ANNUAL REPORT
2007-08

Vallabhbhai Patel Chest Institute
University of Delhi, Delhi, India

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Published and printed by Dr V.K. Vijayan, Director, Vallabhbhai Patel Chest Institute, University of Delhi, Delhi–110 007 ; Phone: 27667102, 27667441, 27667667, 27666182 and printed at Cambridge Printing Works, B-85, Naraina Industrial Area, Phase-II, New Delhi–110 028; Phone: 25893439, 25891262.

From the Director's Desk

The Vallabhbhai Patel Chest Institute (VPCI) continued to play a major role in the spheres of postgraduate medical education, research and patient care activities. Two new facilities were added to the Institute in the year under review as part of the infrastructure development. These were the establishment of a "Yoga Therapy and Research Centre" in collaboration with Morarji Desai National Institute of Yoga (MDNIY), New Delhi on 22nd June 2007 and a "Cardio-pulmonary Rehabilitation Clinic" on 18th September 2007 at the Viswanathan Chest Hospital attached to the Institute (previously known as Clinical Research Centre).

The *Indian Journal of Chest Diseases and Allied Sciences* started in 1959 by (late) Prof. Raman Viswanathan, Founder-Director of VPCI entered its 50th year of publication in 2008. On this occasion, the first Golden Jubilee issue (January-March), consisting of outstanding review articles on important topics in chest medicine contributed by National and International scientists of repute, was published by the Institute.

The 58th Foundation Day was celebrated on 5th and 6th April 2007. A National Symposium on "Lung Pathology" was organized on 5th April 2007 and the 9th "Prof. Raman Viswanathan-VPCI Oration" was delivered by Prof. K.K. Talwar, Director, Postgraduate Institute of Medical Education and Research, Chandigarh on 6th April 2007. The Institute organized the 7th CME on "Recent Advances in Bronchial Asthma" on 6th May 2007 and a workshop on "Tobacco-Free Environment" on 29th August 2007.

Prof. P.N. Srivastava, First Chancellor, Manipur Central University, Imphal and former Vice-Chancellor, Jawaharlal Nehru University, New Delhi, delivered the 3rd "Prof. Autar Singh Paintal Memorial Oration" on 24th September 2007. The Institute organized the 41st Annual Conference of the Indian College of Allergy, Asthma and Applied Immunology from 9th-12th December 2007 in which more than 300 delegates participated from all parts of the country.

The Faculty members were engaged in various research projects sponsored by different agencies of Government of India, World Health Organization, etc. The vibrancy of these research projects / activities can well be judged from the List of Publications, Guest Lectures delivered and papers presented in the national and international conferences by the faculty members of the Institute. It is very encouraging to note that one of the postgraduate students of MD (Biochemistry) has received the best paper award in the area of Chronic Obstructive Pulmonary Disease at the 12th Asian Pacific Congress of the Asian Pacific Society of Respirology held in Gold Coast, Queensland, Australia from 30th November to 4th December 2007. The hospital wing of the Institute continued to provide excellent diagnostic and treatment services including Critical Care management to patients suffering from chest diseases.

Dr V.K. Vijayan
Director

ANNUAL REPORT (2007-08)

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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 Founder 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 the understanding of 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 was started from July 1960.
April 6,	1961	Foundation Day Celebrations 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.
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	Prof. A.S. Paintal was elected General President of the Indian Science Congress Association [1984-85].
	1986	Prof. A.S. Paintal was appointed as Director-General of the Indian Council of Medical Research.
	1985	Prof. H.S. Randhawa was elected Vice-President of the International Society for Human and Animal Mycology [1985-88].
	1986	Padma Vibhushan was awarded to Prof. A.S. Paintal.
	1986	Prof. A.S. Paintal was elected President of the Indian National Science Academy [1986-88].
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, former Director-General, ICMR and former 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	Dr V.K. Vijayan was elected International Regent, American College of Chest Physicians, U.S.A [2000-06].
March	2001	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 and 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 was started.
November 21,	2001	Tobacco Cessation Clinic was started.
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	A State-of-the-Art Oxygen Plant was inaugurated 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 Member, Planning Commission, Government of India and former Professor and Head, Department of Medicine, All India Institute of Medical Sciences, New Delhi.
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.
April 6,	2005	7th Prof. R. Viswanathan-VPCI Oration by Prof. Naranjan S. Dhalla, Professor and Director, Institute of Cardio-vascular Sciences, St. Boniface General Hospital and Research Centre, University of Manitoba, Winnipeg, Canada. The VPCI Oration was re-named as "Prof. R. Viswanathan-VPCI Oration" in 2005.
September 24,	2005	1st Prof. A.S. Paintal Memorial Oration by Prof. M.S. Valiathan, Honorary Adviser, Manipal Academy of Higher Education, Manipal (Karnataka).
January 10,	2006	An 8-bedded Intensive Care Unit was inaugurated by Prof. P.N. Srivastava, Chairman, Governing Body (VPCI).
April 6,	2006	8th "Prof. R.Viswanathan-VPCI Oration" by Prof. C.N. Deivanayagam, former Medical Superintendent, Hospital for Thoracic Medicine, Chennai.
September 24,	2006	2nd "Prof. A.S. Paintal Memorial Oration" by Prof. P.N. Tandon, President, National Brain Research Centre Society, Gurgaon.

December 8,	2006	Inauguration of the Golden Jubilee Auditorium by organizing an International Symposium on Herbal Drug Research and Therapy in Chest Medicine.
March 2,	2007	The Hospital wing of the Institute, Clinical Research Centre has been re-named as "Viswanathan Chest Hospital" in honour of the Founder-Director of the Institute and the Golden Jubilee Auditorium has been re-named as "Paintal Memorial Golden Jubilee Auditorium" in honour of the former Director of the Institute by a resolution of the Governing Body.
April 6,	2007	9th "Prof. Raman Viswanathan-VPCI Oration" by Prof. K.K. Talwar, Director, Postgraduate Institute of Medical Education and Research, Chandigarh.
June 22,	2007	Yoga Therapy and Research Centre [in collaboration with the Morarji Desai National Institute of Yoga (MDNIY) , New Delhi was inaugurated.
September 18,	2007	Cardio-pulmonary Rehabilitation Clinic was inaugurated.
September 24,	2007	3rd "Prof. A.S.Paintal Memorial Oration" by Prof. P.N. Srivastava, First Chancellor, Manipur Central University, Imphal and former Vice-Chancellor, Jawaharlal Nehru University, New 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.

Objectives

The main objectives of VPCI have been to conduct research on basic and clinical aspects of chest medicine, to train post graduates in Pulmonary Medicine and allied subjects, to develop new diagnostic technology and disseminate it to other institutions in the country and to provide specialised clinical and investigative services to patients.

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, Radiodiagnosis and Imaging, Respiratory Allergy and Applied Immunology, Respiratory Medicine and Thoracic Surgery. These Departments along with Outdoor / Indoor patient-care services and Respiratoy Emergency section are housed in Viswanathan Chest Hospital. The other Departments of the Institute include Biochemistry, Clinical Biochemistry, Biostatistics, Medical Mycology, Microbiology, Pathology, Pharmacology, Physiology and Respiratory Virology. These Departments are headed by their respective Faculty Members. 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 functioning details are shown in the Administrative Structure chart in the succeeding pages.

GOVERNING BODY

CHAIRMAN	
The Vice-Chancellor, University of Delhi (Ex-Officio) or a person nominated by him	**Prof. N.K. Ganguly** Former Director-General, ICMR, New Delhi
MEMBERS	
Treasurer, University of Delhi (Ex-Officio)	**Mrs Janaki Kathpalia**
Two members nominated by the Executive Council, University of Delhi	**Prof. Rup Lal** *(25.01.2008 onwards)* **Prof. S.K. Vij** *(23.02.2007 onwards)* **Prof. V.K. Bhasin** *(20.07.2007-07.11.2007)*
Dean, Faculty of Medical Sciences, University of Delhi	**Prof. P. Kar**
Three members nominated by the Ministry of Health and Family Welfare, Government of India, New Delhi	**Shri Raghubir Singh** Additional Secretary and Financial Advisor **Smt. Bhavani Thyagarajan** Joint Secretary **Dr R.K. Srivastava** Director-General of Health Services
One Member, not connected with the University, nominated by the Executive Council, University of Delhi	**Prof. J.N. Pande** Former Head, Department of Medicine, AIIMS, New Delhi
One Professor of the Institute by rotation according to seniority for a period of one year	**Prof. S.K. Bansal** *(till 02.11.2007)* **Prof. S.N. Gaur** *(03.11.2007onwards)*
One Reader or Lecturer of the Institute by rotation according to seniority for a period of one year	**Dr Anuradha Chowdhary** *(till 02.11.2007)* **Dr B. Menon** *(03.11.2007onwards)*
MEMBER-SECRETARY	
Director, Vallabhbhai Patel Chest Institute University of Delhi, Delhi (Ex-Officio)	**Dr V.K. Vijayan**

Standing Finance Committee

Shri Raghubir Singh — *Chairman*
Additional Secretary and Financial Advisor
Ministry of Health and Family Welfare
Government of India
Nirman Bhawan
New Delhi

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

Member

Joint Secretary or Nominee
Ministry of Health and Family Welfare
Government of India
Nirman Bhawan
New Delhi

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

Deputy Registrar — *Member*
V.P. Chest Institute
University of Delhi
Delhi

Scientific Advisory Committee

Prof. S.K. Jindal — *Chairman*
Head
Department of Pulmonary Medicine
Post Graduate Institute of Medical Education and Research
Chandigarh

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

DDG (M) — *Member*
Ministry of Health and Family Welfare
Government of India
New Delhi

Principal — *Member*
University College of Medical Sciences (UCMS)
Delhi

Prof. S.K. Chhabra — *Member*
Head
Department of Cardiorespiratory Physiology
V.P. Chest Institute
University of Delhi
Delhi

Prof. S.K. Bansal — *Member*
Professor
Department of Biochemistry
V.P. Chest Institute
University of Delhi
Delhi

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. S.N. Singh — *Member*
Dean, Faculty of Law
University of Delhi, Delhi

Prof. S. Tandon — *Member*
Head, Department of Social Work
University of Delhi, Delhi

Prof. R. Dewan — *Member*
Head, Department of Medicine
Maulana Azad Medical College and
Associated LNJP and GB Pant Hospitals
B.L. Taneja Block, 1st Floor
New Delhi

Prof. S. Dwivedi — *Member*
Head, Department of Medicine / Preventive Cardiology
University College of Medical Sciences (UCMS)
Delhi

Prof. Ashok Kumar Saxena — *Member*
Professor
Department of Anesthesiology and Critical Care
University College of Medical Sciences (UCMS)
Delhi

Prof. B.D. Banerjee — *Member*
Professor
Department of Biochemistry
University College of Medical Sciences (UCMS)
Delhi

Dr Ashima Anand — *Member*
Principal Investigator
DST Project
V.P. Chest Institute
University of Delhi, Delhi

Animal Ethics Committee

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

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

Dr Mandira Varma — *Member*
Reader, Department of Microbiology
V.P. Chest Institute
University of Delhi, Delhi

Prof. Anita Kotwani — *Member*
Reader, Department of Pharmacology
V.P. Chest Institute
University of Delhi, Delhi

Dr Rameshwar Singh — *Member*
Veterinary Surgeon (Retd) - DIPAS
DG-II / 199-D, Vikaspuri
New Delhi

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

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

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

Mrs Uma Tyagi — *Member*
Librarian
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

M. Rahman, MSc, PhD, PGDCP
Lecturer

Cardiorespiratory Physiology

S.K. Chhabra, MBBS, MD
Professor

Clinical Biochemistry

V. Rohil, MBBS, MD
Lecturer

Medical Mycology

(Mrs) Anuradha Chowdhary, MBBS, MD
Reader

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
Reader

Pathology

(Mrs) Ritu Kulshrestha, MBBS, MS (Biomedical Sciences), DNB (Pathology), MNAMS
Lecturer

Pharmacology

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

(Mrs) Anita Kotwani, MSc, PhD
Reader

(Mrs) Kavita Gulati, MSc, PhD
Lecturer

Physiology

K. Ravi, MSc, PhD
Professor

Vishal Bansal, MBBS, MD, DNB
Lecturer

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

Respiratory Allergy and Applied Immunology

B.K. Menon, MBBS, DMRD, MD
Reader

M.K. Agarwal, MSc, PhD, FCAI
Re-employed Professor

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
Reader

Viswanathan Chest Hospital

Officer-in-Charge
V.K. Vijayan

Library

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

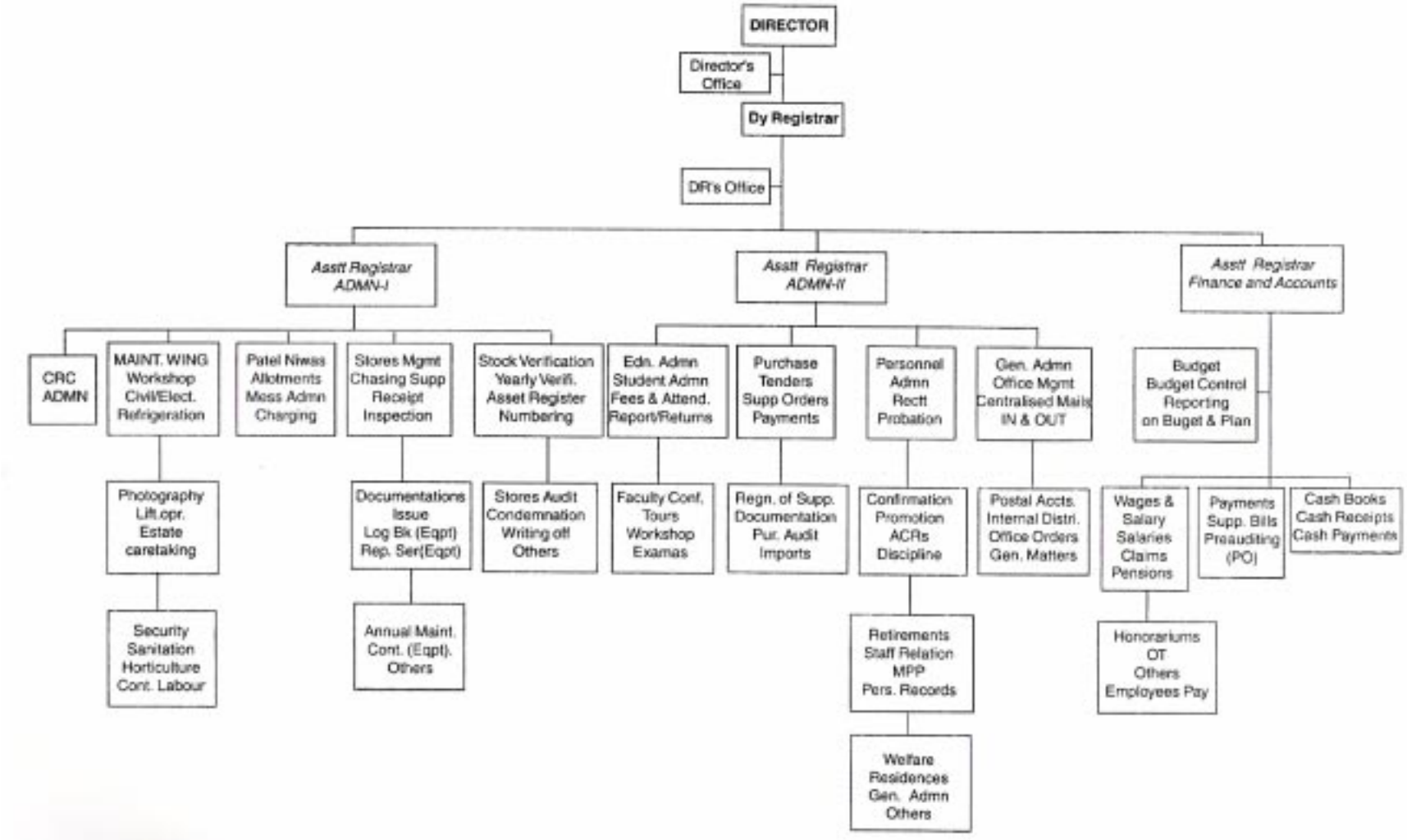
Animal House

Rajinder Bajaj, BVSc & AH
Veterinarian

Administration

B.K. Singh, MA (Publ. Admn), MA (Eng.), PGDPM, LLB, PhD
Deputy Registrar (up to 05.09.2007)

ADMINISTRATIVE STRUCTURE



Inauguration of "Yoga Therapy and Research Centre" at VPCI in collaboration with Morarji Desai National Institute of Yoga, New Delhi, held on 22nd June 2007. *Dignitaries on the dais (left to right):* Dr Raj Kumar, (Respiratory Medicine, VPCI), Dr I. Basavaraddi, Director, Morarji Desai National Institute of Yoga, Dr Samuel Verghese, Joint Secretary, AYUSH, Ministry of Health & Family Welfare, Government of India, Dr V.K. Vijayan (Director, VPCI), and Dr B.K. Singh (Deputy Registrar, VPCI).

Inauguration of "Cardio-pulmonary Rehabilitation Clinic" at VPCI held on 18th September 2007.

CENTRAL FACILITIES

Viswanathan Chest Hospital

The Viswanathan Chest Hospital (VCH), (formerly known as Clinical Research Centre), 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. 8 bedded Respiratory Intensive Care Unit (ICU),
8. Sleep Laboratory,
9. Tobacco Cessation Clinic,
10. Yoga Therapy and Research Centre,
11. Cardio-pulmonary Rehabilitation Clinic.

During the year 2007-08, the Viswanathan Chest Hospital continued to provide specialised investigations and treatment to patients referred to this Institute.

The detailed data of patients attending VCH are as follows:

Number of new patients attending OPD	:	9445
Number of visits of old patients to OPD	:	46465
Total		**55910**

Total number of indoor patients

General Wards	:	1837
Emergency Wards	:	1623
Total		**3460**

Emergency treatment provided	:	18090
Total number of patients treated in ICU	:	385

Number of specialised investigations done

Pulmonary function tests	:	19511
Arterial blood gases	:	3502
Bronchoscopy	:	186
Bronchoalveolar lavage	:	33
CT scans	:	2120
Ultrasound examinations	:	408
X-rays	:	19437
Electrocardiogram	:	4474
Polysomnograms	:	92

HIV testing	:	103
Serum IgE test	:	282
Skin tests	:	788
HBs Ag tests	:	07
Flowcytometry	:	702
Clinical Biochemistry	:	13943

Tobacco Cessation Clinic

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

Yoga Therapy and Research Centre

The Yoga Therapy and Research Centre [in collaboration with the Morarji Desai National Institute of Yoga (MDNIY), New Delhi], runs on every Monday to Saturday from 8:00 A.M. – 4:00 P.M.

Cardio-pulmonary Rehabilitation Clinic

The Cardio-pulmonary Rehabilitation Clinic has been started from September 18, 2007 at the Viswanathan Chest Hospital of our Institute. The patients with disability in 'activities of daily living' (ADL) are being enrolled for rehabilitation programme. In this programme, patients undergo assessment and 30 - 40 minutes of supervised exercise training, five days a week, for a total of six weeks. Exercise sessions include, 'interval walk', 'arm and cycle ergometery', 'strength training', with exercise intensity set according to symptom limitation. Patients also attend educational sessions on topics such as breathing exercises, energy conservation, lung health, medications and stress management.

The Cardio-pulmonary Rehabilitation Clinic runs on every Tuesday and Thursday from 2:30 – 4:30 P.M.

Animal House

The 'state-of-the-art' Animal House centers on the objective for the experimental research involving live animals, the most reliable result will be obtained from animals that are healthy, unstressed and at ease with their surroundings. Different species, pathogen free animals are bred in the animal house. The rooms of the animal house are well maintained, ventilated with filtered air and have climate and lightning control facilities.

The animal house is registered for breeding and experiments on animal with Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Animal Welfare Division, Government of India, New Delhi.

The Institute Animal Ethics Committee (IAEC) kept a vigil so as to promote the humane approach of animal experimentation and provides specifications that enchance animal care and quality in the pursuit of advancement of scientific knowledge.

It is indeed gratifying to report that our animal house has been accredited with standards of Public Health Services (PHS) Policy on Human Care and Use of Laboratory Animal Welfare (OLAW), Department of Health and Human Services, National Institute of Health, Bethesda, USA.

Library

The Institute has one of the best library in the field of Pulmonary Disease and Allied Sciences having 9,869 Books, 18,845 bound Journals, 117 CD's, 442 Thesis and 91 National and International Reports. A total of 96 Journals (91 International and 05 National) are being subscribed by the library, 20 Journals (08 International and 12 National) are being received on exchange programme with the Institute's Journal and 33 Journals (09 International and 24 National) are 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 Institutes of the University of Delhi. Library is also affiliated with 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 and specific information, if required. 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 has been provided right on the desktop of each Faculty Member through LAN and ISDN connectivity with 128 KBPS line from 8.00 A.M. to 7.00 P.M., on all the seven days of the week. Library also provides inter-library loan facilities and reprographic services on demand.

The Library follows an Open Access system. Library is equipped with modern information technology equipments and continues to provide Internet / E-mail services to the users to access CAS (Current Awareness Services) and SDI (Selective Dissemination of Information) services. These are provided to the users in the form of online / offline through e-mail and print during the year. Library uses 'LibSys 4.0' software package, which is an integrated multi-user library management system that supports all in-house operations of the Library. The 'LibSys' consists of modules on acquisition, cataloguing, circulation, serials, article indexing and OPAC.

The Library services are available to Members / Users of Delhi University from Monday to Friday {8.30 A.M. - 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*** **(IJCDAS)**, jointly with the National College of Chest Physicians (India). The Journal started in 1959 by (late) Prof. R. Viswanathan, Founder-Director of VPCI. The year '2008' is a proud moment for the Publication Division because ***the Indian Journal of Chest Diseases and Allied Sciences*** **(IJCDAS)** has entered its 50th year of publication in 2008. On this occasion, the Division had brought out the first Golden Jubilee issue (January-March) consisting of state-of-the-art review articles in frontier areas of Chest Medicine and these articles were contributed by eminent scientists of National and International repute.

The Journal has a wide national and international circulation and is indexed in Index Medicus, Medline, IndMed, INSEAR, and Ulrich's Directory, 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. Identification of the protein: acyl transferase function of calreticulin: possible biological significance

Earlier works carried out in our laboratory have for the first time reported the ability of calreticulin, an endoplasmic reticulum resident protein to transfer acetyl group from acetoxy derivative of several classes of polyphenols such as coumarins, chromones, flavones, and xanthones, called 'polyphenolic acetate' (PA), to certain receptor proteins. Hence, the enzyme was designated as calreticulin transacetylase (CRTAase). Cytochrome P-450 (CYP), NADPH- cytochrome P-450 reductase (CYPR), nitrc oxide synthase (NOS) and cytosolic glutathione S- transferase (GST) were found to be a target for CRTAase catalysed acetylation by the model acetoxy drug, 7, 8-diacetoxy-4-methylcoumarin (DAMC). Accordingly, the catalytic activity of CYP-linked mixed function oxidases (MFO) and GST was irreversibly inhibited while CYPR and NOS were remarkably activated by a model PA, 7,8-diacetoxy-4-methylcoumarin. Structure activity relation studies (SAR) concerning the specificities of various PAs to liver microsomal TAase and TAase related biological effects were carried out.

In addition, current studies carried out in our laboratory have evidenced the ability of calreticulin to transfer the higher homologues of acetyl group such as propionyl and butyryl group from propoxy and butoxy derivatives of coumarins and chromones to the aforementioned receptor proteins . Accordingly, propoxy derivatives of polyphenols were also effective in eliciting the biological actions such as the enhancement of intra cellular nitric oxide (NO) levels. Further studies are in progress to examine the ability of these acyloxy polyphenols to cause the desired NO –related physiological effects.

2. Inhibitory action of polyphenolic acetate (PA) on protein kinase C

Our investigations have indicated protein kinase C (PKC) as another target for CRTAase- catalysed acetylation by PA. Human blood lymphocyte PKC was found to be irreversibly inhibited by 8-diacetoxy-4-methylcoumarin (DAMC). These studies were extended to the action of PA on the lymphocytes of the asthmatic patients. The activity of PKC in lymphocytes of asthmatic patients was found to proportionally increase with the severity of the disease. When PA was incubated with lymphocytes of normal patients, PKC was inhibited marginally. On the other hand, lymphocyte PKC of severe asthmatic patients was inhibited drastically. Several PAs inhibited PKC of asthmatic patients in tune with their specificity to CRTAase. DAMC was found to exert maximum inhibitory action on PKC, while 7, 8-dihydroxy-4-methylcoumarin (DHMC), the deacetylated product of DAMC, failed to inhibit PKC. Several inhibitors of PKC, such as calphostin C, tamoxifen, cyclosporine, etc., are known. Most of these are competitive inhibitors of PKC that cause inhibition by binding to the regulatory or the catalytic domain of PKC. Our investigations as described earlier highlighted for the first time that DAMC was an irreversible inhibitor of PKC possibly by acetylation of the protein. Also, there have been no reports on the modification of PKC by way of acetylation. The inhibition of PKC is known to result in diminished release of mediators of inflammation, such as IL-2. Polyphenolic acetate can thus be expected to play an important role in controlling the inflammation in asthmatic conditions and may eventually serve as potential drug candidates.

3. Effect of polyphenolic acetate (PA) on IL-6 production by peripheral blood mono nuclear cells

Our investigations highlighted the modulation of TNF-α-induced activity of NOS and subsequent inhibition of the release of IL-6 by PA. Peripheral blood mono nuclear cells (PBMC) when treated with TNF-α resulted in the enhanced activity of NOS as compared to untreated PBMC. 8-diacetoxy-4-methylcoumarin (DAMC) in conjunction with TNF-α was found to cause significantly higher levels of NO in PBMC as compared to that treated with TNF-α alone. Since TNF-α is known to cause the induction of cellular iNOS, further elevation of NO levels by DAMC is indicative of the activation of iNOS by way of acetylation. Incubation of iNOS specific inhibitor N-[3-(Aminomethyl) benzyl] acetamidine [1400W, Product of Sigma Chemical Company] with PBMC one hour prior to adding TNF-α and PA resulted in the reduction of NO levels to that observed in case of control, confirming the activation of PBMC iNOS by PA. Further, DAMC was found effective in the inhibition

of TNF-α-induced release of IL-6 in PBMC. Thus, PA might inhibit TNF-α-induced IL-6 production by PBMC through the prevention of TNF-α-stimulated activation of specific kinases (MAPK), which may eventually contribute to the anti-inflamatory effect of PA.

