes followed by 2 different strains in subsequent 2 episodes. The two strains from this patient were 90% similar to each other and 92% similar to the three identical strains. In one patient who experienced three episodes of OPC, the first two isolates were identical and the third isolate was 68% similar to first. Among the four patients in whom the two episodes of recurrent OPC was with different *C. albicans* strains the recurrence was due to 61%, 60%, 91%, 95% related strains. In the absence of FCZ prophylaxis, azole resistance did not emerge in these cases. As observed in other countries, recurrent OPC was due to the same or highly related strain in 86% of patients suggesting that patients remained colonised following treatment and these strains or minor variants are responsible for subsequent infections.

Diagnostic Services

The Department continued to provide diagnostic mycological and serologic services to the Clinical Research Center of the Institute and other hospitals in Delhi. A total of 984 clinical specimens/samples (both indoor and outdoor patients) were processed during the year. These included 462 blood specimens, 284 sputum, 190 bronchial lavage/aspirate/washings, 21 tissue/nasal biopsies, 5 skin/nail scrapings, 3 pleural fluid and 19 miscellaneous (swabs/urine/pus, etc.) specimens. Besides referral services for identification of clinical isolates of fungi was extended to other institutions on request.

Microbiology

Research

1. Biochemical and molecular characterisation of respiratory isolates of *Moraxella catarrhalis*

A total of 34 isolates suspected to be *M. catarrhalis* were subjected to detailed biochemical tests including nitrate reduction, glucose fermentation, DNAase, and tributyrin hydrolysis and were confirmed as *M. catarrhalis*. Antibiotic resistance profiling of these isolates revealed that 35% were resistant to cefaclor while 29% were resistant to erythromycin. Molecular epidemiologic typing of these isolates by SDS-PAGE whole cell protein profile analysis and ribotyping revealed all the strains to have unique protein profiles as well as unique ribopatterns.

2. ESBLs and ESBL plasmids in clinical isolates

A total of 200 clinical isolates of various gram negative pathogens were screened for ESBL production by NCCLS disc diffusion as well as by Broth Microdilution Technique. NCCLS phenotyping confirmatory test, double disc synergy Test and modified double disc test were used as the confirmatory tests. As many as 71% of *E.coli*, 75% of *Klebsiella*, 48% of *Proteus* and 56% of *Pseudomonas* clinical isolates showed ESBL production.

3. Analysis of isoniazid and rifampicin resistance mutations in the clinical isolates of *M. tuberculosis* by sequencing and dot-blot hybridisation

Multidrug-resistant tuberculosis (MDR-TB) is an increasing problem worldwide. Rapid diagnostic assays for MDR-TB should address this problem by enabling early isolation and treatment of patients with this disease. Rifampicin resistance is an excellent marker for multidrug-resistant *Mycobacterium tuberculosis*, as 90% of rifampicin-resistant *M. tuberculosis* strains are also isoniazid resistant. Rifampicin resistance is also amenable to detection by rapid genotypic assays, because approximately 95% of all rifampicin-resistant strains contain mutations localised in an 81-bp core region of the bacterial RNA polymerase gene, *rpoB*. Moreover, virtually all mutations that occur in this region result in rifampicin resistance. By contrast, nearly all rifampicin-susceptible *M. tuberculosis* isolates have the same wild-type nucleotide sequence in this region. Five probes A, B, C, D and E have been designed to cover the 81 bp hot spot region of the *rpoB* gene of the wild type *M. tuberculosis* (H37Rv) genome. Absence of hybridisation with any of the five probes would indicate rifampicin resistance.

One hundred and twenty-four patients of pulmonary tuberculosis, attending the Department of Respiratory Medicine at V.P. Chest Institute, Delhi and R.B.T.B. Hospital, Delhi, were taken for the study. Susceptibility testing of 79 isolates was done by BACTEC 460 TB system and the proportion method. Twenty-nine (36.70%) isolates were resistant to rifampicin, 31 (39.24%) to isoniazid, 35 (44.30%) to streptomycin and 26 (32.91%) to ethambutol. Twenty-one (26.58%) isolates were resistant to rifampicin and isoniazid and 40 (50.63%) isolates were susceptible to rifampicin and isoniazid. Dot-blot hybridisation assay was carried out on 67 of the 79 isolates, first with probe E, because mutation detectable by probe E is the commonest mutation within the hot spot. Probe E is complementary to the region covered by codons 528 to 533. The results demonstrate that 38 out of 42 rifampicin sensitive isolates (n = 67) were showing hybridisation with probe E (90.48% correlation with rifampicin sensitivity). Among the 25 rifampicin resistant isolates 15 showed no hybridisation (60% correlation). The results were confirmed by sequencing. Among the 27 isolates (18 susceptible and 9 resistant) tested by sequencing a mutation was detected at codon 531 in five of the nine resistant isolates. The sixth isolate had a double mutation at codons 516 and 533. Dot-blot hybridisation with probe E correctly detected the mutations in the region complementary to the probe E as it did not hybridise with the PCR amplicon of these six isolates. The seventh and eighth isolates had mutations at codons 516 and 522 respectively, which are outside the region complementary to probe E. Therefore, we observed hybridisation with probe E for these isolates. Only one rifampicin resistant isolate demonstrated unexplained results. Though this isolate did not show hybridisation with probe E, no mutation was found in the *rpoB* core region in the isolate on sequencing. Further investigation is going on to confirm these findings.

Dot-blot hybridisation assay with probe A was carried out on 35 isolates (25 rifampicin sensitive, 10

rifampicin resistant). Probe A showed hybridisation with all the isolates, indicating absence of mutation in the region complementary to the probe A. Probes B, C and D are being used to locate additional mutations within the hot spots in these isolates.

4. Mycobacterial-epithelial interaction in innate immune response to tuberculosis and its role in transcriptional regulation of inducible nitric oxide synthase (iNOS)

Earlier, we have demonstrated that human alveolar epithelial cell line A549 respond to *M. tuberculosis* infection by producing a significant level of nitric oxide. Also, introduction of the Th1 type cytokines (IFN-γ, TNF-α, IL-1β) into the experimental system led to further up regulation of nitric oxide production and mycobactericidal activity of the A549 cells.

Presently, we have studied the signal transduction machinery in regulation of the expression of iNOS gene in the A549 cells following *M. tuberculosis* infection. The A549 cells infected with *M. tuberculosis* were treated with the three cytokines individually or in combination. At each experimental time point confocal microscopy was undertaken to establish internalisation of mycobacteria by the A549 cells.

In additional experiments, it was further investigated whether mycobacterial sub cellular components could precipitate the same effects as was observed with live mycobacteria. Host cell protein was extracted from infected and cytokine treated A549 cells and electrophoretic mobility shift assay (EMSA) was carried out for STAT1 and NFkB, the transcription factors associated with induction of iNOS gene and subsequent release of nitric oxide.

The oligo probes were synthesized, based on the sequence from the human iNOS promoter -5.2 kb region (specific for binding of STAT1 protein) and -5.8 kb region (bifunctional for binding both STAT1 and NFkB). Cell lysates from *M. tuberculosis* infected alveolar epithelial cells demonstrated mobility shift with both the probes, there by suggesting that *M. tuberculosis* infected alveolar epithelial cells utilised both JAK-STAT and NFkB pathways for induction of iNOS and NO production. Also, stimulation of the cells with IFN-γ prior to infection showed protein DNA complex for both -5.2 and -5.8. However, introduction of TNF-α in the experimental system yielded quite a different result. While protein DNA complex was obtained from *M. tuberculosis* infected A549 cells with -5.2 construct, treatment of the infected cells with TNF-α abolished it completely. No protein-DNA complex was observed with -5.2 regions. When a parallel was drawn between nitric oxide production and gel shift results, it was observed that TNF-α had no up regulatory effect on the nitric oxide production by the A549 cells. In contrast, the amount of NO produced was significantly higher when IFN-γ was used to stimulate the infected cells, either alone or in combination with TNF-α and IL-1β.

Our findings suggest that TNF-α probably takes a regulatory role in the nitric oxide mediated mycobactericidal activity of alveolar epithelial cells. In a situation where epithelial cells are infected by *M. tuberculosis* which by itself induces cytokine release leading to high nitric oxide release, further addition of TNF-α initiates a regulatory response. By a mechanism not well understood, TNF-α leads to abrogation of binding of STAT1 to -5.2; possibly thereby regulating NO production by the *M. tuberculosis* infected A549 cells. Because excessive NO production should lead to the killing of A549 cells, a considered niche for the mycobacteria. Our results points toward fine tuning of nitric oxide production by the alveolar epithelial cells in response to cytokine stimulation and presence of intracellular mycobacterium. Ability of the alveolar epithelial cells for differential regulation of STAT1 and NFkB opens up a new area of investigation to understand the active role played by the alveolar epithelial cells in the innate immune response to tuberculosis.

5. PCR and RFLP typing of the Indian *M. avium* strains using IS1245 insertion sequence marker

In the post AIDS era *M. avium* has emerged as a major opportunistic pathogen, infecting nearly 50% of HIV/AIDS patients in the western world. India with its one billion populations and a projected burden of 20-25 million cases of HIV/AIDS by 2010 is marked as a major target for spread of HIV. In this context, it was relevant to initiate a database of genotypes of *M. avium* isolates from India. Till date, there is no report from India regarding the typing profile of *M. avium*, a potential pathogen. The present study was therefore designed to genotype the Indian *M. avium* strains of human origin.

Sixty-five biochemically identified *M. avium* isolates were subjected to IS1245 based restriction fragment length polymorphism (RFLP) and polymerase chain reaction (PCR) typing. IS1245 insertion sequence based

RFLP demonstrated polymorphism in 84.6% isolates. While 15.4% isolates did not hybridise on southern blot and therefore were RFLP negative. Among the 55 isolates that were RFLP positive 8 showed 1-3 bands, 19 had bands ranging from 4-9, and 28 isolates had $\geq$ 10 bands each. Although the strains could be clubbed on the basis of number of bands, the banding profile was highly polymorphic. Among the 55 strains type able by RFLP, four clusters and 40 unique types of polymorphism were observed.

Application of IS1245 based PCR typing on the same isolates showed that 87.7% isolates were type able by PCR typing. Interestingly however the 10 isolates that were not type able by IS1245 RFLP were type able by IS1245 based PCR typing. Among the 57 PCR typed isolates a cluster of 14 isolates with identical 3-banded pattern was observed. Notably, 5 of the ten IS1245 RFLP negative isolates were within this cluster.

Our results demonstrate that *M. avium* strains from India are highly polymrophic with remarkable genetic diversity and heterogeneous RFLP profile. We observe that 47% (n=27) isolates had RFLP profile suggestive of bird and animal origin indicating a strong association with the environment. By applying two typing methods based on IS1245 on the isolates (n=65), 100% typeability could be achieved.

6. Infection of human monocyte derived macrophages with *M. tuberculosis* induces apoptosis of T cells: A potential mechanism for persistent infection

In *in vivo* condition macrophages phagocytose *M. tuberculosis* and present antigens to T cells and this starts a cascade of immune response. In turn T cells activated in the presence of antigens produce IFN-γ which further activates macrophages to elicit mycobactericidal activity. Macrophages on infection with *M. tuberculosis* produce TNF-α and nitric oxide (NO) as mycobactericidal components. It has been previously reported that pulmonary tuberculosis patients show some T cell hypo responsiveness. The T cells in these patients also show reduced response towards the antigens of *M. tuberculosis.*

In our present plan of experiments, we hypothesised that the T cell hypo-responsiveness may be because T cells undergo apoptosis during infection as the mycobactericidal products like TNF-α and NO are reported to be proapoptotic in nature. We designed experiments to correlate the T cell death in co-culture assays with Mϕ nitric oxide and TNF-α as ex vivo attributes.

In our experiments, as a control we have used phytohaemagglutin (PHA) as a nonspecific activator of T cells. For studying the fate of antigenically activated T cells in milieu peripheral blood mononuclear cells (PBMC**)** were activated with secretory culture filtrate protein (CFP**)** of mycobacteria. In case of co culture assay where nonspecifically activated T cells are co-cultured with *M. tuberculosis* infected macrophages the T cells undergo apoptosis. In this system NO production as well as CD95 expression on T cell is high and may be responsible for T cell death.

In case of whole PBMC infected with *M. tuberculosis* the T cells are presumably activated by macrophage processed *M. tuberculosis* antigens. CD95 expression study by flowcytometry shows that apoptotic cells are less in this system. This was further supported by co-culture experiment when CFP activated T cells were co-cultured with infected macrophages. So it can be concluded that antigenically activated T cells have more survival rate as compared to non-specifically activated T cells. Antigenically activated T cells in co-culture experiments also express low CD95 and NO production in co-culture supernatant. The survival of CFP activated T cells in co-culture experiments indicate that certain factors may be produced by *M. tuberculosis* infected macrophages which reduce the activation induced cell death of antigenically activated T cells.

We have also observed that maximum TNF-α is produced by infected macrophages that are co-cultured with CFP activated T cells. This observation points towards the role of specifically activated T cells which may modulate the response of macrophages in a way to induce more mycobactericidal TNF-α but they themselves express low CD95 and sustain their own survival in stress conditions. Thus, we can hypothesize that in healthy individuals interaction of macrophages with *M. tuberculosis* and *M. tuberculosis* antigen activated T cells synergise their activity in such a way that immune response appears to be in favour of the host. This may be the reason behind the persistence of infection without developing the disease in healthy individuals.

7. Prevalence of *Mycoplasma pneumoniae* infection in patients of acute exacerbation of chronic obstructive pulmonary disease

Forty-six patients of acute exacerbation of COPD attending the Department of Respiratory Medicine at

V.P. Chest Institute, Delhi were taken up for the study. Throat swabs and sputum samples were collected from the patients for culture and PCR. Sera were collected for serological diagnosis of *M. pneumoniae* infection, from the patients as well as seven healthy controls. Samples were cultured on PPLO medium and incubated at 37 °C. A part of the sample was stored at –70 °C to be used for PCR. PCR was standardised in the lab using a primer set amplifying a 375 bp region of the P1 gene. None of the clinical samples studied showed the desired amplicon in the direct PCR assay. PCR carried out from the culture suspension of a sample suspected to have a positive growth of *Mycoplasma* was also negative. The sera obtained from patients were taken up for serological studies. Only one patient had a positive IgM titer. IgG antibodies were detected in 17 samples. Ten of the patients were followed up. Two of these patients showed a 4-fold change in the IgG titer on follow up. Gelatin particle agglutination test was carried out in 39 samples and was positive in nine patients. Five of these patients also had a positive IgG titer. We thus found serological evidence of *Mycoplasma pneumoniae* infection in atleast three patients of acute exacerbation of COPD, one of which tested positive for IgM antibodies and two showed a four fold change in IgG antibody titer.

8. Direct susceptibility to paranitrobenzoic acid for early identification of *M. tuberculosis*

An important aspect of tuberculosis control is proper diagnosis and identification of *M. tuberculosis.* Laboratory services for mycobacterial diseases face new challenges in the era of AIDS and multi-drug resistant tuberculosis. Laboratory results must be accurate and be generated on time. Though several rapid techniques are available for the identification of *M. tuberculosis* complex, culture based techniques still remain the mainstay of diagnosis in the third world countries. However, culture of *M. tuberculosis* requires at least 3 weeks of incubation and additional time for identification using biochemical reactions. BACTEC, though faster, is very expensive and cannot be used by peripheral laboratories. The objective of the present study was to perform a direct susceptibility testing of smear positive sputum samples to paranitrobenzoic acid (PNB) for early identification of *M. tuberculosis.* Three consecutive sputum samples from 50 patients of pulmonary tuberculosis, attending the Department of Respiratory Medicine at V.P. Chest Institute, Delhi, were examined by Ziehl-Neelsen staining and cultured on Lowenstein Jensen medium. Twenty-five smear positive sputa were also cultured on Lowenstein-Jensen medium containing paranitrobenzoic acid at a concentration of 0.5 mg / ml and incubated at 37 °C. After 3 weeks of incubation, growth was observed on all the drug free Lowenstein-Jensen slants but none of the slants containing PNB which inhibited the growth of *M. tuberculosis* complex. The cultures were further confirmed as *M. tuberculosis* by niacin, nitrate and catalase tests. Serial concentrations of known cultures of *M. tuberculosis*, *M. fortuitum*, *M. scrofulaceum* and *M. avium* were used as controls in the study. Direct susceptibility testing to PNB was thus found to be a simple, cheap and technically feasible method of preliminary identification *M. tuberculosis* and could be adapted to be used in Level II laboratories especially in developing countries.

9. Identification of *M. tuberculosis* by PCR restriction analysis

Until recently, the diagnosis of tuberculosis was based on clinical features, radiological examinations, immunological tests, microscopic identification, or *in vitro* cultures. Acid-fast staining of specimens combined with isolation and culture of the bacilli remains the "gold standard" method to specifically identify mycobacteria. Because of the slow growth rate of *M. tuberculosis*, this method is time-consuming, and the diagnosis can take up to 8 weeks. Hence, there is an urgent need of a technique that would identify *M. tuberculosis* directly from samples for adequate control of tuberculosis. PCR restriction analysis (PRA) is a simple molecular technique that can be used directly on samples to identify *M. tuberculosis.* Of the 40 smear positive sputum samples studied, we successfully identified *M. tuberculosis* by PCR restriction analysis of the *hsp* 65 gene in all the samples studied. The assay was also positive in one of the three smear negative samples studied.

Diagnostic Services

Details of diagnostic services provided to the indoor and outdoor patients are given on the next page.

i. Bacteriology Laboratory

Clinical specimens processed for isolation of aerobic pathogens:

Nature of Specimen	***No.***
Sputum	1868
Pleural fluid	38
Bronchoalveolar lavage	45
Bronchial aspirate	150
Post-bronchial sputum	07
FNAC	07
Pus	08
Synovial fluid	01
Urine	178
Blood	25
Endotracheal secretion	02
Throat swab	07
Tracheal aspirate	07
Catheter tip	01
Total 2344	

The specimens yielded 181 strains of *Pseudomonas aeruginosa,* 177 strains of *Streptococcus pneumoniae,* 71 of *H. influenzae,* 33 of *Moraxella catarrhalis,* 57 of *K. pneumoniae,* 57 of *E. coli, 16 of Klebsiella oxytoca,* 5 of *Enterobacter* spp. , 22 of *Acinetobacter* spp., 16 of *S. aureus* , 3 of *Citrobacter koseri.* A large number of these isolates were resistant to multiple antibiotics. None of the *H. influenzae* and *S. pneumoniae* isolates showed resistance to any of the antibiotics.

ii. Mycobacteriology Laboratory

a) **Clinical specimens processed during the year**

Nature of Specimen	***No.***
Sputum	5667
Post-bronchoscopy sputum	167
Bronchial aspirate	169
Bronchoalveolar lavage (BAL)	49
FNAC	11
Pleural Fluid	43
Endotracheal aspirate	02
Synovial fluid	02
Urine	07
Biopsy	02
Pus	02
Liver abscess	01
Total	**6122**

(*b)* **Clinical specimens processed with BACTEC 460 TB system**

Nature of Specimen	***No.***
Sputum	103
Drug sensitivity	69
Total	**172**

Pathology

Routine Diagnostic Work

Details of the diagnostic services provided to the indoor and outdoor patients during the year are given below:

a.	**Hematology**		**No.**
	Total no of blood samples examined	:	7051
	Hemoglobin estimation	:	9696
	Total leukocyte count	:	9661
	RBC count	:	1253
	Differential leukocyte count	:	9661
	ESR (Westergren)	:	9001
	Reticulocyte count	:	60
	Absolute eosinophil count	:	636
	Mean corpuscular volume (MCV)	:	1463
	Mean corpuscular hemoglobin(MCH)	:	1463
	Hematocrit	:	1253
	Platelet count	:	626
	Peripheral smear	:	65
	P/S for malarial parasite	:	115
	Bleeding time	:	561
	Clotting time	:	561
b.	**Clinical Pathology**		
	Urine examination		
	Albumin	:	5192
	Sugar	:	5192
	Bile pigments	:	22
	Bile salts	:	22
	Urobilinogen	:	00
	Microscopic examination	:	5192
c.	**Cytology**		
	Sputum	:	39
	BAL fluid- diagnostic	:	14
	BAL fluid- experimental	:	50
	FNAC	:	25
	Bronchial aspirate	:	09
	Pleural fluid	:	12
	Bronchial brushings	:	00
	Ascitic fluid	:	00
	Miscellaneous	:	01
d.	**Clinical Chemistry**		
	S. cholesterol	:	93
	Glucose	:	1525
	B. Urea	:	921
	S. creatinine	:	921
	S. total proteins	:	391
	S. albumin	:	377
	S. total bilirubin	:	652

S. direct bilirubin	:	652
SGOT	:	661
SGPT	:	650
S. alkaline phosphatase	:	599
S. calcium	:	00
S. uric acid	:	12
S. triglycerides	:	93
S. HDL	:	92
S. phosphorus	:	00
S. magnesium	:	02
CK-MB	:	00

e. Histopathology

Surgical biopsies	:	08
Experimental biopsies	:	87

Pharmacology

Research

1. A multicentric, double blind randomised placebo controlled study evaluating the efficacy and tolerability of the polyherbal preparation LL-2123 HP against hepatotoxicity in patients with pulmonary tuberculosis

The study has been completed in 2004 and the data has been compiled and analysed. The results show that the polyherbal preparation has significant hepatoprotective effects against ATT-induced liver damage, particularly during the initial intensive phase of chemotherapy. The manuscript is being prepared for submission to a scientific journal of merit.

