ANNUAL REPORT
2014-15

Vallabhbhai Patel Chest Institute
University of Delhi, Delhi, India

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The 62nd Institute's Day was celebrated on 12th January 2015. Honourable Lt. Governor of Delhi, Shri Najeeb Jung was addressing the audience on this occasion. Prof. Dinesh Singh, Vice-Chancellor of the University of Delhi in his presidential address highlighted the need of collaborative research activities between VPCI and other Departments of University of Delhi.

On the Occasion of Birth Anniversary of Sardar Vallabhbhai Patel, Rashtriya Ekta Diwas was celebrated at VPCI on 31st October 2014. Prof. Dinesh Singh, Vice-Chancellor, University of Delhi inaugurated the bust of Sardar Vallabhbhai Patel at VPCI.

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Published and printed by Professoe S.N. Gaur, Director (Acting), Vallabhbhai Patel Chest Institute, University of Delhi, Delhi-110 007; Phone: 27402435, 27667102, 27667441, 27667667, 27666182, and printed at Bengal Offset Works, 335, Khajoor Road, Karol Bagh, New Delhi-110005 (Phone: 23610455, 23674614).

From the Director's Desk

I feel privileged to bring out the Annual Report of the Vallabhbhai Patel Chest Institute (VPCI) for the year 2014-15. The Report presents as a comprehensive treatise highlighting the present achievements of the Institute in the fields of 'Education', 'Research', 'Patient care' and other developmental activities.

The Institute organized the 16th Prof. Raman Viswanathan-VPCI Oration on the occasion of 65th Foundation Day on 6th April 2014. The Oration was delivered by Prof. P.S. Shankar, Emeritus Professor of Medicine, Rajiv Gandhi Institute of Health Sciences, Bangalore, Karnataka. The Institute also organized the 10th Prof. Autar Singh Paintal Memorial Oration on 24th September 2014. The Oration was delivered by Prof. M. Fahim, former Professor & Head, Dept. of Physiology, VPCI and Adjunct Research Professor, Dept. of Physiology, Hamdard Institute of Medical Sciences & Research, JamiaHamdard, New Delhi. During the year, the Institute initiated an Oration in honour of our former Director, Prof. H.S. Randhawa, an internationally acclaimed Medical Mycologist. The 1st Prof. H.S. Randhawa Oration was delivered by Prof. Ziauddin Khan, Chairman, Dept. of Microbiology, Kuwait University, Kuwait, on 12th January 2015.

Fulfilling one of the mandates of the Institute, many scientific programmes were organised during this year. Important among them are; Symposium on Pulmonary Rehabilitation in COPD (4th April 2014), Symposium on Personalized Therapeutics in Lung Cancer - The Path Ahead (16th April 2014), Update on NSCLC (9th July 2014), CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases (11th July 2014), Update on Chronic Obstructive Pulmonary Disease (COPD) (30th July 2014), RNTCP Update (13th August 2014), Workshop on Bronchial Asthma (18th-19th October 2014), An Interactive Lecture on Science & Public Health (27th October 2014), APACI Workshop on Epidemiology and Control of Influenza (7th -8th November 2014), Allergy and Immunology Educational Symposium (18th November 2014), Update on Lung Cancer (28th January 2015), Symposium on Bioethics in Medical Research (3rd February 2015), 40th Workshop on "Respiratory Allergy: Diagnosis and Management (23rd-27th February 2015) and European Society of Clinical Microbiology and Infectious Diseases (ESCMID) Postgraduate Education Course (19th -21st March 2015). The Institute also organized several VPCI Honour Lectures and Public Lectures during the period.

In addition to this, the Institute organized the following programmes; International Clinical Trials Day 19th May 2014), World Environment Day (5th June 2014), World No Tobacco Day (6th June 2014), Independence Day (15th August 2014), Teachers' Day (5th September 2014), Swachha Bharat Abhiyaan (2nd October 2014), Rashtriya Ekta Diwas (31st October 2014), Good Governance Day (26th December 2014) Institute Day (12th January 2015) and Republic Day (26th January 2015) during the period.

Postgraduate medical education is one of the thrust areas of the Institute. Students are trained for DM, MD and DTCD degree courses in Pulmonary Medicine; MD in Biochemistry, Physiology, Microbiology and Pharmacology and for PhD degree in Chest Medicine and Allied Sciences. A large number of students from other institutions / colleges were also trained in various departments of the Institute. The research contributions from the Institute are widely acclaimed. The vibrancy of these research projects / activities can be well judged from the list of publications in peer reviewed journals, guest lectures delivered and original papers presented in the International and National conferences by the faculty members and students of the Institute. The faculty members also received various Awards and Honours in their field of specialization.