4. Study of synthetic metalloporphyrins as potential antimalarial *in vitro* screening and *in vivo* effects

The malaria parasite is a prevalent human pathogen with at least 300 million acute cases of malaria each year globally and more than a million deaths. It has been recognised since ancient time that malaria fever is highly periodic but the mechanism poorly understood. Malaria fever is related to the parasite growth in erythrocytes. The interaction between the parasite and the human host involves a number of interaction that result in the parasite evading the human immune system. Since the stage of malaria life cycles are complex, this allow the use of various immune evasion strategies by the malaria parasite. The invasive and transmission stages of the malaria parasite *Plasmodium falciparum* express several proteins with domains implicated in host-parasite interactions. A deeper understanding of the nature and regulation of protective immune mechanisms against this parasite will facilitate the development of much needed vaccines. Persistence of the asexual erythrocytic (blood) stages following nature recovery from the acute phase of the infection is common in malaria infection. An important reason for the persistence of malaria infection within populations is the ability of the parasites to undergo repeated antigenic variation. The malaria parasite has a complex lifecycle, involving humans and *Anopheles* mosquitoes. The human stages develop after an infected female *Anopheles* mosquito injects sporozoites (10 to 100 during the blood meal) into the human. These migrate to the liver (within 30 minutes), where those not blocked by antibodies penetrate into the liver and begin dividing within hepatocytes. During this time, cytotoxic T cell (CTLs) and IFN gamma-producing cells can promote elimination of intracellular parasites. This replication lasts from 2-10 days, and merozoites develop within hepatocytes. These cell than rupture, and merozoites enter the blood and invade erythrocytes. Each hepatocytes release ten thousands of merozoites. These events comprise the pre-erythrocytic (liver) stage of malaria. After merozoites have invaded host erythrocytes they mature and continue to divide asexually to become schizonts, rupturing 48 hours later each intra erythrocytic expansion-burst infection cycle results in 20-30 new merozoites.

Synthetic metalloporphyrins, with the central atom of heme is replaced by other elements cannot be degrade to bile pigments are known to modulate the heme oxygenase activity. These metalloporphyrins may possess novel biological properties to intervene malaria as with jaundices and anemia. The present study is designed to investigate the role of metalloporphyrins in modulating malaria and *in vitro* and *in vivo* study. To see the effect of metalloporphyrins in *in vivo* and *in vitro* is under experimental work. Where activity of glutathione-S-transferase, catalase, heme-oxygenase and glutathione reductase has been estimated by homogenate of liver and spleen of Swiss Albino mice under 25 ± 3 gram and IC50 value of synthetic metalloporphyrins has also been done and results were quite satisfactory. The metalloporphyrins are being used are Tin protoporphyrin and Chromium protoporphyrin (SnPP and CrPP).

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

Lipid rafts are involved in signalling events and changes in their lipid composition may bring about changes in the functions of plasma membrane, leading to pathophysiology and disease manifestation. The study was continued on plasma membranes prepared from the RBCs obtained from the peripheral blood of asthmatic patients and healthy volunteers. Our earlier studies have shown that there was a decrease in total phospholipid and cholesterol contents in asthmatics. Our present studies on further analysis of the total phospholipids revealed that in asthmatics, there was an increase in sphingomyelin (Sph), and phosphatidyl inositol (PI), and a decrease in the phosphatidyl choline (PC), phosphatidyl serine (PS) and phosphatidyl ethanolamine (PE) in comparison to the healthy subjects. The fatty acid analysis in asthmatics revealed the presence of palmitate, stearate, oleate and linoleate in PC, caprylate in PE, beheneate in PI, stearate and beheneate in PS and linolenate in Sph. An increase in Sph and decrease in total cholesterol content in asthmatics clearly indicate change in lipid raft composition whereas a significant decrease in PC contents show a change in fluidity of the membrane in erythrocytes of the asthmatics.

6. Experimental asthma: a study on transmembrane signalling in airway smooth muscles (ASM) and peripheral blood lymphocytes during the development of airway hypersensitivity in guinea pig

We had demonstrated that in ovalbumin sensitised animals, the onset of the airway and dermal

hypersensitivity takes place on day 9th, which was optimally present on day 14th and 28th as compared to the controls. The present preliminary studies on total protein kinase C (PKC) activity in ASM of the guinea pig showed a decrease in its activity on day 9th by 71% and 64% in control and experimental group respectively. In experimental group, it increased to the maximum on day 14th (by 64%), followed by fall towards baseline on day 28th. The values in control groups also gradually returned towards baseline on day 28th. It shows that the initiation of the airway hypersensitivity is associated with a fall in total PKC activity in ASM. The PKC activity was maximum on day 14th when the airway hyper-reactivity reached maximum.

7. ATP-binding cassette transporter (ABCD1) gene polymorphism in adrenoleukodystrophy

In our earlier studies on ABCD1 gene polymorphism in adrenoleukodystrophy we observed polymorphisms in exon 1, 6 and 10, besides changes in some intron regions. Recently in our studies, for the first time, we found the first patient with childhood cerebral adrenoleukodystrophy to have a novel de novo 3' splice site mutation in this gene. The other investigations in this patient, such as magnetic resonance imaging (MRI) of brain reveals large confluent hyper intense areas (T2/FLAIR) in bilateral cerebral white matter, predominantly parieto-occipital, with extension into posterior regions that leads to the breakdown of blood-brain barrier. The increased level of very long chain fatty acids (VLCFA) is also consistent with the biochemical defect for adrenoleukodystrophy. Sequencing of ABCD1 gene of this patient identifies a 3' splice site mutation (intervening sequence 4 [IVS4] -2a>g). We did not find any mutation in the gene of proband mother which confirms its de novo occurrence.

Biostatistics

The Department provides statistical assistance in planning, designing, analyses and execution for the research work of various departments of the Institute. It conducts teaching programmes for the postgraduate students as and when needed. The Department takes care of in- and out-patients' records. Additionally, it compiles reports to Government of Delhi, Government of India, UGC, etc., periodically pertaining to the institute.

Cardiorespiratory Physiology

Research

1. Time series study on air pollution and mortality for Delhi

This study was carried out in collaboration with the Energy Research Institute, Delhi and completed during the year. The following were the objectives *a)* to assess the time series data on air quality parameters and mortality to study the relationship between air pollution (mainly RSPM) and all-cause mortality in Delhi; and *b)* to assess the daily change in mortality in relation with change in air quality after controlling for the exogenous parameters. Data on air quality, weather parameters and registered deaths in the Municipal Corporation of Delhi and New Delhi Municipal Committee were collected for the period of 2002-2004. It was observed that there was a definite correlation between daily mortality and PM_{10} levels. For every 10mg / m^3 increase in PM_{10}, all-cause mortality increased by upto 0.2%. Similar data was also obtained in Chennai and Ludhiana. The mortality risk in Chennai was found to be higher at 0.4% per 10µg / m^3 but similar to Delhi and Ludhiana. This is the first time series analysis carried out in India and is a valuable contribution to the knowledge about adverse consequences of air pollution.

2. Assessment of the effects of high particulate pollutants on pulmonary health status in selected mega-cities of South Asia

This is an ongoing study. In a multinational collaborative study, assessment of effects of particulate pollution on lung health in the Indian subcontinent is being carried out in selected mega cities of India, Pakistan, Bangladesh, Nepal and Sri Lanka. In India, the studies are being carried out in Delhi and Kolkata. During the baseline survey, a standardised respiratory questionnaire was administered to adults above 18 years of age residing in the residential campus of National Physical Laboratory, New Delhi. Prevalence of respiratory symptoms – cough, dyspnoea, wheezing and phlegm production; prevalence of asthma and chronic abstractive pulmonary disease (COPD) are the outcome parameters. A sample of 1050 was studied. This was followed by study of acute effects by repeating the surveys in seasons of high, medium and low air pollution. For the acute effects, frequency of acute respiratory (upper / lower) symptoms in adults and children, health care utilisation and mortality were recorded. Data has also been received from the centres in Sri Lanka and Bangladesh. Preliminary data analysis is being carried out.

3. Pulmonary function in normal children in Delhi region: development of reference standards for spirometry

The objectives of the study are to study pulmonary function in schoolgoing children and develop regression equations for predicting spirometric variables in children residing in Delhi. Development of robust regression equations with a standardised methodology will be of immense value in research and in clinical practice including diagnosis and management of respiratory diseases such as bronchial asthma. This study will also provide inputs to software manufacturers to include these as prediction equations in equipment shipped to India. So far, data of nearly 150 children has been collected.

4. Pulmonary function in normal adults in India: development of reference standards for spirometry, static lung volumes and single breath diffusion capacity

This is a multicentric study of lung function parameters in normal adult subjects. The objectives are to study pulmonary function in normal healthy adults and develop regression equations for predicting spirometric variables**,** static lung volumes and single breath diffusion capacity for four regions in India: North (Delhi), South (Bangalore), East (Kolkata) and West (Mumbai). Our Institute plays as the national coordinating center for this study. After screening by chest radiograph at static lung volume measurements and diffusing capacity measurements were carried out. So far, data on 50 adults has been collected.

5. Factors affecting attainment of control in asthma

The attainment of control among asthmatics in the population is unsatisfactory. What is the extent of attainment of control in a tertiary care centre where guideline-based management is practiced is not known. The aim of this study was to assess the extent of control achieved by the asthma patients after a minimum of

three month of therapy in a tertiary care center as defined by asthma guidelines and identify the factors that determine the attainment of control. It was a cross-sectional study of 125 asthmatics (57 males and 68 females) done over one year. Patients were initially divided into two groups: *Group A* (totally controlled and well controlled) and *Group B* (uncontrolled) according to the Gaining Optimal Asthma controL (GOAL) study criteria for control. Factors that may be associated with control were recorded from history and investigated. We observed that nearly two-thirds of the patients were well-controlled. Younger age, lower body mass index (BMI), female sex, shorter duration of disease, absence of triggering factors, milder severity, better compliance to treatment and shorter gap between duration of disease and start of therapy at the hospital were factors associated with better control. After adjusting for these factors in multiple logistic regression model, sex and compliance emerged as the independent predictor variables of control. The study identifies areas and factors where greater emphasis should be laid in management of asthma.

6. Evaluation of three measures of dyspnoea in chronic obstructive pulmonary disease (COPD)

There are few studies of comparative evaluation of different measures of dyspnoea in COPD and their relationship with physiological measures of severity. We compared the Modified Medical Research Council (MMRC) scale, Baseline Dyspnea Index (BDI) and Oxygen Cost Diagram (OCD) and examined their interrelationships and correlations with spirometry, arterial blood gases and the 6 min walk distance (6MWD) in 88 male patients with moderate or severe COPD (GOLD stages II, III and IV). Stage II patients had less dyspnoea and a greater 6MWD than stage III and IV patients but the latter two groups did not differ. The OCD and BDI were strongly correlated but had weak correlations with spirometric parameters and none with 6MWD. Patients with MMRC grade differed significantly from those with grade 4 dyspnoea for spirometric parameters and blood gases but there were substantial overlaps in patients with grade 3 with other grades. However, groups according to MMRC grades differed significantly for OCD and BDI scores. The inter-relationships among the MMRC gradeing, BDI and OCD are sufficiently strong but these have weak or no relationship with physiological variables and 6MWD. The three scales perform similarly and any one may be used.

Medical Mycology

Research

1. A study of species spectrum of fungi causing systemic mycoses in HIV patients in a New-Delhi hospital and their antifungal susceptibility pattern

A collaborative study was undertaken to determine the type and prevalence of systemic mycoses in HIV patients in Smt. Sucheta Kriplani Hospital, an affiliate of Lady Harding Medical College, New Delhi. A total of 56 clinical specimens were collected from HIV patients suspected of systemic mycoses for mycological investigations. This included 25 sputum, 15 CSF, 12 blood, 2 BAL, and one each of epiglotic ulcer and lymph node biopsy. The specimens were homogenized and examined microscopically (KOH wet mount / fungal stains such as PAS and GMS) and cultured on Sabouraud glucose agar, CHROM agar, yeast phosphate agar, simplified Staib's niger seed medium, etc. The inoculated media were incubated at 28 ^{0}C and examined periodically. Species identification of the yeast isolates was done, based on morphological characters seen on various culture media including corn meal agar and by ID 32 C carbohydrate assimilation profiles, detected by mini API system (bioMerieux, Marcy-I' Etoile, France). The mould isolates were identified by their detailed macroscopic and microscopic morphological characteristics on standard mycological media. Precipitating antibodies against pathogenic aspergilli such as *A. fumigatus*, *A. flavus*, *A. niger*, etc., were determined by Ouchterlony's double immunodiffusion test, using the in-house prepared antigens. Thirteen cases of cryptococcosis were diagnosed based on isolation of *Cryptococcus neoformans* from 15 CSF and one blood specimen. A rare case of invasive pulmonary aspergillosis was diagnosed in a one-month old HIV positive neonate based on demonstration of hyaline septate branched hyphae in KOH wet mount of epiglottis ulcer biopsy, histopathologic examination and isolation of *Aspergillus fumigatus* in culture. The fungi isolated from respiratory specimens were *Candida albicans, C. tropicalis, A. flavus* and *A. fumigatus*. The study emphasises the etiologic role of opportunistic fungal pathogens in HIV patients.

2. Antifungal susceptibility patterns and molecular characterisation of *Cryptococcus neoformans* and *C. gattii*

Cryptococcus neoformans and *Cryptococcus gattii* are two major etiologic agents of cryptococcosis, a potentially fatal fungal infection with predilection for the central nervous system. The disease has a worldwide distribution. Patients with AIDS and other immunodeficiencies are especially prone to cryptococcosis. In India, cryptococcosis has been increasingly reported recently due to an ever-rising population of immunocompromised individuals especially those with AIDS. The present study was undertaken to determine the antifungal susceptibility patterns of the *C. neoformans* species complex isolates and to investigate the molecular types of indigenous *C. neoformans* and *C. gattii* isolates by PCR fingerprinting, using single repetitive oligonucleotide $(GACA)_4$ as a single primer. Presumptive identification of *C. neoformans* species complex isolates was done by macroscopic and microscopic examination of variably chocolate brown yeast-like colonies developing on niger seed agar medium and subsequently confirmed by verification of salient physiological characteristics of the isolates, employing ID 32 C carbon assimilation profiles read and interpreted by mini API system. Antifungal susceptibility testing of 102 clinical isolates of *C. neoformans* and two of *C. gattii* was done by CLSI microbroth dilution method (M27A2). The test antifungals included amphotericin B, 5-flurocytosine, fluconazole, voriconazole and itraconazole. Briefly, RPMI buffered to pH 7 with MOPS was used with an inoculum adjusted to 0.5 MacFarland standard for inoculating the microtiter plates. Reference strains of *Candida krusei*, ATCC 6258, *Candida parapsilosis*, ATCC 90018 and *C. neoformans* ATCC 90112, were used for quality control. The plates were incubated at 35 ^{0}C and MICs were interpreted after 72 hrs of incubation. All of the 102 clinical isolates of *C. neoformans* and two of *C. gattii* showed low MICs for amphotericin B and the azoles tested. However, three clinical isolates of *C. neoformans* were resistant to 5-flurocytosine (MIC>64µg / ml). The MIC_{90} and susceptibility ranges for *C. neoformans* isolates were as follows; 0.5 (0.03-1) µg / ml for amphotericin B, 4 (0.25-64) µg / ml for 5-fluorocytosine, 4 (0.5-16) µg / ml for fluconazole, 0.125 (0.03-0.5) µg / ml for itraconazole, 0.125 (0.015-2) µg / ml for voriconazole. Antifungal susceptibility testing (AFST) revealed that primary resistance

against the antifungals amphotericin B, fluconazole, itraconazole and voriconazole was a rare occurrence.

A total of 142 isolates of *C. neoformans* species complex (*C. neoformans*, n = 90 and *C. gattii* , n = 52) obtained from nine different tree species distributed in five different geographical areas were subjected to PCR fingerprinting with the repetitive oligonucleotide $(GACA)_4$ as a single primer. The PCR fingerprinting types (VNI, VNII, VNIII, VNIV and VGI, VGII, VGIII, VGIV) were assigned according to the major bands that were typical for that pattern. Bands were included in the analysis if they were visible, independent of their intensity. Out of 90 *C. neoformans* and 52 *C. gattii* isolates typed by PCR fingerprinting, 80 (89%) proved to be *C. neoformans* var *grubii*, molecular type VNI, whereas all of the *C. gattii* isolates belonged to molecular type VGI. Notably, 10 of the 90 (11%) isolates identified as *C. neoformans* by phenotypic characteristics proved to be *C. gattii* by PCR fingerprinting. The results demonstrate that molecular typing is a much more specific and reliable technique than phenotypic characterisation for species identification of the *C. neoformans* and *C. gattii*.

3. Occurrence and etiology of fungal sinusitis in a New Delhi teaching hospital

Fungal rhinosinusitis (FRS) has recently emerged as an increasingly important clinical entity with a world-wide distribution. However, there is paucity of information on the prevalence of this disease in the Union Territory of Delhi and many other parts of India. The present study aimed at investigating the prevalence and etiology of fungal sinusitis in Delhi. The study group comprised of 50 patients with chronic rhinosinusitis (CRS) consecutively seen in the ENT Department, Lady Hardinge Medical College, New Delhi, during July 2005 to September 2007. All of the patients underwent computed tomography (CT) of the paranasal sinuses, total leukocyte count, differential leukocyte count and absolute eosinophil count. Endoscopically removed sinus mucosa and intrasinus debris obtained from patients were investigated for fungal etiology by direct microscopy and culture on standard mycological media. One half of each specimen was fixed in formal saline and submitted for histopathologic examination and the other half was utilised for mycological investigations. Based on histopathologic observations, the specimens were categorised as follows: *Group I* showed presence of mucin infiltrated with hyphae compatible with allergic fungal rhinosinusitis (AFRS); *Group II* had fungal hyphae without mucin suggestive of fungal ball; *Group III* had mucin negative for fungal element suggestive of eosinophilic mucin rhinosinusitis, and *Group IV* showed neither hyphae nor mucin which suggested non-mycotic etiology of CRS. Of the 50 cases of CRS investigated, 23 (46%) had demonstrable fungal etiology. This included 13 cases (26%) classified as AFRS and 10 cases (20%) as fungal ball. Eight of the cases in AFRS group were confirmed by isolation of the etiologic agent in culture. *Aspergillus flavus* proved to be the etiologic agent in seven of these cases whereas it was *A. fumigatus* in the remaining cases. In the fungal ball group seven of the cases were diagnosed by demonstration of fungus in histopathologic examination and three by direct microscopy of wet KOH mounts. Only five of the cases were culture positive, the etiologic agents being *A. flavus* in four cases and an unidentified *Aspergillus* in a solitary case. The results indicate that *Aspergillus flavus* is the predominant etiologic agent of fungal sinusitis in the Union Territory of Delhi. We believe that fungal sinusitis is currently underdiagnosed and underreported in this region as also in many other parts of India due to inadequate awareness and lack of mycologic diagnostic facilities.

Diagnostic Services

The Department continued to provide diagnostic mycological and serologic services to the Viswanathan Chest Hospital of the Institute and to other hospitals in Delhi. A total of 1298 clinical specimens were processed during the year. These included 444 blood, 670 sputum, 164 bronchial lavage / aspirate / washings, three tissue biopsies / skin biopsies, and 17 miscellaneous (swabs / urine / pus / FNAC) specimens. Besides referral services for identification of clinical isolates of fungi was extended to other institutions on request.

Microbiology

Research

1. Functional analysis of *mce4A* gene of *M. tuberculosis* H37Rv using antisense approach

mce1A gene of *M. tuberculosis* H37Rv was found to be implicated in the cell invasion and providing enhanced survival inside macrophage cell line. Four homologs of this gene organised in four operons, are present in the mycobacterial genome. *mce4A* gene being a homolog of *mce1A* gene, function of this gene was analysed by blocking expression using antisense RNA. Recombinant *M. tuberculosis* (*mce4A*s) was created which carries a 1.1kb region of *mce4A* gene in a reverse orientation in a plasmid to express antisense RNA. Results show reduced expression of *Mce4A* as demonstrated by western blot using anti *mce4A* antibodies raised in rabbit. Recombinant *M. tuberculosis* expressing antisense RNA for *mce1A* (*mce1A*s) was also created using same strategy. Both recombinant strains along with H37Rv as a control, were used for infection of THP-1 macrophage cell line. As *mce1A* was found to be expressed during log phase and *mce4A* during stationary phase, infection was performed in two sets, one with log phase culture and another with stationary phase. After six hours of infection at a multiplicity of infection (MOI) of 1: 10, cells were washed to remove extracellular bacteria and colony forming unit (CFU) count was done at different time intervals. It was observed that *mce4A*s survival was markedly reduced at 48 hrs of infection when stationary phase culture was used. Effect of expression of *mce4A*s on the other genes of the operon by RT-PCR, is under investigation.

2. Analysis of polymorphism of *mce1* and *mce4* operons in different clinical isolates of *M. tuberculosis*

It is often reported by clinicians that different clinical isolates of *Mycobacterium tuberculosis* (MTB) vary in their potential to cause tuberculosis and severity of infection brought about by them also varies. The *mce* operons of MTB are known to be involved in the entry of mycobacterium inside the host's cell which is the first step in pathogenesis. To investigate the possible effect of polymorphism of the *mce* operons on the pathogenic potential of MTB a study was initiated to determine the differences at the genetic level of *mce1* and *mce4* operons by single nucleotide polymorphism (SNP) analysis.

The genes of *mce1* and *mce4* operons of around 100 clinical isolates of MTB varying in their drug susceptibility profile were sequenced through Sequenom Mass Array technology [in collaboration with the Center for Genomic Application (TCGA), New Delhi]. SNPs were most commonly found in clinical isolates 591 / 00, 652 / 00, 77 / 01 and reference strains LVS and BCG. The comparative analysis had shown that *mce4* operon is more polymorphic than *mce1* operon. Moreover, drug sensitive clinical isolates were more susceptible to mutations as compared drug resistant isolates. These results indicate that possibly the drug sensitive isolates undergo polymorphism as an immune evasion mechanism. The *in silico* analysis of the SNPs reflected at the amino acid changes are presently under study.

3. Functional analysis of *lprN* gene of *mce4* operon of *M. tuberculosis* H37Rv

We reported last year that we have cloned and expressed the *lprN* gene. Following expression of *lprN* protein, it has now been prepared in a pure form by affinity chromatography as a 41kDa protein. The purified protein will be subsequently injected subcutaneously at different concentration in BALB / c mice. The spleen cells will be harvested to study the cell mediated immune response against the protein. Moreover, the protective immune response will be studied by challenging the immunised mice with *M. tuberculosis* H37Rv through CFU analysis.

4. Functional characterisation of *lspA* gene of *M. tuberculosis*: cloning, expression and its role during pathogenesis

Lipoprotein processing by the type II signal peptidase (SPase II) is known to be critical for intracellular growth and virulence for many bacteria, but its role in *Mycobacterium tuberculosis* (MTB) is poorly understood. We wish to establish the role of *lspA* gene (Rv1539) during pathogenesis by studying its effect on infectivity by *M. tuberculosis*. Two approaches are being attempted: *a)* cloning and over-expression of *lspA* and *b)* by abolishing

its expression by antisense approach. To achieve this we have cloned the Signal peptidase II gene of MTB (H37Rv) in pGEM®-T Easy Vector and sub-cloned into the pTrc-HisC expression vector. The Spase II enzyme has been affinity purified. Cell culture experiments to determine the effect of the enzyme on virulence of MTB is under way.

6. Prospects for the development of anti-tubercular drugs based on the transacetylase function of glutamine synthetase (GS) gene of *M. tuberculosis*

This study aims at molecular cloning and expression of GS Gene (*Rv2220*) from *M. tuberculosis* in a suitable vector, purification and characterisation of recombinant GS and characterisation of TAse activity of GS. The aim is to develop antitubercular drug that may use GS TAse activity. Molecular cloning of GS (*Rv2220*) was undertaken using suitable primers with restriction sites Bam H1 in the forward primer and Not I in the reverse primer to amplify the full-length gene.

FP: 5' – GATACAGTAA**GGATCC**ATTCTGTGACGG-3' 28mer
Bam H1 site (Bold)
RP: 5' – CTACAC**GCGGCCGC**CGAAGAGTCCTT -3' 26mer
Not I site (Bold)

PCR was carried out using genomic DNA isolated from *M. tuberculosis* using Gradient PCR BioRad I thermal cycler. The eluted 1.5 kb amplicon was first cloned in pGEM-T Easy Vector. The recombinant gene was excised and then sub cloned in pGEX-5X-3 expression vector at Bam H1 and Not I site. The reading frame was confirmed by sequencing (AB1 prism version 2.1, Microsynth).

Some of the compounds which have been synthesised have been screened for their antimycobacterial activity on refernce strain H37Rv by the method of Microplate Alamar Blue Assay.

7. Correlation between genetic polymorphism and homeostasis of TH1-Th2 cytokine in pulmonary and extrapulmonary tuberculosis

This study aims to investigate the influence of host genetic factors on the variability of clinical presentation of tuberculosis. In this study, we propose to address the question of the possible influence of genetic polymorphism in cytokine genes of the host on the spectrum of clinical presentation, from pulmonary tuberculosis to lymph node tuberculosis. The panel of cytokine genes selected for the study includes IFN-γ, IL-2, TNF-α, IL-18, TNF-α, IL-4, Il-8, Il-10, Il-6, IL-1Ra.

Samples of blood have been collected from 15 healthy volunteers and 20 patients suffering from pulmonary tuberculosis. Serum has been separated from an aliquot for cytokine estimation and the other portion has been used for genomic DNA isolation. Single nucleotide polymorphism (SNP) analysis for the selected genes is under way.

8. Bacteriological studies on *Streptococcus pneumonia* isolates from clinical samples

Antibiotic Susceptibility: Antibiotic susceptibility of 57 *S. pneumoniae* isolates was carried out using the Kirby Bauer's disk diffusion technique. Forty-two(74%) isolates were resistant to oxacillin. Eleven (19%) were resistant to erythromycin. Twenty-nine (51%)were resistant to tetracycline. Most of the isolates were found resistant to co-trimoxazole. Twenty-two (38.5%) were resistant to ciprofloxacin and nine (20%) were resistant to chloramphenicol.