2. Possible protective role of Livina (a polyherbal preparation) against anti-tubercular therapy (ATT)-induced hepatotoxicity

Recruitment of patients in the above clinical trial has been initiated, and the study is in progress. Out of the total 60 patients planned for the study, 25 patients have been completed or nearing completion and the number of drop outs are 11. Enrolment process for more patients is in progress, and this is likely to take another 3 months. After completion of the study the data will be analysed. The treatment is being given in the randomised pattern, and the computer generated random chart is being followed for allocation of Livina and placebo.

3. Studies on the possible role of nitric oxide in the regulation of neurobehavioural and immunological responses during stress

Nitric oxide (NO) is now recognised as an important bioregulatory molecule and its importance in several inflammatory and immunological states and respiratory diseases is well recognised. Immunocompromised situations enhance the susceptibility to disease and there is a clear correlation between neural pathways, immunity and somatic / visceral disorders. Stress is known to induce complex neural interactions and also modulate immune functions. The present study evaluated the possible role of nitric oxide in the neural modulation of immunity and some related responses in experimental animals. Stress induced suppression of different aspects of behaviour and immune function (humoral and cell-mediated) and these effects were stressor intensity dependent. Nitric oxide modulators like precursors (L-Arginine) and synthesis inhibitors (L—NAME, 7-NI) influenced specific immunity in a complex manner and these correlated with total nitrite / nitrate levels in the plasma and the brain. Additional studies showed that repeated stress exposure induced a degree of behavioural adaptation / tolerance in rats, and these effects were associated with corresponding fluctuations in brain nitrate / nitrite levels. Both changes in acutely and repeatedly stressed animals were associated with reduced brain NO metabolites, and studies with L-Arginine confirmed these findings. NO also regulated humoral and cell-mediated immune responses during stress, and L-Arginine and L-NAME showed opposite effects on these parameters. Behavioural factors were also good predictors of the stress-induced immunomodulation and its regulation by NO. Interestingly, NO exerted a protective effect against stress-induced immune suppression and this could have an impact on several psychosomatic disorders including those involving the respiratory tract and allied systems. Similar protective effects of NO enhances were seen on the gastric mucosa during stress, and NO inhibitors produced opposite effects, on cold restraint stress induced gastric ulceration in rats. Some immunological parameters are still to be completed and studies are on in that direction. It is likely that the project will be completed in three months time. The data will then be analysed.

4. Studies on the possible role of pro-oxidant/anti-oxidant balance in theophylline toxicity

Theophylline is now emerging as an important adjunct to therapy in bronchial asthma because of some newly discovered pharmacological effects. The anti-inflammatory and immunomodulatory effects of the drug are now known, but a safer toxicity profile could make its use more acceptable. Its close relationship with reactive oxygen species (ROS) and reactive nitrogen species (RNS) is shown in its pharmacological effects and the present study was designed to evaluate the role of free radicals in theophylline toxicity. The study was designed to measure theophylline induced convulsions and correlate the anti-oxidant / pro-oxidant

status in the brain. Modulation of these effects with anti-oxidants was seen and melatonin and n-acetylcystrine were particularly effective in this regard. Combination of melatonin with NO synthase inhibitors had a greater effect than melatonin alone. These efffects were true for both convulsiogenic and pro-convulsant effects of theophylline. Studies in respect of theophylline, anti-oxidants and brain anti-oxidant status are in currently in progress. Anti-convulsant effects were also seen with the NO synthase inhibitor, L-NAME and 7-nitroindazole, and melatonin synergised with the NO synthase inhibitor effects. Biochemical studies with brain homogenates have supported the pharmacological data. Malondialdehyde (MDA) and total nitrates / nitrites (Nox) levels in brain homogenates were raised after aminophylline and superoxide dismutase (SOD) levels were lower than vehicle treated group. The study has also been extended to the pentylene tetrazole(PTZ)-kindling model of seizures, and the results are closely similar to that obtained in other models. The applied significance of these findings is immense with respect to the safe use of theophylline in bronchial asthma.

5. Experimental studies on the role of free radicals in emotional and environmental stress

The effects of emotional and xenobiotic stressors on immune function and its modulation by free radicals are being studied. Pharmacological and biochemical data have showed that lipid peroxidation is associated with stress induced immunomodulation and anti-oxidants reverse this. Behavioural studies have shown a close correlation between behavioural patterns and immune responses. Restraint stress (RS) suppressed both behavioural and immunoogical responses, and these were attenuated by the antioxidants, ascorbic acid and melatonin. These changes were associated with modulations in the levels of malondialdehyde (MDA) and superoxide dismutase (SOD) in the blood and the brain. The studies will now be extended to enviromnmental stressors like endosulfan, alone and in combination with RS, and the behavioural, biochemical and immunological parameters will be studied.

6. A clinical study on the regulatory role of nitric oxide in the possible association between smoking and pulmonary tuberculosis

The rate of occurrence of pulmonary TB in smokers and non-smokers were studied and several variables like age, sex, socio-economic status, intensity, duration and type of smoking were assessed. A close correlation was found between the various above mentioned factors and the incidence of pulmonary TB. Further, the levels of NO metabolites in these patients were evaluated before and after ATT, and it was observed that nitrite (NO_2) levels were higher in pre-ATT pulmonary TB patients, which were lowered after 2 months of intensive ATT with 4-drug regime (RHZE). This is an interesting finding and indicates a possible correlation between pulmonary TB, smoking and NO. It is planned to extend this study to compare NO levels in normal (non-TB) smokers and non-smokers, and also smokers and non-smokers with other commonly encountered respiratory disorders. The study is now being extended to other respiratory disorders with reference to NO.

7. A pharmacological assessment of flouroquinolone convulsiogenesis in experimental animals

The effects of some commonly used flouroquinolones (FQs) were assessed on convulsiogenesis in rats with an aim to elucidate the possible mechanisms involved therein. Although ciprofloxacin, ofloxacin and levofloxacin did not induce any appreciable seizures, per se, all these FQs induced diffrenetial degrees of seizures and lethality in rats, when combined with subthreshold electro-convulsiveshock (ECS). Pretreatments with antioxidants, alpha tocopherol and melatonin showed significant protective effects against ECS+FQ induced seizures and lethality. Depletion of antioxidant defense systems further sensitised these animals to FQ+ECS seizures. Further, FQs also had a neurosensitising effect when combined with subeffective doses of aminophylline, and these were also antagonised by the antioxidant pretreatments. The results are suggestive of the possible involvement of oxidative stress in the neurosensitising effects of FQs, and are of considerable significance with respect to the use of these agents in respiratory infections alone and in the presence of bronchial asthma.

Physiology

Research

1. Modulation of the responsiveness of the guinea pig isolated trachealis to contractile agonists under low temperature

The isolated tracheal ring segments with and without epithelium were examined in organ bath setup for recording the effect of cooling on the responsiveness of airway smooth muscle on the cumulative concentration-response curves of the contractile mediator of airway smooth muscles (ASM), and the following was absorved: *(i)* Cooling the trachea (both intact and epithelium denuded preparations) decreased maximal isometric tension (Tmax) to histamine with increased sensitivity; *(ii)* Cooling the trachea decreased both Tmax and sensitivity to serotonin. This hyporeactivity and hyposensitivity of serotonin was not modified by epithelial denudation. Cooling inhibited relaxation of the trachea to higher concentrations of serotonin (both intact and denuded preparations); and *(iii)* The influence of cooling on ASM was found to be agonist-specific and was independent of the airway epithelium.

2. Effect of severe cold and hypoxia on cardiovascular responses in rats

Measurement of pulmonary arterial pressure is required in high altitude related problems. Hypoxia induced hyperventilation and pulmonary vasoconstriction is one of the important physiological responses for the maintenance of normal ventilation / perfusion ratio during hypoxic stress, which is very important for the survival of the organism. However, accentuated response of the pulmonary vascular bed to alveolar hypoxia leads to higher elevation of blood pressure, which is one of the important factors in causation of pulmonary edema. In order to investigate this phenomenon pulmonary, systemic and ventilatory responses to hypoxia were studied by passing hypoxic gas mixture (10% O_2 & 90% N_2) through specially fabricated one-way breathing valve placed in the trachea of the rat under chloralose (80 mg / kg BW) anesthesia. The pulmonary arterial cannulation was done in rats with intact chest and recording the pressure trace. Initially the catheter, having a curve at the tip was placed inside a cannula, was introduced in to the right ventricle *via* external jugular vein. Subsequently the cannula was withdrawn then the catheter was maneuvered into the pulmonary artery. Respiratory rate was recorded using a thermocouple wire placed inside the one-way breathing valve. Blood pO_2, pCO_2 and SaO_2 were also monitored by collecting arterial blood samples anaerobically before and during hypoxic exposure using blood gas analyser.

3. Cardiovascular functions on exposure to arsenic in rats

In many countries people are continuously exposed to high levels of arsenic through drinking water. It has been suggested that arsenic exposure increases the incidence of mortality from cardiovascular diseases. The magnitude of the cardiovascular injuries may depend on the nature, duration and concentration of arsenic exposure.

The cardiovascular effects of acute and chronic exposure of Wistar rats to different concentrations (25, 50 and 60 µg / ml water) of sodium arsenate in drinking water were investigated. The animals were exposed to arsenic for different durations (acute 1-2 days, chronic 2-6 months). Blood pressure (BP), heart rate (HR) and baroreflex (BR) were recorded. Effect of certain vasoactive agents *e.g.* adenosine, acetylcholine, isoproterenol and sodium nitroprosside *in vivo* and in isolated aorta were examined before and after chronic or acute exposure of arsenic (*in vitro*). Dose responses of acetylcholine, adenosine, isoproterenol and sodium nitroprosside before and after incubation of tissues with L-NAME, glibenclamide and indomethacin were studied to examine the role of endothelium dependent mechanisms in arsenic induced vascular changes (*in vitro*).

4. Effect of morphine on neural regulation of blood pressure and behaviour in animals

The mammalian heart is innervated from the sympathetic and parasympathetic division of the autonomic nervous system and these modulate cardiac activities by acting simultaneously in varying magnitudes. Intravenous morphine decreases blood pressure (BP) and there are several issues related to the circulatory effect of epidural morphine. However, action of epidural morphine on cardiac functions is unclear.

There are reports indicating that endogenous opioids may modulate neural processes, which are essential to memory consolidation.

In this study the effect of epidural administration of morphine on arterial baroreflex was examined in rats anaesthetised with α-chloralose. Blood pressure was varied by injecting varying doses of phenylephrine or sodium nitroprusside through a polyethylene catheter in the femoral vein. Arterial blood pressure was recorded through the femoral arterial catheter using a pressure transducer (BLPR) connected to a strain guage coupler amplifier (WPI). Permanent records of arterial blood pressure and heart rate were obtained from the oscilloscope (Tektronix) on a floppy disc. A polyethylene catheter was placed at $T_1 - T_2$ level of the spinal chord for epidural administration of morphine: Morphine inhibited the baroreflex responses suggesting the involvement of sympathetic limb of the autonomic nervous system in morphine induced inhibition of the baroreflex.

5. Arterial baroreflex responses during experimentally induced hyperlipidemia in rabbits

Atherosclerosis is a major cause of coronary heart disease and death. It elicits structural changes in the systemic arteries. Atherosclerosis was earlier assumed to be an entirely structural disease. Several investigations have demonstrated that atherosclerosis is also a functional disease. Atherosclerosis is associated with endothelial dysfunction, activation of platelets and decreased baroreceptor sensitivity. Most studies have demonstrated that oxidised LDL and not the native LDL can cause slowly developing apparently irreversible inhibition of endothelium-dependent relaxation. The various treatments are not effective in reducing the plasma level of LDL, which is a major source for genesis of atherosclerosis and damage to the vascular endothelium. An endogenous herbal drug Lipotab (Hamdard, India) is known to reduce cholesterol and triglyceride in patients with hyperlipidemia. However, its mechanism of action is not known.

Therefore, in the present study baroreflex function was assessed by the conventional method. Arterial blood pressure was varied over a wide range by injecting varying doses of phenylephrine hydrochloride and sodium nitroprusside and resultant changes in heart rate were recorded. Heart rate was plotted against arterial pressure to obtain baroreflex blood pressure-heart rate relationship. Baroreflex response curves were obtained in hyperlipidemic animals and in animals treated with Lipotab having elevated cholesterol levels. The early results showed a reduced sensitivity of baroreflex chronotropic response in animals with hyperlipidemia.

6. Mechanism of action of estrogen on hemodynamic parameters in rabbits

The effect of estrogen (17 β-estradiol) on the cardiovascular performance before and after the blockade of left anterior descending coronary artery was studied in anesthetised, thoracotomised positive pressure ventilated rabbits.

The mechanism of action of estrogen by infusing 17 β-estradiol on the isolated vessels in the presence of various blockers *in vitro* preparation is being investigated. The work is in progress.

7. Bronchial reactivity in diabetic guinea pigs

Recent studies have shown that diabetic people rarely suffer from asthma. Coexistence of these two diseases, however, has also been reported in a small number of patients. Data regarding the mechanism involved in the genesis of these pathological conditions together is scarce. In this context the present study was undertaken to investigate the responsiveness of airway smooth muscle, with or without epithelium, to certain bronchoactive agents in animal models of *(a)* diabetes, *(b)* hyper-reactive airways and *(c)* diabetes with hyper-reactive airways.

Responsiveness of isolated airway smooth muscle to certain bronchoactive agents was observed in animals from control group. Similar isolated airway smooth muscle response studies have been conducted in experimental models of diabetes and hyper-reactive airways. Presently, experimental model of diabetes along with hyper-reactive airways is being prepared for further studies.

8. Neural and cardiovascular responses during epilepsy in conscious animals

In the present study the changes in electroencephalogram (EEG) and haemodynamic variables during epilepsy and after treatment with anti-epileptic drugs and calcium channel blockers were studied in conscious

animals. Telemetric technique was used for recording EEG, and blood pressure during epileptic seizures in conscious animals. Telemetry provides a number of advantages over conventional methods for monitoring blood pressure (BP), heart rate (HR) and other biopotentials from conscious freely moving animals. This procedure eliminates the stress caused by restrain and need of anesthesia during measurement. Moreover haemodynamic measurements during seizures are not possible using conventional methods. Therefore, in the present study haemodynamic variables were measured using Data Sciences International (DSI) USA, Telemetric System.

Pentylenetetrazole 50 mg/kg IP was given to the animals to induce seizures, 5 minutes after pentylenetetrazole injection the seizures were observed in the animals. The different phases of seizures were identified by observing the behaviour of the animal. The seizures lasted about 30 minutes after pentylenetetrazole injection. During this period there was increased firing of neurons. The EEG showed increased amplitude with spikes and polyspikes, which were parallel with the increase in the mean blood pressure. Pretreatment of nefidipine not only maintained the blood pressure in normal range but also reduced the seizures.

9. Effect of mucus hyper secretion on respiratory impedance in a murine model of asthma

Mucus hypersecretion is associated with plugging of airways and presumably increase in airway resistance (impedance). This had not been tested quantitatively. Inhalation of methacholine aerosol is associated with mucus secretion and bronchoconstriction in mice with experimental asthma and goblet cell metaplasia. We blocked mucus secretion in such mice by inhibition of the MARCKS protein that is essential for secretion of mucus by airway goblet cells using a 24 amino acid peptide that identical to its N-terminus (MANS). This was confirmed histologically by fluorescent staining of intracellular mucus of airway goblet cells. Mice pre-treated with the MANS peptide demonstrated significantly reduced increase in airway resistance compared to control mice, confirming the role of mucus secretion in changes in respiratory impedance. The difference between the two groups was 0.3 cm H_2O which is about one-third of normal specific airway conductance and is biologically significant.

10. Protective role of carboxylic ionophore monensin in experimentally induced septic shock in rabbits

Septic shock is commonly encountered in clinical settings and is characterised by a distributive defect and absolute volume loss into the interstitial space caused by enhanced microvascular permeability. If shock progresses, the cardiac index may become inappropriately low, with elevated systemic vascular resistance. Its management includes adequate fluid resuscitation followed by inotropic and vasoactive agents to increase cardiac index, to restore adequate blood pressure and to ensure adequate oxygen delivery to the tissues. Initially dopamine was preferred agent because it has both alpha and beta adrenergic properties that can correct the low vascular tone and sustain cardiac pump activity, but it can increase pulmonary capillary wedge pressure which is not desirable in presence of respiratory failure, a syndrome frequently associated with sepsis. For these reasons, dobutamine is preferred to treat haemodynamic disorders associated with septic shock in patients with severe pneumonia and acute respiratory distress syndrome. Dobutamine has little effect on cardiac index, therefore combination of norepinephrine and dobutamine can increase cardiac index because of both alpha-one and beta-one adrenergic property but catecholamines has a disadvantage because they are known to increase the myocardial oxygen consumption.

The carboxylic ionophores have an advantage over catecholamines in increasing external cardiac work without a corresponding increase in myocardial oxygen consumption. The occurrence of myocardial depression is a well documented phenomenon due to down regulation of beta receptor density in sepsis.

In view of the above cardiovascular effects of a strong pressor agent carboxylic ionophore (monensin) is compared with various pressor agents in experimentally induced septic shock in rabbits.

11. Evaluation of the mechanism of action of aspirin as a cardioprotective agent in experimentally induced cholesterolemic rats

Hypercholesterolemia is a most common cardiovascular disorder, which may generate free radicals and cause impairment of endothelial functions. In clinical practice aspirin is one of the drugs prescribed to the patients suffering from such vascular disorders. The beneficial cardiovascular effects of aspirin cannot be

explained completely by its known platelet inhibitory effect, as other platelet inhibitory agents have not been found as effective as aspirin. Earlier studies support the hypothesis that aspirin may possess antioxidant properties and improve endothelial function in pathophysiologic states such as hypercholesterolemia. However, the mechanism of action of aspirin at vascular level is not known. Therefore, the present study was designed to evaluate the role of aspirin on endogenous free radical generation, endothelium-derived hyperpolarising factor, endothelium-derived relaxing factor (NO) and baroreceptors mediated blood pressure regulatory mechanism in experimentally induced hypercholesterolemia in rats.

12. Effect of remote preconditioning on myocardial reperfusion injury

Ischemic preconditioning (IPC) is known to reduce infarct size of heart caused by reperfusion. Protection can be achieved either by an ischemic stimulus of the heart itself or by ischemia of an organ distant to the heart. Protection by inducing ischemia of a distant organ to the heart is known as 'Remote Preconditioning' (RPC). Recent studies have indicated that a brief period of ischemia and reperfusion (ischemic preconditioning) in a remote organ reduces myocardial infarct size, protecting against subsequent sustained myocardial ischemia. Remote preconditioning has been suggested to act *via* both humoral and neuronal pathways. Several mediators have been suggested to be involved in this process. Adenosine, Delta-1 opioid receptor, Bradykinin have been found to initiate the cardioprotective effect of RPC. A recent study showed the involvement of AT_1 receptor in remote renal preconditioning. PKCε (Protein kinase Cε), NO and K_{ATP} channels, all have been shown to mediate RPC.