The Institute continues to publish its reputed quarterly publication *The Indian Journal of Chest Diseases and Allied Sciences*, in collaboration with the National College of Chest Physicians (India). The journal has wide national and international circulation. The Institute also publishes the VPCI Newsletter in every six months interval regularly.

The Viswanathan Chest Hospital (VCH) attached to the Institute is a tertiary care Chest Hospital with state-of-the-art equipment. A large number of patients from Delhi and other parts of the country utilize the facilities available in the hospital. The 128-bedded hospital wing with eight-bedded Respiratory Intensive Care Unit, Sleep Laboratory, The National Centre of Respiratory Allergy, Asthma and Immunology

(NCRAAI), Tobacco Cessation Clinic, Cardio-pulmonary Rehabilitation Clinic, and Yoga Therapy and Research Centre are integral part of the VCH for providing excellent diagnostic and treatment facilities to thousands of patients thronging the hospital for relief.

On the occasion of "Rashtriya Ekta Diwas" on 31st October 2014 the bust of Sardar Vallabhbhai Patel has been unveiled at the VPCI campus. Prof. Dinesh Singh, Hon'ble Vice Chancellor, University of Delhi, unveiled this bust.

Prof. A.S. Paintal Memorial Museum was inaugurated on 6th January 2015. The scientific equipments that Prof. Paintal used, the honours that he received, the books that he possessed, his scientific papers and various photographs are displayed in the museum for inspiration to the students, scientific community and public at large.

During the period, the Institute also constructed a "Patients' Waiting Hall" for the attendants of the patients and a well-furnished "VPCI Gym with Badminton Court" for the staff and students of VPCI.

Prof. Rajendra Prasad superannuated as Director on 28.02.2015 and I took over the charge as Director (Acting) from 01.03.2015.

I hope this presentation of our activities will be able to provide an overview into the progress made during the year 2014-15.

Prof. S.N. Gaur

Director (Acting)

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CONTENTS

MILESTONES OF INSTITUTE

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 understanding the functioning of lung and its diseases.
July 1,	1957	Prof. R. Viswanathan took over as full-time Director of the Institute. Previously, he was the Deputy Director General of Health Services, Govt. of India and Honorary Director of the Institute.
September 24,	1957	Pt. Jawaharlal Nehru said in a message: "It was a brave act of the University of Delhi to start the V.P. Chest Institute".
October 24,	1957	Clinical Research Centre was inaugurated by Prof. 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 renamed 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-named as "Diploma in Tuberculosis and Chest Diseases" (DTCD) from XIV Course. The XV DTCD Course 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 the Institute staff participated in the Republic Day parade.