Minimum Inhibitory Concentration (MIC): Only four isolates were found resistant (MIC>= 2), 16 intermediate sensitive (MIC 0.5-1) to penicillin by MIC testing. Seven intermediate sensitive (MIC= 0.5) and four were found resistant (MIC =1) to erythromycin. Hence MIC testing is a better indicator of penicillin resistance.

Serotyping Using Multiplex PCR: Serotyping of *S. pneumoniae* using the conventional antisera is very expensive and subjective. Hence a multiplex PCR was developed to serotype the strains. It involved a set of 5 reactions. Each reaction consisted of 4 serotypes and an internal control. First two reactions consisting of primers for serotypes 19A, 19F, 1, 6, 7F, 23F, 5 and 14 were used in 50 isolates of *S. pneumoniae*. The 2 sets of reactions identified serotypes in 17 / 50 (34%) isolates. They were 19A(4), 19F(2), 1(4), 6(1), 7F(4) and 14(2). The work of carrying the remaining reactions for more serotypes is underway.

Direct Detection of *Streptococcus pneumoniae* in Clinical Samples Using Two-step PCR: Direct detection of *S. pneumoniae* was carried out in 75 clinical samples like CSF, bronchial alveolar lavage fluid and pleural aspirate. It consisted of a two-step PCR, the first step detected the 16S RNA of the bacterium and the 2nd step detected *S. pneumoniae* specifically. Out of 75 samples tested 17 were positive by PCR. Of these six was also culture positive. However, 11 samples, which were positive by PCR, was culture negative showing that PCR was more sensitive in detecting *S. pneumoniae* in clinical samples.

9. Identification and characterisation of plasmids responsible for extended spectrum b-lactamase (ESBL) mediated resistance in clinical isolates

ESBL plasmids were identified by using transformation, electroporation and curing techniques in clinical isolates of *E. coli*, *Klebsiella* spp., *Proteus* spp. and *Pseudomonas aeruginosa*.

Conjugative ESBL coding plasmids of 140 and 150 kb were identified in 14/64 CAZ resistant ESBL positive *E. coli*, of 132-170 kb in 09/50 CAZ resistant ESBL producing *Klebsiella* spp., of 115-125 kb in 06/43 CAZ resistant ESBL producing *Proteus* spp. and of 125-146 kb in 05/24 CAZ resistant ESBL producing *Pseudomonas aeruginosa* isolates. These ESBL coding plasmids also conferred resistance to several antimicrobial agents *viz*., cefpodoxime, cefotaxime, ceftriaxone, aztreonam, cefepime, amikacin, gentamicin and ciprofloxacin. Using transformation, an ESBL coding plasmid of 122 kb in *Klebsiella* spp. and a plasmid of 113 kb in *Pseudomonas aeruginosa* could be identified. Transformation was not successful in *E. coli* and *Proteus* spp. All the isolates were found to harbor 1-7 plasmids: their sizes ranging between 1-170 kb. All the strains carried at least one large plasmid (≥ 60 kb.).

Seven of the 10 ESBL coding plasmids of 150 kb isolated from 10 different *E. coli* isolates showed similar restriction patterns. The 170 kb ESBL plasmids from two isolates of *Klebsiella* spp. had identical restriction patterns. Similarly, 146 kb plasmids of two other isolates of *Klebsiella* spp. also had identical restriction patterns. Since these isolates had been recovered from a single hospital, it indicated a vertical transfer of plasmids amongst different isolates of the same species. The ESBL plasmids having identical molecular weights were recovered from different isolates of *E. coli* and *Klebsiella* spp. However, restriction fingerprinting revealed dissimilar patterns, thereby showing that these plasmids were different. Hence, no horizontal transfer between ESBL coding plasmids isolated from *E. coli* and *Klebsiella* spp. was encountered. However, a 146 kb plasmid isolated from transconjugants of two *Klebsiella* spp isolates and one *P. aeruginosa* isolate revealed identical restriction patterns demonstrating horizontal transfer of plasmids between these organisms. Similarly, six ESBL coding plasmids of 125 kb isolated from transconjugants of three isolates each of *Proteus* spp. and *P. aeruginosa* showed identical restriction patterns demonstrating horizontal transmission of this plasmid across the above named bacteria

10. Detection of AmpC β-lactamases in clinical isolates of *Klebsiella* spp.

A total of 100 isolates of *Klebsiella* spp. were screened for cefoxitin (30µg) by Kirby Bauer disc diffusion method. Of these isolates, 21 showed reduced susceptibility to cefoxitin and were considered as screen positive.

All the screen positive isolates were subjected to four different phenotypic tests:

a. Modified Three Dimensional test,
b. AmpC disk test I,
c. AmpC disk test II,
d. Inhibitor (Boronic acid) based detection method.

Modified Three Dimensional test and AmpC disc test detected Five (5%) isolates to be AmpC producers, where as AmpC disk test II could detect only six (6%) isolates to be AmpC positive. Inhibitor based detection method detected AmpC β-lactamases in seven (7%) isolates of *Klebsiella* spp. Comparative evaluation of the above mentioned tests was also carried out which showed that inhibitor (Boronic acid) based detection method could detect more number of isolates to be AmpC producer and hence was the sensitive of the four techniques.

11. Detection of metallo-β-lactamases (MBLs) in clinical isolates of *P. aeruginosa*

A total of 200 clinical isolates of *P. aeruginosa* collected from various hospitals in Delhi were screened for

MBL production by checking susceptibility to imipenem (10µg) and ceftazidime (30µg) by Kirby Bauer disk diffusion method. Out of these 200 isolates, 76 (38%) were screen positive which were further subjected to various phenotypic tests:

a. Modified Hodge test (MHT),
b. Combined Disk test (CDT),
c. Double Disk Synergy test (DDST),
d. Extended EDTA Disk Synergy test (eEDST),
e. EDTA Imipenem Microbiological assay (EIM).

Modified Hodge text detected 63 out of 76 screen positive isolates as MBL producers, followed by eEDST, which detected 62 isolates. Combined disk test detected MBLs in 55 isolates, DDST in 51 isolates whereas EIM assay detected the minimum number of isolates (45) to be a MBL producer.

12. Analysis of rifampicin resistance mutations in the clinical isolates of *M. tuberculosis* by a mutant probe in a dot blot format

A dot-blot hybridisation assay that detects all mutations occurring in the *M. tuberculosis rpoB* hot-spot region is being developed. The assay uses five probes (A to E) capable of binding to different target segments within the *rpoB* hot-spot region of the wild type *M. tuberculosis* genome. Absence of hybridisation with any of the probes in the assay when a mutation is present indicates rifampicin resistance, a surrogate marker for multidrug resistant *M. tuberculosis*. The present study is a preliminary investigation to assess the suitability of the assay for detection of resistance mutations in *rpoB* in clinical isolates of *M. tuberculosis* from Delhi, India. The assay has been standardised for probes D and E which detect 75% of rifampicin resistance mutations. We have further worked with probe B which detects additional 20% of the rifampicin resistance mutations. Since the G:C content of probe B is high, a satisfactory assay could not be developed with probe B due to hybridisation of the probe even in the presence of mutations. Hence, bioinformatics analysis was carried out for probe B. A new probe was designed by introducing a mutation at the 5' end of the probe to weaken it. It is hypothesised that this probe would be weak enough to disassociate from the target sequence in the presence of a mutation. Further work is in progress.

13. PCR restriction analysis in early identification of *M. tuberculosis* from clinical samples and cultures

An attempt was made to apply PCR-restriction fragment length polymorphism (PRA) technique for early detection and identification of *M. tuberculosis* directly in clinical samples. We studied 184 sputum samples from the same number of patients. *hsp65* PRA was applied on the DNA extracted directly from the sputa. We could detect and identify *M. tuberculosis* in 86% of the AFB smear positive samples (n=116) and 33.3% of AFB smear negative samples (n=18) obtained from patients with clinical and radiological evidence of tuberculosis. *M. tuberculosis* was not detected in 50 AFB smear negative sputum samples obtained from patients suffering from respiratory diseases other than tuberculosis. PRA in 20 sputum samples was repeated after autoclaving the samples. Out of these 20 samples, 11 smear positive samples gave positive results with PRA, both before and after autoclaving. Of the nine smear negative samples, four gave positive results with PRA before and after autoclaving.

To test the sensitivity of the assay, a smear negative sample was spiked with serial dilutions of H37Rv. The protocol could detect up to 102 organisms / ml. PRA was found to be a simple and reproducible method for early detection of *M. tuberculosis* from sputum samples. Effort is on to apply the method on other clinical samples also.

The advantage of direct PRA is that it needs just 24 hours for identification after sample collection whereas biochemical reactions require at least four weeks from the time of first inoculation for final identification. PRA scored over conventional techniques in the rapid detection of *M. tuberculosis* directly from the samples. PRA proved to be a reliable and simple method for direct identification of clinically important mycobacteria to the species level. The assay does not need any high-cost instrumentation or technical expertise. In addition, PRA could be performed after autoclaving the samples, which would reduce the risk of infection in laboratory technicians. PRA could prove to be a suitable rapid method of identification of *M. tuberculosis* directly from

clinical samples.

We have also tested 70 isolates obtained from patients suffering from tuberculosis. PRA identified all the 69 / 70 isolates studied to the species level. Majority of the isolates (65 / 70) were found to be *M. tuberculosis*. The other mycobacterial species detected were *M. intracellulare* (2 / 70), *M. scrofulaceum* (1 / 70) and *M. fortuitum* (1 / 70). The RFLP banding pattern of one strain could not be discerned.

14. Search for a novel primer set to detect and identify *M. tuberculosis* by a single-enzyme PRA protocol

Using bioinformatics, we have designed a new set of primers for a 308 bp region of the *hsp65* gene different from the primers used in our earlier study. Our BLAST analysis confirms that the region of *hsp65* gene amplified by this primer set is present only in mycobacteria. Additionally, screening by Mapdaw software (DNA Star) searched out an exclusive cleavage site for the restriction enzyme *NruI* that cleaves this region of the *hsp65* gene only in the *M. tuberculosis* complex into two easily discernible bands, as visualised on agarose gel. This enzyme does not have any restriction sites on the *hsp65* genes of atypical mycobacteria. Hence, once the PCR product is restricted, this would confirm the presence of *M. tuberculosis*. The primer set designed by us is a novel one, absolutely different from the primers for *hsp65* gene reported so far. The results of bioinformatics have to be confirmed experimentally.

Diagnostic Services

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

i. Bacteriology Laboratory

Clinical specimens processed for isolation and identification of aerobic pathogens

Nature of Specimen	***No.***
Sputum	2109
Urine	219
Bronchial aspirate	63
Bronchoalveolar lavage (BAL)	56
Pleural fluid	32
Blood	130
Endotracheal aspirate	42
Bipap swab	29
Pus	08
Throat swab	11
Miscellaneous	14
Total	**2713**

Organisms Isolated	***No.***
Pseudomonas spp.	114
Pseudomonas aeruginosa	80

E. coli	48
Klebsiella spp.	42
Citrobacter spp.	04
Enterobacter spp.	02
Proteus vulgaris	01
Acinetobacter spp.	81
Moraxella catarrhalis	40
Haemophilus influenzae	31
Streptococcus pneumoniae	54
Staphylococcus aureus	12
CNS	03
Enterococcus	04
Total	**516**

ii. Mycobacteriology Laboratory

a) **Clinical specimens processed for diagnosis of tuberculosis**

Nature of Specimen	***No.***
Sputum	6383
Bronchial aspirate	76
Bronchoalveolar lavage (BAL)	86
FNAC	02
Pleural Fluid	52
Lymphnode biopsy	05
Tracheal aspirate	16
Urine	01
Pus	04
Semen	01
Biopsy	07
Peritoneal aspirate	01
Skin biopsy	04
Total	**6638**

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

Nature of Specimen	***No.***
Sputum	70
Broncial wash	04
Pleural fluid	06
Pus	04
Bronchial aspirate	01
Tracheal aspirate	01
Bronchoalveolar lavage (BAL)	05
Lymphnode biopsy	02
Total	**93**

c) **Drug sensitivity** (clinical samples) : 30

Pathology

Research

1. Immunohistochemical staining on fine needle aspiration biopsy - cell block specimens in the differential diagnosis of lung cancers

Fine needle aspiration biopsy (FNAB) is used extensively in the clinical workup of radiologically detected lung lesions. However, categorisation of lung cancer by morphology alone is limited by overlapping morphological features. The utility of immunohistochemical panel of antibodies to thyroid transcription factor (TTF-1), synaptophysin, chromograninA (CgA), cytokeratin-pan, cytokeratin-7 (CK-7), cytokeratin-20 (CK-20), leucocyte common antigen (LCA), and carcinoembryonic antigen (CEA) in cytologic cell block samples in the differential diagnosis of lung cancers was evaluated. Twenty-nine FNAB's of newly diagnosed cases of lung cancer were studied. Immunohistochemistry was done on paraffin embedded cell block sections. Morphological diagnosis of non small cell carcinoma was made in 76% (22 / 29) and small cell carcinoma in 24% (7 / 29) cases. 71.4% (5 / 7) cases of small cell carcinoma were CgA+ / TTF-1+, 14.3% (1 / 7) were CgA+ / synaptophysin+ / TTF-1 negative. In one case LCA positivity lead to diagnosis of non Hodgkin's lymphoma. Non small cell carcinoma was categorised further into well differentiated -11 / 22 (50%), moderately differentiated-7 / 22 (31.8%) and poorly differentiated- 4 / 22 (18.2%) cases. Cytokeratin-pan positivity in squamous cell carcinomas (n=15) was seen to be related to cellular differentiation. All three cases of adenocarcinoma were CK-7+ / CK-20 negative. In one case of large cell carcinoma chromogranin A positivity lead to recategorisation as large cell neuroendocrine carcinoma. Our results suggest that the proposed panel of immunohistochemical markers might help further classification of lung carcinomas even in small FNAB material and permit more consistent patient enrollment for trials with targeted treatments.

2. Coagulation profiles in patients with acute exacerbations of chronic obstructive pulmonary disease (AECOPD)

Chronic obstructive pulmonary disease (COPD) patients have an ongoing prothrombotic state and are predisposed to venous thromboembolism during acute exacerbations of COPD (AECOPD). The coagulation profile in patients of COPD during acute exacerbations was studied and correlated with haematological and clinical parameters. Sixty-eight patients with average age 65 years (Males-60, Females- 8) were included in the study. Patients with AECOPD, having at least 10 pack years of smoking, deranged coagulation profile; raised PT and APTT, showed poor outcome in terms of longer duration of stay in ICU and increase in mortality risk. Our results show that there is necessity of dynamic trace of coagulation and haematological data in patients of AECOPD with severe chronic respiratory insufficiency in order to reduce the associated mortality and morbidity.

3. Mean platelet volume, platelet count in asthma: relation to disease status and peripheral eosinophilia

Platelets have been suggested to play a primary role in the pathogenesis of bronchial asthma. Peripheral platelet count, mean platelet volume (MPV) can be an indicator of airflow limitation and are being evaluated for their relationship to airflow limitation and peripheral eosinophilia in asthmatic patients. One hundered-twenty-four asthma patients, 5 to 55 years of age with 64 males and 60 females were studied. Thrombocytopenia was seen in 28 / 124 cases (22.6%). Significant correlation was found between platelet count and disease severity ($p = 0.02$). The mean MPV± SD of all patients was 6.9± 1.0 fL. Mean platelet volume was reduced (< 6.5 fL) in 39 / 124 cases (31.5%). In this group of patients an inverse correlation of MPV with FEV_1 was seen, however it was not statistically significant ($p = 0.12$). Absolute esonophil count (AEC) was <440 cells / cmm in 54 cases and elevated in 70 cases. Peripheral platelet counts were inversely correlated to AEC, but were not statistically significant. It was concluded that a significant correlation between peripheral platelet counts and severity of airflow limitation exists and needs to be prospectively studied for evaluating its role as peripheral cellular marker of inflammation in asthma patients**.**

4. Role of transbronchoscopic lung biopsy (TBLB) in diagnosis of diffuse parenchymal lung diseases

The present study was undertaken to evaluate the clinical usefulness of TBLB in the diagnosis of patients with diffuse pulmonary diseases. A retrospective analysis of 354 endobronchial (EBB) and transbronchial lung biopsies (TBB)

was done. Pathologic features evaluated in each case were: alveolar architecture, inflammatory infiltrate, granulomatous inflammation, atypical cells, interstitial fibrosis, fibroblast foci, vasculopathy, pigment deposition, and honeycomb change. There were 191 males and 163 females with a mean age of 49 years. In 216 (61%) out of 354 procedures the results of TBLB were clinically helpful. These included 51 cases of interstitial pneumonitis with fibrosis, 49 cases of granulomatous inflammation and 42 cases of carcinoma lung. An adequate lung parenchymal biopsy without a specific diagnostic abnormality was identified in 51 (14.41%) cases. In 87 procedures (24.6%), no lung parenchyma was obtained. This was similar to other studies which have noted the problem of inadequate lung tissue from TBLB in up to 20 % of patients. Our data reinforces the view that bronchoscopic lung biopsies are an important diagnostic method for the evaluation of patients with diffuse lung disease.

Diagnostic Services

Diagnostic services were provided to the indoor and outdoor patients in subdivisions of haematology, histopathology, cytopathology and clinical pathology.

A. Haematology

All blood samples were analysed using automated five part analyser – Melet Schloesing 9-5. Internal quality control programme was continued.

Haematology Test	Number
Hemoglobin estimation	12,394
Total leukocyte count	12,394
Differential leucocyte count	12,394
ESR	2,603
Absolute eosinophil count	598
Platelet count	2556
Peripheral smear	144
P / S for malarial parasite	27
Reticulocyte count	05

Coagulation Laboratory

Coagulation analysis was carried out using manual kits by Diagnostic Stago on regular basis.

Coagulation Test	Number
Prothrombin time	105
Activated partial thromboplastin time	105
D-dimer	19
Fibrinogen degradation product	16
Bleeding time	216
Clotting time	216

B. Histopathology

Diagnostic histopathology and enzyme histochemistry was continued. Immunohistochemistry using monoclonal antibodies was used for accurate categorisation of lung cancer cases.

Biopsies Processed	Number
Lung biopsy	154
Lymphnode biopsy	01

C. Cytopathology

Diagnostic cytopathology and exfoliative cytology was continued. Special stains – PAS, mucicarmine, AFB were performed on regular basis. Immunohistochemistry was performed on cell blocks made from cytology samples.

Cytology Sample Processed	Number
Sputum	400
BAL fluid	64
FNAB: Percutaneous	115
Transbronchial (TBNA)	28
Bronchial aspirate	66
Pleural fluid	72

D. Clinical Pathology

Urine Analysis	Number
Specific gravity	1844
pH	1844
Albumin	1844
Sugar	1844
Microscopic examination	1844
Ketone bodies	03

Haematology and Clinical Pathology laboratories continued to function on all holidays for emergency, indoor and ICU patients.

Pharmacology

Research

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

A single blind, randomised, placebo controlled study is being conducted to evaluate the efficacy of Livina (a polyherbal formulation) against anti-TB drug therapy induced hepatotoxicity. The study protocol has been approved by the Ethical Committee of the VPCI and after taking written informed consent, the patients were divided into two groups; one receiving Livina and the other receiving placebo. Baseline liver function tests were performed prior to the study, and subsequently at 2, 4 and 8 weeks after initiation of ATT / herbal drug therapy. Thirty-six patients have since completed the study. On interim analysis of the currently obtained qualitative and quantitative data, it appears that Livina has greater protective effects against ATT induced liver damage, as assessed by the qualitative and quantitative markers (SGOT, SGPT, Alkaline phosphatase, Bilirubin, Total proteins). The target is to complete 50 patients in each group and efforts are on to achieve the same.

2. A clinical study to evaluate the efficacy and safety of UNIM-352 (a polyherbal Unani formulation) in patients of bronchial asthma

A double blind, placebo controlled, randomised, parallel design, prospective study is being performed to evaluate the efficacy and safety of UNIM-352, a polyherbal Unani formulation, in patients of bronchial asthma. After taking the written informed consent, the patients were divided into two groups – one receiving UNIM-352 and the other receiving placebo. After baseline pulmonary function test (PFT) data was recorded the patients were put on standard anti-asthma treatment with bronchodilators and steroids as inhalation therapy. Pulmonary function test data was recorded in both groups at 2, 4, 6, 8 and 12 weeks, as also the frequency of use of SOS salbutamol inhalers. Thirty-one patients have since completed the study, and analysis of initial results indicate that the UNIM-352 group showed greater improvement in the PFT data / parameters as compared to the placebo group, and the frequency of use of SOS salbutamol was also less. A total of 100 patients are to be enrolled in this study, which is continuing.

3. A study to monitor adverse drug reactions in patients of chronic obstructive pulmonary disease (COPD)

This is the first study of this kind in which adverse drug reactions (ADR) were monitored in both outpatients and in patients of COPD attending the Viswanathan Chest Hospital of our Institute. The study protocol was approved by the Ethical Committee of the VPCI, and after taking into consideration the various inclusion and exclusion criteria, ADRs were systematically monitored in COPD patients receiving the various forms of drug therapy. The study was also part of the National Pharmacovigilance Programme initiated at the VPCI {sponsored by the WHO-CDSCO (Central Drug Standard Control Organization) collaboration}. Initially, a total of 60 COPD patients were enrolled and evaluated for ADRs, as the prescribed format provided by the CDSCO-DCGI. On evaluation of the ADR reports it was found that mostly ADRs followed a particular pattern in relation to the drug used, *viz.*, beta agonists, theophylline, corticosteroids, anticholinergics, antibiotics, etc., in these COPD patients. The most distinct ADRs were seen in patients receiving inhaled steroids (oropharyngeal thrush and voice disturbances) and / or oral theophylline (GI disturbances, anxiety and palpitations). Causality analysis was done by using Naranjo's scale and there was a more than probable association between drugs and ADR. More patients are being evaluated for ADRs in COPD.

4. Adverse drug reaction monitoring in patients of bronchial asthma

The National Pharmacovigilance Programme has been initiated at the VPCI (sponsored by the WHO-CDSCO collaboration) and as part of this project a study is being conducted to assess ADR patterns in patients with bronchial asthma at the VPCI as well as from adjoining hospitals / clinics. After completing the initial formalities like Ethical Clearance, inclusion / exclusion criteria, informed consent, etc., patients of bronchial asthma are being enrolled for this study. Patients from OPD, wards, as well as those partcipating in the various clinical trials in the institute / department, are also being included to expand the data base. Adverse drug

reactions due to other concomitant diseases and drug treatments are also being recorded to give a more comprehensive picture. This is an ongoing project and is providing interesting data for rationalising drug therapy in asthma, and more patients are being evaluated for ADRs.

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

The effects of emotional and xenobiotic stressors on immune regulation and its modulation by free radicals are being studied. Pharmacocological and biochemical data have showed that lipid peroxidation is associated with stress induced immunomodulation and antioxidants reverse this. Behavioural studies have shown a close correlation between behavioural patterns and immune responses. Using restraint stress as an emotional stressor and endosulphan as the xenobiotic stressor, it has been shown that both forms of stress resulted in enhanced lipid peroxide formation (MDA) and lowered antioxidant defense mechanisms (GSH, SOD, Catalase). Antioxidants (ascorbic acid, tocopherol, melatonin and n-acetylcysteine) reversed these immunosuppressive effects and also altered biochemical markers by differential degrees. This suggests that oxidative stress may be involved in such immunomodulation induced by psychological and environmental factors. There are also indications that nitric oxide may play a crucial role in such stress induced immunomodulation. This study is of considerable applied importance.

6. Studies to explore gender differences in stress responses with special emphasis on nitric oxide (NO)

It is well known that gender differences influence physiological and pharmacological responses. The present study was planned to explore the pharmacological basis for gender differences in stress responses in rats. Restraint stress (RS) induced biological changes are being assessed in both male and female rats, *viz.*, neurobehaviour, immunological and biochemical, and their possible correlation with NO ergic mechanisms are being assessed. Interactions of NO with oxidative stress markers were also evaluated. In addition, the effects of oestrogen antagonists on stress responses in female rats were assessed. Male rats were more susceptible to stress induced changes as compared to females, and both brain and plasma levels of stable NO metabolites (NOx) were higher in females as compared to their male counterparts after RS exposure. The effects of NO precursors were also greater in males. Oxidative stress accompanied emotional stress induced biological changes and NO mimetics attenauated changes in MDA and GSH seen after RS. Stress tolerance was also greater in females who had consireably higher NOx levels in the brain homogenates. Stress gastric ulcer susceptibility was greater in males and also correlated well with plasma NOx levels, as compared to females. These results indicate that males and females react differently to stress, and NO may be having a regulatory influence in this differential nature of response.

7. Role of endogenous opioids and its interactions with NO during stress responses in rats

Endogenous opioids are important neuromoulators during stress reactions and the present experiments were designed to evaluate the possible association between opioids and NO in stress susceptibility and tolerance. Studies were carried out using neurobehavioural, endocrinal and biochemical parameters during restraint stress (RS) and their modulations by opioidergic and NO ergic agents. Neurobehavioural data after acute and repeated RS exposure showed a good correlation with brain biochemical data (NOx). These initial results are encouraging, and suggest that opioids like morphine may act through NO during stress ameliorating effects. Further studies involving neuroendocrinal and immunological markers are in progress and likely to reveal a meaningful hypothesis in relation to this problem.

8. Studies on the possible mechanisms of action of UNIM-352, a polyherbal Unani anti-asthmatic preparation, in experimental animals

UNIM-352 is a polyherbal drug used effectively in treatment of asthma in traditional medicine. The present study was designed to evaluate the possible mechanisms of action in this effect of the drug. Accordingly, its anti-inflammatory and immunomodulatory effects are being explored in *in vitro* and *in vivo* experimental models. The study is in its initial stages and likely to provide interesting information on the pharmacodynamics of the drug.

9. Impact of standard treatment guidelines (STG) and patient education on quality of asthma management

A baseline survey demonstrated that treatment of bronchial asthma was not in accordance with STG in

secondary care public facilities in Delhi. Educational intervention of prescribers had not much effect on the prescribing behaviour of doctors.

Hence, the present work was planned in the Viswanathan Chest Hospital of our Institute where all prescribers are chest specialists and are expected to follow the STGs. Unlike other government hospitals of Delhi, medicines are not given free to patients in this hospital. Most of the times patients are referred to this Institute for chest diseases and all patients purchase the prescribed medicines from private facilities (chemist shops).