However, an orderly signal transduction pathway of RPC is still unclear and elusive, which needs a detailed study to explore the potential mediators of this phenomenon. PKCε has been found to mediate the cardioprotective effect of RPC. Mesentric artery PC reduces infarct size, which is completely blocked by PKC inhibitor. RPC also reduces the cytosolic / particulate fraction of PKCε -an indicator of PKC activity. However, the precise mechanism(s) of RPC is still not clear. In early IPC, PKCε is activated *via* PI3K / Akt pathway, which ultimately activates mitochondrial K_{ATP} channels. Mitochondrial K_{ATP} channel is the most important mediator in the cardioprotective effect of IPC. Diazoxide, a selective activator of mitochondrial K_{ATP} channels has been shown to be protective and a selective inhibitor of mitochondrial K_{ATP} channels, 5-hydroxydecanoate, blocks the protection provided by IPC. It has been reported that eNOS activates mitochondrial K_{ATP} channel *via* PKCε dependent mechanism in the cardioprotective action of IPC. Kuntscher *et al*, 2002, reported that NO plays an important role in the mechanism of both acute 'classic' as well as acute RPC. Therefore, it is possible that remote preconditioning induces cardioprotection *via* activation of eNOS–PKCε – mitochondrial K_{ATP} channel pathway.

13. To study the vasoactive responses in animal models of non-cirrhotic portal hypertension (NCPH)

We shall be developing more rabbit model of non-cirrhotic portal hypertension as per the standardised protocol to further extend our study in understanding the pathophysiology of portal hypertension. The availability of the non-cirrhotic portal fibrosis models gives us an opportunity to study the development of collaterals and consequent porto-systemic shunting using fluorescent microspheres. Blood flow will be measured in the superior mesenteric vein and artery using transit time ultrasound in future. These studies are necessary to validate the increase in the regional blood flow and splanchnic blood flow, which are part of the hyperdynamic circulation seen in portal hypertension. We would also determine the role of nitric oxide in portal hypertension. Serum nitrate and nitrite shall be measured using Griess reagent in the blood plasma. We would further see inducible and constitutive nitric oxide synthase expression.

14. Studies on hemodynamics and vascular responsiveness in rabbit model of non-cirrhotic portal hypertension

The effect of non-cirrhotic portal hypertension on isolated aortic tissues of rabbits was studied at one month after the induction of portal hypertension. The results have shown a hyper-responsiveness of aortic smooth muscles activity in isolated aortic segments recorded in isolated tissue organ bath setup. The tissues from control animals and from experimental animals (non-cirrhotic portal fibrosis) were tested with vasoconstrictors-phenylephrine and potassium chloride. There was biphasic of acetylcholine and isoproterenol action noted in the aortic rings from both the control and experimental animals. By inhibiting endothelium dependent mechanism individually (NO blocker, K channel blocker, postacyclin inhibitor) we

have attempted to elucidate whether vascular endothelium has any role in the responsiveness or aortic tissues from non-cirrhotic portal fibrosis animals.

15. Behaviour of pulmonary vagal sensory receptors during high altitude exposure

When man is exposed to high altitude, he experiences a variety of respiratory responses such as cough and tachypnea accompanied by dyspnea. It has been often speculated that these responses are due to stimulation of the sensory receptors of the lungs with vagal afferents. However, till date no study has been performed regarding the behaviour of lung receptors during high altitude simulation. On ascending further, many of these subjects suffer from pulmonary edema. It is possible that at moderate altitude, during acute exposure, the sensory receptors may be giving warning signals about the condition of the lung. When the duration of exposure is extended, their activity may get 'adapted' with the result one continues climbing and pulmonary edema gets precipitated. Alternatively, these receptors may continue to get stimulated and their increased activity may try to prevent the body getting into a comatous state. A preliminary investigation to examine these proposals has just been started in experimental rabbits.

Radiodiagnosis and Imaging

The Department continued to provide routine diagnostic services to the patients attending the Clinical Research Centre of the Institute. The Department consists of three units: *(i)* CT Scan Unit, *(ii)* Ultrasound Unit and *(iii)* X-ray Unit.

(i) CT Scan Unit

A total of 828 CT examinations were performed during the year as per details given below:

Examination	Number
Chest CT	624
Head CT	20
PNS CT	71
Spine CT	01
Abdomen CT	03
CT guided FNAC	109
Total	**828**

(ii) Ultrasound Unit

A total of 582 Ultrasound examinations were done during the year as per details given below:

Examination	Number
Chest USG	223
Abdomen USG	321
USG guided procedures	38
Total	**582**

(iii) X-ray Unit

A total of 14834 X-ray examinations were done during the year as per details given below:

Examination	Number
Chest X-rays (film)	11247
Chest X-rays (PACS)*	2433
PNS X-rays (film)	648
PNS X-rays (PACS)*	438
Bone X-rays (film)	68
Total	**14834**

***Picture archiving and communication systems**

Respiratory Allergy and Applied Immunology

Research

1. Clinico-immunological studies on clinically important fungal allergens

Alternaria and *Mucor* have been found to be important fungal allergens of Delhi metropolitan area. These two fungi have been cultured for preparation of allergen extracts. Their physiochemical and clinico-immunological properties will be studied by performing skin tests, RAST, RAST inhibition, SDS-PAGE, immunoblot, etc.

2. Inhibitory effect of Azelastine nasal spray on histamine and allergen induced skin prick test (SPT) response in patients with allergic rhinitis

The results of this study suggest that diagnostic skin tests on the patients could be performed even when they were using antihistamine nasal spray (Azelastine). There was no difference in the results obtained on male patients as against female patients.

3. Comparative evaluation of allergenic significance of various species of mosquitoes prevalent in Delhi metropolitan area and physicochemical and immunochemical characterisation of their whole body extracts

Of the various species of mosquitoes prevalent in Delhi atmosphere, three species namely, *Anopheles stephensi*, *Culex quinquefasciatus* and *Aedes aegypti* have been reported to be clinically significant in patients with IgE mediated Type I allergic respiratory disorders. We have planned to study their clinical and immunochemical properties. Heterogeneity of patient's immune response to various allergenic components in these three different species will also be investigated. Identification, purification and isolation of clinically important major allergens in the aqueous extracts will also be undertaken. Extensive laboratory rearing was undertaken to obtain suitable amount (about 100 grams dry wt.) of the whole body lyophilized powder. Besides laboratory rearing of another mosquitoes species (*Anopheles stephensi*) is in progress.

Allergen extract of *Culex quinquefasciatus* was prepared and skin prick tests have been performed on patients suffering with naso-respiratory disorders. Blood samples from suitable patients have been collected for further immunochemical and clinico-immunologic studies.

4. Identification, purification and characterisation of major and minor allergens of some clinically important allergens of India used for the diagnosis and immunotherapy of patients suffering with allergic rhinitis and bronchial asthma and development of techniques and reagents for their quality control

For quality control of allergen extracts used for diagnosis and immunotherapy of patients suffering with IgE mediated type I allergic naso-bronchial disorders, quantification of total allergen contents has been recommended. We have undertaken a detailed study: *(i)* to identify of major and minor allergens of various clinically important indigenous allergen extracts of our country, and *(ii)* to develop techniques and prepare reference reagents for quality control of clinically important indigenous allergen extracts. For the present study, extract of various clinically important inhalant allertgens, *i.e.* pollen, fungi, insects, etc., will be studied.

During the last one year allergen extract of one insect *Culex quinquefasciatus* and four pollen types (*Prosopis juliflora, Ricinus communis, Holoptelia integrifolia, Morus alba)* have been prepared and skin tests on the patients have been performed to study their allergenic significance. Blood samples have been collected for further immunochemical studies.

5. Assessment of biocontaminants from indoor environments

The present study has been initiated to study the indoor air quality in some school buildings in Delhi which includes identification and quantification of fine, living airborne bio-particles, which may be responsible for variety of diseases among the occupants of the building (students). The three schools selected for the study include; *(i)* Govt. Senior Secondary School (boys & girls), Dhaka, *(ii)* Anglo-Indian School, Daryaganj and *(iii)* G.G.K.G. School, Daryaganj. These schools have diverse building configuration. For achieving the goals of the project air samples will be collected and analysed for various biocontaminants (fungi and bacteria) and their seasonal variations will be studied. Techniques to be used for the project have

been standardised. Biocontaminants of outdoor air will also be studied to study the factors affecting indoor aerospora. Besides information will also be collected from occupants of the building (students) regarding their health problems. The database will be used to consider sick building syndrome and building related illness.

6. Effect of a polyvalent bacterial extract in the prophylaxis of acute exacerbation of COPD

The study was performed to find out the effect of 7 mg of polyvalent bacterial extract (Bronchovaxom) per day on clinical parameters and frequency of exacerbations in cases of moderate to severe COPD. There was a significant decrease in the mean number and duration of acute episodes in the group treated with Bronchovaxom. There was also a significant reduction in severity of cough, expectoration and dyspnea in those treated with Bronchovaxom. A significant reduction in the use of antibiotics, bronchodilators and expectorants was with the use of Bronchovaxom. It was concluded that the addition of Bronchovaxom results in reduction in number and duration of exacerbations and improvement in symptoms and reduction in use of concomitant medication in patients of moderate to severe COPD.

Respiratory Medicine

The Department is involved in the patient care (Outdoor and Indoor), research on different aspects of respiratory diseases and teaching of the postgraduate students in the subject – Pulmonary Medicine (MD and DTCD) of University of Delhi.

Research

1. Prevalence of sleep related breathing disorders in Indian adults

A population-based survey to ascertain the prevalence of sleep related breathing disorders in Indian adults was conducted in urban population of Delhi. Thirty-two municipal wards (as clusters), out of a total of 134 wards of the Municipal Corporation of Delhi, were selected by cluster sampling method initially. One polling station from each cluster was then selected by simple random sampling method. Population of each polling station was ascertained and households from each polling station were selected by systematic sampling method to obtain a sample of 225-250 people from each polling station. Field Investigators (Medical-Social Workers) made home visits to administer a predetermined questionnaire to all adult members of over 18 years of age residing in the house and asked questions exactly as per the questionnaire and filled up the responses. The questionnaire had fifteen multiple-choice questions and each question was scored according to the severity of breathing disorder symptoms by use of a five-point scale. Each subject was asked to choose one of the five alternative answers to each question: *1.* "never", *2.* "less than once a week", *3.* "once or twice a week", *4.* "three to five nights / days a week" or *5.* "almost everyday / night". The responders were classified as having sleep related breathing disorder symptoms, if they had loud snoring (scores 4 or 5) and / or daytime sleepiness (falling asleep immediately during the day time while working, reading, etc.) (scores 4 or 5). At the time of interview, age, weight (portable scale) and height were recorded. Detailed sleep study (polysomnography) will be conducted in the Institute on a group of subjects with snoring and daytime sleepiness (score 4 or 5).

The questionnaire on sleep related breathing disorders was administered to 7975 subjects from 32 polling stations and this included 4050 (51%) males and 3925 (49%) females. The mean age of the study population was 38.83 ± 15.70 yrs, mean height 1.62 ± 0.08 m, mean weight 60.79 ± 11.18 kg and mean body mass index (BMI) 23.15 ± 3.76 kg / m^2. Of the 7975 subjects in the study, 411 (5%) had sleep related breathing symptoms. Two hundred and sixty-two (7%) of males and 149 (4%) of females had sleep-related breathing symptoms.

The symptom of snoring was significantly higher in males compared to females (6.1% *vs* 3.3%, P<0.0001). However, morning headache, choking during sleep, memory loss, tiredness, nightmares, nocturnal awakening, difficulty in falling asleep, and history of hypertension and diabetes mellitus were significantly higher in females. Subjects with sleep related symptoms were significantly older in both males (48.14 ± 13.16 yrs *vs* 38.22 ± 15.79 yrs, P<0.0001) and females (49.07 ± 13.94 yrs *vs* 38.40 ± 15.51, P<0.0001) compared to subjects without symptoms. The mean weight and mean body mass index were also significantly higher in both male and female subjects compared to subjects without symptoms. Among the subjects with sleep related symptoms, the prevalence of snoring was significantly higher in males compared to females (94.6% *vs* 87.2%, P<0.01). The proportion of subjects having sleep related symptoms increased as age advances. The same trend was seen in both male and female subjects.

Detailed polysomnographic studies were done in thirty-eight subjects so far.

2. Clinico-immunologic studies on allergen specific immunotherapy in patients of respiratory allergy

Studies on allergen specific immunotherapy from Europe, USA and other countries of the world had showed beneficial effects in allergic rhinitis and asthma. In India, immunotherapy is practiced since the last three decades, but systematic clinical trials are lacking. Here, patients are exposed to multiple aeroallergens throughout the year contrary to temperate regions. The present study aims to carry out double-blind placebo-controlled trial to assess benefits of immunotherapy in patients of respiratory allergy. During the six months period, 25 patients each were recruited in active (therapy) and placebo groups on the basis of history and intradermal testing with allergen extracts. The patients with marked positive skin tests showed significantly elevated specific IgE against respective allergen(s) than normal control. The patients in both the groups

exhibited airway hyper-responsiveness after histamine challenge. After six months of immunotherapy with 2-8 antigens, the patients showed marked reduction in drug/symptom score on a 4-point scale in active group but not in placebo group. Similarly, specific IgE levels are decreased but specific IgG are slightly increased than basal level. Along with IgG, IgG 1 response also showed slight increase. Analysis of cytokines (IL-4,IL-5 and IFN-γ) and IgG4 is underway.

3. Quantitative assessment of exposure to indoor fungi in relation to sensitisation in childhood asthma in Delhi

Asthma is a serious and potentially life threatening illness that affects many children. Indoor fungi are potential sensitisers in early childhood and their quantitative and qualitative prevalence is important for diagnosis and environmental management of asthma.

To investigate indoor fungal concentration and sensitisation pattern to predominant fungi in 50 homes of asthmatic/allergic children, survey was performed using Andersen volumetric air sampler for one year. The atopic status of asthmatic children in allergy to fungi was determined by skin prick test (SPT) to a panel of indoor fungal antigens.

The predominant types observed were *Aspergillus niger*, *A. flavus*, *A. fumigatus*, *A. nidulans*, *Alternaria spp.*, *Cladosporium spp.*, *Penicillium spp.*, *Rhizopus spp.* and *Curvularia spp.*, etc. The highest fungal concentration was observed in the month of January and lowest in June. *Cladosporium spp*. was the highest contributor (1780 CFU/m^3) with 22.6% to total fungal colony concentration in the indoor environment of patients followed by *A. versicolor* (1268 CFU/m^3), *A. niger* (1077 CFU/ m^3), *Alternaria spp.* (996 CFU/ m^3), *A. flavus* (619 CFU/ m^3), and *Penicillium spp.* (508 CFU/ m^3). Outdoor/control environment also showed highest concentration of *Cladosporium spp.* (1874 CFU/ m^3) similar to indoor air followed by *A. versicolor* (1033 CFU/ m^3), *A. niger* (1213 CFU/m^3) and others.

A. fumigatus showed highest (19%) clinically significant skin reactivity in children followed by *A. nidulans* (15.6%), *Alternaria alternata* and *Penicillium citrinum* (14.9%). Mild sensitisation was observed in 29.8% of the children, whereas, 40.4% children showed 2+ and above skin positivity to at least one fungi.

In conclusion, a significantly high viable mold concentration was observed in the homes of asthmatic children in Delhi and thus allergy to mold is one of the risk factors for the development of asthma/allergy in children.

4. Co-occurrence of allergic rhinitis and bronchial asthma, and effect of exposure to environmental tobacco smoke in patients with bronchial asthma and/or rhinitis

Allergic rhinitis and bronchial asthma are now being described as a continuum of inflammation involving one common airway. Exposure to environmental tobacco smoke (ETS) is increasingly being recognised as a key factor in asthma. This study aimed to determine the frequency of co-occurrence of allergic rhinitis and bronchial asthma and to assess the effect of ETS in these patients. A total of 111 patients with a clinical diagnosis of bronchial asthma and/or allergic rhinitis were included in the study. Twenty healthy subjects with no personal or family history of atopy served as controls. All the patients and controls were administered a questionnaire by the same investigator. Of the 111 patients, 83 had bronchial asthma and allergic rhinitis, nine had bronchial asthma only and 19 had allergic rhinitis only. The frequency of co-occurrence of bronchial asthma and allergic rhinitis was 90.2 percent. Both current and perinatal ETS exposures were significantly high in patients with asthma, with or without rhinitis. Cough was the most common symptom on exposure to ETS followed by breathlessness. Both were significantly high in patients with asthma, with or without rhinitis. This study demonstrated that bronchial asthma and allergic rhinitis are closely linked to each other with a co-occurrence of 90 percent. It also showed that ETS exposure, both current and perinatal, is significantly associated with the occurrence of asthma.

5. Assessment of subjective symptom perceptual accuracy of children with asthma and their parents

We assessed the subjective symptom perceptual accuracy of 52 children (30 boys and 22 girls) with asthma and the parent accompanying the child. Zone accuracy index was used in which a pair of subjective (VAS) and objective readings (% of personal best PEF) was evaluated for a match in zones. The average age of our patients was 10.24 years. The mean duration of asthma was 5.87 years while the average age of onset of

disease was 4.21 years. A total of 1456 pairs of subjective and objective readings of 14 days were obtained from the child and parent pairs. There was no significant difference when the accurate readings of children were compared to parents, whether the child was stable or unstable. Also, there was no significant difference between the accurate and inaccurate readings of children and parents. Matches suggestive of overestimation were significantly more in children than in parents. However, in both children and parents, overestimation occurred significantly more than underestimation. When the child was unstable, the most common error for both parents and children was to underestimate symptom severity. However, this underestimation was significantly more than accurate assessment only in parents and not in children. Subgroup analysis revealed that children and parents in mild-moderate group were as accurate as that in the severe group. When inaccurate, children and parents in the severe group underestimated severity significantly more times than those in the mild-moderate group.

6. Assessment of biweekly therapy with prednisolone in the management of allergic bronchopulmonary aspergillosis

We assessed the feasibility of a biweekly prednisolone regimen in 26 patients with allergic bronchopulmonary aspergillosis. The patients were alternatively divided them into 2 groups. After the initial daily dosage for 2 weeks in both groups, an alternate day tapering regimen was initiated in *Group-1*, while a biweekly tapering regimen was followed in *Group-2*. The patients were periodically assessed at 2-monthly intervals for 6 months. The baseline mean duration of illness, total IgE and eosinophil counts were higher while the mean FEV_1 was lower in *Group-2,* but there was no significant difference. A significant ($p<0.05$) improvement in FEV_1 was observed at 2 months in both groups. The total IgE level also decreased significantly at all 2-monthly intervals in both groups. Eosinophil counts decreased significantly from 0 to 2 and 2 to 4 months in both groups. However, one patient in *Group-2* had exacerbation at 3 months and was withdrawn from the biweekly regimen. We concluded that biweekly therapy with prednisolone is as effective as alternate day therapy in managing patients with ABPA.

7. Various clinical aspects of allergic bronchopulmonary aspergillosis

Data on 121 patients with allergic bronchopulmonary aspergillosis (ABPA) were studied. The mean age of the patients was 32 years and the mean time for diagnosis of ABPA was 11 years. Cough and breathlessness were the commonest symptoms, followed by expectoration, wheezing, haemoptysis and chest pain. One patient did not have clinical asthma. Family history of atopy was elicited in 46% patients. Prior to presentation, 80% had erroneously been treated for tuberculosis. Type I skin reaction with *Aspergillus* antigens was positive in all patients. Serum precipitins against *Aspergillus* species were detected in 85%. Total IgE was elevated in all, while IgG / IgE-*Af* was demonstrated in 97% patients. Fleeting shadows were seen in 89% patients. Concomitant allergic *Aspergillus* sinusitis was present in 10 patients, two of whom also had an aspergilloma.

8. Various clinical aspects of pulmonary / extrapulmonary sarcoidosis

Data on 118 patients with sarcoidosis were studied. The mean age of the patients was 43 years and the mean duration of illness was two years. Cough and breathlessness were the commonest symptoms, followed by expectoration, wheezing, chest pain, and haemoptysis. Constitutional symptoms included fever, weight loss and appetite loss. Extrathoracic involvement manifested as skin lesions, nasal symptoms, arthralgia, ocular lesions, cardiac involvement and epididymitis. Clubbing was seen in nine patients. Only two patients had Lofgren's syndrome. Radiologically, 26%, 53% and 19% patients had Type-I, Type-II and Type-III diseases respectively. Two patients had miliary sarcoidosis, while pleural effusion was seen in three patients. Fibreoptic bronchoscopy was done in 92 patients with bronchial / transbronchial biopsy diagnostic in 83. In the remaining 35 patients, sarcoidosis was confirmed histologically by biopsies from other sites.

9. Association of IL-4 gene polymorphisms with asthma in North Indians

Asthma is a complex airway disorder, and a number of genetic loci have been found to be associated with asthma. The 5q31-33 region is one of the most important loci linked to asthma and atopic disorders. However, association studies with candidate genes in this region, such as IL-4, were inconclusive, as both positive and negative results were obtained in several populations studied. The aim of our case-control study was to determine the association between IL-4 and asthma in North Indians. Polymorphisms in the promoter and a dinucleotide repeat in the second intron in IL-4 were genotyped by sequencing and GeneScan analysis,

respectively, in ethnically matched, unrelated patients (n=171) and controls (n=128), following the guidelines of the American Thoracic Society. The proximal promoter region of the IL-4 gene was found to be invariant. Previously reported polymorphisms, -590 C/T and +33 C/T, were found to be absent in our population. The χ^2 test using only large expected cell counts (more than 5% of the sample size) showed a significant association between allele size and disease status (χ^2=38.08, d.f.= 6, $p<0.05$). In addition, a significant difference was observed for the allele and genotype frequencies ($p < 0.0005$ and $p = 0.0009$, respectively) in the patient and the control groups using the Fisher-Freeman-Halton test. Our studies indicate that the promoter of the IL-4 gene is invariant in our population. The case-control studies on the CA repeat polymorphism in the 2nd intron of the IL-4 gene have shown interesting results and indicate the need for further family-based studies.

10. Relationship of serum total IgE levels with pulmonary function in asthmatics

Previous studies suggest the importance of IgE in the patho-physiology of asthma and development of airflow obstruction. Such studies are lacking in Indian subcontinent, though a large population in different age-groups suffer from bronchial asthma. The present study was aimed to determine correlation between elevated serum total IgE and impairment of pulmonary function in asthmatics. Altogether 107 consecutive patients (mean age 32.27 years) of bronchial asthma were included in the present study. Serum total IgE was estimated by ELISA in each patient. Spirometric evaluation of all the patients was done as per the American Thoracic Society guidelines. Chi-square test was used to compare the data of serum total IgE and pulmonary function test. Maximum patients with elevated IgE (201 to >800 IU/ml) were in 31-40 years age group (n=26) followed by 21-30 years (n=23) and least (n=06) in 51 years and above age group. Based on 265 IU/ml IgE cut-off (mean ± 2SD of NHS), 50 (40.6%) asthmatics with or without rhinitis were with impaired (mild, moderate or severe) lung functions. Family history of atopy, skin test positivity, serum total IgE and pulmonary obstruction did not show any correlation. Statistically significant correlation (p=0.008) was observed between elevated serum total IgE levels and decline in pulmonary function (FEV_1) in asthmatics. No such correlation (p=0.620) was evident in asthmatics with associated rhinitis. The measurement of total IgE levels is not significant to assess the extent of pulmonary obstruction and/or sensitisation in patients of asthma with rhinitis.

11. Rice allergy: A chest hospital based survey and immunological analysis of rice extract

Rice can induce asthma and aggravate breathlessness. The present study was aimed to diagnose rice allergy in the patients of respiratory allergy. A total of 1200 patients were included in this study. Patients reporting an allergic reaction on every occasion after eating rice were considered history positive. Skin prick test was performed with rice and other common food extracts. Oral food challenge and double-blind placebo-controlled food challenge were performed to confirm the cases of rice allergy. Protein in rice extracts was separated by SDS-PAGE and Western blot. Serum specimen from skin prick test positive patients were analysed by immunoblot and ELISA. Out of 1200 cases screened, 165 patients gave history of rice allergy. Skin prick test carried out with rice extract demonstrated marked positive reactions in 20 (12.1 %) patients. Specific IgE to rice was highly raised in these patients (ODs 0.30 to 0.654) as compared to normal control (ODs 0.098). Oral food challenge and double-blind placebo-controlled food challenge in these cases confirmed allergy to rice in 4 (2.4 %) patients. SDS-PAGE profile showed 21, 11 and 6 silver stained band of native, boiled and wash water rice extract. Immunoblot with individual rice hypersensitive sera showed 60, 56, 33 and 16–14 kDa, protein as a major allergen. However, boiled rice extract showed 3 IgE reactive bands of molecular weights 53, 24 and 16 kDa with pooled hypersensitive sera. In conclusion, rice allergy was confirmed in 2.4 % cases. Rice can induce IgE mediated allergic reaction and therefore it can be considered as cause of food allergy.

12. Breath carbon monoxide concentration in cigarette and *bidi* smokers in Indian population

To measure and compare the breath CO levels in cigarette and *bidi* smokers in India, a total of 389 smokers (148 *bidi* smokers, 241 cigarette smokers) were included in the study. Breath CO was measured using portable breath CO analyser (Bedfont-England, Smokerlyzer). Analysis of breath CO was made comprising subject who had smoked less than 5 pack years or more than 5 pack years. The tobacco contents of different *bidi* and cigarettes were also measured. Statistical analysis was done using statistical package for social sciences (SPSS), student t test, Levene's test and Chi-square test. A total of 389 smokers with average age of 38.69±13.44 years were studied. The average duration of smoking was 18.19±13.03 years. Average breath CO observed

was 15.62 ppm in smokers and 4.075±1.163 in non-smokers. Average breath CO level was 13.62±5.78 ppm in cigarette and 18.88±7.67 ppm in *bidi* smokers (P<0.001). Breath CO level was significantly high (P=0.002) in *bidi* smokers compared to cigarette smokers when total consumption of *bidi* / cigarette was more than 5 pack years. Average tobacco content of *bidi* (216.8 mg) was significantly less than cigarette (696 mg). *Bidi* is equally or more harmful than cigarette smoking. One *bidi* equal to one cigarette may be used for calculating pack year smoking.

13. Indoor air pollution and respiratory function of children in residential area of Delhi

To assess the impact of indoor air pollution on respiratory functions of children residing in Ashok Vihar area of Delhi, 441 children between the age group 7-15 years from upper, middle and lower socio-economic status family were enrolled for this study. Information about demographic details, in-home smoking, children's respiratory tract illness (cough, wheezing, running nose, or nasal blockage) and indoor suspended particulate matter was collected and analysed. Out of 441 children, 59% were males. Ventilation was poor in 31% of houses, *i.e.* kitchen without exhaust. Respiratory health profile suggested cough in 39% children, suptum production in 14%, shortness of breath in 18%, wheezing in 17%, common cold in 27% and throat infection in 22% of children. Domestic suspended particulate matter (SPM) in 121 children's houses varied from 0.22 to 12.68 mg / m^3 with a mean of 1.5239 mg / m^3 (± 1.4481). Out of these 121 children, 61 (50.4%) had respiratory problems. SPM levels observed was less than 1.5 mg / m^3 in 27 children's houses (44%) and greater than 1.5 mg / m^3 in 34 (56%). In rest of the 60 children who did not have respiratory problems, domestic SPM level observed was less than 1.5 mg / m^3 in 48 (80%) but this was greater than 1.5 mg / m^3 in 12 (20%) children's houses. The study shows that SPM level greater than 1.5 mg / m^3 has significant effect in developing respiratory illness in children. The average indoor SO_2 and NO_2 levels observed in this area was 3.45 mg / m^3 and 20.09 mg / m^3, respectively. Environmental tobacco smoke also have significant effect on respiratory illness of children (p=0.02).

14. Effect of household cooking smoke on the respiratory symptoms of children aged 7-15 years at the Ashok Vihar, Delhi

The health consequences of exposure to household cooking smoke (HCS) among children have been the subject of intense scientific and public health concern. To determine the effect of household cooking smoke and its effects on respiratory symptoms of children, 441 children aged 7-15 years from lower, middle and higher socio-economic classes of the Ashok Vihar area of Delhi were studied. The consent from the parents was taken from all subjects included in the study. The demographic details including in-house smoking, environmental tobacco smoke (ETS) exposure, fuel used for cooking, ventilation in house, children's respiratory illness, etc., were collected from each participant. Indoor samples were collected to know SO_2, NO_2 and suspended particulate matter (SPM) levels in houses. 30.6% houses have only one room that belongs to lower socio-economic class. 69.4% belongs to upper and middle class economic group having separate kitchen with exhaust. Children of lower economic class have more respiratory symptoms than middle or upper class children (p<0.05). Children staying in houses where kitchen is without exhaust (21.7%) has significant respiratory symptoms (p<0.05). Children staying in house where coal, wood and kerosene are used as cokking fuels (22.1%) have significantly high respiratory symptoms (p=0.03) than those using liquefied petroleum gas (LPG) as cooking fuel (77.1%). SO_2 level was found to be significantly high in houses where coal, wood, kerosene was used for cooking food and had significantly high respiratory symptoms (p=0.003) in children staying in these houses. SO_2 level increases with the use of coal, wood, kerosene, etc., as fuel for cooking and also have significant effect on respiratory system of children. The study results show that use of coal, wood, kerosene as cooking fuels have adverse effects on respiratory functions of the children. Therefore, in conclusion, every effort has to be made to reduce children's exposure to household cooking smoke to give them a chance to grow up in healthier environment, through good ventilated houses and ue of solar cooker and smokeless *chulah,* etc..

15. Smoking cessation intervention and continuous abstinence rate at one year

Smoking cessation intervention has become an urgent need because of increased prevalence of tobacco use and increased mortality and morbidity due to tobacco use. Tobacco will become the single leading cause of death by the year 2020 causing 1 out of 8 deaths. Tobacco use is the major preventable cause of death worldwide and the cost effectiveness of clinical smoking cessation intervention have been reported. A total

number of 693 subjects (678 males and 15 females) attended the Tobacco Cessation Clinic (TCC) of V.P. Chest Institute, Delhi, over a period of three years. Out of these 693 subjects, 459 have been followed up for one year and have been included in this study. These subjects had approached to TCC for quitting of their own, through posters, banners displayed or through other subjects who had already enrolled themselves earlier. A pre-planned questionnaire was filled up taking into consideration of tobacco use and willingness to quit. The level of dependence was measured through fagerstrom test. Breath carbon monoxide (CO) level in part per minute (ppm) was measured during their visits. Counselling was given to all subjects. Depending on their severity of dependence, pharmacological treatment was also given. Target quit date was preferentially 8^{th} day of starting the treatment and Bupropion SR 300 mg per day was given for seven weeks. Intensive counseling was provided by the physician at the baseline and brief counselling at every visit weekly during treatment phase and at 12^{th}, 16^{th} and every month. Self reported abstinence was confirmed by a carbon monoxide concentration in expired air at every visit. A follow up visits has been made 719 times by subjects. Out of 693 subjects, 459 have been followed up for one year and these 459 (450 males and 9 females) subjects are included in this study. The average age of subjects were 37.48 ± 13.73 years (15-75 years). The maximum number of subjects were between 20-29 years followed by 30-39 years. This implies that middle age group is more likely to seek help for tobacco cessation. 91.3% of subjects were Hindu by religion. 68.8% of subjects were married. 50.5% of subjects were having education more than 12 class standard. 78.4% subjects were smokers and 12.6% were having smokeless tobacco whereas 8.9% were using both smoking and smokeless tobacco. 55.6% of subjects started these tobacco habits between 11-20 years of age. Majority (53.4%) of subjects stated these habits due to peer pressure. Family history of tobacco use was present in 31.4% subjects. 72.1% subjects were without any co-morbidity. The intervention for tobacco cessation was counselling (81%), counselling with medication (19%). The continuous abstinence rate for these 459 subjects at 1 month, 3-month, 6-month and 12-month was 25.77%, 24.4%, 23.09% and 22.22% respectively. Bupropion SR with counselling has an effective aid to smoking cessation. The continuous abstinence rate at one year is 22.22%.

Respiratory Virology

Research

1. Role of TGF-β on nitric oxide synthase dependent inflammation during experimental influenza infection in mice

Influenza virus infection activates the interferon (IFN) inducible gene, nitric oxide synthase 2 (iNOS). The production of nitric oxide (NO) *via* the iNOS is regulated by a complex network of cytokines. Among these, transforming growth factor-β1 (TGF-β1) is known to suppress iNOS expression and NO production. NO has been shown to contribute to the pathogenesis of influenza virus *via* the formation of more reactive species peroxynitrite.

Eight-week-old BALB/c mice were intranasally instilled with influenza A virus (A/Udorn/317/72/H3N2), 4.1×10^3 PFU of virus in 50µl of allantoic fluid or mock infected 50 µl of allantoic fluid. rTGF-β1 administered to mice by giving intravenous injection of rTGF-β1, 0.5 µg/kg body weight of mouse. The mice were euthanized on days 3, and 6 post infection (p.i.) for analysis of the parameters. Cytokines (IFN-γ and IL-10) in BALF, iNOS activity and NO assayed in the lung homogenate. We observed an increase of lymphocyte count both on 3rd and 6th day p.i. however, administration of rTGF-β1 with virus reduced the lymphocyte count. A significant increase of INF-γ was observed on 3rd day p.i. and reduced to basal level on 6th day. IL-10 level was maximum on 6th day in virus instilled group. Simultaneous administration of rTGF-β1 with virus instillation inhibited release of INF-γ level on 3rd day and increased level of IL-10 till 6th day. The NO production was detected on 3rd day p.i. and maximum level was observed on 6th day p.i in virus instilled group. However, simultaneous administration of rTGF-β1 with virus significantly reduced the level of NO on 3rd and 6th day p.i. Enzymatic level of iNOS was found maximum on 6th day p.i. in virus instilled group and reduced significantly on simultaneous administration of rTGF-β1 with virus. rTGF-β1 acts as an immunomodulatory cytokine and inhibits lymphopoesis after virus infection and lymphocyte activation. It modulates the inflammatory process by inhibiting INF-γ, a proinflammatory cytokine and increased release of IL-10, an anti-inflammatory cytokine. This in turn supresses the interferon inducible gene, iNOS. rTGF-β1 affects recruitment of inflammatory cells and production of NO at the site of inflammation by inhibiting lymphocyte invasion and interfering cytokine mediated inflammatory cascade.

2. Influence of influenza virus infection on cytokine and inflammatory responses in murine model of allergic asthma

Th2 lymphocyte responses are associated with inflammation and disease during allergic responses. Exposure to particular environmental factors during the expression of allergy could result in more pronounced Th2-like immune responses and more severe disease. One factor might be a respiratory virus infection. The aim of our study was to investigate the influence of influenza virus infection on the expression of ovalbumin (OVA)-induced allergy in BALB/c mice. We determined IgE, cytokine profiles in serum and bronchoalveolar lavage (BAL) and histopathological lesions in lungs of OVA-allergic mice after influenza virus (IV) infection. OVA sensitisation and challenge induced IgE in serum, Th2 cytokine release, and mononuclear and eosinophilic inflammation in the lungs. Influenza virus inoculation during the challenge period enhanced OVA-induced IL-5 and IL-10 in BAL and serum. Influenza virus further enhanced the OVA-induced hypertrophy of mucous cells and eosinophilic infiltration in lung tissue. Surprisingly, IV infection decreased Th2 cytokine secretion and eosinophilic influx in bronchoalveolar lavage of OVA-allergic mice. Influenza virus did not change IgE levels in serum. Furthermore, the IV-induced IFN-γ release in BAL of OVA-allergic mice was diminished. Influenza virus infection enhanced particular OVA-induced Th2 cytokine responses and pulmonary lesions in allergic mice and thus aggravated allergic asthma.

3. Characterisation of influenza virus in clinical specimens by rapid molecular techniques

Thirty-five nasopharyngeal swab (NPS) and throat swab specimens were collected from the patients of upper respiratory infection from the OPD of Maulana Azad Medical College (MAMC), Delhi. After processing, the specimens were inoculated into various cell lines *viz.* MDCK and Hep2. Influenza virus was isolated from 4 specimens exhibiting cytopathic effect (CPE) after 48 hours of incubation, which was confirmed by

haemagglutination inhibition test. These specimens were stored at – 80 °C for further characterisation and typing of influenza virus by restriction fragmentation length polymorphism (RFLP), single strand conformation polymorphism (SSCP) and hetroduplex mobility assay (HMA) techniques.

A quick genetic method developed in our laboratory for the screening of influenza A virus isolates obtained from clinical specimens collected from various hospitals at New Delhi, India. These isolates were propagated into MDCK cell line and the virus titre was determined by haemagglutination test (HA). The 400 bp fragment of HA1 gene was amplified by RT-PCR. The variants in amplified fragment were identified by HMA. In HMA, the amplicon of an individual strain was mixed with that of reference strain of influenza A virus and heteroduplexes derived from mismatches migrated slowly as compared to homoduplexes of same size in electrophoresis. The mobility shift of amplicons indicates the divergence of various influenza strains. Hence, the technique is promising for identification of influenza A virus variants. Hetroduplex mobility assay technique, therefore, allows screening of large number of influenza isolates with results available within 48 hours. The advantage of this technique is rapid and economical as compared to lengthy sequencing procedure.

The INSA Honorary Scientist Scheme

Research

1. Cryptococcus neoformans: A study of its natural habitats, serotypes and re-appraisal of isolation techniques *(INSA Scheme)*

Investigations were continued on varied facets of the project as envisaged. However, during the year under reference the main thrust was on further elucidating the environmental reservoir of the pathogen. Two hundred and thirty-eight samples, comprising 195 decayed wood, 33 bark, 10 samples of flowers and berry fruits were collected from 112 living trees belonging to 18 species of 15 plant families. *C. neoformans* was isolated from decayed wood in trunk hollows of 5 tree species, viz., *Syzygium cumini* (black plum, Indian black berry, Java plum, Jamun, Family Myrtaceae), *Ficus religiosa* (peepal tree, bo tree, bodhi tree, Family Moraceae), *Polyalthia longifolia* (mast tree, Family Annonaceae) *Dalbergia sissoo* (shisham, Family Fabaceae) and *Manilkara hexandra* (khirni, Family Sapotaceae). The isolates represented both of the well known *C. neoformans* varieties, *i.e. C. n.* var. *neoformans* which is cosmopolitan and *C. n.* var. *gattii* which is prevalent in tropical or sub-tropical climates but had been rarely reported from India until recently. The prevalence of *C. neoformans* in tree trunk hollows varied from 37.5 % in *S. cumini*, 22.7% in *P. longifolia* to 17.8% in *F. religiosa*. No inference about the prevalence rate in *D. sisoo* and *M. hexendra* trees can be drawn at present due to inadequacy of the sample size investigated. Interestingly, both of the *C. neoformans* varieties co-occurred in trunk hollows of 3 *S. cumini* trees. The distribution of *C. n.* var. *gattii*, serotype B, and *C. n.* var. *neoformans*, serotype A, in *S. cumini* trees was 19% and 15%, respectively. The data on frequency of isolation of the fungus and its estimated population density in the tested samples confirmed that decayed wood in *S. cumini* trunk hollows was the foremost primary niche of *C. n.* var. *gattii*, serotype B, as well as *C. n.* var. *neoformans*, serotype A. These findings differed strikingly from those in Australia by Ellis and Pfeiffer who reported a significant association of *C. n.* var. *gattii* with flowers and other debris of eucalypts and postulated that the fungus had spread to other parts of the world through infected eucalypt seeds exported from their country. Our data refute this hypothesis and lend strong support to the evolving concept that the natural habitat of *C. n.* var. *neoformans* and *C. n.* var. *gattii* is not specific to decayed wood or other plant debris of any particular species, but instead it is a more generalised association.

The re-appraisal of isolation techniques yielded some significant results. Firstly, re-evaluation of the efficacy of simplified niger seed medium vis-a-vis some variants of Staib's complete medium confirmed the high efficacy of the former medium (diphenyl 0.1 g/l) which is inexpensive and yields quicker results of development of the diagnostic brown pigment. However, considering the fact that positive samples heavily contaminated with molds are likely to be missed with low diphenyl concentration, it would be prudent to additionally include the medium with higher diphenyl concentration (1.0 g/l) in any environmental or clinical survey of *C. neoformans* if the samples are likely to harbour a dense population of contaminant moulds.

2. *In vitro* bio-interactions between *Candida* species, *Aspergillus fumigatus* and some other human pathogenic fungi *(ICMR Scheme)*

We have previously reported that *Aspegillus fumigatus*, the principal etiologic agent of bronchopulmonary aspergillosis, is inhibited by *C. albicans*, a frequent colonizer/commensal of the human or animal body, primarily the gastrointestinal tract, oropharynx, respiratory tract and other mucocutaneous regions. This antagonism may result in under-diagnosis of aspergillosis and consequential inappropriate chemotherapy and avoidable complications. To devise a selective medium for rapid isolation of *A. fumigatus* from sputum or other specimens harboring *C. albicans*, a series of experiments employing multiple reference strains and varied inoculation techniques indicated that incorporation of 5 µg/ml of fluconazole in peptone glucose agar (PGA) medium yielded the highest recovery of *A. fumigatus* from a saline conidial suspension mixed with *C. albicans*. Based upon these observations, PGA supplemented with 5 µg/ml of fluconazole (PGFA) was found to be superior to PGA, peptone glucose egg albumin agar (PGEA) and yeast phosphate agar (YPA) for rapid and enhanced recovery of *A. fumigatus* from sputum specimens seeded with this fungus and *C. albicans*.