Objectives of the study

a. Baseline parameters of asthma patients referred to Viswanathan Chest Hospital,
b. to study the impact of standard treatment according to current guidelines on the quality of asthma management,
c. to study the effect of additional intervention with a formal educational programme on the quality of management of asthma.

The study was carried out in the out patient department of the Institute. After enrollment of patient according to the protocol, detailed baseline parameters were noted. Treatment was given according to STG to all patients. Apart from the routine patient education imparted in the OPD, in one group of patients educational intervention was done. Patients were followed after 2, 4, 8, 12, and 24 weeks of enrollment. Follow-up of all patients was completed on April 2007. After that data was entered and analysed.

Analysis of the results revealed that patients who visited the referral hospital for their asthma, initially the mean score of all the domains for asthma were moderately affected. Patients were not informed by their previous treating doctor (mostly general practitioners or government facility) about the proper treatment of asthma.

Asthma control questionnaire clearly showed that there was marked improvement in the mean score of all patients. Knowledge of regarding asthma was improved in both the groups but there was significant improvement in the group for which additional patient education was conducted. The study clearly showed that if asthma is treating according to STGs control of asthma and quality of life improves; additional patient education improves the knowledge regarding asthma treatment.

10. Surveillance of antimicrobial resistance and use in the community and in-depth qualitative investigation for behaviour of antimicrobial drugs use for suitable interventions for rational use of antibiotics

Overuse of antibiotics has contributed to the emergence and spread of antimicrobial-resistance. Resistance to antibiotics is a major public-health problem and antibiotic use is being increasingly recognised as the main selective pressure driving the resistance. Aim of our study is to assess outpatient use of antibiotics and the association with resistance. We are trying to find out the behaviour of all the stakeholders involved in the use of antibiotics.

Phase I of this project was done in November 2003 - December 2004.

Objectives of the study

a. Surveillance of antimicrobial use in the Private pharmacies, Public facilities and Private practitioners.
b. dissemination of the results of Phase I study to all the stakeholders,
c. investigate the reasons for irrational use of antibiotics with all stakeholders through focus group discussions and in-depth interviews,
d. in-depth group discussions and planning suitable and sustainable interventions with all stakeholders.

The second phase of the study is started from November 2007. Data on consumption of antibiotics is being collected by doing exit interviews of the patients purchasing / prescribed any antibiotic from different facilities. As the resistance is being conducted at Ganga Ram Hospital, New Delhi, data is collected in four localities around that hospital. Data is being collected from 30 retail pharmacies, 10 public hospitals and dispensaries and 20 private practitioners and specialists in the catchment area. The work was started from November, which was a pilot survey and the data for survey has been started from December 2007. The study is for 12

months and the target number of exit interviews is conducted at each facility per month.

This is a collaborative work with the Microbiology Department of Sir Ganga Ram Hospital for antibiotic resistance pattern.

Meetings with different stakeholders have been started and we have conducted the in-depth interviews and focus group discussion with pharmacists and one meeting was held with school children of one particular school.

11. Acute effects of tiotropium alone and in combination with formoterol in patients of chronic obstructive pulmonary disease (COPD)

Bronchodilators are the mainstay of pharmacologic therapy for COPD. Current guidelines highlight the fact that, for patients whose conditions are not controlled with bronchodilator monotherapy, the use of a combination of more than one class of bronchodilators may be more effective than the use of single agent with respect to improvements in the lung function, symptoms, and reducing the risk of adverse events. It has been suggested that combining long acting beta two agonist, like formoterol with long acting anticholinergic, like tiotropium could provide important benefits, since these drugs have complimentary actions on the airways.

Objectives of the study

To study and compare the acute effects of following regimens in patients of COPD;

- Tiotropium alone once a day,
- tiotropium + formoterol once a day,
- tiotropium + formoterol in the morning and formoterol in the evening.

This was a randomised, double blind, placebo-controlled and active drug-controlled study. The study showed the beneficial effect of addition of formoterol to tiotropium for the treatment of COPD. In mild COPD patients, addition of second dose of formoterol in the evening has clearly shown beneficial effect. A larger number of mild COPD patients should be studied to confirm this finding.

12. Role of free radicals in theophylline- induced seizures in experimental animals

The anti-inflammatory and immunomodulatory effects of theophylline are known, but a safer toxicity profile could make its use more acceptable. Its close relationship with ROS and RNS is shown in its chemical / pharmacological effects and the present study evaluated the role of free radicals in theophylline toxicity. The study was designed to measure theophylline induced convulsions and correlates it with the anti-oxidant / pro-oxidant status in the brain. Modulation of these effects with anti-oxidants was seen and melatonin was 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 antioxidant status revealed that such seizures were associated with enhanced lipid peroxidation and lowered antioxidant defense in the brain. Anticonvulsant effects were also seen with the NO synthase inhibitor, L-NAME and 7-nitroindazole, and melatonin synergised with the NO synthase inhibitor effects. These neuroprotective effects were associated with attenuations in the brain oxidative and nitrative damage as measured by biochemical markers of lipid peroxidation (MDA), anti-oxidant defense (SOD and catalase) and NO metabolites. Further, the proconvulsant role of theophylline in pentylenetetrazole induced seizures and kindling behaviour is being investigated. Our studies have shown a similar role of reactive oxygen and nitrogen species in the mediation of this behaviour.

13. Pharmacological studies on the role of nitric oxide (NO) in stress adaptation in rats

Stressful stimuli are known to disrupt the physiological milieu and complex mechanisms are proposed and the ability of the organism to cope with such aversive stimuli is crucial determinants of health and disease. Free radicals (ROS and RNS) are crucial biomodulators at the cellular / molecular level, and may be involved in neural transmission. The molecular basis of stress tolerance is of considerable importance for devising strategies for drug therapy in such situations. Preliminary studies showed that subacute / chronic (repeated) stress induced differential attenuations in the normal stress responses in experimental animals, as assessed on behavioural and immunological parameters, and NO-modulators influenced these markers predictably. The

pharmacological and biochemical data show that NO may be involved in the cellular / molecular events resulting in stress tolerance. Using neurobehavioural, endocrinal and visceral parameters as markers of stress, it was observed that repeated stress exposure attenuated acute stress responses and these were associated with parallel changes in plasma and brain NO metabolite levels. Pretreatment with NO modulators also influenced these stress markers and also modulated the biochemical parameters studied. Additional studies with conventional anti-anxiety / anti-stress agents have shown that there may be a possible interaction between NO and some of the classical neurotransmitters during stress. On the other hand, in severe chronic stress models, when rats were exposed to repeated RS (6h) x10, the behavioural responses were completely abolished, whereas, MDA and NOx levels were further aggravated, as compared to the single RS (6h) group. Both acute and chronic stress responses were predictable altered by pharmacological treatment with the NO modulators. These results strongly suggest that acute and chronic restraint stress induces differential neurobehavioural responses which are stressor intensity and duration dependent. Further, short durations of chronic RS induces adaptation, whereas, longer durations of chronic RS lead to breakdown of adaptive mechanisms and such paradoxical stress reactions are under the regulatory control of NO and its interactions with oxidative stress markers.

Physiology

Research

1. Bronchial reactivity in diabetic guinea pigs

Isolated tracheal rings from normal, diabetic, hyper-reactive airways and diabetic plus hyper-reactive airways guinea pigs were used for examining responsiveness of airway smooth muscle to broncho-active agents ACh and Isoproterenol The role of epithelial mediators NO, K_{ATP} channels and prostaglandins were examined by using specific blockers L-NAME, Glybenclamide and Indomethacin.

Enhanced contractile response of ACh in the presence of L-NAME, a NO synthase inhibitor, in control animals and in animals with hyperactive airways, suggests NO mediated bronchodilatory effect. Such a modulatory role of NO was absent in diabetic and diabetic plus hyperreactive animals suggesting loss of NO dependent mechanisms in such diseased conditions. K_{ATP} activated potassium channels do not play any significant role in bronchoconstrictor response of ACh in normal and in diseased conditions. Enhanced contractile response of ACh, after COX blocker, in animals with hyperreactive airways and in airways of control animals suggest a modulatory role of relaxant prostaglandins. The constrictor response of ACh was reduced in diabetic animals and in animals with diabetic plus hyperreactive airways, there was also a reduction in contractile response to ACh, however, it was less than that observed in the case of diabetes alone suggesting a role of contractile prostaglandins in such diseased conditions.

2. Effect of polypharmaceutical herbal drug lipotab in isoproterenol induced chronic heart failure in rats

Lipid reducing synthetic drugs, statins are being used extensively for the treatment of cardiovascular diseases including heart failure. Long term use of statins is known to have adverse effects, therefore the present study was undertaken to examine the therapeutic and prophylactic efficacy of a lipid reducing herbal compound lipotab as an alternative to the conventional therapy bystatins in an experimental model of heart failure. Heart failure (HF) was induced in rats by two subcutaneous injections of isoproterenol (100mg / kg) at an interval of 24 hours. After 15 days of second injection of isoproterenol animals were anaesthetised, catheters were placed in the femoral artery and left ventricle through right carotid artery to record hemodynamic parameters, arterial blood pressure, heart rate, left ventricular pressure, LVdP / dtmax. These parameters were recorded using pressure transducers and software supported Power Lab data acquisition system. Baroreflex sensitivity was assessed from heart rate - systolic arterial pressure relationship. Blood pressure was changed by injecting phenylephrine (PE) and sodium nitroprusside (SNP) through femoral vein catheter. Later animals were ventilated through tracheal cannula with a small animal respirator, thoracotomy was done to expose ascending aorta. An ultrasonic flow probe was fixed around the aorta to record cardiac output with a flowmeter. Experiments were carried out in normal animals (normal control), normal animals treated with lipotab (lipotab *per se*) and normal animals treated with fluvastatin (fluvastatin *per se*). Results demonstrated that in heart failure there was a rise in left ventricular end diastolic pressure and fall in left ventricular contractility. Treatment with lipotab *per se* and fluvastatin *per se* did not show any significant changes in cardiovascular parameters as compared to normal control animals. The model of CHF by administration of isoproterenol / isoprenaline has been standardised and assessment of cardiovascular parameters in CHF rats is in progress.

3. Lipid reducing herbal compounds provides protection against diabetes induced cardiovascular disorders

Diabetes induced cardiomyopathies due to hyperlipidemia, hypercholesterolemia are usually treated by hypolipidemic drugs like statins. In view of the adverse effects of long term use of statins there is a need to look for an alternative to treat or prevent diabetes-induced cardiomyopathies. Therefore, we hypothesised that lipid reducing herbal compound *Arjuna* may provide protection like statins against diabetes induced cardiovascular disorders. Surgical procedures and techniques for recording hemodynamic parameters were standardised for the study. Animals (rats) were anaesthetised, femoral artery cannulation was performed to record arterial blood pressure. A catheter was placed in the left ventricle through right common carotid artery to record left ventricular pressure. Femoral vein catheter was used for injections. Pressure recording was done on a software supported Power Lab data acquisition system using pressure transducers and derived parameters, heart rate,

LVdP / dt, were recorded using Power Lab software. Baroreflex sensitivity was assessed by recording systolic blood pressure and heart rate relationship at varying pressures achieved by intravenous injections of phenylephrine and sodium nitroprusside. Fifty per cent alcoholic extract of herbal drug *Terminalia Arjuna* was prepared using standard extraction procedure to extract the constituents *e.g.* tannins, glycosides, steroids, phenolics, etc. Preliminary experiments demonstrated that *Terminalia Arjuna per se* treatment in Wistar albino rats caused no significant change in hemodynamic parameters as compared to normal control animals. Further experiments are underway to determine the effects of *Arjuna* bark extract in STZ-induced diabetic rats.

4. Evaluation of free radical - mediated impairment of cardiovascular functions on mercury exposure in rats

Mercury (Hg) is an environmental pollutant and a potent metabolic toxin that can cause adverse effects on the cardiovascular and hematopoietic systems. In order to investigate the role of oxidative stress caused due to free radical generation by mercury exposure, we examined the beneficial effect of melatonin, a known antioxidant, in protection from mercury toxicity. Surgical procedures and techniques for recording hemodynamic parameters were standardised for the study. A systemic study was performed on the animals fed with normal pellet diet (control group). We investigated the effects of acute methyl mercury exposure and alterations on neural regulation of arterial blood pressure in anesthetised Wistar albino rats. Femoral artery was cannulated to record the arterial pressure and femoral vein was cannulated for injections. Methyl mercury was administered by slow intravenous infusion. Changes in systolic, diastolic, mean arterial pressure, heart rate and baroreflex sensitivity were evaluated and results were compared with the control group. Baroreflex sensitivity was tested by injecting phenylephrine (PE) and sodium nitroprusside (SNP) through femoral vein catheter. Hemodynamic parameters were recorded using pressure transducers and software supported Power Lab data acquisition system. Mercury exposure caused impairment of hemodynamic parameters and baroreflex sensitivity. A significant improvement in the cardiovascular functions by melatonin treatment in mercury exposed rats was observed.

5. Effect of tadalafil (a novel phosphodiesterase-5 inhibitor) in hypoxia induced pulmonary hypertension in rats

Hypoxia induced pulmonary hypertension is a physiologic regulatory mechanism to minimise ventilation-perfusion mismatch in the lung. However, during global hypoxia, as seen at high altitude, this results in severe increase in pulmonary vascular resistance, pulmonary hypertension, right ventricular dysfunction and pulmonary edema. A systemic study was performed on the animals fed with normal pellet diet. Pulmonary hypertension was induced in anaesthetised rats by subjecting rats to breath hypoxic gas mixture (10% oxygen for 30 minutes). For recording right ventricular pressure and right ventricular contractility, a catheter was placed in the right ventricle *via* right jugular vein. Right femoral artery and vein cannulation was performed for recording systemic blood pressure, heart rate and for drug injection respectively. These parameters were recorded using pressure transducers and software supported Power Lab data acquisition system.

We examined the effect of tadalafil on right ventricular functions in hypoxia induced pulmonary hypertensive rats. Acute hypoxic ventilation for 30 minutes increased the right ventricular systolic blood pressure (index for pulmonary arterial pressure) and right ventricular contractility significantly. Tadalafil pretreatment significantly reduced acute hypoxia induced rise in right ventricular pressure and right ventricular contractility without producing any significant change in systemic blood pressure. To examine the role of free radicals in hypoxia induced pulmonary hypertension the experiments are in progress.

6. Behaviour of rapidly adapting receptors (RARs) during high altitude exposure

The main objectives of this study were to investigate the behaviour of airway RARs to high altitude exposure and see whether their responses to some endogenous chemicals were different at different altitudes. Adult rabbits weighing 2-3 kg housed in separate enclosures in the animal house of VPCI and provided with food and water ad libitum were used as experimental animals. The experiments were performed on three groups of animals – *Group I* (control), *Group II* (Acute exposure to high altitude) and *Group III* (chronic exposure to high altitude). *Group I* breathed room air, *Group II* was exposed to a height of 15000 feet for 12 hrs and *Group III* was exposed to a height of 15000 feet for 36 hrs. Efforts were made to record afferent activity from RARs in each group.

Group I (Control) (n= 10)

Ten RARs were recorded from 10 rabbits. However, the RAR activity was lost in the course of investigation in five. The protocol was completed in the remaining five.

Effect of substance P (SP) on baseline RAR activity

Substance P produced a dose-dependent increase in RAR activity. The threshold dose for increasing the RAR activity ranged from 0.01 to 0.1 µg / kg. At 1µg / kg there was intense stimulation. At the dose of 0.01µg / kg, the RAR activity increased from its control value of 2 ±0.70 to 8.7 ±0.96 impulses / breath; at 0.1µg / kg, from 8 ±1.78 to 13.47 ±0.80 impulses / breath and at the dose of 1 µg / kg from 9.4 ±1.28 to 29.6 ±1.78 impulses / breath. At the threshold dose, there was an increase in peak tracheal pressure which increased further on increasing the dose. At the dose of 0.01µg / kg the tracheal pressure increased from 5.6 ±0.44 to 6 ±0.50 mm Hg, at 0.1 µg / kg, it increased from 6.5 ±0.28 to 7.3 ±0.33 mm Hg and at the dose of 1 µg / kg, it increased from 5 ±0.28 to 7.8 ±0.33 mm Hg. The mean arterial blood pressure decreased with each dose. At the dose of 0.01µg / kg the mean arterial blood pressure decreased from 58 ±4.6 to 51.2 ±4.1 mm Hg, at 0.1 µg / kg, from 63 ±2.5 to 53 ±1.9 mm Hg and at the dose of 1 µg / kg, it decreased from 58 ±2.5 to 44 ±2.01 mm Hg.

Effect of histamine on baseline RAR activity

Histamine produced a dose-dependent increase in RAR activity. The threshold dose for increasing the RAR activity ranged from 3 to 5 µg / kg. At the dose of 3µg / kg, the RAR activity increased from its control value of 3.6 ±0.92 to 5.4 ±1.32 impulses / breath and at 5µg / kg, from 6.2 ±0.8 to 9.2 ±0.94 impulses / breath. At the threshold dose, there was an increase in peak tracheal pressure which increased further on increasing the dose. At the dose of 3µg / kg the tracheal pressure increased from 5.3 ±0.33 to 6.5 ± 0.50 mm Hg and at 5 µg / kg, from 6 ±0.57 to 7 ±0.5 mm Hg. The mean arterial blood pressure decreased with each dose. At the dose of 3µg / kg the mean arterial blood pressure decreased from 92.5 ±2.5 to 76.2 ±4 mm Hg and at 5 µg / kg, it decreased from 72.5 ±2.5 to 60 ±1.5 mm Hg.

The receptors were localised in the lung parenchyma. Portions of lung taken up for histological examination showed normal architecture with no pulmonary congestion, edema, capillary thrombi or atelectasis.

Group II (Acute)

Three rabbits were exposed to an altitude of 15000 feet for 12 hrs. After anesthesia the mean arterial blood pressure and heart rate were 66.6±4.4 mm Hg, 180±0 beats / min respectively. The pH, PCO_2 and PO_2 were 7.4±0.05, 31.7±5.56 mm Hg and 37±7.2 mm Hg respectively.

After ventilation with 8% hypoxic gas mixture, the pH, PCO_2 and PO_2 were 7.3±0.05, 24 ±3.74 mm Hg and 35.2±3.9 mm Hg respectively. Even though RAR activity was recorded in two of them, the protocol could not be completed. Portions of lung taken up for histological examination showed pulmonary congestion predominantly, pulmonary edema and focal capillary thrombi.

Group III (Chronic exposure)

Three rabbits were exposed to an altitude of 15000 feet for 36 hrs. After anesthesia, the mean arterial blood pressure and heart rate were 58.33±6.6 mm Hg and 150 ±17.32 beats / min respectively. The pH, PCO_2 and PO_2 were 7.36±0.06, 25.97±1.88 mm Hg and 41.33±6.3 mm Hg respectively.

After ventilation with 8% hypoxic gas mixture, the arterial blood pH, PCO_2 and PO_2 were 7.33±0.06, 34.3 ±3.48 mm Hg and 42.6±9.55 mm Hg respectively.

In this group also, even though RAR activity was recorded, the protocol could not be completed as the activity got lost in between. Portions of lung were taken up for histological examination.

7. Responsiveness of airway rapidly adapting receptors to cigarette smoke inhalations

The main objectives of this study were to investigate whether *i)* acute inhalation of cigarette smoke activated the RARs and *ii)* repeated exposure to cigarette smoke inhalation reduced their resting activity and their responses to acute cigarette smoke inhalation. Adult rabbits (either sex), weighing 2-3 kg housed in

separate cages at animal house of VPCI and provided with food and water ad libitum were used as experimental animals.

Acute cigarette smoke delivery

A "Y" connector was attached in series to the inlet of the ventilator. To one arm of the Y connector, a lighted cigarette was attached, the other arm open to the air was closed off so that during each ventilatory cycle, air was drawn through the cigarettes and the volume of air inhaled for each puff was equal to one tidal volume of the ventilator. Three minutes prior to the inhalation of cigarette smoke, oxygen supplementation of inspired air was temporarily interrupted.

Chronic exposure to main stream cigarette smoke

Experimental animals were exposed to main stream cigarette smoke (CS) from four cigarettes of a particular brand drawn in to an exposure chamber with a capacity of 60 litres. The exposure period was 1 hr / day, seven days a week for 27 days. During the time of exposure air flow through the chamber was held constant. The exposure chamber was fitted with another small chamber containing soda lime for absorption of expired CO_2. Temperature of chamber was monitored by using thermometer. Control animals were delivered normal room air in identical fashion.

Results and observations

The experimental protocols were performed on eight animals in *Group I* (acute cigarette smoke exposure) and six animals in *Group II* (chronic cigarette smoke exposed). Out of these we successfully recorded RARs in six and five animals from each group respectively. The arterial blood, pH, PCO_2 and PO_2 levels were kept at normal by constant monitoring and were maintained at 7.4±0.2, 39±3 mm Hg and 120±5 mm Hg respectively.

The heart rate and mean arterial blood pressure were recorded as 220±5 beats per min and 72±3 mm Hg respectively. There were no significant changes recorded in mean arterial blood pressure and heart rate during the experimental procedures of both the groups.

Group I

The animals of this group were given only once three puffs of cigarette smoke. During the control period the average RAR activity was 3.2± 0.49 and during the experimental period, it was 6.2±0.4 impulses per breath ($p<0.05$). The peak discharge recorded in this group was 9.2±0.47 impulses ($p<0.001$). The latency of peak discharge was 8.7±0.7 sec.

Group II

The animals of this group were exposed to smoke of four cigarettes 1 hr daily for 27days. On 28th day these animals were given three puffs of cigarette smoke. During the control period the average RAR activity was 9±1.47 and during the experimental period, it was 12.04±2.79 impulses per breath. The peak discharge recorded in this group was 16±3.9. The latency of peak discharge was 6.9±2.9 sec. The results indicate that there is a reduction in the responses of RARs to cigarette smoke following chronic exposure.

8. Behaviour of pulmonary vagal sensory receptors with myelinated afferents during oxidative stress induced airway hyperreactivity and its modulation by antioxidants in guinea pigs

For this study, a successful guinea pig model of asthma was created. In this model oxidant status was determined. In the anaesthetised guinea pigs, afferent activities from SARs and RARs were successfully recorded. Pulmonary mechanics were also recorded in the above animals. The study is in progress and the detailed results will be produced later.

9. Obstructive sleep apnea, oxidative stress and renal function

The main objectives of the present study were *i)* to perform polysomnography *a)* for confirmation of obstructive sleep apnea hypopnea syndrome (OSAHS) in suspected cases and *b)* for assessing the effect of treatments with continuous positive airway pressure (CPAP) and antioxidants, *ii)* to measure urine volume and urine sodium and nitrate excretions, *iii)* to measure oxidative stress in these patients, *iv)* to see the effect of

CPAP on the above parameters and *v)* to observe the effect of oral supplementation with antioxidants –vitamin E and vitamin C on the above parameters. It was observed that diuresis and natriuresis occurred in these patients, which got corrected with two nights of CPAP. After treatment with antioxidants diuresis and natriuresis were still present. Nocturia present in these patients got corrected with two nights of CPAP and after treatment with antioxidants. There were significantly increased levels of nitrate in the urine which decreased significantly after two nights of CPAP but the levels remained significantly high after treatment with antioxidants. The results indicate that the diuresis and natriuresis observed in these patients were due to nitrc oxide (NO) released locally in the kidneys.

Radiodiagnosis and Imaging

The Department continued to provide routine diagnostic services to the patients attending the Viswanathan Chest Hospital 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 2120 CT examinations were done during the period as per the details given in Table 1.

Table: 1: Number and type of CT examinations performed

Examination	Number
Chest CT	1188
Head CT	08
PNS CT	803
Abdomen CT	03
CT guided FNAC	118
Total	**2120**

(ii) Ultrasound Unit

A total of 408 Ultrasound examinations were done during the period as per the details given in Table 2.

Table: 2: Number and type of Ultrasound examinations performed

Examination	Number
Chest USG	201
Abdomen USG	140
USG guided procedures	67
Total	**408**

(iii) X-Ray Unit

A total of 19437 X-ray examinations were done during the period as per the details given in Table 3. Out of a total of 19437 X-ray examinations made, 12805 were done on PACS and 6632 were done on X-ray films.

Table: 3: Number and type of X-ray examinations performed

Examination	Number
PACS*	
Chest X-ray (adult)	12040
Chest X-ray (child)	186
PNS X-ray	579
Total PACS X-rays	**12805**
FILM X-ray	
Chest X-ray (adult)	5649
Chest X-ray (child)	430
PNS X-ray	533
Total Film X-rays	**6632**
Total X- rays	**19437**

PACS*: Picture archiving and communication systems.

The Department continued to function on all holidays for emergency, indoor and ICU patients.

Respiratory Allergy and Applied Immunology

Research

1. Biochemical and clinico-immunologic characterisation of mosquito (*Culex quinquefasciatus*) allergens

We have reported earlier the identification of three major allergenic proteins (24, 30 and 33 kd) of *C quinquefasciatus* whole body extract (WBE). Purification of a major allergenic protein of *C quinquefasciatus* WBE was undertaken by salt precipitation, anion exchange column chromatography and fast protein liquid chromatography (FPLC). The biochemical and allergenic properties of various fractions obtained after different steps of purification were studied using various techniques namely, ELISA (enzyme linked immunosorbent assay) inhibition, SDS-PAGE and western blots. *C quinquefasciatus* WBE was subjected to 80% ammonium sulphate precipitation. The precipitate and supernatant were dialyzed and lyophilized. Eighty per cent precipitable fraction was further purified by ion exchange chromatography on a DEAE-Sephacel column (Anion exchanger). The fraction which showed highest allergenic activity was further purified by FPLC using a prepacked Mono Q column. One allergenic protein of *C. quinquefasciatus* extract (24 kd) identified in western blot experiments was recovered in a FPLC fraction.

2. Identification, purification and characterisation of components of clinically important insect allergens implicated in allergic rhinitis and bronchial asthma

Glycerinated extracts of five common insects of Delhi area, namely cockroach (male), cockroach (female), mosquito, housefly and honey bee were purchased from a commercial manufacturer (All Cure Pharma Pvt. Ltd., Bahadurgarh). In-house allergen extracts were also prepared from the insect powders procured from the above manufacturer for conducting various immunochemical investigations as per standard method. So far, a total number of 129 patients suffering with respiratory diseases have been selected for the present study. Skin prick tests (SPTs) were performed on these patients with a 1:20 w / v dilution of the five insects WBEs, along with positive and negative controls. The positive SPT response (1+ to 4+) in these patients were 28.7% with mosquito, 24.8% with housefly and cockroach (male), 25.6% with cockroach (female) and 23.3% with honey bee extracts. Blood samples (10 ml) have been collected from each patient, serum separated and stored at –20 ^{0}C to perform further clinico-immunologic studies. The protein and carbohydrate contents in these extracts were quantified. Protein profiles of the insect WBEs were studied by subjecting them to SDS-PAGE. Molecular weights of most of the proteins of these extracts were in the range of 14 to 70 kd.

3. Assessment of biocontaminants from indoor environments

Isolation and identification of various microorganisms (bacteria and fungi) present in the indoor air was done on the basis of morphological characterstics, microscopic examination, staining techniques and biochemical testing. The prevalence and seasonal variations of various bacteria and fungal spores, different parameters of school buildings, and user perceptions were studied for the assessment of the indoor air quality of school environment. The common indoor airborne (classroom) fungi identified and isolated included species of *Aspergillus*, *Alternaria*, *Penicillium*, *Cladosporium*, *Fusarium*, etc. *Staphylococcus*, *Streptococcus*, *E. coli*, *Klebsiella* were the common bacteria in indoor environment. Aerial concentration of gram negative bacteria was higher than gram positive. Indoor / Outdoor ratio for microbial concentration was found to be crucial for identifying source of contaminants. Of the various meteorological factors, temperature and humidity had significant impact on bacterial and fungal counts. The results of a preliminary questionnaire based study of 60 students suggested that students may have symptoms of Sick Building Syndrome.

4. Studies on aerobiological aspects, clinico-immunologic assessment of allergenic potential and biochemical characterisation of allergenic components of *Aspergillus* species

Volumetric enumeration of airborne *Aspergillus* species has been conducted for one year. Air samples were collected using a volumetric suction sampler. *Aspergillus* cfu / m^3 / day was highest during summer months and marked monthly variations were observed. Protein content in *Aspergillus* extracts *viz.*, *A. flavus*, *A. fumigatus*, *A. niger* and *A. tamarii* varied from species to species (127 to 184µg / mg). On SDS-PAGE analysis, each *Aspergillus* extract produced a number of protein bands of different molecular weights ranging from 12 to

120 kd. The allergenic significance of these four *Aspergillus* species was studied by performing SPTs on 140 patients suffering from bronchial asthma and/or allergic rhinitis. Of the 560 SPTs performed with four *Aspergillus* extracts, 127 (22.7%) turned out to be positive (1+ to 4+). Allergen specific serum IgE was estimated in the patients' sera showing different grades of cutaneous response by performing ELISA (enzyme linked immunosorbent assay). Average ELISA positivity was 67.2% in 1+ to 4+ cases. It increased to 100% in patients with 3+/4+ SPT response. These results gave evidence that aerial spores and fragments of these four *Aspergillus* species may serve as important inhalant allergens for patients suffering with IgE mediated allergic respiratory diseases.

5. Study on levels of high sensitivity C reactive protein (CRP) in asthmatic patients during exacerbation and remission and its correlation with pulmonary function

C reactive protein (CRP) is an inflammation sensitive plasma protein. We studied the levels of high sensitivity CRP (hs-CRP) in asthmatic patients during periods of exacerbations and in remission and its correlation with pulmonary function test (PFT) parameters in this study of 42 patients.

A total of 56 patients of bronchial asthma who presented with acute exacerbation were evaluated for hs-CRP and pulmonary function parameters. Forty-two patients followed up and repeat evaluation was done four weeks after discharge and stabilisation with inhaled corticosteroid and long acting bronchodilator combination as per GINA guidelines.

The CRP levels at time of exacerbation was found to be higher (mean$\pm$SD: 3.968$\pm$1.98 mg/L) than at remission (1.356$\pm$1.30 mg/L) [$p<0.01$]. The CRP levels showed partial negative correlation with FEV_1 [$r=-0.14$, $p<0.001$]. The FEV_1 value during exacerbation was (1.482$\pm$0.58 L) and in remission was (2.212$\pm$0.89 L). Seventeen patients had symptoms at the end of four weeks. They showed higher CRP levels (2.501 $\pm$ 1.29 mg/L) than those who were asymptomatic (0.758$\pm$0.47 mg/L) [$p<0.001$]. Higher initial CRP levels did not predict poor response to medication. Of the 17 patients, 12 showed partial improvement and had CRP level of 2.053$\pm$1.29 mg/L, five did not improve and had repeated exacerbation (CRP level: 3.575$\pm$0.34 mg/L). C reactive protein was increased in one asymptomatic patient.

C reactive protein level correlates well with the severity of asthma, being highest during exacerbation and lowest with good control, and shows partial negative correlation with FEV_1.

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. Beside routine lectures, clinical demonstrations along with seminars, clinical meetings and journal clubs, daily ICU meetings and mortality meetings were conducted regularly.

Research

1. Occurrence of upper airway symptoms and their impact on quality of life (QoL) in patients with chronic obstructive pulmonary disease (COPD)

Consecutive COPD patients were enrolled. Chronic obstructive pulmonary disease and upper airway symptoms were diagnosed as per the Global initiative for chronic Obstructive Lung Disease (GOLD) and Allergic Rhinitis and its Impact on Asthma (ARIA) guidelines respectively. Quality of life (QoL) was assessed using St George's Respiratory Questionnaire (SGRQ) and Sino-Nasal Outcome Test-22 (SNOT-22). Patients with upper airway symptoms underwent skin prick testing with common aeroallergens and computed tomography of paranasal sinuses (CT-PNS) for evaluation of sinusitis.

Forty-one patients with COPD were enrolled. Upper airway symptoms occurred significantly in 65% (27/41, p=0.03). Patients with upper airway symptoms, when compared to those without, had a significantly higher mean total SGRQ score (64.5±16.7 *vs* 51.3±14.5, p=0.01), symptom score (68.7±16.8 *vs* 48.5±15.4, p=0.00), mean SNOT-22 score (19.1±7.9 *vs* 8.4±8.4, p=.00) and a significantly lower FEV_1 (1.4±0.7 *vs* 2±0.7, p=0.03). A positive correlation existed between SNOT-22 and SGRQ (r=0.36, p=0.02). Patients with upper airway symptoms had sinusitis on CT-PNS in 19/27(70%) and skin prick test positivity in 11/27(40%). Sinusitis occurred significantly in patients with skin prick test positivity (9/11 *vs* 2/11, p=0.00). Mean SNOT-22 score (25.3±4.9 *vs* 14.9±6.9, p=0.00) and mean sinus CT score (4.3±3.7 *vs* 2±1.8, p=0.01) too were significantly higher in those with skin prick test positivity as compared to those with negative skin prick test.

Co-existent upper airway symptoms occurred significantly in patients with COPD and it greatly impaired their QoL. Presence of sinusitis and skin test positivity further impaired the QoL.

2. Assessment of severity of disease in patients with allergic rhinitis when categorised as "Sneezers and runners" and "Blockers"

Patients with a clinical diagnosis of allergic rhinitis as per the ARIA workshop report will be enrolled in the study. All the patients will then be categorised into groups as "Sneezers and runners" and "Blockers" depending upon their most troublesome symptom. The severity of disease of all patients will then be assessed with help of a visual analog scale (VAS) ranging from 0 to 10 cm with severity defined as "0" – no symptoms to "10"-symptoms extremely bothersome. Further a "Sino-Nasal Outcome Test-22 (SNOT-22) questionnaire will be used to assess both symptom severity and impact of disease on health status, with each parameter graded on a 5 point scale ranging from "No Problem" to "Problem as bad as it can be". The study results obtained in the two groups will be compared at the end of the study.

3. Chemico-mineralogical study on indoor suspended particulate matter (SPM) in the industrial areas of Delhi and its relationship with the respiratory allergy in children

Indoor air pollution primarily due to SPM is an environmental concern of many cities throughout the world and affects human health. The United States National Research Council has reported that people spend more than 80% of their time indoors. Women and children are the most vulnerable as they spend more time indoors and are exposed to smoke. Air quality in Delhi is poor and airborne particulate concentration routinely exceed.

The present study was undertaken in Shahdara and Shahzada Bagh industrial areas of Delhi with the primary objective to determine mineralogical and chemical compositions of indoor SPM and their impacts on the health of children especially respiratory allergy.

Indoor SPM level was measured by the Handy Air Sampler (Low Volume Sampler) with 1 LPM (liter per minute) flow rate. The minerals identified in the SPM by X-ray diffraction (XRD) technique and concentration of toxic elements was determined in indoor SPM using atomic absorption spectrophotometer (AAS). Respiratory health status of children was evaluated with history, examination and spirometric evaluation.

A total of 831children (59.7% male and 40.3% female) were studied in the Shahdara and Shahzada Bagh industrial areas of Delhi. 33.8% children were exposed by environmental tobacco smoke (ETS). 70.3% children's family was using LP Gas for cooking where 29.7% using biomass fuels (kerosene, wood, coal and cow dung cakes) for cooking. Diagnosis of asthma, rhinitis and upper respiratory tract infection (URI) was made in 11.8%, 39.0% and 36.2% respectively. The mean indoor SPM level was 1080±482 $\mu g / m^3$. The minerals in SPM was identified which includes quartz, lepidocrocite, calcite and dolomite. Concentration of toxic elements such as Cr, Co, Ni, Pb, Zn, Cu, Mo, Cd, Si, and Al were also determined in the SPM using AAS technique. Asthma was significantly (p=0.001) more in the children where the indoor SPM level was high in the houses. Asthma in children was also significantly more where concentration of Cr, Ni, Pb, Zn, Cu and SiO2 was high in the indoor SPM. Rhinitis and upper respiratory tract infection were significantly more in the children where concentration of Cr, Co, Ni, Pb, Cu and SiO2 was high in the indoor SPM.

Present study concluded that the high concentration of Pb, Cr, Ni, Cu and quartz (SiO2) minerals in the indoor SPM are significantly associated with respiratory allergy in children. These high elemental values in the SPM are possibly derived from industries presence in the surrounding areas which may be responsible for various respiratory allergic diseases.

4. Tobacco consumption and its relation with rhinitis

It is important to stop the consumption of tobacco especially in developing countries. Consumption of tobacco is the important cause of most respiratory diseases. This study was planned to find out the relationship between various form of tobacco consumption, and rhinitis.

Data related with rhinitis were collected from the patients visited to Tobacco Cessation Clinic (TCC), VPCI, University of Delhi, Delhi, to quit their use of tobacco. A control group of non tobacco users were taken from the University area to compare the history of rhinitis between the tobacco users and non tobacco users.

Two hundred-eleven subjects, who visited TCC, their data were analysed. 95.7% were male subjects. Maximum subjects were from the age group of 21-30 years. 72.5% of subjects started their tobacco use between the age of 11-20 years. Fagerstrom score was 5-7 in 46.4% of subjects. 26.1% had breath CO level above 20 ppm. 62.6% of subjects were smokers. Self realisation (64.4%) is the main cause for quitting. Behavioural counselling was provided to 97.6% of subjects. History of rhinitis was present in 55.5% of subjects which was significantly high (p-0.000) compared to non tobacco users (12.8%). 61.4% of smokers had rhinitis which was significantly higher compared to smokeless tobacco (42.9%) users (p-0.018) and both smokers and smokeless tobacco (38.5%) users (p-0.019). History of rhinitis was significantly high in cigarette smokers compared to bidi smokers (p-0.000) and both bidi and cigarette smokers (p-0.188).

The history of rhinitis was significantly high in smokers compared to smokeless tobacco users. It is further concluded that history of rhinitis is more in cigarette smokers compared to bidi smokers.

5. Prevalence of rhinitis in children and outdoor air pollution of Delhi

The prevalence of rhinitis has increased worldwide during the past two or three decades, and the increase appears to be greatest in children, teenagers and young adults. Outdoor air pollutants: NO2, SO2 and SPM a major health problem in industrial workplace, have now been recognised as a significant problem in home and office. Pollution from industrial smoke, fossils fuels burning, cooking fuel smoke, building materials, road dust and biological agents being increasingly found to cause respiratory allergy.

The aim of the present study is to determine the prevalence of rhinitis in Delhi and its relationship with outdoor air pollutants level.

This study took place at Delhi, capital of India. The study areas were divided in nine locations based on the source of pollution such as industrial, residential and villages. The data of outdoor SO2, NO2, SPM, and PM10 were collected from Central Pollution Control Board, Delhi, which were measured by using Respirable Dust Sampler and High Volume Sampler during the study period. Demographic profiles and respiratory symptoms of children were collected by the help of predesign questionnaire. The clinical examination of children was carried out.

A total of 3456 children were examined, of which 59.2% children were male and 40.8% female. Diagnosis of rhinitis was made in 26.1% children. Rhinitis was present in 39.0% of children in industrial, 25.9% in residential and 11.1% in village areas. Rhinitis in children was significantly high in industrial than residential and village areas (p=0.001). The mean level of outdoor SO2, NO2, SPM and PM10 were 8.64±0.93 $\mu g / m^3$, 45.93±17.53 $\mu g / m^3$, 300.29±139.63 $\mu g / m^3$ and 115.00±57.94 $\mu g / m^3$ respectively. The outdoor SPM and PM10 were high in industrial areas compared to residential areas.

The prevalence of rhinitis is significantly more in industrial area compared to residential areas and villages. Outdoor air pollutants mainly SPM and PM10 may be the major risk factor in development of rhinitis. This study suggests that industries play a vital role to increase concentration of outdoor particulate matter, and development of rhinitis in children.

6. Breath carbon monoxide (CO) level of non-smokers exposed to environmental tobacco smoke (ETS) and non active and passive smokers

Consumption of tobacco in any form is a curse to the healthy society. Environmental tobacco smoke (ETS) exposure is also a threat to non-smoker. The non-smoker waiters of hotels, restaurants and bars are vulnerable to ETS exposure. To measure breath CO level of non-smoking subjects exposed to ETS and of non-smoking subjects not exposed to ETS.

The study was conducted by Tobacco Cessation Clinic (TCC), Vallabhbhai Patel Chest Institute, University of Delhi, Delhi, India, with the help of a pre-designed questionnaire. A total of 100 male subjects in two groups were selected for the study. *Group I* consisted of 50 non-smokers exposed to environmental tobacco smoke, (hotels / restaurants / bars waiters) and *Group II* consisted of 50 non-smokers not exposed to ETS. Clinical examinations of every subject were done. Breath CO level of both the groups, ETS exposed (waiters of hotels / bars and restaurants) and non-smokers not exposed to ETS was measured by the Mini Smoklyzer. The mean breath CO level was 9.18±2.84 ppm in *Group I* (ETS exposed) and was 4.56 ±1.62 ppm in *Group II* (non ETS exposed) (p=0.000). The mean breath CO level was significantly high in the ETS exposed subjects who worked more than 9 hours per day in bars, restaurants and hotels (p=0.018). The mean level of breath CO was also found to be significantly high in subjects who were suffering from respiratory diseases compared to normal subjects (p= 0.000).

The mean level of CO was significantly high in the ETS exposed non-smokers who were working in bars, restaurants and hotels compared to non-smokers not exposed to ETS. The abnormally high level of breath CO observed in non-smokers, exposed to ETS may suggest that these subjects may be prone to develop the tobacco related diseases.

7. Body mass index (BMI) and asthma: a correlation in Indian children

Studies have shown that high BMI is positively associated with increasing prevalence of asthma in both children and adults. The objective of this study is to determine the association of BMI with asthma in Indian children along with possible influences of age, sex, socio-economic status and area of living.

A sample of 3,456 children of both sexes aged 7-15 years were randomly selected.This community based cross-sectional study was undertaken in Delhi state which was divided into nine zones into industrial, residential and village areas. A questionnaire suitable to Indian conditions was developed. A careful history to identify respiratory symptoms, examination and spirometry was carried out. Logistic regression was used to compare the various sets of variables related to asthma.

Incidence of asthma in these 3,456 children was 7.7%. There is significant positive association between low body mass index (BMI<18.5 kg / m2) and asthma ($p<0.05$). Majority of the asthmatic children were male in the age group 7-9 years. Similar associations were also seen with upper and lower socio-economic status, and children residing in industrial area.

There is positive association between low BMI and asthma in Indian children. The explanations for which must be sought.

Respiratory Virology

Research

1. Assessment of M1 epitope of influenza virus fused to protein transduction domain (PTD) of HIV as a candidate to inhibit the pathogenesis of the virus

The M1 gene of the influenza virus is responsible for proper packaging of the virus particle. It is reported that though this gene is prone to mutations but there are certain regions in the epitopic portion of this gene which are evolutionarily conserved. The PTD of Tat of HIV is known to translocate through the mammalian cell membrane without the assistance of any external agent. The oligos corresponding to the PTD portion of HIV and to the two epitopic portions of M1 gene were synthesised and we have cloned the oligos corresponding to M1 gene epitope downstream to the oligo corresponding to the PTD of Tat of HIV in a mammalian expression vector *viz*., pSecTag2A. The sequencing has been done to confirm the desired clone. Mammalian cell line *viz*., CHO K1 has been maintained in the lab for expression of the above generated clone. The clones were transfected in the cell line and the purification of the expressed protein is under process.

2. Combinatorial antiviral approach against influenza A virus using ribozyme and siRNA

A multi target approach is needed for effective gene silencing for RNA viruses that combines more than one antiviral approach. Towards this end, we designed a wild type (wt) chimeric construct that consisted of small hairpin siRNA joined by a short intracellular cleavable linker to a known hammerhead ribozyme R_Z, both targeted against M1 genome segment of influenza virus. When this wt chimeric RNA construct was introduced into a mammalian cell line, along with the M1 substrate encoding DNA, very significant (67%) intracellular down regulation in the levels of target RNA was observed. When the siRNA portion of this chimeric construct was mutated keeping the Rz region unchanged, it caused only 33% intracellular reduction. On the contrary, when only the Rz was made catalytically inactive, keeping the siRNA component unchanged, about 20% reduction in the target M1-specific RNA was observed. This wt chimeric construct showed impressive (>80%) protection against virus challenge, on the other hand, the selectively disabled mutant constructs were less effective. Thus, in this proof of concept study we have shown that varying levels of protection against virus challenge was observed with novel mutant versions of the chimeric constructs.

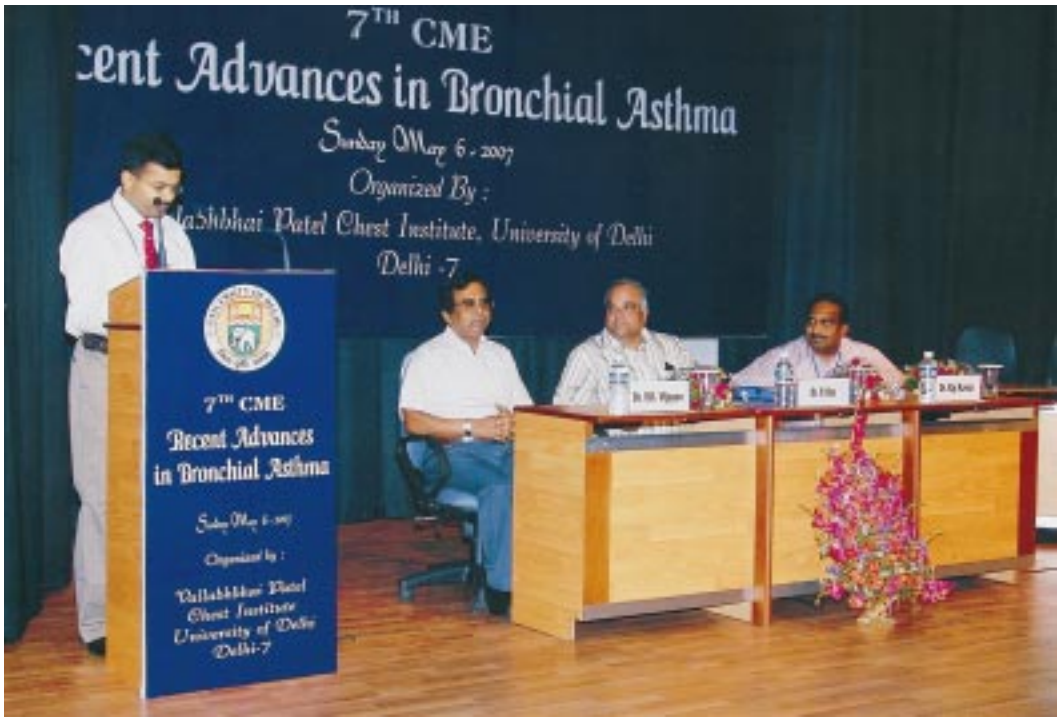
3. Multi-site monitoring of human influenza viruses in India Phase-I

A surveillance effort is being implemented that monitors the antigenic changes of influenza virus isolates in India. Our major research objective is to detect new and potentially dangerous strains of influenza at the earliest moment so that measures can be enacted in the event of a pandemic. Antigenic variation occurs primarily in the HA and NA glycoproteins and results in recurrent epidemics of influenza, thus making it necessary to continuously study the recent variants, so that vaccines can be prepared accordingly.

Since October 2006 to March 2008, a total of 637 nasopharyngeal swab (NPS) and throat swab (TS) specimens have been collected from the Kalawati Saran Children's Hospital (KSCH), New Delhi, the Viswanathan Chest Hospital, VPCI, Delhi, Lok Nayak Jai Prakash Hospital, New Delhi. All the clinical specimens are inoculated in MDCK cell lines after processing of the specimens. Out of 637 specimens, 27 were found positive for H1N1; H3N2 or Influenza B. Positive isolates were typed and subtyped by HAI and IFA technique. The monthly distribution of influenza viruses revealed the peak season for influenza virus circulation to be during the month of January-March and June-July. According to meteorological data influenza virus isolation rate increases, as the temperature decreases, humidity increases and in rainy season. The data indicates that influenza A and B are co-circulating in the community with characteristic marked seasonality.

4. A Study of viral replication inhibition by down regulation of NS1 gene of influenza A virus

The NS1 gene of influenza virus plays a major role in the propagation and pathogenesis of the virus. The viral pathogenesis can be inhibited if the NS1 gene is down regulated. The RNA of the reference strain, A/PR/8/34, of the virus was isolated using Qiagen Viral RNA Isolation Kit. The cDNA was prepared using IM Prom kit (Promega) and PCR was performed using primers specific for NS1 gene. The standardisation of the PCR conditions for this gene is under process.



7th CME on "Recent Advances in Bronchial Asthma" held on 6th May 2007. *Dignitaries on the dais (left to right):* Dr V.K. Vijayan (Director, VPCI), Dr P. Kar, Dean, Faculty of Medical Sciences, University of Delhi and Dr Raj Kumar, Organising Secretary of the CME.

Workshop on "Tobacco Free Environment" held on 29th August 2007.

Postgraduate Training and Teaching

The Institute was initially started with a Diploma course in Tuberculosis and Chest Diseases (DTCD). Later the MD and PhD courses were started. The Institute continues to conduct the DTCD course, MD courses in pulmonary medicine, biochemistry, microbiology, pharmacology and physiology, and PhD programmes (Medical Sciences) in various specialities relating to chest medicine and allied branches, *e.g.*, allergy and immunology, bacteriology, respiratory medicine, mycology, pharmacology, physiology, virology, etc.