To explore the efficacy of peptone glucose fluconazole agar (PGFA) for selective isolation of *A. fumigatus* from clinical specimens colonized by *C. albicans*, freshly expectorated sputum specimens obtained from eight patients with clinical diagnosis of allergic bronchopulmonary aspergillosis (ABPA), aspergilloma, invasive pulmonary aspergillosis (IPA) and other respiratory diseases were investigated, employing PGA as control. Besides, PGEA and yeast phosphate agar (YPA) were included for trial as additional potentially selective culture media. It is noteworthy that PGFA proved to be the best selective medium for isolation of *A. fumigatus* from sputum harbouring *C. albicans*. Yeast phosphate agar and PGEA ranked as second and the third in their efficacy as selective culture media. Further trials on PGFA and other candidate selective media for enhanced isolation of *A. fumigatus* from sputum of bronchopulmonary aspergillosis patients colonized by *C. albicans* are in progress.

Postgraduate Training and Teaching

The Institute has been conducting PhD programmes (Medical Sciences) since its inception in various specialities relating to chest diseases, *e.g.*, allergy and immunology, bacteriology, respiratory medicine, mycology, pharmacology, physiology, virology, etc. Besides this, the Institute conducts MD courses in pulmonary medicine, biochemistry, microbiology, pharmacology and physiology. It also conducts a Diploma course in tuberculosis and chest diseases (DTCD).

DTCD

Session 2003-2005	Session 2004-2006
Dr Sujata Natarajan	Dr Pengovile Ltu
Dr R. Murali	Dr Rajat Rai
Dr Jai Kumar Kriplani	Dr Ajay Kukreja
Dr Deepak Bansal	Dr Anuradha Garg
Dr Kailashchandra Joshi	Dr Shishu Chawla
Dr Ruchi Arora	Dr Priyanka Chaudhary
Dr Uday Aditya Gupta	Dr Hemant Kalra
Dr Vijay Kumar	Dr Amit Kumar Gupta
Dr Rohit Gupta	Dr Rashmi Dhir
Dr Nagendra Kumar Shulania	Dr Rajesh Mohan

MD Degrees (Awarded)

(Session: 2001-2004)

Name	Discipline
Dr Amit Dhamija	Pulmonary Medicine
Dr Krishan Gupta	Pulmonary Medicine
Dr Puneet Khanna	Pulmonary Medicine
Dr Shivu Kaushik	Pulmonary Medicine
Dr Pranav Singh	Pulmonary Medicine
Dr Pulkit Khurana	Medical Biochemistry
Dr Naveen Gupta	Physiology

MD Theses (Submitted)

(Session: 2002-2005)

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Rohit Caroli (Pulmonary Medicine)	Cardiorespiratory responses to exercise in patients with mild to moderate bronchial asthma	Dr V.K. Vijayan
2.	Dr Susheel K. Bindroo (Pulmonary Medicine)	Effect of home-based comprehensive pulmonary rehabilitation programme on disability in patients with persistent bronchial asthma	Prof. S.N. Gaur and Dr Raj Kumar
3.	Dr Amit Sharma (Pulmonary Medicine)	To determine the frequency of co-occurrence of allergic rhinitis and bronchial asthma and to assess the effect of exposure to environmental tobacco smoke in patients with bronchial asthma and/or rhinitis	Prof. Ashok Shah
4.	Dr Tarun Chugh (Pulmonary Medicine)	Physiological and radiological characteristics in patients of chronic obstructive pulmonary disease	Dr Raj Kumar
5.	Dr Parag Vohra (Med. Biochemistry)	Studies on the acetoxy drug: Protein trans-acetylase catalysed activation of nitric oxide synthase in tracheal smooth muscle cells by polyphenolic acetates	Prof. H.G. Raj
6.	Dr Shweta Rawall (Med. Microbiology)	Induction of apoptosis during influenza A virus infection: A study in tissue culture cells	Dr Madhu Khanna and Dr V.K. Vijayan
7.	Dr Anurag Yadav (Pharmacology)	A clinical study to assess the relationship between smoking and pulmonary tuberculosis and its regulation by reactive nitrogen species	Prof. A. Ray and Dr V.K. Vijayan
8.	Dr Manoj Kumar (Med. Physiology)	The effect of deep inspiration on maximal expiratory flows in asthmatics: Relationship to disease severity and modulation by anti-asthma drugs	Prof. K. Ravi and Prof. S.K. Chhabra

MD Theses (Pursued)

(Session: 2003-2006)

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Amit Bansal (Pulmonary Medicine)	A study of sleep-related breathing disorders in chronic obstructive pulmonary disease (COPD) patients with or without cor-pulmonale	Dr V.K. Vijayan
2.	Dr Om Prakash (Pulmonary Medicine)	Clinico-physiological effect of inhaled tiotropium bromide and inhaled ipratropium bromide in stable chronic obstructive pulmonary disease patients: A comparative study	Prof. S.N. Gaur and Dr Raj Kumar
3.	Dr Vikas Mittal (Pulmonary Medicine)	Assessment of subjective symptom perceptual accuracy of children with asthma and their parents	Prof. Ashok Shah
4.	Dr Pankaj Chhabra (Pulmonary Medicine)	Gender differences in perception of dyspnoea, quality of life and pattern of lung function abnormalities in asthma	Prof. S.K. Chhabra
5.	Dr Nitin Goel (Pulmonary Medicine)	Assessment of serum total IgE levels, in smokers, non-smokers and ex-smokers and its relation to lung function, airway symptoms and atopic predisposition	Dr Raj Kumar
6.	Dr Ruchika Gulati (Med. Biochemistry)	Studies on acetoxy drug: Protein transacetylase mediated modification of protein kinase-C activity of peripheral blood lymphocytes obtained from patients of bronchial asthma	Prof. S.K. Bansal, Prof. H.G. Raj and Dr V.K. Vijayan
7.	Dr Rashmi Puri (Microbiology)	Molecular characterisation of respiratory tract isolates of *Moraxella catarrhalis*	Prof. S.S. Thukral
8.	Dr Priyanka Narayan (Pharmacology)	A pharmacological assessment of fluoroquinolone convulsiogenesis in experimental animals	Prof. A. Ray

MD – Ist Year

(Session: 2004-2007)

Name	Discipline
Dr Pankaj Sayal	Pulmonary Medicine
Dr Sandeep	Pulmonary Medicine
Dr Amit Diwakar	Pulmonary Medicine
Dr Ravneet S. Grover	Pulmonary Medicine
Dr Margaret Z. Khuma	Pulmonary Medicine
Dr Usha Singh	Biochemistry
Dr Latika Tyagi	Microbiology
Dr Neeraj Tyagi	Pharmacology
Dr Monika Gupta	Physiology

PhD Awarded/Submitted

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Mr Pankaj Kumar (Biomedical Sciences)	Molecular diagnosis of influenza virus in clinical specimens and study of pathogenesis of influenza virus in human and murine model	Prof. H.G. Raj and Dr Madhu Khanna	Awarded
2.	Mr Ahmad Nadeem (Biochemistry)	Oxidant-antioxidant balance in asthma and COPD: Evaluation of the role of alpha-tocopherol in treatment	Prof. H.G. Raj and Prof. S.K. Chhabra	Awarded
3.	Mr Ashwini Kumar (Microbiology)	A study in understanding the virulence of tuberculosis by analysing polymorphism and expression profile of mce operons of *M. tuberculosis*	Prof. Mridula Bose and Prof. Vani Brahmachari (ACBR, University of Delhi)	Awarded
4.	Mr Hari Nath (Physiology)	Cardiovascular responses to severe cold and hypoxia in man	Prof. M. Fahim	Awarded
5.	Ms Kaveri Chakrabarty (Physiology)	Effect of simulated high altitude exposure on airway smooth muscle activity: Role of nitric oxide and other epithelium derived factors	Prof. M. Fahim	Awarded
6.	Ms Soheila Fazli Tabei (Physiology)	Effect of lead exposure on dopamine receptor mediated changes in behaviour and mechanism of action of lead on vascular smooth muscle response in rats	Prof. M. Fahim and Prof. Mohd. Reza Zarrindast (Tehran Medical University, Iran)	Awarded
7.	Mr Sugata Roy (Microbiology)	Cytokine mediated transcriptional induction of human inducible nitric oxide synthase gene in the lung epithelial cell line A549 infected with *Mycobacterium tuberculosis*	Prof. Mridula Bose and Dr Mandira Varma	Submitted
8.	Mr Sujeet Kumar (Microbiology)	Molecular analysis of *Mycobacterium avium* complex isolates by using restriction fragment length polymorphism and PCR typing	Prof. Mridula Bose and Prof. Madalsa Mathur (UCMS, Delhi)	Submitted
9.	Ms Anbrin Masood (Pharmacology)	Studies on the neuroimmunomodulatory role of nitric oxide (NO) in stress	Prof. A. Ray and Prof. B.D. Banerjee (UCMS, Delhi)	Submitted

PhD Theses (Pursued)

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
1.	Mr Manoj Tyagi (Biochemistry)	Signalling mechanism during the expression of proinflammatory cyto-kines in asthma: A study on role of protein kinase C in macrophage activation and release of interleukin-1β	Prof. S.K. Bansal and Dr V.K. Vijayan	2001
2.	Mr Ajit Kumar (Biochemistry)	Studies on biochemical actions of oxygen containing heterocyclic poly phenols and their acetates on drug metabolism	Prof. H.G. Raj and Dr A.K. Prasad (Chemistry Deptt., University of Delhi)	2002
3.	Ms Garima Gupta (Biochemistry)	Studies on purification, characterisation and molecular cloning of acetoxy drug: Protein transa-cetylase from *Mycobacterium smegmatis*	Prof. H.G. Raj and Prof. M. Bose	2002
4.	Mr Mohd. Adnan Kausar (Biochemistry)	Biochemical and clinico-immunologic characterisation of mosquito (Culex quinquefas-ciatus) allergens	Prof. S.K. Bansal, Prof. M.K. Agarwal and Dr V. K. Vijayan	2005
5.	Ms Prachi Gupta (Biochemistry)	Lipid rafts in bronchial asthma: A study on membrane lipid metabolism in asthmatic patients	Prof. S.K. Bansal and Dr V. K. Vijayan	2005
6.	Mr Tapesh Kumar Tyagi (Biochemistry)	Studies on the novel enzyme acetoxy drug: Protein transacetylase from mesophilic fungus *Starkeomyces sp.*	Prof. H.G. Raj and Prof. R.K. Saxena (Microbiology Deptt., University of Delhi)	2005
7.	Ms Amita Chandolia (Microbiology)	Functional analysis of mce 4 genes of *Mycobacterium tuberculosis* H37Rv using antisense approach	Prof. Mridula Bose, Prof. Vani Brahmachari (ACBR, University of Delhi and Dr Pawan Malhotra (ICGEB, New Delhi)	2004
8.	Ms Monika Sharma (Microbiology)	A study of effect of *Mycobacterium tuberculosis* infection of macrophage on T-cell viability	Prof. Mridula Bose and Prof. H.G. Raj	2004
9.	Mr Vikram Srivastava (Microbiology)	Role of apoptosis in the pathogenesis influenza A virus, correlation of viro-logical and immunological parameters: A study in human and murine model	Dr Madhu Khanna and Dr V. K. Vijayan	2004

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
10.	Mr M.K.R. Khan (Microbiology)	A study of ESBLs and ESBL plasmids in clinical isolates of *E. coli, Klebsiella spp., Proteus spp.* and *Pseudomonas aeruginosa*	Prof. S.S. Thukral	2005
11.	Mr Rishi Pal (Pharmacology)	Experimental studies on the role of free radicals in emotional and environmental stress	Prof. A. Ray and Prof. B.D. Banerjee (UCMS, Delhi)	2004
12.	Dr Vishal Bansal (Physiology)	Mechanism of action of estrogen on hemodynamic parameters in rabbits	Prof. M. Fahim and Prof. Rashmi Babbar (MAMC, New Delhi)	2000
13.	Ms Sujata Upadhyay (Physiology)	Role of oxidative stress in the induction of bronchial hyper-responsiveness and its modulation by dietary anti-oxidant vitamins C and E in guinea pigs	Prof. K. Ravi and Prof. S.K. Chhabra	2001
14.	Ms Mahin Dianat (Physiology)	Effect of morphine on neural regulation of blood pressure and behaviour in animals	Prof. M. Fahim and Prof. Mohd. Reza Zarrindast (Tehran Medical University, Iran)	2002
15.	Mr Namdar Yousefvand (Physiology)	Cardiovascular functions on exposure exposure to arsenic in rats	Prof. M. Fahim	2002
16.	Dr Anurag Aggrawal (Physiology)	Effect of mucus hyper secretion on respiratory impedance in a murine model of asthma	Prof. M. Fahim and Dr Burton F. Dickey (MD Anderson Cancer Center, Houston)	2004
17.	Dr Rajinder Gupta (Physiology)	Protective role of carboxylic ionophore monensin in experimentally induced septic shock in rabbits	Prof. M. Fahim and Dr S.K. Sarin (G.B. Pant Hospital, New Delhi)	2005

Faculty Members Associated as Co-supervisors for PhD Theses of Other Institutions

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Ms Ranju Kumari (Zoology)	Studies on molecular mechanisms of acetyl - CoA independant acetylation	Prof. H.G. Raj and Prof. K. Muralidharan (Zoology Deptt., University of Delhi)	Awarded
2.	Dr Deepa Gadre (Microbiology)	Isolation, identification and plasmid profiles of non-tubercul-ous mycobacteria isolated from hospital patients and environment	Prof. Mridula Bose and Prof. Vibha Talwar (UCMS, Delhi)	Submitted
3.	Mr Robinson Jhallabhai (Physiology)	Arterial baroreflex responses during experimentally induced hypercholesterolemia in rabbits	Prof. M. Fahim and Prof. V.M. Ahuja (MAMC, New Delhi)	Submitted
4.	Mr Neeraj Kumar Saini (Biomedical Sciences)	Functional analysis of mammalian cell entry (mce) proteins in mycobacteria	Prof. Mridula Bose and Prof. Sujata K. Das (Bundelkhand University, Jhansi), Prof. G.L. Sharma (IGIB, Delhi)	Pursued
5.	Ms Dolly Kumari (Biomedical Sciences)	Study of food allergens	Dr Raj Kumar and Dr Susheela Sridhara and Dr B.P. Singh (IGIB, Delhi)	Pursued
6.	Ms Seema (Chemistry)	Studies on acetoxy drug protein transacetylase from human placenta	Prof. H.G. Raj and Prof. R.C. Rastogi (Chemistry Deptt., University of Delhi)	Pursued
7.	Mr Jitendra K. Nagar (Geology)	Suspended particulate matter enriched aerosol areas and its relationship with human health	Dr Raj Kumar and Prof. J.P. Shrivastava (Geology Deptt., University of Delhi)	Pursued
8.	Mr M. Irfan Beig (Life Sciences)	Neural and cardiovascular responses during epilepsy in conscious animals	Prof. M. Fahim and Dr Anju Katyal (Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi)	Pursued

S. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
9.	Mr M. Shahid (Pharmacology)	Effect of remote preconditioning on myocardial re-perfusion injury	Prof. M. Fahim and Prof. K.K. Sharma (UCMS, Delhi)	Pursued
10.	Mr M. Tauseef (Pharmacology)	Evaluation of the mechanism of action of aspirin as a cardio-protective agent in experimentally induced cholesterolemic rats	Prof. M. Fahim and Prof. K.K. Sharma (UCMS, Delhi)	Pursued
11.	Mr R. Rizvi (Physiology)	To study the vasoactive responses in animal models of non-cirrhotic portal hypertension (NCPH)	Prof. M. Fahim and Prof. Rashmi Babbar (MAMC, New Delhi), Dr S.K. Sarin (G.B.Pant Hospital, New Delhi)	Pursued
12.	Ms Bano Saidullah (Zoology)	Bronchial reactivity in diabetic guinea pigs/rats	Prof. M. Fahim and Prof. K. Muralidharan (Zoology Deptt., University of Delhi)	Pursued

Distinguished Visitors

- **Dr Nalin Rastogi**, Head of the TB Reference Laboratory, Institute Pasteur France, Guadeloupe, delivered a talk entitled "Contribution of new molecular tools to study the global spreading and biogeographical specificity of *Mycobacterium tuberculosis"*. (November 01, 2004).
- **Dr Dewan Syed Abdul Majid**, Associate Professor, Department of Physiology, Tulane University Health Sciences Center, New Orleans, Lousiana, USA, delivered a lecture on "Reactive oxygen species in the development of hypertension". (December 27-28, 2004).
- **Prof. Ashok Kumar Grover**, Department of Medicine, McMaster University, Hamilton, Ontario, Canada, delivered a lecture on " Caloxins - a novel class of inhibitors of plasma membrane calcium pumps. (February 14, 2005).
- **Dr Vejnovic Milos**, Head of Chest Department, Sombor General Hospital, Sombor, Serbia and Montenegro. (March 22, 2005).

Awards/Honours

Dr V.K. Vijayan

- **Sir Ronald Ross Memorial Oration**, Postgraduate Institute of Medical Education and Research, Kolkata.
- **Dr M. Santosham Oration**, Indian Association for Bronchology, New Delhi.
- **Dr Prem Sobti-ABC Foundation Excellence Award for the Best Chest Specialist of India-2003**, New Delhi.
- **Prof. A.K. Nag Choudhury Memorial Lecture**, Pharmacological Society of India, Kolkata.
- **National College of Chest Physicians (I)-Cipla Oration,** NAPCON-2004, Ahmedabad.
- **International Regent,** American College of Chest Physicians, U.S.A.
- **President,** Indian Association for Bronchology.
- **Vice President,** World Lung Foundation, South Asia.
- **Editor-in-Chief and Publisher**, *The Indian Journal of Chest Diseases & Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Member,** Editorial Advisory Board, *Chest* (Indian Edition), an official publication of American College of Chest Physicians, U.S.A.
- **Member,** Editorial Advisory Board, *Thorax* (South Asian Edition), an official publication of British Thoracic Society, U.K.
- **Member,** International Advisory Board**,** *Internal Medicine Journal of Thailand,* an official publication of the Royal College of Physicians of Thailand.
- **Member,** International Advisory Board, *The Journal of Environmental Medicine*, Thailand, published under the auspices of the Environmental Medicine Centre, Mettapracharak Hospital (What Rai Khing).
- **Member,** Editorial Board, *Lung India,* an official publication of the Indian Chest Society.
- **Member,** Editorial Board**,** *Indian Journal of Tuberculosis*, an official publication of the Tuberculosis Association of India.
- **Member,** Editorial Advisory Committee, *Pulmon*, an official publication of the Academy of Pulmonary and Critical Care Medicine.
- **Member**, Project Review Committee of the Joint Working Group of the Indo-US Concept Proposals on Environmental and Occupational Health, Indian Council of Medical Research, New Delhi.
- **Member**, Programme Advisory Committee (PAC) on Health Sciences under Science & Engineering Research Council (SERC), Department of Science and Technology, Government of India, New Delhi.
- **Member**, Technical Committee for procurement of scientific equipments for ICMR Institutions / Centres.
- **Chairperson**, Project Review Committee for experiments involving human subjects, Jawaharlal Nehru University (JNU), New Delhi.
- **Chairman**, Project Review Committee for the Division of Non Communicable Diseases in the area of Environmental Hygiene, ICMR, New Delhi.
- **Member**, Monitoring Committee, ICMR project on "A Multi-centric Study on Epidemiology of Asthma and Atopy in Adults".

- **Member**, Data Safety Monitoring Bureau (DSMB), Department of Biotechnology (DBT) project on "Efficacy and safety of immunomodulator *Mycobacterium w.* as an adjunct therapy in pulmonary tuberculosis".
- **Member**, Scientific Advisory Committee, New Delhi Tuberculosis Centre.

Prof. H.G. Raj

- **Convenor,** M.Sc. Degree Programme, Department of Agrochemicals and Pest Management, University of Delhi, Delhi.
- **Expert Member**, Research Advisory Panel, Institute of Nuclear Medicine and Allied Sciences, Delhi.
- **Expert Member,** Recruitment and Assessment Centre, Defence Institute of Physiology and Allied Sciences, Delhi and other DRDO Institutions.
- **Expert Member**, Research Advisory Council, Bundelkhand University, Jhansi.

Prof. M. Fahim

- **Member**, Steering Committee, to monitor progress of the project on "Development of Integrated Software for Quantification of Autonomic Tone" submitted by AIIMS, New Delhi.
- **Member**, Academic Council, University of Delhi, Delhi.
- **Member**, University Court, University of Delhi, Delhi.
- **Member**, Academic Council, Jamia Millia Islamia, New Delhi.
- **External Expert Member,** Board of Research Studies, Jamia Millia Islamia, New Delhi.
- **Expert Member**, Recruitment and Assessment Centre, Defence Institute of Physiology and Allied Sciences, Delhi and other DRDO Institutions.

Prof. S.N. Gaur

- **Chairperson,** Expert Committee, CSIR for upgradation / extension of JRF / SRF, IGIB.
- **Member**, Task Force ICMR on Food Allergy.
- **Dr Raman Viswanathan Memorial Oration**, NAPCON-2004, Ahmedabad.
- **Member,** Board for Purchase of Bronchoscope, MCD, Delhi.
- **Member,** Board on Asthma, MCD, Delhi.
- **Member,** Core Group, National Guidelines for Bronchial Asthma, WHO sponsored Symposium, PGIMER, Chandigarh.
- **Member,** Board of Studies, Department of TB and Respiratory Diseases, AMU, Aligarh.

Prof. S.S. Thukral

- **Convenor,** MSc-PhD Degree Programme (Medical Microbiology), Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi.

Prof. A. Ray

- **Member,** Project Expert Committee, Department of ISM&H (AYUSH), Ministry of Health & FW, Govt. of India, New Delhi.
- **Expert Member**, Recruitment and Assessment Centre, Defence Institute of Physiology and Allied Sciences, Delhi and other DRDO Institutions.
- **Expert Member,** Selection Committee for Scientists, Institute of Advanced Research in Science & Technology, Guwahati, Assam**.**
- **Expert Member,** Project Evaluation Committee, DST-WOS-A Scheme, Govt. of India**.**

- **Member,** Institutional Ethics Committee, IGIB-CSIR, New Delhi**.**
- **Expert Member**, Fellowship Evaluation Committee, ICMR, New Delhi.

Prof. Mridula Bose

- **Secretary**, Indian Association of Medical Microbiologists (Delhi Chapter).
- **Member**, Editorial Board, *The Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).

Prof. Ashok Shah

- **Head**, University Department of Tuberculosis and Respiratory Diseases, Faculty of Medical Sciences, University of Delhi, Delhi.
- **Vice-President**, Indian College of Allergy, Asthma and Applied Immunology, Delhi.
- **Secretary-cum-Treasurer**, Indian Association of Sarcoidosis and Other Granulomatous Disorders (IASOG).
- **Member**, Scientific Advisory Committee, Indian Council of Medical Research – National Informatics Centre for Biomedical Information, National Informatics Centre, New Delhi.
- **Editor**, *The Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Member,** Editorial Board**,** *The Indian Journal of Tuberculosis*, an official publication of the Tuberculosis Association of India.
- **Member**, Editorial Board, *The Indian Journal of Allergy, Asthma and Applied Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Member,** Editorial Board, *Lung India*, an official publication of the Indian Chest Society.
- **Member**, Editorial Board, *Current Medical Trends*, Jaipur.
- **Membe**r, National Committee on "Bibliographic Biomedical Database from Indian Literature", National Informatics Centre, New Delhi.
- **Member**, World Association of Medical Editors (WAME), and **Member**, Membership Committee, WAME.
- **Member**, Institutional Human Ethics Committee, Institute of Genomics and Integrative Biology, New Delhi.
- **Member**, Technical Committee, Lala Ram Swaroop Institute of Tuberculosis and Respiratory Diseases, New Delhi.

Prof. S.K. Chhabra

- **Advisor,** Indoor Air Pollution and Environmental Health, Tata Energy Research Institute (TERI), New Delhi.
- **Associate Editor**, *The Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Member**, Editorial Board, *The Indian Journal of Allergy, Asthma and Applied Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Fellow**, National College of Chest Physicians (India).

Prof. K. Ravi

- **National Science Day Oration,** Defence Institute of Physiology and Allied Sciences, Delhi.
- **Head**, Department of Physiology, University of Delhi, Delhi.

- **Member**, Academic Council, University of Delhi, Delhi.
- **Member**, University Court, University of Delhi, Delhi.
- **Expert Member**, Recruitment and Assessment Centre, Defence Institute of Physiology and Allied Sciences, Delhi and other DRDO Institutions.

Prof. S.K. Bansal

- **General Secretary,** Biotechnology Society of India.
- **Member,** Doctoral Committee**,** National Institute of Immunology, New Delhi.

Dr Malini Shariff

- Awarded **Biotechnology Overseas Associateship (2003-04)** by the Department of Biotechnology, Ministry of Science and Technology, Govt. of India, New Delhi from November 2004 - May 2005 at Centers for Disease Control and Prevention, Streptococcal Genetics Laboratory, Respiratory Division Branch, Atlanta, GA, USA.

Dr Raj Kumar

- **Associate Editor**, *Journal of Occupational Health and Environmental Medicine*, an official publication of the Indian Association of Occupational Health (Delhi State).
- **Member**, Editorial Board, *The Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Member**, Editorial Board, *The Indian Journal of Allergy, Asthma and Applied Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Member,** Inspection team for recognising of Study Centre of Bundelkhand University, 2004, Jhansi.

Dr Anuradha Chowdhary

- Awarded **George McCracken Infectious Disease Fellowship Grant** by the American Society of Microbiology to participate in 44th Inter Science Conference on Antimicrobial Agents and Chemotherapy, Washington, DC, USA.

Dr Mandira Varma

- **Best Poster Award** for her poster entitled ”Detection of MDR-TB through analysis of rifampicin resistance mutations in clinical isolates of *M. tuberculosis* by a rapid molecular technique” at the Symposium on HIV-TB Co-infection of the Indian Association of Medical Microbiologists (Delhi Chapter).

Dr Rajinder Bajaj

- **Member**, Animal Ethics Committee, Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi.
- **Member**, Animal Ethics Committee, Department of Biosciences, Jamia Millia Islamia, New Delhi.
- **Member**, Animal Ethics Committee, Institute of Genomics and Integrative Biology, Delhi.

Dr Rohit Caroli [MD Student-Pulmonary Medicine]

- **Original Scientific Paper (Open category): -II Prize** for his paper entitled, “Cardio-pulmonary responses to exercise in patients of mild to moderate bronchial asthma” *(Guide: Dr V.K. Vijayan)* at NAPCON-2004, Ahmedabad, November 16-21, 2004.

Dr Susheel Kumar Bindroo [MD Student-Pulmonary Medicine]

- **Original Scientific Paper (Open category): -II Prize** for his paper entitled, “Effect of home based pulmonary rehabilitation programme on disability in patients with persistent bronchial asthma” *(Guide: Prof. S.N. Gaur)* at NAPCON-2004, Ahmedabad, November 16-21, 2004.

Dr Amit Sarma [MD Student-Pulmonary Medicine]

- **Ist Prize** for the case report entitled, "Chronic community-acquired acinetobacter pneumonia that responded to inadvertent rifampicin administration" *(Guide: Prof. Ashok Shah)* at NAPCON-2004, Ahmedabad, November 16-21, 2004.

Sponsored Research Projects

S. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction and Duration	Budget (in Rs.)
1.	Prof. H.G. Raj (Biochemistry)	Discovery of the new enzyme acetocxy drug: Protein transacetylase from lung and liver studies on isolation, purification and molecular cloning	D.B.T. June 3, 2002 (Four years)	35.05 Lakhs
2.	Prof. S.K. Bansal (Biochemistry)	Studies on mechanism of signal transduction during release of proinflammatory cytokines IL- 1β and TNF-α by alveolar macrophages in asthma	I.C.M.R. November 20, 2001 (Four years)	19.79 Lakhs
3.	Prof. S.K. Chhabra (C.R. Physiology)	Potentiation of allergic asthma by air pollution: The ozone-allergen interaction and its modulation by dietary anti-oxidants, alpha-tocopherol and ascorbic acid	I.C.M.R. January 23, 2002 (Three years and two months)	18.83 Lakhs
4.	Prof. S.S. Thukral (Microbiology)	Molecular characterisation of clinical isolates of *C. diptheriae*	I.C.M.R. September 14, 2001 (Three years)	14.84 Lakhs
5.	Prof. S.S. Thukral (Microbiology)	Molecular charcterization of respiratory isolates of *Moraxella catarrhalis*	I.C.M.R. January 14, 2005 (Three years)	3.27 Lakhs (Ist year)
6.	Prof. Mridula Bose (Microbiology)	Analysis of polymorphism and expression profile of genes of the mammalian cell entry (mce) operons in clinical isolates of *M. tuberculosis*	I.C.M.R. March 8, 2002 (Four years)	18.91 Lakhs
7.	Prof. Mridula Bose (Microbiology)	Mycobacterial-epithelial interaction in innate immune response to tuberculosis and its role in transcriptional regulation of inducible nitric oxide synthase (iNOS)	I.C.M.R. December 5, 2003 (One year)	5.96 Lakhs
8.	Prof. Mridula Bose (Microbiology)	Analysis of isoniazid and rifampicin resistance mutations in the clinical isolates of *M. tuberculosis* by sequencing and dot-blot hybridisation	I.C.M.R January 8, 2003 (Three years)	12.48 Lakhs (2½ years)
9.	Dr Mandira Varma (Microbiology)	Prevalence of *Mycoplasma pneumoniae* infection in patients of acute exacerbation of COPD: Evaluation by different diagnostic techniques	I.C.M.R March 12, 2003 (Three years)	8.34 Lakhs (IInd year)
10.	Prof. A. Ray (Pharmacology)	Studies on the possible role of nitric oxide in the regulation of neuro-behavioural and immunological responses during stress	D.S.T. February 16, 2001 (Four years)	17.11 Lakhs

S. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction and Duration	Budget (in Rs.)
11.	Prof. A. Ray (Pharmacology)	A multicentric, double blind randomized placebo controlled study evaluating the efficacy and tolerability of the polyherbal preparation LL-2123 HP against hepatotoxicity in patients with pulmonary tuberculosis	Lupin Ltd August 18, 2003 (Two years)	2.11 Lakhs
12.	Prof. A. Ray (Pharmacology)	Possible protective role of Livina (a polyherbal preparation) against anti-tubercular therapy (ATT)-induced hepatotoxicity	Day's Medical Stores Mfg. Ltd June 6, 2003 (Two years)	2.99 Lakhs
13.	Prof. M. Fahim (Physiology)	Arterial baroreflex responses during experimentally induced hypercholesterolemia in rabbits	U.G.C. April 18, 2001 (Upto March, 2005)	6.04 Lakhs
14.	Prof. M. Fahim (Physiology)	Cardio-protective role and mechanism of action of 17 β estradiol in anaesthetised animals	C.S.I.R. May 2, 2003 (Three years)	7.77 Lakhs
15.	Prof. M. Fahim (Physiology)	Antiatherogenic potentials of Seabuckthorn and Rhodiola in experimental animals	D.R.D.O. March 18, 2004 (Two years)	4.68 Lakhs
16.	Prof. M. Fahim, Prof. K. Ravi and Dr Vishal Bansal (Physiology)	Establishment of Patch Clamp Lab and Cell Culture Facility under Funds for Improvement in Science and Technology (FIST) programme	D.S.T. February 3, 2003 (Five years)	56.70 Lakhs
17.	Dr V.K. Vijayan (Respiratory Medicine)	Prevalence of sleep related breathing disorders in Indian adults	D.S.T. September 11, 2002 (Three years)	10.21 Lakhs
18.	Dr V.K. Vijayan (Respiratory Medicine)	The effects of tiotropium bromide with or without inhaled fluticasone dipropionate and salmeterol on lung inflammation in bronchial asthma	Cipla Ltd March 8, 2005	1.50 Lakhs (Ist year)
19.	Dr V.K. Vijayan and Dr Raj Kumar (Respiratory Medicine)	Tobacco Cessation Clinic at V.P. Chest Institute during the year 2004 and conducting related activities	W.H.O. February 23, 2004 (One year)	2.14 Lakhs
20.	Prof. S.N. Gaur (Respiratory Medicine)	Clinico-immunologic studies on allergen specific immunotherapy in patients of respiratory allergy	D.S.T. January 16, 2004 (Three years)	5.08 Lakhs
21.	Dr Raj Kumar (Respiratory Medicine)	Studies on foods as sensitising and inducing factors of allergy disorders with special reference to bronchial asthma	I.C.M.R. December 31, 2001 (Three years and three months)	16.16 Lakhs

S. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction and Duration	Budget (in Rs.)
22.	Dr Raj Kumar (Respiratory Medicine)	Anti-smoking campaign and intervention against smoking for Delhi University college students	W.H.O. September 27, 2002 (Upto June 2004)	9.40 Lakhs
23.	Dr Raj Kumar (Respiratory Medicine)	Effect of indoor air pollution on respiratory function of children	Ministry of Environment and Forest October 7, 2003 (Three years)	20.97 Lakhs
24.	Dr Madhu Khanna (Respiratory Virology)	Genetic analysis of influenza virus in clinical specimens by rapid molecular techniques	D.S.T. October 1, 2003 (Three years)	18.27 Lakhs
25.	Dr Madhu Khanna (Respiratory Virology)	Study of virological and biochemical regulatory mechanism of influenza virus induced apoptosis in murine model of allergic asthma	C.S.I.R. March 5, 2003 (Three years)	13.51 Lakhs
26.	Dr Sujata K. Dass *DST's SERC Fast Track Scheme for Young Scientist* (Biochemistry)	Role of meta-alloporphyrins in modulating the malaria induced hemolytic anaemia in mouse model	D.S.T. February 21, 2003 (Three years)	11.70 Lakhs
27.	Dr Yogesh Kumar Tyagi *DST's SERC Fast Track Scheme for Young Scientist* (Biochemistry)	Designing substrates specific for the acetoxy drug: Protein transacetylase with a view to target functional proteins	D.S.T. June 12, 2003 (Three years)	11.94 Lakhs
28.	Dr Vinita Katiyar *DST's SERC Fast Track Scheme for Young Scientist* (Respiratory Allergy and Applied Immunology)	Assessment of biocontaimnants from indoor environment	D.S.T. August 13, 2004 (Three years)	10.08 Lakhs
29.	Mr Sujeet Kumar Senior Res. Fellow *Guide*: Prof. Mridula Bose (Microbiology)	PCR and RFLP typing of the Indian *M. avium* strains using IS1245 insertion sequence marker	C.S.I.R. August 1, 2001 (Five years)	4.63 Lakhs (Upto IVth year)
30.	Dr Kavita Gulati Res. Associate *Guide*: Prof. A. Ray (Pharmacology)	Role of free radicals in theophylline induced seizures in experimental animals	C.S.I.R. March 1, 2002 (Three years)	4.42 Lakhs

S. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction and Duration	Budget (in Rs.)
31.	Mr Vikram Srivastava Senior Res. Fellow *Guide*: Dr Madhu Khanna (Respiratory Virology)	Role of apoptosis in the pathogenesis of influenza A virus, correlation of virological and immunological parameters: A study in human and murine model	I.C.M.R. September 11, 2003 (Three years)	3.11 Lakhs (IInd year)
32.	Ms Swati Omanwar Senior Res. Fellow *Guide:* Prof. M. Fahim (Physiology)	Role of free radicals in functional changes in cardiovascular regulatory mechanisms and vascular responsiveness on mercury exposure in rabbits	I.C.M.R. September 2, 2004 (Three years)	1.56 Lakhs (Ist year)
33.	Ms Sujata Upadhayay Senior Res. Fellow *Guide:* Prof. K. Ravi (Physiology)	Role of oxidative stress in the induction of bronchial hyper-responsiveness and its modulation by dietary anti-oxidant vitamin C and F in gunea pigs	I.C.M.R. Feburary 5, 2004 (Two years)	2.34 Lakhs (1 ½ years)
34.	Dr Ashima Anand (Principal Scientific Officer) (DST Centre for Visceral Mechanisms)	Studies on exertional breathlessness (Under development of practical applications arising from advances in visceral mechanisms, *i.e.* J receptors, chemoreceptors, etc)	I.C.M.R. October 29, 2003 (Three years)	27.26 Lakhs (Upto IInd year)
35.	Prof. H.S. Randhawa (INSA Honorary Scientist)	*Cryptococcus neoformans:* A study of its natural habits, serotypes and reappraisal of selective isolation techniques	I.N.S.A. January 1, 2001 (Three years)	1.75 Lakhs
36.	Prof. H.S. Randhawa (INSA Honorary Scientist)	*In vitro* bio-interactions between *Candida* species, *Aspergillus fumigatus* and some other human pathogenic fungi	I.C.M.R. January 31, 2003 (Three years)	6.10 Lakhs (2 ½ years)

Orations/Guest Lectures

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
1.	Dr V.K. Vijayan	Health benefits of smoking cessation	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
2.	Dr V.K. Vijayan	Tuberculosis and HIV/AIDS	National Institute of Communicable Diseases	Foundation Day Function of National Institute of Communicable Diseases Delhi July 30, 2004
3.	Dr V.K. Vijayan	Toxic trauma affecting the lungs	Medical College Alappuzha	Mid-term Conference of the Academy of Pulmonary and Critical Care Medicine Kerala October 10, 2004
4.	Dr V.K. Vijayan	NCCP (I) Cipla Oration titled, "Chemical inhalation injury with special reference to the Bhopal disaster"	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
5.	Dr V.K. Vijayan	Diagnosis and management of parapneumonic effusions	Chest Clinic, Thiruvalla and American College of Chest Physicians (Indian Chapter)	Update on Pulmonary Infections and Sepsis Kottayam December 4, 2004
6.	Dr V.K. Vijayan	Cough-variant asthma	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
7.	Dr V.K. Vijayan	Treatment of pulmonary tuberculosis in Indian Tuberculosis Control Programme	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
8.	Dr V.K. Vijayan	Chemical inhalation injuries with special reference to the Bhopal disaster	National Chest Institute	Dr Prem Sobti-ABC Foundation Award Oration New Delhi January 9, 2005
9.	Dr V.K. Vijayan	• Treatment of pulmonary tuberculosis • Recent advances in the management of bronchial asthma	Indian Pharmacological Society	37th Annual Conference of the Indian Pharmacological Society Kolkata January 14-16, 2005
10.	Dr V.K. Vijayan	Sir Ronald Ross Memorial Oration titled, "Chemical inhalation injuries with special reference to the Bhopal disaster"	Postgraduate Institute of Medical Education and Research	Postgraduate Institute of Medical Education and Research Kolkata January 16, 2005
11.	Dr V.K. Vijayan	Medical care in 21st century	Kerala Orthopedics Association	24th Annual Conference of the Kerala Orthopedics Association Calicut February 4, 2005
12.	Dr V.K. Vijayan	Pulmonary function tests	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
13.	Dr V.K. Vijayan	Dr M. Santosham Oration titled, "BAL studies in chemical inhalation injury and infectious diseases"	Indian Association for Bronchology, and Batra Hospital and Medical Research Centre	10th National Conference of the Indian Association for Bronchology New Delhi February 11-13, 2005
14.	Dr V.K. Vijayan	Pulmonary function tests in clinical practice	Northern Railway Central Hospital	Respiratory Update 2005 New Delhi March 23, 2005
15.	Prof. H.G. Raj	Polyphenolic acetates are novel anti-genotoxic agents	Indian National Science Academy and Jamia Hamdard	Indo-UK Seminar on Ecotoxicity, Cancer, Monitoring and Protection New Delhi August 29, 2004

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
16.	Prof. M. Fahim	Cardiovascular regulatory functions of sensory receptors	University of Nebraska Medical Center	University of Nebraska Medical Center U.S.A. February 25, 2005
17.	Prof. M. Fahim	Properties and functions of cardiac sensory receptors	University of California	University of California U.S.A. March 16, 2005
18.	Prof. S.N. Gaur	Basics of applied immunology	Indian College of Allergy, Asthma and Applied Immunology (North Zone)	Summer Convention of Indian College of Allergy, Asthma and Applied Immunology (North Zone) Faizabad April 10-11, 2004
19.	Prof. S.N. Gaur	Pharmacogenetics in the management of asthma	S.M.S. Medical College	Update on Recent Advances in Asthma Jaipur September 12, 2004
20.	Prof. S.N. Gaur	Dr Raman Viswanathan Memorial Oration titled, "Past, present and future of asthma management" • Farmer's lung disease • Pulmonary rehabilitation programme in COPD	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
21.	Prof. S.N. Gaur	Global consensus in immunotherapy	Indian College of Allergy, Asthma and Applied Immunology	Symposium on Immunodiagnosis and Immunotherapy-Part II at 38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
22.	Prof. S.N. Gaur	Difficult asthma	Kota Medical College	NCCP (I) Rajasthan State Conference NCCP-RAJCON-05 Kota, Rajasthan February 5, 2005
23.	Prof. S.N. Gaur	Management of difficult asthma	Guwahati Medical College	Respiratory Update 2005 Guwahati March 26, 2005