DTCD

Session 2006-2008	Session 2007-2009
Dr Ajay Sagar	Dr Manju Batharia
Dr Vaishali Khorwal	Dr Neelima Diwakaran
Dr Amica Joan Rynjah	Dr S. Vidya Nair
Dr Avisham	Dr Deepeish Gupta
Dr Azeem Iqbal	Dr Anuradha
Dr Nalanda Debnath	Dr Praveen Kumar Thakur
Dr Ravinder Kumar	Dr Ananya Prabhu
Dr Madhu Kanodia	Dr Ashish Kumar Prakash
Dr Shailesh Kumar	Dr Shabd Prakash
Dr Vivek Parate	Dr Khriezovou Solo

MD Degrees (Awarded)

(Session: 2004-2007)

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

MD Theses (Submitted)

(Session: 2005-2008)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Ankur Girdhar (Pulmonary Medicine)	Evaluation of systemic inflammation in patients with chronic obstructive pulmonary disease and asthma and effects of standard treatment on the level of inflammation in these patients	Dr V.K. Vijayan and Dr B.K. Menon
2.	Dr Anupam Kumar Singh (Pulmonary Medicine)	A comparative study of inhaled and intravenous magnesium sulphate as an adjunct to standard treatment protocol for management of severe exacerbation of bronchial asthma	Prof. S.N. Gaur and Dr Raj Kumar
3.	Dr Danish Jamal (Pulmonary Medicine)	The occurrence of nocturnal sleep disturbances, daytime sleepiness and sleep specific quality of life disturbances in patients with allergic rhinitis	Prof. Ashok Shah
4.	Dr Ramaraju Karthikeyan (Pulmonary Medicine)	Predictors of emergency departments use in asthmatics	Prof. S.K. Chhabra
5.	Dr Priyanka Aggarwal (Pulmonary Medicine)	Diagnostic yield of induced sputum and various bronchoscopic samples in sputum smear negative tuberculosis	Dr Raj Kumar and Dr Mandira Varma
6.	Dr Anjali Vinocha (Biochemistry)	Biochemical studies on protein kinase-C in peripheral blood lymphocytes of COPD patients	Prof. S.K. Bansal and Dr V.K. Vijayan
7.	Dr Archana Angrup (Microbiology)	Drug resistance profiling and molecular typing of *Mycobacterium tuberculosis* isolates from a DOTS centre and a private hospital in Delhi	Dr Mandira Varma and Prof. Mridula Bose
8.	Dr Gaurav Vishnoi (Pharmacology)	A study to monitor adverse drug reactions in patients of bronchial asthma	Prof. A. Ray and Dr V.K. Vijayan
9.	Dr Payal Bhalla (Physiology)	Attenuation of angiotensin converting enzyme inhibitor induced cough by supplementation with iron and anti-oxidants	Prof. K. Ravi and Prof. N.P. Singh (MAMC, New Delhi)

MD Theses (Pursued)

(Session: 2006-2009)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Amit Kumar Lohia (Pulmonary Medicine)	Airway obstruction, bronchial hyperre-activity and sensitivity to common aeroallergen in allergic rhinitis	Prof. S.N. Gaur
2.	Dr Avi Kumar (Pulmonary Medicine)	Occurrence of upper airway symptoms and their impact on quality of life (QoL) in patients with COPD	Prof. Ashok Shah
3.	Dr Kripesh Ranjan Sarmah (Pulmonary Medicine)	Factors affecting attainment of control in asthma	Prof. S.K. Chhabra
4.	Dr Nurul Haque (Pulmonary Medicine)	Effect of glycemic control on outcome of acute exacerbation of COPD	Dr Raj Kumar and Dr V.K. Vijayan
5.	Dr Rajnish Kaushik (Pulmonary Medicine)	Evaluation of the effect of inhaled ciclesonide on the allergic and inflammatory markers in bronchial asthma	Dr B.K. Menon and Dr V.K. Vijayan
6.	Dr Sant Ram (Biochemistry)	Studies on purification and characterisation of glutamine synthetase from *Mycobacterium smegmatis* with special reference to acetyl transferase activity	Prof. H.G. Raj and Prof. Mridula Bose
7.	Dr Jyoti Chaudhary (Microbiology)	Evaluation of polymerase chain reaction based detection of *Streptococcus pneumonia* in clinical samples and molecular characteri-sation of the culture isolates	Dr Malini Shariff, Prof. S.S. Thukral and Prof. Monorama Deb (VMMC & Safdarjung Hospital, New Delhi)
8.	Dr Mohammed Imran (Pharmacology)	Acute effects of tiotropium alone and in combination with formoterol in patients with COPD: comparision of three regimens	Dr Anita Kotwani, Dr V.K. Vijayan and Prof. S.K. Chhabra
9.	Dr Tripat Deep Singh (Physiology)	Obstructive sleep apnea, oxidative stress and renal function	Prof. K. Ravi and Dr V.K. Vijayan

MD Theses (Pursued)

(Session: 2007-2009)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Hemant Kalra (Pulmonary Medicine)	Pattern of infection in intensive care unit of Vallabhbhai Patel Chest Institute, Delhi	Dr V.K. Vijayan and Dr Malini Shariff
2.	Dr Sunil Kumar Pandita (Pulmonary Medicine)	Evaluation of systemic inflammatory markers, oxidant-antioxidant status and sputum cytology in stages of chronic obstructive pulmonary diseases	Dr B.K. Menon, Dr V.K. Vijayan and Dr Ritu Kulshrestha

MD-Ist Year
(Session: 2007-2010)

Name	Discipline
Dr Nikhil Modi	Pulmonary Medicine
Dr Rahul Roshan	Pulmonary Medicine
Dr Ravi Shekhar Jha	Pulmonary Medicine
Dr Sukanya Gangopadhyay	Biochemistry
Dr Shivika Juneja	Microbiology
Dr Dushyant Lal	Pharmacology
Dr Preeti Deep Singh	Physiology

PhD Awarded/Submitted

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Ms Garima Gupta (Biochemistry)	Studies on purification, characterisation and molecular cloning of acetoxy drug: protein transacetylase from *Mycobacterium smegmatis*	Prof. H.G. Raj and Prof. Mridula Bose	Awarded
2.	Mr Vikram Srivastava (Microbiology)	Role of apoptosis in the pathogenesis of influenza A virus, correlation of virological and immunological parameters: a study in human and murine model	Dr Madhu Khanna and Dr V.K. Vijayan	Awarded
3.	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	Awarded
4.	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)	Awarded
5.	Dr Vishal Bansal (Physiology)	Mechanism of action of estrogen on hemodynamic parameters in rabbits	Prof. M. Fahim and Prof. Rashmi Babbar (MAMC, New Delhi)	Awarded
6.	Ms Ruqiaya Nazir (Microbiology)	Effect of programmed cell death and cytokines induced by influenza A virus infection in allergic asthma: a study in murine model	Dr Madhu Khanna	Submitted
7.	Dr Swati Omnwar (Physiology)	Functional changes in vascular responsiveness following mercury exposure in rats	Prof. K. Ravi and Prof. M. Fahim	Submitted

PhD Theses (Pursued)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
1.	Mr Anil Singh Baghel (Biochemistry)	Studies on molecular cloning and expression of acetoxy drug: protein transacetylase of *M. tuberculosis* with special reference to the role of polyphenolic acetates as antitu-berculous drugs	Prof. H.G. Raj and Prof. Mridula Bose	2005
2.	Mr Mohd. Adnan Kausar (Biochemistry)	Biochemical and clinicoimmunologic characterisation of mosquito (*Culex quinquefasciatus*) allergens	Prof. S.K. Bansal, Prof. M.K. Agarwal and Dr V.K. Vijayan	2005
3.	Ms Prachi Gupta (Biochemistry)	Lipid rafts in bronchial asthma: a study on membrane lipid metabo-lism in asthmatic patients	Prof. S.K. Bansal and Dr V.K. Vijayan	2005
4.	Ms Shwetambari Arora (Biochemistry)	Studies on acetoxy drug: protein transacetylase in hypoxia induced pulmonary hypertension	Prof. H.G. Raj and Prof. Daman Saluja (ACBR, University of Delhi)	2005
5.	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., South Campus, University of Delhi)	2005
6.	Mr Neeraj Kumar (Biochemistry)	Molecular and biochemical basis of variation in clinical phenotypes of adrenoleukodystrophy	Prof. S.K. Bansal, Dr K.K. Taneja (IGIB, Delhi), Prof. Veena Kalara, Prof. Madhuri Behari (AIIMS, New Delhi) and Prof. S. Aneja (LHMC, New Delhi)	2006
7.	Mr Rakesh Kumar Mishra (Biochemistry)	Experimental asthma: a study on transmembrane signalling in airway smooth muscles and peripheral blood lymphocytes during the development of airway hypersen-sitivity in guinea pigs	Prof. S.K. Bansal, Prof. S.K. Chhabra and Dr Ritu Kulshrestha	2006

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
8.	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
9.	Ms Monika Sharma (Microbiology)	To study the effect of *Mycobacterium tuberculosis* infection of macrophages on T-cell viability	Prof. Mridula Bose and Prof. H.G. Raj	2004
10.	Ms Rashmi Pasricha (Microbiology)	Functional analysis of *lprN* of *mce4* operon of *M. tuberculosis*	Prof. Mridula Bose and Prof. Vani Brahmachari (ACBR, University of Delhi)	2005
11.	Ms Maansi Vermani (Microbiology)	Studies on aerobiological aspects, clinico-immunologic assessment of allergenic potential and biochemical characterisation of allergenic components of *Aspergillus* species	Prof. S.S. Thukral, Prof. M.K. Agarwal and Dr V.K. Vijayan	2007
12.	Mr Prashant Kumar (Microbiology)	Assessment of conserved epitopes of M1 of influenza virus fused to protein transduction domain (PTD) of Tat of HIV as a potential vaccine candidate	Dr Madhu Khanna and Dr Akhil Banerjee (NII, New Delhi)	2007
13.	Ms Saakshi Pal Singh (Microbiology)	Studies on detection and characterisation metallo-beta-lactamases in clinical isolates of *Pseudomonas aeruginosa*	Prof. S.S. Thukral and Dr Malini Shariff	2007
14.	Ms Tanushree Barua (Microbiology)	Studies on detection and characterisation of AmpC B-lactamases in clinical isolates of *Klebsiella* spp. and *Escherichia coli*	Prof. S.S. Thukral and Dr Malini Shariff	2007
15.	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
16.	Mr Ayanabha Chakraborty (Pharmacology)	Studies to explore gender related differences in stress responses with special reference on the role of nitric oxide	Prof. A. Ray and Prof. B.D. Banerjee (UCMS, Delhi)	2005

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
17.	Ms Rashmi Anand (Pharmacology)	Experimental studies on the role of opioids in stress and their interactions with nitric oxide in rats	Prof. A. Ray	2006
18.	Ms Sreemanti Guhathakurta (Pharmacology)	Studies on the possible mechanisms involved in the effects of UNIM-352, a polyherbal, anti-asthmatic unani preparation in experimental animals	Prof. A. Ray, Dr V.K. Vijayan, Dr Kavita Gulati and Prof. B.D. Banerjee (UCMS, Delhi)	2007
19.	Mr Abdul Yasir (Physiology)	Responsiveness of airway rapidly adapting receptors and oxidant-antioxidant status to cigarette smoke inhalation in normal and sensitised rabbits	Prof. K. Ravi and Prof. S.K. Chhabra	2005
20.	Ms Ruchi Bhagat (Physiology)	High altitude simulation on lung physiology and vagal afferent activity	Prof. K. Ravi and Dr Shashi Bala Singh (DIPAS, Delhi)	2007

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

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Mr M. Irfan Beig (Life Sciences)	Neural and cardiovascular responses during epilepsy in conscious animals	Dr Anju Katyal (ACBR, University of Delhi) and Prof. M. Fahim	Awarded
2.	Mr M. Shahid (Pharmacology)	Effect of remote preconditioning on myocardial reperfusion injury	Prof. K.K. Sharma (UCMS, Delhi) and Prof. M. Fahim	Awarded
3.	Mr M. Tauseef (Pharmacology)	Evaluation of the mechanism of action of aspirin as a cardioprotective agent in experimentally induced cholesterolemic rats	Prof. K.K. Sharma (UCMS, Delhi) and Prof. M. Fahim	Awarded
4.	Ms Bano Saidullah (Zoology)	Bronchial reactivity in diabetic guinea pigs / rats	Prof. K. Muralidhar (Zoology Deptt., University of Delhi) and Prof. M. Fahim	Awarded
5.	Ms Dolly Kumari (Biomedical Sciences)	Study of food allergens	Dr Susheela Sridhara, Dr B.P. Singh (IGIB, Delhi), and Dr Raj Kumar	Awarded
6.	Mr R. Rizvi (Physiology)	To study the vasoactive responses in animal models of non-cirrhotic portal hypertension (NCPH)	Prof. Rashmi Babbar (MAMC, New Delhi), Dr S.K. Sarin (G.B. Pant Hospital, New Delhi) and Prof. M. Fahim	Submitted
7.	Mr Prabhjot Singh (Biochemistry)	Studies on the enzymatic propionylation of proteins and related biological effects	Prof. J. Gambhir (Deptt. of Biochemistry, UCMS, Delhi) and Prof. H.G. Raj	Pursued
8.	Mr Neeraj Kumar Saini (Biomedical Sciences)	Functional analysis of mammalian cell entry (*mce*) proteins in mycobacteria	Prof. Sujata K. Das (Bundelkhand University, Jhansi), Prof. G. L. Sharma (IGIB, Delhi) and Prof. Mridula Bose	Pursued

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
9.	Ms Prija Ponnan (Computational Biochemistry)	In silico studies on structure, functions and application of a novel transacetylase mediating protein acetylation independent of acetyl CoA	Prof. R.C. Rastogi (Chemistry Deptt., University of Delhi) and Prof. H.G. Raj	Pursued
10.	Mr Jitendra K. Nagar (Geology)	Suspended particulate matter enriched aerosol areas and its relationship with human health	Prof. J.P. Shrivastava (Geology Deptt., University of Delhi) and Dr Raj Kumar	Pursued
11.	Ms Shipra Gupta (Med. Biochemistry)	Studies on isolation and mechanism of action of the antihyperglycemic and hypolipdemic compound (s) from the leaf extract of *Casssia auriculata* in experimentally induced diabetic animals	Prof. S.B. Sharma, Prof. K.M. Prabhu (UCMS, Delhi) and Prof. S.K. Bansal	Pursued
12.	Ms Monika Joon (Microbiology)	Functional genomics of *mce* operons through the analysis of clinical isolates and knock out strains	Prof. Vani Brahmachari (ACBR, University of Delhi) and Prof. Mridula Bose	Pursued
13.	Mr Mahesh Seth (Physiology)	Evaluation of novel peptidomimics as angiotensin converting enzyme inhibitors (Aceis) for anti-hypertensive activity using animal models of hypertension	Dr M. Ezaj Hussain (Jamia Milia Islamia, New Delhi) and Prof. M. Fahim	Pursued

Distinguished Visitors

- Prof. Suresh C. Tyagi, Professor and Vice Chair for Research, Department of Physiology and Biophysics, Stodghill Endowed Chair in Biomedical Sciences, University of Louisville School of Medicine, A-1115, 500, South Preston Street, Louisville, KY 40202. Delivered a lecture at VPCI, entitled, "MMPs in heart failure: the good, the bad and the ugly" (November 22, 2007).

- Dr Maya R. Jerath, Assistant Professor of Medicine, University of North Carolina, U.S.A. Discussed various aspects in the field of Respiratory Allergy and Applied Immunology. She delivered a lecture at VPCI, entitled, "Food Allergy" (November 28, 2007).

- Dr Sukhmay Lahiri, Professor of Physiology, Medical School, Pennsylvania University, PA, U.S.A. Delivered a lecture at VPCI, entitled, "Reversal of store-operated calcium channels in hypoxic but not in hypercapnic calcium rises by 2-APB in rat carotid body glomus cells" (February 14, 2008).

Awards/Honours

Dr V.K. Vijayan

- **President,** Indian College of Allergy, Asthma and Applied Immunology, Delhi.
- **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** of the Executive Committee and Central Planning Committee, Asia Pacific Society of Respirology.
- **Chair,** Clinical Respiratory Medicine Assembly, Asia Pacific Society of Respirology.
- **Member,** Editorial Advisory Board, *Chest*, an official publication of the American College of Chest Physicians, U.S.A.
- **Member,** Editorial Board, *World Allergy Organization Journal*, an official publication of the World Allergy Organization.
- **Member,** Editorial Advisory Board, *Chest* (Indian Edition), an official publication of the American College of Chest Physicians, U.S.A.
- **Member,** Editorial Advisory Board, *Thorax* (South Asian Edition) an official publication of the British Thoracic Society, U.K.
- **Member,** Editorial Board, *The Open Respiratory Medicine Journal*, an Open Access online Journal.
- **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,** Editorial Board, *Indian Journal of Sleep Medicine*, an official publication of the Indian Sleep Disorders Association.
- **Executive Committee Member,** Tuberculosis Association of India, New Delhi.
- **Member,** Scientific Advisory Committee, National Institute of Occupational Health (ICMR), Ahmedabad.
- **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, New Delhi.
- **Expert Member,** Inter-departmental Review Panel, High Altitude Medical Research Centre (HAMRC), a joint venture between Defence Research and Development Organisation (DRDO) and Directorate General of Armed Force Medical Services (DGAFMS).
- **Chairman,** Project Review Committee for the Division of Non Communicable Diseases in the field of Environment, ICMR, New Delhi.
- **Member,** Expert Committee of the Project Review Group (PRG) for Indo-US Project Proposals in the area of Environmental and Occupational Health, ICMR, New Delhi.
- **Member,** Committee to examine the Vision Document of L.R.S. Institute of Tuberculosis and Respiratory Diseases, New Delhi.

- **Member,** Sub-Committee of the Postgraduate Medical Education Committee of the Medical Council of India with regard to "Quantification of clinical material required in the subject of TB & Chest" (October 2007).
- **Member,** Technical Advisory Committee on Child Labour, Ministry of Labour and Employment, Government of India.
- **Chairman,** Selection Committee to select Senior Research Officer (Scientist C), Industrial Hygiene at National Institute of Occupational Health (ICMR), Ahmedabad.
- **Inspector,** Medical Council of India for starting MD (Chest) and DTCD Courses at Santosh Medical College under Santosh University, Ghaziabad.

Prof. M. Fahim

- **Member,** Research Project, Defence Research Deveolpment Organisation, New Delhi.
- **Chairman,** Selection Committee, Recruitment and Assessment Centre, Defence Research Deveolpment Organisation, New Delhi.
- **Member,** Selection Committee, Medical College, Jamia Hamdard, New Delhi.
- **Member,** Advisory Committee, Centre for Physiotherapy and Rehabilitation Centre, Jamia Milia Islamia University, New Delhi.
- **Chairman,** Animal Ethical Committee, Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi.

Prof. M.K. Agarwal

- **Editor,** *Bioscience Trends*, Published by International Research Cooperation Association for Bio & Socio-sciences Advancement (IRCA-BSSA), Japan.
- **Member,** Editorial Board, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology, Delhi.
- **Member,** Vision Committee (VISION 2020) of National Institute of Biologicals (NIB), Ministry of Health and Family Welfare, Government of India.
- **Member,** Scientific Advisory Committee, International Life Sciences Institute – India.

Prof. S.N. Gaur

- **Expert Member**, Committee on Prevention, Abatement and Control of Pollution, Ministry of Environment & Forest, Government of India.
- **Member,** (Insect Allergy Committee, Immune Modulation Committee, Evaluation and Outcomes Research Committee), American Academy of Allergy, Asthma and Immunology).

Prof. A. Ray

- **President,** Society of Pharmacovigilance (India).
- **Member,** Editorial Board, *Indian Journal of Pharmacology*, an official publication of the Indian Pharmacological Society.
- **Member,** Editorial Board, *Journal of Pharmacovigilance and Drug Safety*.
- Elected **Fellow**, Indian Pharmacological Society.

Prof. Ashok Shah

- **Member,** World Allergy Organiztion (WAO) Speciality and Training Council.
- **Editor**, *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 the American College of Chest Physicians, U.S.A.
- **Associate Editor,** *Indian Journal of Tuberculosis*, an official publication of the Tuberculosis Association of India.
- **Member,** Editorial Board, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology, Delhi.
- **Member,** Editorial Board, *Lung India*, an official publication of the Indian Chest Society.
- **Member,** Editorial Board, *Clinical and Molecular Allergy*.
- **Member,** Editorial Board, *Open Allergy Journal*.

Prof. S.K. Chhabra

- **Member,** Selection Committee, Recruitment and Assessment Centre, Defence Research Deveolpment Organisation, New Delhi.
- **Associate Editor**, *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 Board, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology, Delhi.
- **Member,** Editorial Board, *Lung India*, an official publication of the Indian Chest Society.

Prof. K. Ravi

- **Member,** Selection Committee, Recruitment and Assessment Centre, Defence Research Deveolpment Organisation, New Delhi.
- **Member,** Project Review Committee, Defence Research Deveolpment Organisation, New Delhi.

Prof. S.K. Bansal

- **Secretary**, Biotechnology Society of India.
- **External Expert,** Assessment Committee in "Biosciences and Biotechnology" of Recruitment and Assessment Board (RAB) of CSIR.
- **External Expert,** Selection Committee for Senior Research Fellow, Malaria Research Centre, Delhi.

Dr Raj Kumar

- **Member**, Editorial Board**,** *International Journal of Occupational and Environmental Health*, U.S.A.
- **Member,** Editorial Board, *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 Board, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology, Delhi.

Dr Madhu Khanna

- **Expert Member,** Selection Committee for admission of PhD Programme, Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi.

Dr Anuradha Chowdhary

- **Awarded 2nd Prize** for her paper entitled, *"Experince with cryptococcosis in HIV patients in a North Delhi hospital"* (by L. Kapoor, Anuradha Chowdhary, H.S. Randhawa) at 7th National Conference of Society for Indian Human and Animal Mycology (SIHAM 2008), Mumbai, February 4-6, 2008.

Dr Anita Kotwani

- **Project Member and Country Coordinator**, WHO-HAI project on Medicine Prices.

- **Executive Member,** International Society for Pharmacoeconomics and Outcome Research (ISPOR), Indian Chapter.

Dr Vishal Bansal

- **Awarded Best Poster Presentation** for the paper titled; "*Vascular smooth muscle responses to estrogen – possible mechanisms*" (by V. Bansal, R. Babar, M. Fahim) at 2nd International Symposium on Recent Advances in Cardiovascular Sciences, New Delhi, February 28, 2008.

Dr Rajinder Bajaj

- **Member**, Animal Ethics Committee, Department of Biosciences, Jamia Millia Islamai, New Delhi.
- **Member**, Animal Ethics Committee, Institute of Genomics and Integrative Biology, Delhi.

Dr Anjali Vinocha (MD Student)

- **Awarded Best Poster Presentation** in the area of COPD for the paper titled; "*Nicotine and salbutamol induced changes in protein kinase C activity in lymphocytes in COPD*" (by Anjali Vinocha, V.K. Vijayan, S.K. Bansal), in the 12th Congress of the APSR / 2nd Joint Congress of the APSR and ACCP held from 30th November 2007 to 4th December 2007 at Gold Coast Convention & Exhibition Centre, Queensland, Australia.

Ms Ruquiya Nazir (PhD Student)

- **Awarded Best Poster Presentation**, for her paper titled, *"Inflammatory and cytokine responses of Influenza A virus infection induced in murine model of allergic asthma"* (by Ruquiaya Nazir, M.Fahim, Ritu Kulshrestha, Madhu Khanna) at 41stAnnual Conference of the Indian College of Allergy, Asthma & Applied Immunology, Delhi, December 9-12, 2007.

Sponsored Research Projects

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
1.	Prof. H.G. Raj (Biochemistry)	Development of novel therapeutics based upon natural products from Indian medicinal plants	Department of Scientific and Industrial Research, Ministry of Science and Technology, Govt. of India March 29, 2007 (One year)	57.28 Lakhs
2.	Prof. S.K. Chhabra (Cardiorespiratory Physiology)	Assessment of the effects of high particulate pollutants on pulmonary health status in selected mega-cities of South Asia	National Physical Laboratory March 20, 2006 (Two years)	1.00 Lakh
3.	Prof. S.K. Chhabra (Cardiorespiratory Physiology)	Pulmonary function in normal children in Delhi region: development of reference standards for spirometry	I.C.M.R January 23, 2007 (Three Years)	5.88 Lakhs
4.	Dr Anuradha Chowdhary (Medical Mycology)	Environmental prevalence of *Cryptococcus neoformans*, its mycoserologic and genotypic characteristion and role in pulmonary infections	D.S.T. May 20, 2005 (Three years)	11.22 Lakhs
5.	Prof. S.S. Thukral, Dr Malini Shariff* (Microbiology)	Molecular charcterisation of respiratory isolates of *Moraxella catarrhalis*	I.C.M.R. January 14, 2005 (Three years)	9.41 Lakhs
6.	Prof. S.S. Thukral, Dr Malini Shariff* (Microbiology)	Molecular characterisation of ESBL plasmids responsible for resistance to III / IV generation cephalosporins in clinical isolates of *E. coli*, *Klebsiella* spp., *Proteus* spp. and *Pseudomonas aeruginosa*	C.S.I.R. March 17, 2005 (Three years)	13.13 Lakhs
7.	Prof. S.S. Thukral, Dr Malini Shariff* (Microbiology)	Detection and characterisation of AmpC β-lactamases in clinical isolates of *Klebsiella* spp. and *E.coli*	I.C.M.R. March 29, 2007 (Three years)	4.48 Lakhs
8.	Prof. Mridula Bose (Microbiology)	Functional characterisation of *lspA* gene of *Mycobacterium tuberculosis*: cloning, expression and its role during pathogenesis	D.B.T. June 19, 2006 (Three years)	17.35 Lakhs
9.	Prof. Mridula Bose (Microbiology)	Functional genomics of mammalian cell entry (*mce*) operons in clinical isolates of *M. tuberculosis* : regulation and expression analysis using Knockout strains	D.S.T. September 5, 2006 (Three years)	11.16 Lakhs

*Presently looking after the project.