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
24.	Prof A. Ray	Nitrc oxide: A target molecule for drug development in stress and anxiety	International Union of Pharmacology (Clinical Pharmacology Section)	8th World Congress of Clinical Pharmacology and Therapeutics Australia August 1-6, 2004
25.	Prof. A. Ray	Nitric oxide: A target molecule for drug development	Department of Pharmaceutical Sciences	Nagpur University Nagpur August 21, 2004
26.	Prof A. Ray	Nitrc oxide and CNS – Immune interactions	Indian Pharmacological Society	37th Annual Conference of the Indian Pharmacological Society Kolkata January 14-16, 2005
27.	Prof. Mridula Bose	Comparision of mammalian cell entry (mce) operons of mycobacteria: *In silico* analysis and expression profiling	International Centre for Genetic Engineering and Biotechnology	International Centre for Genetic Engineering and Biotechnology New Delhi November 15-17, 2004
28.	Prof. Mridula Bose	Nitric oxide, cytokines and innate immune response to tuberculosis	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005
29.	Prof. Ashok Shah	The nose in bronchial asthma	Indian College of Allergy, Asthma and Applied Immunology (North Zone)	Summer Convention of Indian College of Allergy, Asthma and Applied Immunology (North Zone) Faizabad April 10-11, 2004
30.	Prof. Ashok Shah	Allergic bronchopulmonary aspergillosis: A diagnosis frequently overlooked	Dokkyo University School of Medicine, Tochigi, Japan, and The Japanese Society of Allergology	6th Asia Pacific Congress of Allergology and Clinical Immunology Japan October 4-7, 2004
31.	Prof. Ashok Shah	Anaerobic lung infections	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
32.	Prof. Ashok Shah	Allergic fungal diseases (Lecture delivered at 'Meet the Professors sesion')	Trans-Pacific Allergy and Immunology Society	10th Biennial Congress of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004
33.	Prof. Ashok Shah	Allergic rhinitis: Recent concepts in management	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
34.	Prof. Ashok Shah	Allergic bronchopulmonary and sinus aspergillosis	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005
35.	Prof. Ashok Shah	Sneeze and wheeze	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
36.	Prof. Ashok Shah	Sarcoidosis: An enigma	Indian Association for Bronchology, and Batra Hospital and Medical Research Centre	10th National Conference of the Indian Association for Bronchology New Delhi February 11-13, 2005
37.	Prof. S.K. Chhabra	Adverse impacts of air pollution	Toxic Links	Symposium on Air Pollution and Environmental Impact: Toxic Links New Delhi November 17, 2004
38.	Prof. S.K. Chhabra	Occupational asthma	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
39.	Prof. S.K. Chhabra	Epidemiology of asthma	Trans-Pacific Allergy and Immunology Society	10th Biennial Congress of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004
40.	Prof. S.K. Chhabra	Assessment of health impacts of air pollution	The Energy and Resources Institute	Symposium on Environmental Monitoring and Assessment for Urban Areas New Delhi November 25, 2004
41.	Prof. S.K. Chhabra	Pharmacotherapy of bronchial asthma	Moolchand Hospital and IMA (NDB Chapter of IMA)	Symposium on Bronchial Asthma: Management Update New Delhi January 29, 2005
42.	Prof. S.K. Chhabra	Body plethysmography	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
43.	Prof. S.K. Chhabra	Management of COPD	Northern Railway Central Hospital	Respiratory Update 2005 New Delhi March 23, 2005
44.	Prof. S.K. Chhabra	Interstitial lung diseases	Maulana Azad Medical College	MAMCOS Mid Con 2005 New Delhi March 27, 2005
45.	Prof. K. Ravi	Pathophysiological significance of type J receptors	Institute of Genomics and Integrative Biology	Symposium in Honour of Prof. A.S. Paintal Delhi January 11, 2005
46.	Prof. K. Ravi	Interactive physiology – the need of the hour	Department of Science and Technology	Interaction Meeting in Animal Physiology Mangalore February 11-13, 2005
47.	Prof. K. Ravi	National Science Day Oration titled, "Discovery of a new reflex"	Defence Institute of Physiology and Allied Sciences	National Science Day Oration Delhi February 28, 2005

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
48.	Dr Raj Kumar	Smoking cessation	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
49.	Dr Raj Kumar	Tobacco cessation	Prayash (a N.G.O.)	Seminar on Smoking Cessation New Delhi October 6, 2004
50.	Dr Raj Kumar	• Smoking cessation • Food allergy	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
51.	Dr Raj Kumar	Food allergy	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
52.	Dr Raj Kumar	Smoking cessation	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
53.	Dr Mandira Varma	Molecular diagnosis of tuberculosis	Bio-Merieux	Scientific Conference on Tuberculosis, from Physio-pathlogy to Diagnosis of Tuberculosis France July 1-3, 2004
54.	Dr Anuradha Chowdhary	Respiratory and systemic mycoses in AIDS	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
55.	Dr Balakrishnan Menon	Diagnosis and management of bronchial asthma	Association of Chest Physicians (Agra)	Chest Update Agra August 14, 2004

S. No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
56.	Dr Balakrishnan Menon	Picture archiving and communication systems: Clinical applications	Indian Radiological and Imaging Association (IRIA)	58th Annual Congress of Indian Radiological and Imaging Association (IRIA - 2005) Agra January 22-25, 2005
57.	Dr Kavita Gulati Res. Associate *Guide:* Prof. A. Ray (Pharmacology)	Nitric oxide: Its possible role in drug toxicity	Indian Pharmacological Society	37th Annual Conference of the Indian Pharmacological Society Kolkata January 14-16, 2005

Conferences/Symposia/Seminars/Workshops/CMEs

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
1.	Dr V.K. Vijayan	Chaired a session on Smoking cessation	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
2.	Dr V.K. Vijayan	Lecture on: Management of stable asthma Chaired a session on Bronchial asthma	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
3.	Dr V.K. Vijayan	Expert Member in the Asian Leadership Forum	Malaysian Medical Association (Penang Branch)	Allergy Summit of the Malaysian Medical Association Malaysia August 7, 2004
4.	Dr V.K. Vijayan	Lectures on: • Spirometry (Workshop on Pulmonary Function Tests) • Sarcoidosis: Diagnostic approaches (Symposium on Respiratory Clinical Practice)	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
5.	Dr V.K. Vijayan	Lecture on: Cough variant asthma (Meet the Professor Sesion) Chairperson of a panel discussion on Immunotherapy-systemic *versus* sublingual	Trans-Pacific Allergy and Immunology Society	10th Biennial Congres of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004
6.	Dr V.K. Vijayan	Presented a paper on: Gender differences in sleep-related breathing disorders in Indian subjects	Asian Pacific Society of Respirology	9th Congress of the Asian Pacific Society of Respirology Hong Kong December 10-13, 2004
7.	Dr V.K. Vijayan	Chaired a session on Pulmonary eosinophiliosis	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
8.	Dr V.K. Vijayan	Chaired a session on Respiratory and other infectious diseases	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005
9.	Dr V.K. Vijayan	Expert Member	Post Graduate Institute of Medical Education Research (PGIMER)	Workshop on Formulation of Guidelines for Management if Asthma at Primary and Secondary Levels of Health Care (WHO-India Biennium) Chandigarh February 19-20, 2005
10.	Prof. H.G. Raj	Chaired a session on Understanding biological processes	Dr Ambedkar Centre for Biomedical Research, University of Delhi	International Conference on Chemistry–Biology Interface: Synergistic New Frontiers Delhi November 21-26, 2004
11.	Prof. M.K. Agarwal	Lectures on: • Introduction and basic immune response with special reference to Type I and Type III hypersensitivity disorders • Allergy to common Indian insects • *In vitro* diagnosis of allergic diseases: Principles and methods	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
12.	Prof. S.N. Gaur	Lectures on: • Clinical aspects of respiratory allergic disorders • Extrinsic allergic alveolitis • Clinical demonstration of skin testing in allergic patients: Methods and interpretation • Allergen immunotherapy: An overview • Management of difficult asthma	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
13.	Prof. S.N. Gaur	Lectures on: • Basics of immunology • Bronchopulmonary allergy • Practical demonstration of intradermal skin test and prescription writing	M.K.C.G. Medical College and Hospital	State Level CME-cum-Workshop on Allergy and Applied Immunology Berhampur September 25, 2004
14.	Prof. S.N. Gaur	Lecture on: Aging of lung Moderator, Symposium on Respiratory allergy and immunology	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
15.	Prof. S.N. Gaur	Chaired a session on Allergic manifestation of different systems	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
16.	Prof. S.N. Gaur	Chaired a session on Bronchoscopy	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
17.	Prof. S.N. Gaur	Chaired the Plenary session on Thoracoscopy, bronchoscopy and endobronchial tumour destruction	Indian Association for Bronchology, and Batra Hospital and Medical Research Centre	10th National Conference of the Indian Association for Bronchology New Delhi February 11-13, 2005
18.	Prof. S.N. Gaur	Expert Member	Postgraduate Institute of Medical Education and Research	Workshop on Formulation of Guidelines for Management of Asthma at Primary and Secondary Levels of Health Care (WHO-India Biennium) Chandigarh February 19-20, 2005
19.	Prof. S.N. Gaur	Lecture on: Farmer's lung	Centre for Occupational and Environmental Health, and DGHS (Govt. of India)	Workshop on Recent Trends in Occupational Medicine Practice New Delhi February 26, 2005
20.	Prof. S.N. Gaur	Lecture on: Role of pulmonary rehabilitation programme in COPD	King George Medical University	CME – VII, Annual Day Celebration, King George Medical University Lucknow March 19, 2005

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
21.	Prof. S.N. Gaur	Lecture on: Cure TB	Lupin Limited	CME on World TB Day Delhi March 24, 2005
22.	Prof A. Ray	Member, Co-ordination committee	Central Drug Standard Control Organisation and World Health Organisation	National Pharmaco-vigilance Programme New Delhi October 28-29, 2004
23.	Prof. Ashok Shah	Chaired a session on Respiratory allergies: Basic and applied immunotherapy	Indian College of Allergy, Asthma and Applied Immunology (North Zone)	Summer Convention of Indian College of Allergy, Asthma and Applied Immunology (North Zone) Faizabad April 10-11, 2004
24.	Prof. Ashok Shah	Lecture on: Management of allergic rhinitis Chaired sessions on • Epidemiology of asthma • Patient education in asthma	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
25.	Prof. Ashok Shah	Lectures on: • Allergic rhinitis: Diagnosis and management • Self management and patient education in bronchial asthma • Allergic bronchopulmonary aspergillosis	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
26.	Prof. Ashok Shah	Chaired a session on Understanding allergy	Indian College of Allergy, Asthma and Applied Immunology and Aventis Pharma	4th Asia Pacific Allergy Forum New Delhi September 4-5, 2004
27.	Prof. Ashok Shah	Chaired a session on Asthma: Adult	Dokkyo University School of Medicine, Tochigi, Japan, and The Japanese Society of Allergology	6th Asia Pacific Congress of Allergology and Clinical Immunology Tokyo, Japan October 4-7, 2004
28.	Prof. Ashok Shah	Chaired a session on Birth cohort studies	Trans-Pacific Allergy and Immunology Society	10th Biennial Congress of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
29.	Prof. Ashok Shah	Chaired a session on Fundamentals of immunology	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
30.	Prof. Ashok Shah	Chaired a session on CME update	Shri Moolchand Kharaiti Ram Hospital	CME on Asthma Management Update New Delhi January 29, 2005
31.	Prof. Ashok Shah	Chaired a session on Respiratory disorders exclusively in females	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
32.	Prof. Ashok Shah	Expert Member	Postgraduate Institute of Medical Education and Research	Workshop on Formulation of Guidelines for Management of Asthma at Primary and Secondary Levels of Health Care (WHO-India Biennium) Chandigarh February 19-20, 2005
33.	Prof. Ashok Shah	Lecture on: Sneeze and wheeze	Indian Academy of Pediatrics	CME on Allergic Disorders in Children New Delhi March 12, 2005
34.	Prof. S.K. Chhabra	Lectures on: • Pulmonary functions tests in bronchial asthma • Inhalation devices	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
35.	Prof. S.K. Chhabra	Lectures on: • Epidemiology and pharmacological treatment of bronchial asthma • Pulmonary function testing (Lecture-cum-demonstration) • Management of asthma in special situations	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
36.	Prof. S.K. Chhabra	Lecture on: Respiratory mechanics	Fortis Hospital	Workshop on Mechanical Ventilation Noida January 22, 2005

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
37.	Prof. S.K. Chhabra	Expert Member	Postgraduate Institute of Medical Education and Research	Workshop on Formulation of Guidelines for Managemenat Primary and Secondary Levels of Health Care (WHO-India Biennium) Chandigarh February 19-20, 2005
38.	Prof. K. Ravi	Chaired a session on Breathlessness and exercise limitation	Indian National Science Academy	Symposium on Studies on Breathlessness and Exercise Limitation New Delhi December 6, 2004
39.	Prof. K. Ravi	Lecture on: 50 years of the discovery of J receptors	Defence Institute of Physiology and Allied Sciences	International Workshop on Emerging Trends in High Altitude Physiology and Medicine Delhi January 8, 2005
40.	Prof. K. Ravi	Coordinating Chairman of a session on Prof. A.S. Paintal's research contributions	Institute of Genomics and Integrative Biology	Symposium in Honour of Prof. A.S. Paintal Delhi January 11, 2005
41.	Dr Raj Kumar	Lecture on: Patient education in bronchial asthma	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
42.	Dr Raj Kumar	Lecture on: Food allergy and genetically modified food	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
43.	Dr Mandira Varma	Presented a poster on Rapid detection of rifampicin resistance in *Mycobacterium tuberculosis* isolates from India and Mexico with a molecular beacon assay	American Society for Microbiology	44th Interscience Conference on Antimicrobial Agents and Chemotherapy U.S.A. October 30 - November 2, 2004
44.	Dr Mandira Varma	Presented a poster on Detection of MDR-TB through analysis of rifampicin resistance mutations in clinical isolates of *M. tuberculosis* by a rapid molecular technique	All India Institute of Medical Sciences and Indian Association of Medical Microbiologists (Delhi Chapter)	Symposium on HIV-TB Co-infection New Delhi December 4, 2004

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
45.	Dr Anuradha Chowdhary	Presented a paper on comparison of multilocus sequencing typing (MLST) and Ca3 fingerprinting for *Candida albicans* subtyping	American Society for Microbiology	44th Interscience Conference on Antimicrobial Agents and Chemotherapy U.S.A. October 30 - November 2, 2004
46.	Dr Anuradha Chowdhary	Presented a paper on Peptone glucose fluconazole agar, a selective medium for rapid and enhanced isolation of *Aspergillus fumigatus* from aqueous suspensions and sputum seeded with *C. albicans*	Indian Association of Medical Microbiologist (Delhi Chapter)	Academic Meet of Indian Association of Medical Microbiologist (Delhi Chapter) New Delhi December 4, 2004
47.	Dr Balakrishnan Menon	Chaired a session on Diagnosis of asthma	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
48.	Dr Balakrishnan Menon	Lectures on: • Imaging in asthma • Radiology of allergic diseases	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
49.	Dr Balakrishnan Menon	Chaired a session on Data security in picture archiving and communication systems (PACS)	Vepro India	1st PACS Conference New Delhi July 23-24, 2004
50.	Dr Balakrishnan Menon	Chaired a session on Tuberculosis	Association of Chest Physicians (Agra)	Chest Update Agra August 14, 2004
51.	Dr Balakrishnan Menon	Presented a paper on A controlled trial of oral N-acetylcysteine in the treatment of COPD	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
52.	Dr Balakrishnan Menon	Presented a paper on Effect of a polyvalent bacterial extract in the prophylaxis of acute exacerbation of COPD	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004
53.	Dr Balakrishnan Menon	Lecture on: Bronchial asthma: GINA guidelines Chaired a session on Allergy and asthma	Babu Jagjivan Ram Hospital	CME on Bronchial Asthma New Delhi January 20, 2005

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
54.	Dr Balakrishnan Menon	Chaired the free papers session	Tuberculosis Association of India & L.R.S. Institute of Tuberculosis and Respiratory Diseases	59th National Conference of Tuberculosis and Chest Diseases New Delhi February 3-6, 2005
55.	Dr Balakrishnan Menon	Lecture on: MDR-TB: Strategies for management Chaired a session on DOTS	Babu Jagjivan Ram Hospital	CME on Tuberculosis on the occasion of World TB Day New Delhi March 25, 2005
56.	Dr Rohit Caroli (MD Student) *Guide: Dr V.K. Vijayan*	Presented a paper on Cardiopulmonary responses to exercise in patients of mild to moderate bronchial asthma	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
57.	Dr Susheel Kumar Bindroo (MD Student) *Guide: Prof. S.N.* Gaur	Presented a paper on Effect of home based pulmonary rehabilition programme on disability in patients with persistent bronchial asthma	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
58.	Dr Amit Sarma (MD Student) *Guide: Prof. Ashok Shah*	Presented a case report on Chronic community-acquired acinetobacter pneumonia that responded to in advertent rifampicin administration	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
59.	Dr Yogesh Kumar Tyagi *DST's SERC Fast Track Scheme for Young Scientist* (Biochemistry)	Presented a poster on Studies on synthesis of poly-phenolic compounds and their biological activity evaluation	Karel Jearbek, Institute of Chemical Process and Fundamentals	11th International Conference on Polyphenols and Organic Chemistry Prague, Czech Republic July 18-23, 2004
60.	Mr Manoj Tyagi (PhD Student) *Guide: Prof. S.K. Bansal and Dr V.K. Vijayan*	Presented a paper on Kinetics of expression of IL-1β and TNF-α induced by drugs in alveolar macrophages of patients of bronchial asthma	British Biochemical Society	Biosciences 2004 Conference U.K. July 18-23, 2004
61.	Ms Amita Chandolia (PhD Student) *Guide: Prof. Mridula Bose*	Presented a poster on Comparision of mammalian cell entry (mce) operons of mycobacteria: *In silico* analysis and expression profiling	International Centre for Genetic Engineering and Biotechnology	International Centre for Genetic Engineering and Biotechnology New Delhi November 15-17, 2004

S. No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
62.	Ms Amita Chandolia (PhD Student) *Guide: Prof. Mridula Bose*	Presented a poster on Understanding the evolutionary significance of mce operons of mycobacteria	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005
63.	Ms Monika Sharma (PhD Student) *Guides: Prof. Mridula Bose and Prof. H.G. Raj*	Presented a poster on T cell apoptosis: A possible mechanism for persistence of pathogen	International Centre for Genetic Engineering and Biotechnology	International Centre for Genetic Engineering and Biotechnology New Delhi November 15-17, 2004
64.	Mr N.K. Saini (PhD Student) *Guide: Prof. Mridula Bose*	Presented a poster on Over expression of the Mce4a protein of *M. tuberculosis* and its biocharacterisation	Institute of Biomedical Sciences, Bundelkhand University	2nd International Conference on Recent Advances in Biomedical and Therapeutic Sciences Jhansi January 6-8, 2005
65.	Mr Vikram Srivastava (PhD Student) *Guides: Dr Madhu Khanna and Dr V.K. Vijayan*	Presented a paper on Effect of TGF-β on the resolution of immune response after influenza A virus infection	National Institute of Virology	International Symposium on Emerging Viral Diseases Pune October 11-13, 2004