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
10.	Prof. Mridula Bose (Microbiology)	Prospects for the development of anti-ubercular drugs based on transacetylase function of glutamine synthase	D.B.T May 17, 2007 (Three years)	53.38 Lakhs
11.	Prof. Mridula Bose (Microbiology)	Correlation between genetic polymorphism and homeostasis of Th1 – Th2 cytokines in pulmonary and extra-pulmonary tuberculosis	C.S.I.R. May 17, 2007 (Three years)	10.21 Lakhs
12.	Dr Malini Shariff (Microbiology)	Evaluation of phenotypic and genotypic methods for the detection and characterisation of metallo-β-lactmasses in clinical isolates of *Pseudomonas aeruginosa*	C.S.I.R. November 20, 2007 (Three years)	6.91 Lakhs
13.	Dr Mandira Varma (Microbiology)	Rapid identification of Mycobacteria to the species level by PCR restriction analysis in clinical samples	I.C.M.R. January 16, 2008 (One year)	6.33 Lakhs
14.	Prof. A. Ray (Pharmacology)	Studies on the possible mechanisms involved in the effects of UNIM-352, a polyherbal, anti-asthmatic unani preparation in experimental animals	Department of Ayurveda, Yoga & Naturopathy, Unani, Siddha and Homeopathy (AYUSH) September 29, 2006 (Three years)	28.29 Lakhs
15.	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 (Five years)	3.99 Lakhs
16.	Prof. A. Ray (Pharmacology)	A study to assess the efficacy of UNIM-352 (ZN_5) in bronchial asthma	Central Council for Research in Unani Medicine March 11, 2005 (Three years)	4.21 Lakhs
17.	Dr Anita Kotwani (Pharmacology)	Continued surveillance of antimicrobial resistance and use in the community and in-depth qualitative investigation for behaviour of antimicrobial drugs use for suitable interventions for rational use of antibiotics	W.H.O. August 27, 2007 (One year)	3.45 Lakhs
18.	Dr Kavita Gulati (Pharmacology)	Pharmacological studies on the role of nitric oxide (NO) in stress adaptation in rats	D.S.T. March 29, 2005 (Three years)	16.26 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
19.	Prof. M. Fahim, Prof. K. Ravi and Dr Vishal Bansal (Physiology)	Establishment of Patch Clamp Lab & Cell Culture Facility under Funds for Improvement in Science and Technology (FIST) programme	D.S.T. February 3, 2003 (Five years)	67.21 Lakhs
20.	Prof. M. Fahim (Physiology)	Bronchial reactivity in diabetic guinea pigs	I.C.M.R December 28, 2005 (Three years from September 5, 2006)	3.83 Lakhs
21.	Prof. M. Fahim (Physiology)	Regulation of pulmonary vascular tone during hypoxia induced pulmonary vasoconstriction	Life Sciences Research Board (LSRB), DRDO December 13, 2006 (Three years)	14.41 Lakhs
22.	Prof. M. Fahim (Physiology)	Lipid reducing herbal compounds provide protection against diabetes induced cardiovascular disorders	Central Council for Research in Unani Medicine (CCRUM) October 10, 2007 (Two years)	13.32 Lakhs
23.	Prof. K. Ravi (Physiology)	Behaviour of pulmonary vagal sensory receptors during high altitude exposure	D.I.P.A.S. March 16, 2005 (Three years)	8.92 Lakhs
24.	Prof. K. Ravi (Physiology)	Responsiveness of airway rapidly adapting receptors to cigarette smoke inhalation in normal and sensitised rabbits	I.C.M.R. July 21, 2005 (Three years)	13.37 Lakhs
25.	Prof. K. Ravi (Physiology)	Behaviour of pulmonary vagal sensory receptors with myelinated afferents during oxidative stress induced airway hyperreactivity and its modulation by antioxidants in guinea pigs	D.S.T. November 8, 2005 (Three years)	23.78 Lakhs
26.	Prof. M.K. Agarwal (Respiratory Allergy and Applied Immunology)	Identification, purification and characterisation of components of clinically important insect allergens implicated in allergic rhinitis and bronchial asthma	I.C.M.R October 23, 2006 (Three years)	3.61 Lakhs
27.	Dr B.K. Menon (Respiratory Allergy and Applied Immunology)	Real time PCR based rapid detection of *Mycobacterium tuberculosis* from peripheral blood samples	D.B.T. December 18, 2007 (Three years)	7.20 Lakhs
28.	Dr V.K. Vijayan (Respiratory Medicine)	The effects of tiotropium bromide with or without inhaled fluticasone dipropionate and salmetrol on lung inflammation in bronchial asthma	M/s. Cipla Ltd. March 8, 2005 (Three years)	2.50 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
29.	Dr Raj Kumar (Respiratory Medicine)	Effect of indoor air pollution on respiratory function of children	Ministry of Environment and Forest October 7, 2003 (Four years)	20.97 Lakhs
30.	Dr Raj Kumar (Respiratory Medicine)	Tobacco Cessation Clinic at V.P. Chest Institute during the years 2006 and 2007, and conducting related activities	W.H.O. January 27, 2006, February 05, 2007 and January 01, 2008 (Three years)	7.23 Lakhs
31.	Dr Raj Kumar (Respiratory Medicine)	A comparative study of breath CO level of passive smokers, Delhi	W.H.O. May 15, 2007 (Three and half months)	1.50 Lakhs
32.	Dr Madhu Khanna (Respiratory Virology)	A combinatorial antiviral approach against influenza A virus using ribozyme and siRNA	D.B.T. March 21, 2006 (Three years)	44.53 Lakhs
33.	Dr Madhu Khanna (Respiratory Virology)	Multi-site monitoring of human influenza in India - Phase I	I.C.M.R. November 8, 2006 (Two years)	39.07 Lakhs
34.	Dr Madhu Khanna (Respiratory Virology)	A study of viral replication inhibition by down regulation of NS1 gene of influenza virus	C.S.I.R November 16, 2007 (Three years)	6.91 Lakhs
35.	Dr Sujata K. Dass DST's SERC Fast Track Scheme for Young Scientist (Biochemistry)	A study of synthetic metalloporphyrins as potential antimalarials: *in vitro* screening and *in vivo* effects	D.S.T June 05, 2006 (Three years)	17.00 lakhs
36.	Dr Yogesh Kumar Tyagi DST's SERC Fast Track Scheme for Young Scientist (Biochemistry)	Designing and synthesis drug candidates with a view to develop novel antitubercular drugs	D.S.T. February 20, 2007 (Up to July 2007)	9.00 Lakhs
37.	Dr Ajit Kumar DST's SERC Fast Track Scheme for Young Scientist (Biochemistry)	Studies on molecular mechanism of calreticulin transacetylase (CRTAse) catalysed activation of nitrc oxide synthase and its biological implications	D.S.T. January 04, 2008 (Three years)	19.94 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
38.	Dr Vinita Katiyar DST's SERC Fast Track Scheme for Young Scientist (Respiratory Allergy & Applied Immunology)	Assessment of biocontaminants from indoor environments	D.S.T. August 13, 2004 (Three years)	10.08 Lakhs
39.	Ms Prachi Gupta Senior Res. Fellow *Guide*: Prof. S.K. Bansal (Biochemistry)	A study of lipid rafts: evaluation of the activity of phospholipase A2 sphingomyclinase and protein kinase C in asthmatic patients using erythrocyte membrane as model	I.C.M.R. November 08, 2007 (Three years)	0.88 Lakhs
40.	Ms Preeti Sinha Senior Res. Fellow *Guide:* Dr Anuradha Chowdhary (Medical Mycology)	Systemic mycoses in a New Delhi pediatric hospital: a study of their prevalence, species spectrum of etiologic fungi, laboratory diagnostic and therapeutic aspects	I.C.M.R October 03, 2006 (Up to October 05, 2007)	1.54 Lakhs
41	Mr Ayanabha Chakraborti Senior Res. Fellow *Guide:* Prof. A. Ray (Pharmacology)	Studies to explore gender related difference in stress response with special emphasis on the role of nitric oxide	I.C.M.R May 29, 2006 (Three years)	2.34 Lakhs
42.	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)	4.48 Lakhs
43.	Ms Mitali Jindal Senior Res. Fellow *Guide:* Prof. M. Fahim (Physiology)	Role of free radicals in functional changes in cardiovascular regulatory mechanisms on mercury exposure in rats (*in vivo*)	I.C.M.R December 14, 2006 (Three years)	2.69 Lakhs
44.	Ms Anu Sharma Senior Res. Fellow *Guide:* Prof. M. Fahim (Physiology)	Effect of polypharmaceutical herbal drug lipotab on isoproterenol induced chronic heart failure in rats	I.C.M.R. January 03, 2008	1.13 Lakhs
45.	Mr Vikram Srivastava Senior Res. Fellow *Guide*: Dr Madhu Khanna (Respiratory Virology)	Role of apotosis 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 (Four years)	6.38 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
46.	Dr Ashima Anand (Principal Investigator) DST Project	A study of methods for reducing exertional breathlessness and increasing exercise capability	D.S.T August 30, 2006 (Three years)	37.70 Lakhs
47.	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 (Eight years)	3.25 Lakhs

Orations/Guest Lectures

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
1.	Dr V.K. Vijayan	Health benefits of smoking cessation with special reference to cardio-respiratory health	Serbian Physiological Society, Serbian Association for Arteriosclerosis, Thrombosis and Vascular Biology Research, International Academy of Cardiovascular Sciences (IACS), Ministry of Sciences and Environmental Protection, Ministry of Health, Serbia, and the Serbian Academy of Science and Arts	Conference on "Nutrition, Treatment and Cardiovascular Risk Management Novi Sad, Serbia May 24-27, 2007
2.	Dr V.K. Vijayan	Treatment of tuberculosis in Indian tuberculosis control programme	Indian Association of Leprologists and Institute of Life Sciences, Chhatrapati Shahu Ji Maharaj University	25th Biennial Conference of the Indian Association of Leprologists Kanpur November 19, 2007
3.	Dr V.K. Vijayan	Patho-physiology of asthma including pulmonary function tests	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
4.	Dr V.K. Vijayan	Prevalence, risk factors and management issues in Indian patients with bronchial asthma	Indian Medical Association, Medical Council of of India and American Association of Physicians of Indian Origin	First Indo-US Healthcare Summit New Delhi December 13-15, 2007
5.	Dr V.K. Vijayan	Obstructive sleep apnea	Indian Society of Sleep Research and National Institute of Mental Health and Neurosciences	3rd National Conference of the Indian Society of Sleep Research Bangalore December 16, 2007
6.	Dr V.K. Vijayan	Bronchoalveolar lavage– methodology	Indian Association of Bronchology and Malabar Institute of Medical Sciences	13th National Conference of the Indian Association of Bronchology (BRONCON 2008) Calicut February 1-3, 2008

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
7.	Dr V.K. Vijayan	Tobacco control-imperative for lung health	Bangladesh Lung Foundation	1st International Conference on Lung Health (PULMOCON-2008) Dhaka, Bangladesh February 20-22, 2008
8.	Dr V.K. Vijayan	Tobacco control: imperative for cardio-pulmonary health	Delhi Institute of Pharmaceutical Sciences & Research (DIPSAR)	2nd International Symposium on Recent Advances in Cardio-vascular Sciences New Delhi February 28, 2008
9.	Prof. H.G. Raj	Role of calreticulin transacetylase in the activation of nitrite reductase by polyphenolic peracetates in human platelets: a pathway for the enhancement of nitric oxide levels independent of nitric oxide synthase	Department of Human Physiology and Pharmacology "Vittorio Erspamer" Sapienza University of Rome and Institute for Biomolecular Chemistry of CNR, CNR, P.le Aldo Moro 5	2nd Indo-Italian Workshop on Chemistry and Biology of Antioxidants Aula Marconi Rome July 9-11, 2007
10.	Prof. H.G. Raj	Biological implication of calreticulin transacetylase mediated enhancement of intracellular nitric oxide by specific polyphenolic acetates	Department of Chemistry, University of Delhi	3rd Indo-Italian Workshop on Chemistry and Biology of Antioxidants Delhi, November 28-30, 2007
11.	Prof. H.G. Raj	Novel biological function of calreticulin: a prominent cellular calcium-binding protein	Department of Chemistry, University of Delhi	1st DU-SDU Seminar on Emerging Trends in Interfacial Areas of Chemical, Biological and Environmental Sciences Delhi March 17-18, 2008
12.	Prof. M. Fahim	Neural regulatory cardiovascular functions during oxygen deficiency	Physiological Society of India and Manav Rachna Education Institutions	XIXth Annual Conference of Physiology on Current Approach of Physiology to Therapeutics and Rehabilitation Faridabad December 6-8, 2007
13.	Prof. M. Fahim	Oxidative stress impairs neural regulation of cardiovascular functions	Department of Physiology, Maulna Azad Medical College	National Symposium on Oxidative Stress and Cognition–An Overview New Delhi February 8-9, 2008

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
14.	Prof. M. Fahim	Neuro-humoral regulatory cardiovascular functions in health and diseases	College of Pharmacy, Jamia Hamdard	Hamdard University New Delhi February 26, 2008
15.	Prof. M. Fahim	Reflex regulation of cardiovascular functions in oxygen deficiency	Delhi Institute of Pharmaceutical Sciences & Research (DIPSAR)	2nd International Symposium on Recent Advances in Cardiovascular Sciences New Delhi February 28, 2008
16.	Prof. M. Fahim	Baroreflex control of blood pressure cardiovascular functions in health and disease	Department of Physiology, Tibbiya College	UGC Sponsored Teachers Reorientation Programme AMU, Aligarh March 29, 2008
17.	Prof. M.K. Agarwal	• Allergy, allergens and immune response • Basic immune response • Research in clinically important allergens in India with special reference to insects	Association of Chest Physicians and Indian Medical Association	NORAACON, North Zone Allergy and Asthma Conference Bareilly August 12, 2007
18.	Prof. M.K. Agarwal	Allergy and allergen research in India: an overview	Industrial Toxicology Research Centre	5th Annual Conference of Biotechnology Society of India (BIOTECH 2007)- Advances and Strategies in Biotechnology : A Global Perspective Lucknow November 17-19, 2007
19.	Prof. M.K. Agarwal	• Basic immune response with special reference to respiratory allergy • Immunobiochemical characterisation of insect derived aeroallergens, frequency of clinical reactivity in patients, diversity in their allergen binding IgE antibody profiles and identification of major and minor, and cross reacting and unique allergenic components	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41stAnnual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
20.	Prof. S.N. Gaur	Present and future of immunotherapy	Association of Chest Physicians and Indian Medical Association	NORAACON, North Zone Allergy and Asthma Conference Bareilly August 12, 2007
21.	Prof. S.N. Gaur	Immunotherapy in asthma	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
22.	Prof. S.N. Gaur	Immunotherapy guidelines for India	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
23.	Prof. A. Ray	Strategies for overcoming drug resistance	Indian Council of Medical Research	3rd Medical Development Congress New Delhi September 16, 2007
24.	Prof. A. Ray	Nitric oxide: an endogenous adaptogen during stress	Indian Pharmacological Society and National Institute of Pharmaceutical Education and Research	40th Annual Conference of the Indian Pharmacological Society on Changing Trends in Drug Discovery and Development Mohali November 1-3, 2007
25.	Prof. A. Ray	Nitric oxide: its role in infection and immunity	Department of Pharmaceutical Science, M.S. University and Indian Pharmacological Society (Vadodara Branch)	M.S. University Vadodara March 18, 2008
26.	Prof. A. Ray	Recent trends in nitric oxide research	University Institute of Pharmaceutical Sciences	University Institute of Pharmaceutical Sciences, Punjab University Chandigarh March 29, 2008
27.	Prof. Mridula Bose	Recent advances in molecular diagnostic methods in tuberculosis	L.R.S. Institute of Tuberculosis and Respiratory Diseases	L.R.S. Institute of Tuberculosis and Respiratory Diseases New Delhi March 28, 2008

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
28.	Prof. Ashok Shah	Asthma, allergic rhinitis and sinusitis	Association of Chest Physicians and Indian Medical Association	NORAACON, North Zone Allergy and Asthma Conference Bareilly August 12, 2007
29.	Prof. Ashok Shah	Allergic bronchopulmonary aspergillosis : diagnosis and radiology	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
30.	Prof. Ashok Shah	Pathphysiology of severe asthma	World Allergy Organization(WAO), Allergy and Immunology Society of Thailand, Asia-Pacific Association of Allergology and Clinical Immunology and West Pacific Allergy Organization	20th World Allergy Congress Bangkok, Thailand December 2-6, 2007
31.	Prof. Ashok Shah	Allergic bronchopulmonary and sinus aspergilosis	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
32.	Prof. Ashok Shah	Smoking and tuberculosis	New Delhi Tuberculosis Centre and Maulana Azad Medical College	62nd National Conference on Tuberculosis and Chest Diseases (NATCON 2007) New Delhi December 14-16, 2007
33.	Prof. Ashok Shah	• Allergic bronchopulmonary and sinus aspergillosis • Asthma, rhinitis and sinusitis: current concepts	Kandy Society of Medicine	30th Annual Academic Sessions Gannoruwa, Kandy, February 13-15, 2008
34.	Prof. Ashok Shah	Sarcoidosis – anything new?	Bangladesh Lung Foundation	1st International Conference on Lung Health (PULMOCON-2008) Dhaka, Bangladesh February 20-22, 2008

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
35.	Prof. S.K. Chhabra	COPD in primary care	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
36.	Prof. S.K. Chhabra	Assessment of control in asthma; role of hygiene in asthma	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
37.	Prof. K. Ravi	R.S. Sinha Memorial Oration 2006 titled, "Unravelling the natural stimulus for airway rapidly adapting receptors – A unifying theory"	Annamalai University	94th Indian Science Congress Annamalai, Tamilnadu January 3-7, 2007
38.	Dr Raj Kumar	Pharmacological management	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
39.	Dr Raj Kumar	Food allergy in bronchial asthma – our experience	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
40.	Dr Raj Kumar	Smoking cessation	New Delhi Tuberculosis Centre and Maulana Azad Medical College	62nd National Conference on Tuberculosis and Chest Diseases (NATCON 2007) New Delhi December 14-16, 2007
41.	Dr Raj Kumar	Role of bronchoscopy in sputum negative pulmonary tuberculosis	Indian Association of Bronchology and Malabar Institute of Medical Sciences	13th National Conference of the Indian Association of Bronchology (BRONCON 2008) Calicut February 1-3, 2008
42.	Dr Raj Kumar	Food allergy in respiratory diseases	Bangladesh Lung Foundation	1st International Conference on Lung Health (PULMOCON-2008) Dhaka, Bangladesh February 20-22, 2008

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
43.	Dr Mandira Varma	Serological techniques used for detection of *Mycoplasma pneumoniae*	Indian Association of Mycoplasmologists and S.N. Medical College	VIII Annual Conference of Indian Association of Mycoplasmologists Agra October 5-6, 2007
44.	Dr B.K. Menon	Skin tests for urticaria and drug reactions	All India Institute of Medical Sciences	Dermatology Update New Delhi April 14-15, 2007
45.	Dr B.K. Menon	• Anti IgE therapy for asthma– current indications • Indications and contradictions of allergy testing	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
46.	Dr Anuradha Chowdhary	Fungal pathogens in critically ill patients	Indian Society of Critical Care Medicine and Indraprastha Apollo Hospitals	6th Annual Conference of Delhi & NCR Chapter of Indian Society of Critical Care Medicine New Delhi September 27-30, 2007
47.	Dr Anita Kotwani	Research tools to measure medicines prices and availability	Department for Internal Development (DFID)	Medicines Transperency Alliance (MeTA) Meeting for Stakeholders London April 17-18, 2007
48.	Dr Anita Kotwani	Medicine prices, availability, price regulation and components: Indian surveys	World Health Organization	Advance Technical Briefing Seminar Pharmaceutical on Medicines Prices, Availability and Price Regulation Geneva April 30-May 4, 2007
49.	Dr Anita Kotwani	Access to essential medicines: the present scenario	Indian Pharmacological Society and National Institute of Pharmaceutical Education and Research	40th Annual Conference of the Indian Pharmacological Society on Changing Trends in Drug Discovery and Development Mohali November 1-3, 2007

Sl No.	Faculty Member	Title of Lecture	Organiser(s)	Conference, Place and Date
50.	Dr Kavita Gulati	Stress-induced modulation of the neuro-immune axis and its regulation by nitric oxide (NO) in rats	Indian Pharmacological Society and National Institute of Pharmaceutical Education and Research	40th Annual Conference of the Indian Pharmacological Society on Changing Trends in Drug Discovery and Development Mohali November 1-3, 2007
51.	Dr Kavita Gulati	Pharmacovigilance in special settings : a case study	Society of Pharmacovigilance (India) and National Institute of Medical Sciences, Medical College & Hospital	7th Annual Conference of Society of Pharmacovigilance (India) Jaipur November 23-25, 2007
52.	Dr Kavita Gulati	Experimental studies with herbal drugs as potential adaptogens	Defence Institute of Physiology & Allied Sciences (DIPAS)	Workshop on Continuing Education Programme on Phytochemistry Delhi December 10-14, 2007
53.	Dr Ritu Kulshrestha	Pathology of pneumoconiosis and other miscellaneous causes of interstitial lung diseases	International Academy of Pathology – Indian Division (IAPID) and Postgraduate Institute of Medical Education and Research	Symposium on Interstitial Lung Diseases Chandigarh November 26, 2007
54.	Dr Ritu Kulshrestha	Analysis of bronchoalveolar lavage fluid	Indian Association of Bronchology and Malabar Institute of Medical Sciences	13th National Conference of the Indian Association of Bronchology (BRONCON 2008) Calicut February 1-3, 2008

Conferences/Symposia/Seminars/Workshops/CMEs

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
1.	Dr V.K. Vijayan	Chaired a session on Lung pathology	V.P.C.I., University of Delhi	National Symposium on Lung Pathology on the eve of 58th Foundation Day of V.P.C.I. Delhi April 5, 2007
2.	Dr V.K. Vijayan	Lecture on: Cough variant asthma	S.P. Medical College and the Indian College of Allergy, Asthma & Applied Immunology	2nd Workshop on Clinical Allergy, Asthma and Immunology Bikaner April 13-15, 2007
3.	Dr V.K. Vijayan	Chaired a session on ILD – definition, pathogenesis and classification	V.P.C.I., University of Delhi	6th CME: Recent Advances in Bronchial Asthma Delhi May 6, 2007
4.	Dr V.K. Vijayan	Participated as Advisory Board Member Chaired a session on Global intervention at the population level	Serbian Physiological Society, Serbian Association for Arteriosclerosis, Thrombosis and Vascular Biology Research, International Academy of Cardiovascular Sciences (IACS), Ministry of Sciences and Environmental Protection, Ministry of Health, Serbia, and the Serbian Academy of Science and Arts	Conference on "Nutrition, Treatment and Cardiovascular Risk Management Novi Sad, Serbia May 24-27, 2007
5.	Dr V.K. Vijayan	Lecture on: Health hazards of smoking	V.P.C.I., University of Delhi, Ministry of Health & Family Welfare, Govt. of India and W.H.O.	Workshop on Tobacco Free Environments Delhi August 29, 2007
6.	Dr V.K. Vijayan	Chaired sessions on • World epidemiology of COPD • Bronchodilator therapy in COPD – new measures • Lung in extreme environments	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
7.	Dr V.K. Vijayan	Participated in the Executive Council Meeting and Central Congress Committee Meeting Chaired a session on Clinical respiratory medicine	Asian Pacific Society of Respirology (APSR) and American College of Chest Physicians (ACCP)	12th Congress of APSR / 2nd Joint Congress of APSR and ACCP Queensland, Australia November 30 - December 4, 2007
8.	Dr V.K. Vijayan	Organising Chairman Chaired sessions on • Food allergy • Immunotherapy guidelines	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
9.	Dr V.K. Vijayan	Chaired a session on Important management issues in special population with community acquired pneumonia	National Academy of Medical Sciences (India) and Postgraduate Institute of Medical Education and Research	Tele-Conference on Community Acquired Pneumonia Chandigarh December 23, 2007
10.	Dr V.K. Vijayan	Lecture on: Introduction to bronchoscopy	Indian Association of Bronchology and Malabar Institute of Medical Sciences	Workshop on Bronchoscopy as a part of the 13th National Conference of the Indian Association of Bronchology (BRONCON 2008) Calicut February 1-3, 2008
11.	Dr V.K. Vijayan	Lecture on: Anti IgE in the treatment of bronchial asthma	Indian College of Allergy, Asthma & Applied Immunology (South Zone Chapter)	4th Workshop on Allergy: Allergen Specific Immunotherapy Bangalore February 15-17, 2008
12.	Dr V.K. Vijayan	Chaired a session on Recent insight into interstitial lung disease	Bangladesh Lung Foundation	1st International Conference on Lung Health (PULMOCON-2008) Dhaka, Bangladesh February 20-22, 2008
13.	Dr V.K. Vijayan	Chaired a session on Recent advances in cardiovascular sciences	Delhi Institute of Pharmaceutical Sciences & Research (DIPSAR)	2nd International Symposium on Recent Advances in Cardiovascular Sciences New Delhi February 28, 2008
14.	Dr V.K. Vijayan	Moderator, Panel discussion on 'How I evaluate my excessively sleepy patients?'	Delhi Heart and Lung Institute	Symposium and Workshop on Sleep Related Disorders Delhi March 9, 2008

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
15.	Dr V.K. Vijayan	Resource Person	World Bank, United Nations Development Programme (UNDP), United Nations Industrial Development Organisation (UNIDO), United Nations Environment Programme (UNEP), Division of Technology, Industry & Economics (DTIE), Ozon Action Programme and Department of Environment, Ministry of Natural Resources and Environment, Government of Malaysia	South Asia and South East Asia Pacific (SEAP) Regional Workshop on Phasing-out CFC-Based Metered Dose Inhaler (MDI) Langkawi, Malaysia March 13-15, 2008
16.	Dr V.K. Vijayan	Chaired sessions on • Diet and diet reforms • Psychosomatic practices	Gandhi Bhawan, University of Delhi and Morarji Desai National Institute of Yoga	Workshop on Yoga for Healthy Lifestyle with special reference to University Students Delhi March 27-28, 2008
17.	Prof. H.G. Raj	Chaired a session on Respiratory signal transduction mechanisms	Association of Clinical Biochemists of India	34th National Conference of Association of Clinical Biochemists of India New Delhi December 17-20, 2007
18.	Prof. H.G. Raj	Member, Organising Committee	Department of Chemistry, University of Delhi	3rd Indo-Italian Workshop on Chemistry and Biology of Antioxidants Delhi November 28-30, 2007
19.	Prof. H.G. Raj	Member, Organising Committee	Department of Chemistry, University of Delhi	1st DU-SDU Seminar on Emerging Trends in Interfacial Areas of Chemical, Biological and Environmental Sciences Delhi March 17-18, 2008

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
20.	Prof. M. Fahim	Chaired a session for Evaluating prize winning posters	Deptt. of Physiology, U.C.M.S. & G.T.B. Hospital and Central Council for Research in Yoga and Naturopathy	National Symposium on Emerging Role of Physiology and Lifestyle Interventions in Health Sciences New Delhi February 29, 2008
21.	Prof. M.K. Agarwal	Lectures on: • Basic immune response in health and disease • Immunodiagnosis of allergic diseases • An overview of clinical significance of insects as causative factors in respiratory allergy	Department of T.B. & Respiratory Diseases, S.P. Medical College, Bikaner and Indian College of Allergy, Asthma & Applied Immunology (West Zone)	2nd Workshop on Clinical Allergy, Asthma and Immunology Bikaner April 13-15, 2007
22.	Prof. M.K. Agarwal	Chaired a session on Allergic diseases	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
23.	Prof. M.K. Agarwal	Workshop Coordinator	Indian College of Allergy, Asthma & Applied Immunology (South Zone Chapter)	4th Allergy Workshop of the Indian College of Allergy, Asthma & Applied Immunology on: Allergen Specific Immunotherapy (ASIY -2008) Bangalore February 15-17, 2008
24.	Prof. M.K. Agarwal	Lectures on: • Basic immune response in health and disease • Role of environmental bioparticles in allergic respiratory diseases: diagnosis and management	Institute of Life Long Learning, Academic Research Centre, University of Delhi, Delhi	Refresher Course in Environmental Studies for College and University Teachers Delhi February 25, 2008
25.	Prof. S.N. Gaur	Lectures on: • Future aspects of allergen immunotherapy in respiratory allergy • Implication of black box warning in respiratory diseases	Department of T.B. & Respiratory Diseases, S.P. Medical College, Bikaner and Indian College of Allergy, Asthma & Applied Immunology (West Zone)	2nd Workshop on Clinical Allergy, Asthma and Immunology Bikaner April 13-15, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
26.	Prof. S.N. Gaur	Chaired a session on Allergic rhinitis	Jaipur Golden Hospital	CME on Respiratory Diseases (Respivision) New Delhi April 15, 2007
27.	Prof. S.N. Gaur	Chaired a session on Epidemiology of bronchial asthma	V.P.C.I., University of Delhi	7th CME on Recent Advances in Bronchial Asthma Delhi May 6, 2007
28.	Prof. S.N. Gaur	National Advisor Chaired a session on smoking cessation	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
29.	Prof. S.N. Gaur	Chaired a session on Aerobiology / allergy prevention	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
30.	Prof. S.N. Gaur	Chaired the guest lecture session on New generation methods for drug susceptibility testing for tuberculosis	New Delhi Tuberculosis Centre and Maulana Azad Medical College	62nd National Conference on Tuberculosis and Chest Diseases (NATCON 2007) New Delhi December 14-16, 2007
31.	Prof. S.N. Gaur	Presented a poster on A two year double blind placebo controlled study on immunotherapy with single and mixed allergen preparation	World Allergy Organization(WAO), Allergy and Immunology Society of Thailand, Asia-Pacific Association of Allergology and Clinical Immunology and West Pacific Allergy Organization	20th World Allergy Congress Bangkok, Thailand December 2-6, 2007
32.	Prof. S.N. Gaur	Lectures on: • Background of the Indian guidelines of allergen immunotherapy • Efficacy of immunotherapy in asthma and rhinitis • Compare and contrast WHO, Europeon, USA and Indian guidelines on allergen immunotherapy • Allergen: efficacy, dosage, composition in immunotherapy	Indian College of Allergy, Asthma & Applied Immunology (South Zone Chapter)	4th Allergy Workshop of the Indian College of Allergy, Asthma & Applied Immunology on: Allergen Specific Immunotherapy (ASIY - 2008) Bangalore February 15-17, 2008

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
33.	Prof. S.N. Gaur	Lecture on: Past and future immunotherapy in asthma	Rajasthan Chapter of NCCP (I)	7th RAJCON-2008 Jaipur February 25, 2008
34.	Prof. A. Ray	Lecture on: Clinical studies with polyherbal agents against drug-induced hepatotoxicity	Defence Institute of Physiology & Allied Sciences (DIPAS)	Workshop on Continuing Education Programme in Phytochemistry Delhi December 10-14, 2007
35.	Prof. Mridula Bose	Presented a paper on the immunogenic and pathogenic potential of a multidrug resistant clinical isolate (#591) in an ex-vivo system of host-parasite infection	Indian Immunology Society and National AIDS Research Institute	34th Indian Immunology Society Conference and International Symposium on HIV Immunology Pune December 16-18, 2007
36.	Prof. Ashok Shah	Lecture on: GINA guidelines 2006	Deptt. of Pulmonary Medicine, Indira Gandhi Medical College	Pulmonary Medicine Update Shimla April 7-8, 2007
37.	Prof. Ashok Shah	Lectures on: • Asthma, rhinitis and sinusitis • Allergic rhinitis – recent concept in management	Department of T.B. & Respiratory Diseases, S.P. Medical College, Bikaner & Indian College of Allergy, Asthma & Applied Immunology (West Zone)	2nd Workshop on Clinical Allergy, Asthma and Immunology Bikaner April 13-15, 2007
38.	Prof. Ashok Shah	Lecture on: Allergic rhinitis, asthma and sinusitis	Jaipur Golden Hospital	CME on Respiratory Diseases (Respivision) New Delhi April 15, 2007
39.	Prof. Ashok Shah	Chaired sessions on • Diagnosis and classification of bronchial asthma • Management of stable asthma • Management of acute exacerbation	V.P.C.I., University of Delhi	7th CME on Recent Advances in Bronchial Asthma Delhi May 6, 2007
40.	Prof. Ashok Shah	Presented a paper on Nocturnal sleep disturbances, excessive daytime sleepiness and impairment in sleep specific quality of life in patients with allergic rhinitis	European Academy of Allergology and Clinical Immunology	XXVI Congress of the European Academy of Allergology and Clinical Immunology Gotberg, Sweden June 9-13, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
41.	Prof. Ashok Shah	Lectures on: • How to search medical literature? • How to write a research paper for a medical Journal	Department of Pulmonary Diseases and Tuberculosis, J.L.N. Medical College	CME on Pulmonary Medicine Ajmer July 7, 2007
42.	Prof. Ashok Shah	Chaired sessions on • Food allergy • Insect allergy • Present and future of Immunotherapy	Association of Chest Physicians and Indian Medical Association	NORAACON, North Zone Allergy and Asthma Conference Bareilly August 12, 2007
43.	Prof. Ashok Shah	Lecture on: Allergic bronchopulmonary aspergillosis-underrecognised	Department of Pulmonolgy, Thoracic Surgery and Medical Intensive Care, Fortis Flt Lt Rajan Dhall Hospital	Workshop on New Horizons in Pulmonology, Thoracic Surgery and Critical Care New Delhi August 23-27, 2007
44.	Prof. Ashok Shah	Chaired a round table discussion on Sarcoidosis and tuberculosis : enigma	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
45.	Prof. Ashok Shah	Chaired a session on Clinical immunology	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
46.	Prof. Ashok Shah	Chaired a session on Guest lecture – ISTC and RNTCP	New Delhi Tuberculosis Centre and Maulana Azad Medical College	62nd National Conference on Tuberculosis and Chest Diseases (NATCON 2007) New Delhi December 14-16, 2007
47.	Prof. Ashok Shah	Lecture on: Geriatrics and pulmonology	Central Council for Research in Ayurveda & Siddha	National Workshop on Ayurveda & Siddha for Geriatric Health Care New Delhi January 23-24, 2008
48.	Prof. Ashok Shah	Chaired a session on allergy updates	Bangladesh Lung Foundation	1st International Conference on Lung Health (PULMOCON-2008) Dhaka, Bangladesh February 20-22, 2008

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
49.	Prof. S.K. Chhabra	Lecture on: Pulmonary function tests	Jaipur Golden Hospital	CME on Respiratory Diseases (Respivision) New Delhi April 15, 2007
50.	Prof. S.K. Chhabra	Chaired a session on Inhalation therapy and patient education	V.P.C.I., University of Delhi	7th CME on Recent Advances in Bronchial Asthma Delhi May 6, 2007
51.	Prof. S.K. Chhabra	Course Director : Workshop on Pulmonary function tests	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
52.	Prof. S.K. Chhabra	Course Director : Workshop on Pulmonary function tests	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007
53.	Prof. S.K. Chhabra	Chaired a panel discussion on COPD	New Delhi Tuberculosis Centre and Maulana Azad Medical College	62nd National Conference on Tuberculosis and Chest Diseases (NATCON 2007) New Delhi December 14-16, 2007
54.	Prof. S.K. Chhabra	Panelist, panel discussion on Sleep apnea	Delhi Heart and Lung Institute	Symposium and Workshop on Sleep Related Disorders Delhi March 9, 2008
55.	Prof. K. Ravi	Chaired a session on Oxidative stress : role in human body	Department of Physiology, Maulna Azad Medical College	National Symposium on Oxidative Stress and Cognition – An Overview New Delhi February 8-9, 2008
56.	Prof. S.K. Bansal	Member, Organising Committee Chaired a session on Role of biotechnology industry	Industrial Toxicology Research Centre	5th Annual Conference of Biotechnology Society of India (BIOTECH 2007)- Advances and Strategies in Biotechnology : A Global Perspective Lucknow November 17-19, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
57.	Prof. S.K. Bansal	Presented posters on • Nicotine and salbutamol induced changes in protein kinase C activity in lymphocytes in COPD • Expression of interleukin 1-β and tumor necrosis factor-α by lipopolysaccharide, histamine and methacho-linechloride in alveolar macrophages in asthma	Asian Pacific Society of Respirology (APSR) and American College of Chest Physicians (ACCP)	12th Congress of APSR / 2nd Joint Congress of APSR and ACCP Queensland, Australia November 30 - December 4, 2007
58.	Prof. S.K. Bansal	Convener and Chairperson of two Symposia on 'Cardiac Signal Transduction Mechanisms' and 'Respiratory Signal Transduction Mechanisms'	Association of Clinical Biochemists of India and Escorts Heart Institute and Resarch Centre Ltd	ACBICON 2007 – 34th National Conference of Association of Clinical Biochemists of India New Delhi December 18-20, 2007
59.	Prof. S.K. Bansal	Member, Organising Committee Chaired a session on Oxidative stress	Department of Biochemistry, All India Institute of Medical Sciences	SFRR-Satellite India-2008 Meeting New Delhi February 11-12, 2008
60.	Prof. S.K. Bansal	Chaired a session on Post genomic era technologies	Department of Biochemistry, Maulana Azad Medical College and Associated Hospitals	Molecular Medicine Update-2008 on the eve of MAMC Golden Jubilee celebration New Delhi March 28-29, 2008
61.	Dr Raj Kumar	Resource Person Lecture on: Health impact of tobacco use	Ministry of Health & Family Welfare, Government of India and National Institute of Health and Family Welfare	Workshop on Training Program and Planning Meeting for Implementation of National Program for Tobacco Control New Delhi November 12-13, 2007
62.	Dr Raj Kumar	Chaired a session on Asthma– epidemiology and pathophysiology	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy, Asthma & Applied Immunology Delhi December 9-12, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
63.	Dr Raj Kumar	Co-chairman of a session on Rhinitis	Indian Medical Association, Medical Council of India and American Association of Physicians of Indian Origin	First Indo-US Healthcare Summit New Delhi December 13-15, 2007
64.	Dr Raj Kumar	Lecture on: Respiratory diseases and yoga	Gandhi Bhawan, University of Delhi and Morarji Desai National Institute of Yoga	Workshop on Yoga for Healthy Lifestyle Delhi March 27-28, 2008
65.	Dr Mandira Varma	Presented a poster on Role of *Mycoplasma pneumoniae* infection in acute exacerbations of COPD	Indian Association of Mycoplasmologists and S.N. Medical College	VIII Annual Conference of Indian Association of Mycoplasmologists Agra October 5-6, 2007
66.	Dr Mandira Varma	Presented a paper on Drug resistance: a dot blot hybridisation assay to detect select rifampicin resistance mutations in clinical isolates of *M. tuberculosis*	Indian Association of Medical Microbiologists (Delhi Chapter) and Indraprastha Apollo Hospitals	Delhi Chapter of Indian Association of Medical Microbiologists New Delhi November 24, 2007
67.	Dr Madhu Khanna	Presented a paper on Catalytic nucleic acids mediated gene silencing of influenza A virus	Center for Disease Control (CDC)	Options for Influenza Control VI Toronto, Ontario, Canada June 17-23, 2007
68.	Dr Madhu Khanna	Presented a paper on Antisense mediated enhanced cleavage of M1 gene of influenza A virus by catalytic nucleic acids and siRNA	Department of Plant Pathology, Indian Agricultural Research Institute	International Conference on Emerging and Re-emerging Viral Diseases of the Tropics and Sub Tropics New Delhi December 11-14, 2007
69.	Dr B.K. Menon	Lecture on: Skin tests for urticaria and drug reactions	All India Institute of Medical Sciences	Dermatology Update New Delhi April 14-15, 2007
70.	Dr B.K. Menon	Lecture on: Lung function testing in bronchial asthma	Northen Railway Divisional Hospital	CME on Bronchial Asthma New Delhi May 8, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
71.	Dr B.K. Menon	Presented a paper on Study on serum and urinary cortisol levels of asthmatic patients after treatment with high dose beclomethasone, budesonide, fluticasone or ciclesonide	Turkish Society of Allergy and Clinical Immunology and Turkish Thoracic Society	World Asthma Meeting (WAM – 2007) Istanbul, Turkey June 22-25, 2007
72.	Dr B.K. Menon	Presented a paper on Study on levels of high sensitivity C reactive protein in asthmatic patients during exacerbation and remission and its correlation with pulmonary function	European Respiratory Society	European Respiratory Society Annual Congress (ERS – 2007) Stockholm, Sweden September 15-19, 2007
73.	Dr B.K. Menon	Lecture on: DOTS plus	Babu Jagjivan Ram Hospital	CME on RNTCP (DOTS) New Delhi March 26, 2008
74.	Dr Anuradha Chowdhary	Presented papers on • A rare case of chromoblastomycosis in a renal transplant recipient caused by anon sporulating *Rhytidhysteron* species • Experience with cryptococcosis in HIV patients in a North Delhi Hospital	Society for Indian Human and Animal Mycology (SIHAM) and Seth GS Medical College & KEM Hospital	7th National Conference of Society for Human and Animal Mycology (SIHAM 2008) Mumbai February 4-6, 2008
75.	Dr Anuradha Chowdhary	Presented a paper on Occurrence and etiology of fungal rhino-sinusitis in a New Delhi teaching hospital	International Society for Human and Animal Mycology (ISHAM) and Postgraduate Institute of Medical Education and Research	International Workshop on Fungal Sinusitis, (ISHAM) Chandigarh February 9-11, 2008
76.	Dr Anita Kotwani	Presented a paper on Determining antibiotic use in India	International Society of Pharmacoeconomics and Outcome Research (ISPOR)	12th International Conference of ISPOR Virginia, U.S.A. May 19-23, 2007
77.	Dr Anita Kotwani	Presented a paper on 'Pricing'	University of Utrecht and World Health Organization	International Conference on Pharmaceutical Policy Analysis Zeist, The Netherlands September 19-23, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
78.	Dr Anita Kotwani	Presented a paper on Surveillance of antibiotic use in the community Chaired a session on Toxicology	Indian Pharmacological Society and National Institute of Pharmaceutical Education and Research	40th Annual Conference of the Indian Pharmacological Society on Changing Trends in Drug Discovery and Development Mohali November 1-3, 2007
79.	Dr Vishal Bansal	Presented a paper on Effects of estrogen on isolated vascular smooth muscle	Physiological Society of India and Manav Rachna Education Institutions	XIXth Annual Conference of Physiology on Current Approach of Physiology to Therapeutics and Rehabilitation Faridabad December 6-8, 2007
80.	Dr Vishal Bansal	Presented a poster on Vascular smooth muscle responses to estrogen – possible mechanisms	Delhi Institute of Pharmaceutical Sciences & Research (DIPSAR)	2nd International Symposium on Recent Advances in Cardiovascular Sciences New Delhi February 28, 2008
81.	Dr Kavita Gulati	Panelist in the discussion on Rationality assessment of fixed dose combinations	All India Institute of Medical Sciences	Brainstorming Workshop on Rationality Assessment and Guidelines for Fixed Dose Combinations New Delhi June 25-26, 2007
82.	Dr Kavita Gulati	Presented a poster on Effects of varying intensity and duration of restraint stress on neurobehavioural and endocrinal responses in rats : possible regulation by nitric oxide	Hungarian Cell Stress Society, Cell Stress Society International and Eotvos Lorand University	2nd World Conference of Stress & 3rd Cell Stress Society International Congress on Stress Responses in Biology and Medicine Budapest, Hungary August 23-26, 2007
83.	Dr Ritu Kulshrestha	Moderator, the Specialty Breakfast session on Pulmonary pathology (Postgraduate Series)	Indian Association of Pathologists and Microbiologists and Postgraduate Institute of Medical Education and Research	Annual Conference of the Indian Association of Pathologists and Microbiologists Chandigarh November 28, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
84.	Dr Danish Jamal (MD Student) *(Guide: Prof. A. Shah)*	Presented a paper on The occurrence of nocturnal sleep disturbances, daytime sleepiness and sleep specific quality of life (QOL) disturbances in patients with allergic rhinitis	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2007) Chandigarh November 22-25, 2007
85.	Dr Danish Jamal (MD Student) *(Guide: Prof. A. Shah)*	Presented a paper on Allergic rhinitis: occurrence of sinusitis in 'sneezers-runners' and 'blockers' Presented a poster on Disturbances in nocturnal sleep, excessive daytime sleepiness and sleep-specific quality of life impairment in patients with allergic rhinitis	World Allergy Organization(WAO), Allergy and Immunology Society of Thailand, Asia-Pacific Association of Allergology and Clinical Immunology and West Pacific Allergy Organization	20th World Allergy Congress Bangkok, Thailand December 2-6, 2007
86.	Ms Prachi Gupta (PhD Student) *(Guide: Prof. S.K. Bansal)*	Presented a paper on Changes in the sphingomyelin, phosphatidyl choline and cholesterol in erythrocyte membrane of asthmatic patients	Association of Clinical Biochemists of India and Escorts Heart Institute and Resarch Centre Ltd	ACBICON 2007 – 34th National Conference of Association of Clinical Biochemists of India New Delhi December 18-20, 2007
87.	Mr Rakesh Kumar Mishra (PhD Student) *(Guide: Prof. S.K. Bansal)*	Presented a paper on Changes in protein kinase C activity in airway smooth muscles during the development of airway hyperreactivity in guinea pigs: a preliminary study	Association of Clinical Biochemists of India and Escorts Heart Institute and Resarch Centre Ltd	ACBICON 2007 – 34th National Conference of Association of Clinical Biochemists of India New Delhi December 18-20, 2007
88.	Mr Neeraj Kumar (PhD Student) *(Guide: Prof. S.K. Bansal)*	Presented a paper on ABCD1 gene polymorphism in X-linked adrenoleukodystrophy in Indian population	Association of Clinical Biochemists of India and Escorts Heart Institute and Resarch Centre Ltd	ACBICON 2007 – 34th National Conference of Association of Clinical Biochemists of India New Delhi December 18-20, 2007
89.	Archana Angrup (MD Student) *(Guide: Dr Mandira Varma)*	Presented a poster on Drug resistance profiling and genotyping of *Mycobacterium tuberculosis* isolates from a DOTS center and private hospitals in Delhi	Kasturba Medical College and Indian Association of Medical Microbiologists	31st Annual Conference of Indian Association of Medical Microbiologists Mangalore November 16-20, 2007

Sl No.	Participant	Role/Topic	Organiser(s)	Name, Venue and Date
90.	Dr Vinita Katiyar *(Guide: Prof. M.K. Agarwal)*	Report of the project "Assessment of biocontaminants from indoor environments"	Department of Science & Technology	Group Monitoring Workshop (GMW) Kalimpong May 21-22, 2007
91.	Ms Ruquiya Nazir (PhD Student) *(Guide: Dr Madhu Khanna)*	Presented a poster on Inflammatory and cytokine responses of influenza A virus infection induced in murine model of allergic asthma	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	41st Annual Conference of the Indian College of Allergy , Asthma & Applied Immunology Delhi December 9-12, 2007

Participation in Advanced and Specialised Training Programme by Faculty Members

Sl No.	Participant (Department)	Course Title/ Topic	Training Duration	Host
1.	Dr Ritu Kulshrestha (Pathology)	Training on Microarry Technology	April 16-18, 2007	Institute of Pathology (ICMR), New Delhi
2.	Dr Anita Kotwani (Pharmacology)	Short course on "Use of Real World Data in Outcome Research"	May 20, 2007	International Society of Pharmaco-economics & Outcome Research, Virginia, U.S.A.
3.	Dr Vishal Bansal (Physiology)	Post-graduate Training in Pulmonary Rehabilitation	August 1, 2006 - July 31, 2007	Department of Respiratory Medicine, West Park Healthcare Centre, Division of Respirology, Faculty of Medicine, University of Toronto, Toronto, Canada
4.	Dr B.K. Menon (Respiratory Allergy and Applied Immunology)	Training on Avian Influenza	February 1-2, 2008	National Institute of Communicable Diseases, Delhi
5.	Dr Raj Kumar (Respiratory Medicine)	Interventional Bronchoscopy	July 12-16, 2007	Workshop of 2nd Asia Pacific Congress of Bronchology, Singapore
6.	Dr Madu Khanna (Respiratory Virology)	Multi- Site Monitoring of Human Influenza Viruses in India: Phase-I	October 10, 2007	ICMR-CDC Surveillance Workshop on the Project Human Influenza, National Institute of Virology, Pune

Short Term Specialised Trainings Imparted by Faculty Members

Sl No.	Name, Subject and Organisation	Course Title/Topic	Faculty Member (Department)	Period
1.	Ms Vristi Rustagi B.Tech. (Biotechnology) Amity Institute of Biotechnology, Amity University, Noida (U.P.)	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	July 18 - August 17, 2007
2.	Ms Kriti Sharma, Ms Avneet Ahluwalia M.Sc. (Biotechnology) Punjab Technical University, Jalandhar, Punjab	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	October 01 - November 30, 2007
3.	Mr Vikrant Singh Rajput B. Tech. (Biotechnology) Amity Institute of Biotechnology, Amity University, Noida (U.P.)	Molecular techniques relevant to biotechnology	Prof. Mridula Bose (Microbiology)	June 15 - August 14, 2007
4.	Ms Suman Kumar*, Ms Jyoti Tyagi** M.Sc. (Biotechnology) Banasthali Vidyapith, Rajasthan	* Identification of clinical isolates of *M. tuberculosis* by PCR-RA **Expression, purification and refolding of *mce4A* protein of *M. tuberculosis* (H37Rv)	Prof. Mridula Bose (Microbiology)	January 01 - March 31, 2008
5.	Ms Shalu Devi M.Sc. (Microbiology) Gurkul Kangri Vishwa-vidyalaya, Hardwar	PCR restriction analysis (PRA): a rapid diagnostic method for detection of *M. tuberculosis*	Dr Mandira Varma (Microbiology)	January 01 - April 30, 2007
6.	Dr Sapna Gupta Lecturer Nehru Homeopathic Medical College, Delhi	Histopathology and cytology techniques in pulmonary pathology	Dr Ritu Kulshrestha (Pathology)	June 1- June 30, 2007

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 events the staff members of the Institute had participated in various Annual Tournaments and Annual Athletic Meet of Delhi University Staff Club and won awards in various events.

List of Publications

1. Aggarwal B, Menon B. A case with pulmonary tuberculosis, pleural effusion, miliary tuberculosis, cervical and mediastinal lymphadenopathy, tubercular arthritis, psoas abscess and severe anemia. *Respir Med Extra* 2007; 3: 79-82.
2. Arora Shvetambri, Vora P, Kumar A, Tyagi YK, Raj HG, Dwarakanath BS, *et al.* Calreticulin transacetylase catalyzed activation of muscle cell nitric oxide synthase by acetoxy coumarin. *Biol Pharmacol Bull* (Japan) 2008; 31: 709-13.
3. Ashraf MZ, Reddy MK, Hussain ME, Podrez EA, Fahim M. Contribution of EDRF and EDHF to restoration of endothelial function following dietary restrictions in hypercholesterolemic rats. *Indian J Exp Biol* 2007; 45: 505-14.
4. Bansal Seema, Gaspari M, Raj HG, Cuda G, Verheij E, Tyagi YK, *et al* . Calreticulin transacetylase mediates the acetylation of nitric oxide synthase by polyphenolic acetate. *Appl Biochem and Biotech* 2008; 144: 37-45.
5. Chakraborti A, Gulati K, Ray A. Estrogen actions on brain and behaviour: recent insights and future challenges. *Rev Neurosci* 2007; 18: 395-416.
6. Chhabra SK, Chhabra P. Hepatic hydrothorax without ascitis. *Indian J Chest Dis Allied Sci* 2007; 49: 177-9.
7. Chhabra SK, Chhabra P. Distribution of body mass index and determinants of nutritional status among adults in Delhi. *J Health Pop Nutr* 2007; 25: 294-301.
8. Chhabra SK. Assessment of control in asthma: the new focus in management. *Indian J Chest Dis Allied Sci* 2008; 50: 109-16.
9. Chowdhary A, Guarro J, Randhawa HS, Gené J, Cano J, Jain RK, *et al*. A rare case of chromoblastomycosis in a renal transplant recipient caused by a non-sporulating species of *Rhytidhysteron Med Mycol* 2007; 46: 163-6.
10. Diwakar A, Dewan RK, Chowdhary A, Randhawa HS, Khanna G, Gaur SN. Zygomycosis – a case report and overview of disease in India. *Mycoses* 2007; 50: 247-54.
11. Gaur SN, Jain SK, Singh AB. Prevalence of asthma, allergic rhinitis and sensitization with pollen and fungal allergens in the residents of Narora Atomic Power Plant Township, Narora, Uttar Pradesh, India. *Indian J Allergy Asthma Immunol* 2007; 21: 1-7.
12. Gaur SN, Singh AB, Mehta AK. Successful desensitization with honeybee venom – a case report. *Indian J Allergy Asthma Immunol* 2007; 21: 69-72.
13. Gautam P, Sundaram CS, Madan T, Gade WN, Shah A, Sirdeshmukh R, *et al*. Identification of novel allergens of *Aspergillus fumigatus* using immunoproteomics approach. *Clin Exp Allergy* 2007; 37:1239-49.
14. Gugnani HC, Paliwal-Joshi A, Rahman H, Padhye AA, Singh TSK, Das TK, *et al*. Occurrence of pathogenic fungi in soil of burrows of rats and of other sites in bamboo plantations in India and Nepal. *Mycoses* 2007; 50: 507-11.
15. Gulati K, Chakraborti A, Ray A. Modulation of stress induced neurobehavioral changes and brain oxidative injury by nitric oxide (NO) mimetics in rats. *Behav Brain Res* 2007; 183: 226-30.
16. Gulati K, Ray A, Pal R. Free radicals and drug toxicity: focus on theophylline. *Cell Mol Biol* 2007; 53: 78-83.
17. Gulati K, Ray A, Vijayan VK. Free radicals and theophylline neurotoxicity: an experimental study. *Cell Mol Biol* (Noisy-le-grand) 2007; 53: 42-52.

18. Gulati K, Vishnoi G, Tyagi N, Vijayan VK, Ray A. A study to monitor adverse drug reactions of theophyline in patients of obstructive airway diseases. *J Pharmacovigil Drug Safety* 2007; 4: 33-4.

19. Gupta K, Kumar R, Gaur SN. Effect of a domiciliary pulmonary rehabilitation programme on disability in patients with interstitial lung diseases. *Indian J Chest Dis Allied Sci* 2007; 49: 213-7.

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24. Khanna M, Kumar P, Singh V, Nazir R, Vijayan VK. Expression of macrophage inflammatory protein-1α and eosinophilic derived neurotoxin in upper respiratory secretions during influenza virus infection. *Indian J Chest Dis Allied Sci* 2007; 49: 81-5.

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29. Kumar R, Nagar JK, Kumar H, Kushwah A, Meena M, Kumar P, *et al*. Association of indoor air pollution level with respiratory problem among children in industrial area of Delhi, India. *Arch Environ Occup Health* 2007; 62: 75-80.

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31. Mehta AK, Gaur SN, Arora N, Singh BP. Effect of choline chloride in allergen induced mouse model of airway inflammation. *Eur Respir J* 2007; 30: 662-71.

32. Menon B, Aggarwal B. Pulmonary tuberculosis in a case of Rubinstein Taybi syndrome. *Respir Med Extra* 2007; 3: 164-7.

33. Menon, B, Aggarwal B. Influence of spinal deformity on pulmonary function, arterial blood gas values and exercise capacity in thoracic kyphoscoliosis. *Neurosciences* 2007; 12: 293- 8.

34. Menon B, Kulshreshtra R, Aggarwal B, Sharma S, Jain P. A rare case of non-small cell lung carcinoma in an 18-year-old female. *Indian J Chest Dis Allied Sci* 2007; 49: 103-5.

35. Nagar JK, Shrivastava JP, Kumar R, Chandra U, Rathi B, Rana SVS, *et al*. Urban air pollution : a global health problem. *Bull Env Sci* 2007; XXV: 201-23.

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correlation on augmentation of antigen challenge by influenza A virus infection. *Indian J Exp Biol* 2008; 46: 151-8.

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