Participation in Organising of Conferences/Symposia/ Seminars/Workshops/CMEs

S. No.	Faculty Member	Associated As	Organiser(s)	Conference, Place and Date
1.	Dr V.K. Vijayan	Organising Chairman	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
2.	Dr V.K. Vijayan	Organising Chairman	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
3.	Dr V.K. Vijayan	Member, National Advisory Committee	Institute of Genomics and Integrative Biology and Biotechnology Society of India	2nd National Conference of the Biotechnology Society of India (Biotech 2004: Challenges and Opportunities) New Delhi October 13-15, 2004
4.	Dr V.K. Vijayan	Organising Chairman (India)	Trans-Pacific Allergy and Immunology Society	10th Biennial Congres of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004
5.	Prof. H.G. Raj	Member, Organising Committee	Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi	International Conference on Chemistry Biology Interface: Synergistic New Frontiers Delhi November 21-26, 2004
6.	Prof M.K. Agarwal	National Advisor	Institute of Genomics and Integrative Biology and Biotechnology Society of India	2nd National Conference of the Biotechnology Society of India (Biotech 2004: Challenges and Opportunities) New Delhi October 13-15, 2004
7.	Prof. S.N. Gaur	• National Advisor • Member, Scientific Committee	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2004) Ahmedabad November 16-21, 2004
8.	Prof. S.N. Gaur	Member, Advisory Committee	Indian College of Allergy, Asthma and Applied Immunology	38th National Convention of the Indian College of Allergy, Asthma and Applied Immunology Bhubaneshwar December 17-19, 2004

S. No.	Faculty Member	Associated As	Organiser(s)	Conference, Place and Date
9.	Prof. A. Ray	Member, National Advisory Committee	Indian Pharmacological Society	37th Annual Conference of the Indian Pharmacological Society Kolkata January 14-16, 2005
10.	Prof. Ashok Shah	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
11.	Prof. Ashok Shah	Member, Scientific Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
12.	Prof. Ashok Shah	Chairman, Scientific Committee	Trans-Pacific Allergy and Immunology Society	10th Biennial Congress of the Trans-Pacific Allergy and Immunology Society Mumbai November 21-23, 2004
13.	Prof. S.K. Chhabra	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
14.	Prof. S.K. Chhabra	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
15.	Dr Raj Kumar	Organising Secretary	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
16.	Dr Raj Kumar	Organising Secretary	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
17.	Dr Raj Kumar	Member, Organising Committee	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
18.	Dr Madhu Khanna	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004

S. No.	Faculty Member	Associated As	Organiser(s)	Conference, Place and Date
19.	Dr Vishwajeet Rohil	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
20.	Dr Vishwajeet Rohil	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
21.	Dr Vishal Bansal	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
22.	Dr Vishal Bansal	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
23.	Dr Balakrishnan Menon	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
24.	Dr Balakrishnan Menon	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
25.	Dr Balakrishnan Menon	Member, Organising Committee	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004
26.	Dr Mujeeb-ur-Rahman	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
27.	Dr Mujeeb-ur-Rahman	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
28.	Dr Rajinder Bajaj	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004

S. No.	Faculty Member	Associated As	Organiser(s)	Conference, Place and Date
29.	Dr Rajinder Bajaj	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
30.	Mrs Uma Tyagi	Member, Organising Committee	V.P.C.I. University of Delhi	National Update on Smoking Cessation Delhi April 5, 2004
31.	Mrs Uma Tyagi	Member, Organising Committee	V.P.C.I. University of Delhi	4th CME: National Update on Bronchial Asthma Delhi April 25, 2004
32.	Mrs Uma Tyagi	Member, Organising Committee	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	31st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 30-May 7, 2004

Participation in Advanced and Specialised Training Programme

S. No.	Participant (Department)	Course Title/ Topic	Training Duration	Host
1.	Dr Mujeeb-ur-Rahman (Biostatistics)	BenMAP_International (The Environmental Benefits Mapping and Analysis Program for International Applications) Software Program by United States Environmental Protection Agency (USEPA) Protection Agency	November 29-December 2, 2004	Ministry of Environment and Forests, and United States Environmental SCOPE Complex, 7, Lodi Road, New Delhi-110003
2.	Dr Vishwajeet Rohil (Clinical Biochemistry)	Educational Science Technology for Medical Teachers	February 28 - March 9, 2005	Department of Medical Education, National Teacher Training Centre, Maulana Azad Medical College, New Delhi-110002
3.	Dr Anuradha Chowdhary (Medical Mycology)	Research Methods in Epidemiology	April 26 – May 27, 2004	Centre for Disease Control and Prevention, Atlanta, USA.
4.	Prof A. Ray (Pharmacology)	Workshop-cum-Training Programme in Pharmacovigilance	January 17-23, 2005	World Health Organisation, Mumbai
5.	Dr Raj Kumar (Respiratory Medicine)	Diagnostic and Thoracoscopy Course	November 23-26, 2004	Department of Pulmonary Diseases, Division of Thoracic Oncology, Hospital Sainte-Marguerite BP 29 – 13274, Marseille Cedex 09, France

Short Term Specialised Trainings Imparted by Faculty Members

S. No.	Name and Organisation	Subject	Faculty Member (Department)	Period
1.	Mr Vipin Puspwan (M.Sc. Final year) Department of Microbiology Gurkul Kangri Vishwavidyalaya, Haridwar	A survey of systemic pathogenic fungi occurring in the respiratory tract of patients clinically suspected of bronchopulmonary mycoses	Dr Anuradha Chowdhary (Medical Mycology)	January 3 - April 30, 2005
2.	Ms Bhawna Dhiman (M.Sc. Final year) Department of Biotechnology, M.M.P.G. College, Modinagar (U.P.)	PCR restriction analysis as a molecular diagnostic technique for *M. tuberculosis*	Prof. M. Bose and Dr Mandira Varma (Microbiology)	Five months (March - July 2004)
3.	Mr Deepak Goel (M.Sc. Final year) Department of Biotechnology Institute of Applied Medicine and Research, Ch. Charan Singh University Meerut (U.P.)	Cloning and expression of mce4 gene of *M. tuberculosis*	Prof. M. Bose (Microbiology)	Five months (March - July 2004)
4.	Ms Pallavi Gupta (M.Sc. - PhD combined Courses in Biomedical Sciences) Dr B.R. Ambedkar Centre for Biomedical Research University of Delhi, Delhi	Identification of clinical isolates of *M. tuberculosis* by a rapid molecular method, molecular typing by IS 16110 RFLP and PCR restriction analysis (PRA) of the putative promoter region of mce4 operon in search of polymorphism	Prof. M. Bose (Microbiology)	Six months (January - June 2004)
5.	Ms Gagan Deep Kaur (M.Sc. - PhD combined Courses in Biomedical Sciences) Summer Trainee Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Effect of alcohol on smooth muscle activity and its influence on the responsiveness of vascular smooth muscle to phenylephrine (a vasoconstrictor) and acetylcholine (a vasodilator) in rabbits	Prof. M. Fahim and Dr Vishal Bansal (Physiology)	Three months (May - July 2004)

S. No.	Name and Organisation	Subject	Faculty Member (Department)	Period
6.	Ms Karabi Das (M.Sc. - PhD combined Courses in Biomedical Sciences) Summer Trainee Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Influence of Cox inhibitor indomethacin on the neural regulation of blood pressure by arterial baroreceptors in rats	Prof. M. Fahim (Physiology)	Three months (May - July 2004)
7.	Ms Manmeet Chawla (M.Sc. - PhD combined Courses in Biomedical Sciences) Summer Trainee Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Effect of morphine on cardiovascular response to phenylephrine and sodium nitroprusside and baro-receptor mediated blood pressure regulation	Prof. M. Fahim (Physiology)	Three months (May - July 2004)
8.	Ms Priyanka Raj (M.Sc. - PhD combined Courses in Biomedical Sciences) Summer Trainee Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Effect of vasoactive agents on arterial smooth muscles of diabetic rabbits	Prof. M. Fahim (Physiology)	Three months (May - July 2004)

Cultural and Sports Activities

During this year, the staff of the Institute had a very eventful and memorable time. The performances (songs and dances, mono-actions, jokes, etc.) of the staff members at the Annual Function of the Delhi University Staff Club were highly appreciated.

In the Sports and Games event, the staff members of the Institute had participated in various Annual Tournaments of Delhi University Staff Club and won awards in various events as per details given below:

- Mr Mahipal (Medical Mycology) was the member of Runner's up Cricket Team.
- Mr Santosh Kotch (Pathology) and Mr Eric Harrison (Library) stood second place in the Doubles category of Table Tennis event.
- Mr Santosh Kotch (Pathology) stood third place in the Single category of Table Tennis event.
- Mr Satish Sharma (Accounts Section) stood third place in the Lucky Doubles category of Table Tennis event.

List of Publications

1. Bhist V, Arora N, Singh BP, Pasha S, Gaur SN, Sridhara S. Epip1, an allergic glycoprotein of *Epicoccum purpurascens* is a serine protease. *FEMS Immunol Med Microbiol* 2004; **42**: 205-11.
2. Bindroo S, Kumar R. New insights in asthma, management options and current practice for use of oral methylxanthin in retard form. *Medicine Update* 2004; **12**: 1-3.
3. Chhabra SK. Assessment of response to treatment in COPD. *Chest* (India) 2004; **5**: 309-11.
4. Chhabra SK. Does increased dietary salt intake worsen asthma? (Editorial). *Indian J Chest Dis Allied Sci* 2004; **46**: 247-50.
5. Chhabra SK. Body plethysmography. In: *Manual of Pulmonary Function Tests.* New Delhi. LRS Institute of Tuberculosis and Respiratory Diseases; 2005.
6. Chhabra SK, Arora VK**.** Bronchial Asthma. In: V.K. Arora, ed *Practical Approach to Respiratory Diseases.* New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2005: 222-30.
7. Chhabra SK, De Sajal. Clinical significance of hilar thoracic index and width of right descending branch of pulmonary artery in chronic obstructive pulmonary disease. *Indian J Chest Dis Allied Sci* 2004; **46**: 91-97.
8. Chhabra SK, De Sajal. Cardiovascular autonomic neuropathy in chronic obstructive pulmonary disease. *Respir Med* 2005; **99**: 126-33.
9. Chhabra SK, Gupta U. Diagnosing tubercular pleural effusions. *Chest* 2005; **127**: 1078.
10. Chowdhary A, Singh K. Spectrum of fungal keratitis in North India. *Cornea* 2005; **24**: 8-15.
11. Chowdhary A, Randhawa HS, Sharma S, Brandt ME, Kumar S. *Malassezia furfur* in a case of onychomycosis: colonizer or etiologic agent? *Med Mycol* 2005; **43**: 87-90.
12. Dam T, Isa M, Bose M. Drug-sensitivity profile of clinical *Mycobacterium tuberculosis* isolates: a retrospective study from a chest-disease institute in India. *J Med Microbiol* 2005; **54**: 269-71.
13. Das S, Gupta K, Gupta A, Gaur SN. Comparison of the efficacy of inhaled budesonide and oral choline in patients with allergic rhinitis. *Saudi Med J* 2005; **26**: 421-24.
14. Gaur SN. Immune mediators in pulmonary tuberculosis: before and after chemotherapy. *Indian J Allergy Asthma Immunol* 2004; **18**: 13-17.
15. Gugnani HC, Fisher MC, Paliwal-Joshi A, Vanittanakom N, Singh I, Yadav PS. *Cannomys badius* as natural animal host of *Penicillium marneffei* in India. *J Clin Microbiol* 2004; **42**: 5070-75.
16. Hanif K, Fahim M, Pavar MC, Bansal V, Pasha S. Hypotensive effect of novel chimeric peptides of met-enkephalin and FMRFa. *Regul Pept* 2005; **125**: 155-61.
17. Jain Deepika, Raj HG, Gangal SV, Chhabra SK. Effect of sensitisation on membrane ion fluxes and intracellular calcium in guinea pigs. *Indian J Med Res* 2004; **120**: 534-41.
18. Kaur CK, Menon B, Menon MPS.The polymerase chain reaction and its role in TB management. *Pulmon* 2004; **6**: 55-58.
19. Khanna P, Shah A. Allergic rhinitis: a comparative profile of “sneezers and runners” and “blockers”. *Ann Allergy Asthma Immunol* 2005; **94**: 60-64.
20. Khanna P, Devgan SC, Arora VK, Shah A. Hydrocarbon pneumonitis following diesel siphonage. *Indian J Chest Dis Allied Sci* 2004; **46**: 129-32.
21. Kohli E, Gaspari M, Raj HG, Parmar VS, Sharma SK, Vander GJ, Kumari R, Gupta G, Seema, Khurana P, Tyagi YK, Watterson AC, Olsen CE. Acetoxy drug: protein transacetylase of buffalo liver-characterisation and mass spectrometry of the acetylated protein product. *Biochim Biophys Acta* 2004; **1698**: 55-66.

22. Kumar A, Chandolia A, Chaudhary U, Brahmachari V, Bose M. Comparison of mammalian cell entry operons of mycobacteria: *in silico* analysis and expression profiling. *FEMS Immunol Med Microbiol* 2005; **43**: 185-95.

23. Kumar R, Kumar H. Smoking cessation. In: V.K. Arora, ed *Practical Approach to Respiratory Diseases.* New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2005: 435-41.

24. Kumar R, Prakash S, Singh Kushwah A, Kumar H. Smoking cessation: control measures. *Lung India* 2005; **22**: 66-71.

25. Kumar R, Vatsa HK, Prasad G. Airway obstruction in rhinitis. *Int Med J Thai* 2004; **20**: 95-98.

26. Kumar S, Singh BK, Kalra N, Kumar V, Kumar A, Prasad AK, Raj HG, Parmar VS, Ghosh B. Novel thiocoumrins as inhibitors of TNF-α induced ICAM-1 expression in human umbilical vein endothelial cells (HUVECs) and microsomal lipid peroxidation. *Biorg Med Chem* 2005; **13**: 1605-13.

27. Ma AA, Ravi K, Bravo EM, Kappagoda CT. Effects of gadolinium chloride on slowly adapting and rapidly adapting receptors of the rabbit lung. *Respir Physiol Neurobiol* 2004; **141**:125-35.

28. Madan T, Priyadarsiny P, Vaid M, Kamal N, Shah A, Haq W, Katti SB, Sarma PU. Use of a synthetic peptide epitope of *Asp f 1*, a major allergen or antigen of *Aspergillus fumigatus*, for improved immunodiagnosis of allergic bronchopulmonary aspergillosis. *Clin Diagn Lab Immunol* 2004; **11**: 552-58.

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30. Menon B, Kaur CK, Menon MPS. Biochemical markers in lung disease. *Pulmon* 2004; **6**: 19-22.

31. Menon B, Malik A, Chugh Ayushi, Vashishat B. Radiological appearances in a rare case of tracheomegaly, tracheal diverticulosis, bronchomegaly and bronchiectasis. *Indian J Chest Dis Allied Sci* 2005; **47**: 39-41.

32. Menon B, Meghna. A rare case of pulmonary, joint, cardiac and mediastinal involvement in rheumatoid arthritis with bronchial asthma and allergic rhinitis. *Indian J Chest Dis Allied Sci* 2004; **46**: 213-16.

33. Menon B, Arora VK. Oxidants and antioxidants in health and disease. In: V.K. Arora, ed *Practical Approach to Respiratory Diseases.* New Delhi: Published by Jaypee Brothers Medical Publishers (P) Ltd; 2005: 281-89.

34. Menon B, Meghna A. A rare cause of exertional dyspnea and hemoptysis in a 30-year-old female. *Indian J Chest Dis Allied Sci* 2005; **47**: 57-59.

35. Nadeem A, Chhabra SK, Raj HG. Increased oxidative stress in acute exacerbations of asthma. *J Asthma* 2005; **42**: 45-50.

36. Nagarkatti R, Kumar R, Sharma SK, Ghosh B. Association of IL-4 gene polymorphisms with asthma in north Indians. *Int Arch Allergy Immunol* 2004; **134**: 206-12.

37. Nagarkatti R, Rao CB, Vijayan VK, Sharma SK, Ghosh B. Signal transducer and activator of transcription 6 haplotypes and asthma in the Indian population. *Am J Respir Cell Mol Biol* 2004; **31**: 317-21.

38. Parekh U, Gupta K, Sharma S, Gaur SN. A comparative evaluation of the efficacy of inhaled beclomethasone diproprionate, budesonide and fluticasone propionate in the management of bronchial asthma. *Indian J Allergy Asthma Immunol* 2004; **18**: 33-38.

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41. Rahman M, Rao KV. Suitability of Broka's Index for the nutritional status of adults. *Man in India* 2004; **84**: 257-70.

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44. Randhawa HS, Kowshik T, Sinha KP, Sandhu RS, Chowdhary A. Rapid isolation of *Aspergillus fumigatus* on peptone glucose fluconazole agar from aqueous suspensions and sputum seeded with *Candida albicans*. *Cur Sci* 2005; **88**: 1-6.

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46. Shah A. Asthma and *Aspergillus* (Editorial). *Indian J Chest Dis Allied Sci* 2004; **46**: 167-70.

47. Shah A. Fifty years of allergic bronchopulmonary aspergillosis. *Indian J Allergy Asthma Immunol* 2004; **18**: 1-11.

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51. Shah A, Panjabi C, Maurya V, Khanna P. Multidrug resistant miliary tuberculosis and Pott's disease in an immunocompetent patient. *Saudi Med J* 2004; **25**: 1468-70.

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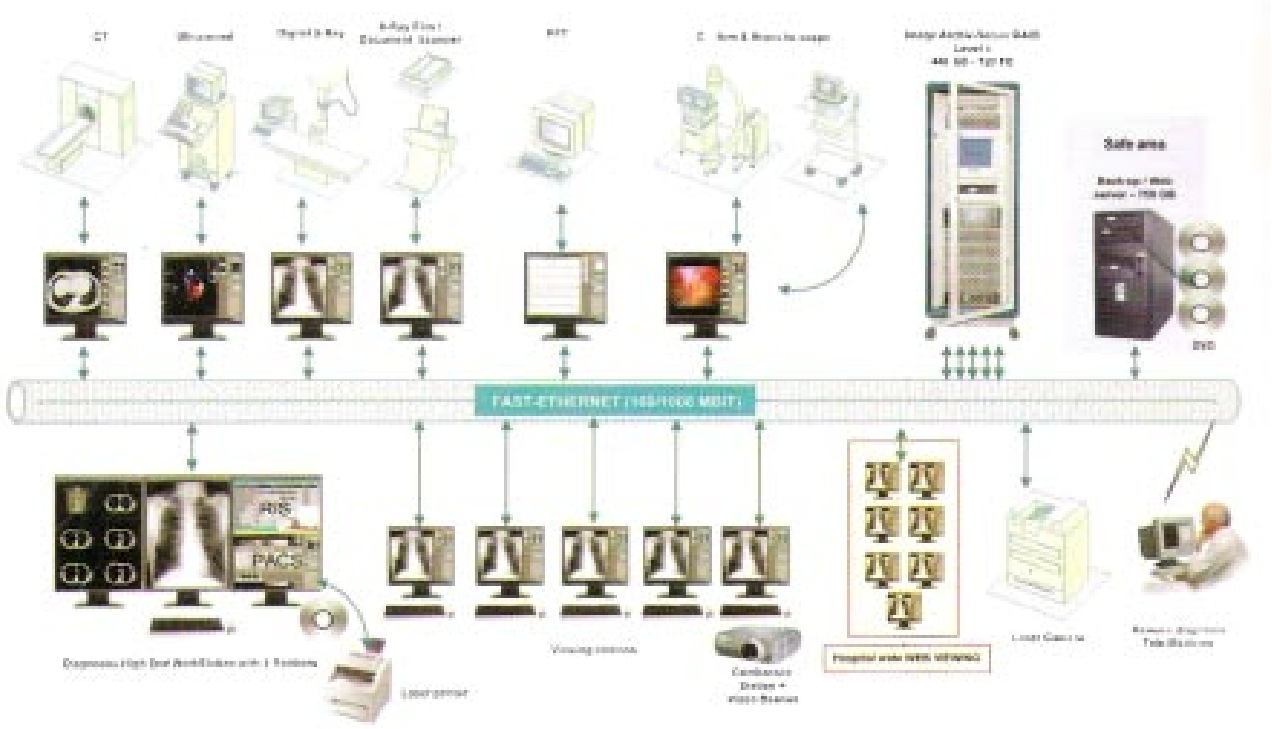
Professor H.S. Randhava, Ex-Director, VPCI, receiving the memento from Dr V.K. Vijayan, Director, after delivering the 6th VPCI Oration on April 6, 2004.

Dignitaries on the dias during the National Update on Smoking Cessation on April 05, 2004; *from left to right:* Dr Raj Kumar; Prof. P.N. Srivastava; Dr Padam Singh, Additional Director-General, ICMR and Dr V.K. Vijayan.

Dignitaries on the dias during the 4th CME: National Update on Bronchial Asthma on April 25, 2004; *from left to right:* Dr V.K. Vijayan; Prof. R. Sambasiva Rao, Additional Director-General, CGHS and Dr Raj Kumar.



Picture Archiving and Communication Systems (PACS) installed in VPCI.