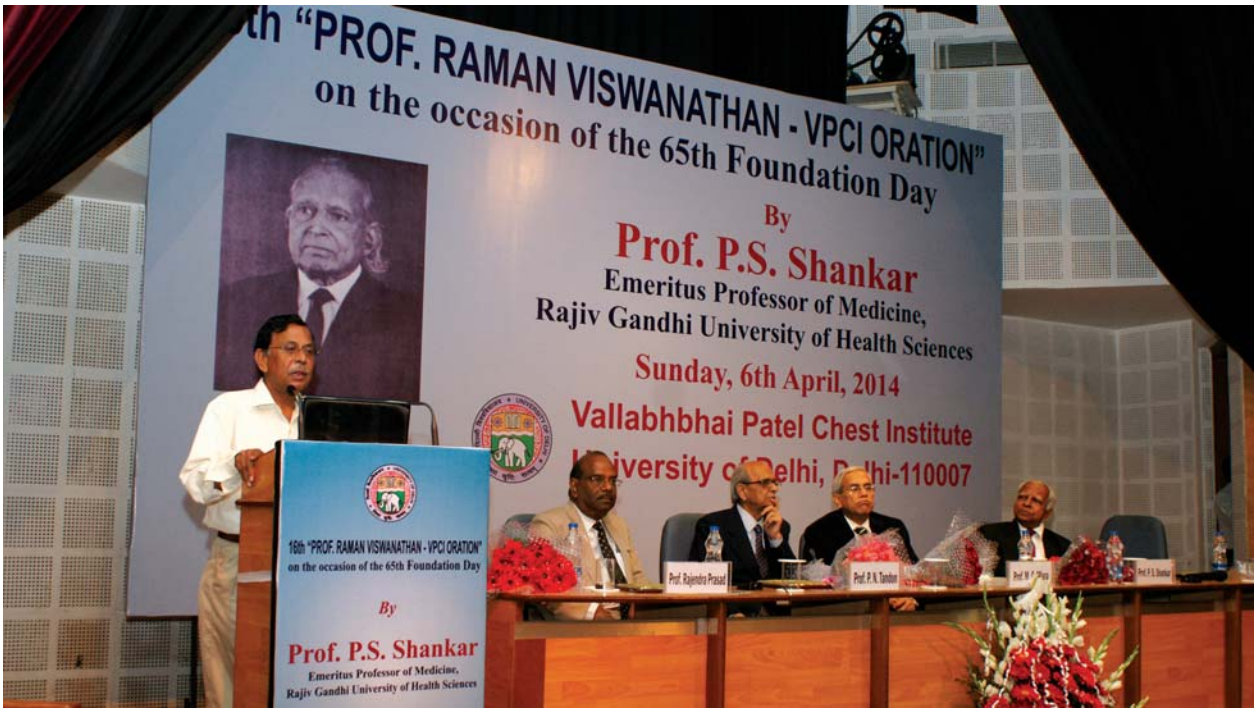
February 20-24,	1963	VII International Congress on Diseases of the Chest was held at Vigyan Bhawan under the auspices of V.P. Chest Institute, Indian Association for Chest Diseases and the University of Delhi.
August 1,	1964	Prof. A.S. Paintal joined as the Director of the Institute.
April 6,	1965	Patel 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].
	1985	Prof. H.S. Randhawa was elected Vice-President of the International Society for Human and Animal Mycology [1985-88].
	1986	Prof. A.S. Paintal was appointed as Director-General of the Indian Council of Medical Research.
	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. VPCI Oration was started.
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.
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 [2000-06].
March	2001	A Respiratory Critical Care Unit was started.
March 15,	2001	CT Scan Centre was inaugurated by Honourable Padma Shree Dr C.P. Thakur, the Union Minister of Health and Family Welfare, Govt. of India.
November 21,	2001	Tobacco Cessation Clinic was started.

August 14,	2002	A State-of-the-Art Oxygen Plant was inaugurated by Prof. P.N. Srivastava, Chairman, Governing Body (VPCI).
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.
	2004	Launching of the Institute website: www.vpci.org.in
September 24,	2005	Prof. A.S. Paintal Memorial Oration was started.
January 10,	2006	An 8-bedded Intensive Care Unit was inaugurated by Prof. P.N. Srivastava, Chairman, Governing Body (VPCI).
December 8,	2006	Inauguration of the Golden Jubilee Auditorium by organising 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.
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 17,	2009	Approval by the University of Delhi to start Superspeciality DM Course in Pulmonary Medicine in VPCI with an intake of two seats per year.
August 3,	2010	Approval by the University of Delhi to start Diploma Course in Allergy and Clinical Immunology in VPCI with an intake of two seats per year.
February 12,	2011	Inauguration of the National Centre of Respiratory Allergy, Asthma and Immunology by Prof. P.N. Tandon, President, National Brain Research Centre Society and Chairman, Governing Body, V.P. Chest Institute, Delhi.
March 15,	2011	Permission from Medical Council of India to start DM (Pulmonary Medicine) course with annual intake of two students per year from the academic year 2011-12.
November 21,	2012	Prof. Rajendra Prasad joined as the Director of the Institute.
May 7,	2013	DOTS Centre was inaugurated by Prof. P.N. Tandon, Chairman, Governing Body, VPCI.
August 18,	2013	DMA Centenary Institution Award received from Mrs Sheila Dikshit, the Hon'ble Chief Minister, Govt. of NCT Delhi for the "Outstanding Contribution in the Field of Patient Health Care" at Maulana Azad Medical College, New Delhi.
August 23,	2013	New Ward (44 beds) was inaugurated by Prof. P.N. Tandon, Chairman, Governing Body, VPCI.
		VPCI Newsletter was inaugurated by Prof. P.N. Tandon, Chairman, Governing Body, VPCI.
January 6,	2015	Prof. A.S. Paintal Memorial Museum inaugurated.

Prof. R. Viswanathan-VPCI Orations

1st Oration	April 6, 1999	Prof. N.K. Ganguly, Director-General, Indian Council of Medical Research, New Delhi.
2nd Oration	April 6, 2000	Prof. A.S. Paintal, former Director-General, ICMR and former Director, VPCI.
3rd Oration	April 6, 2001	Dr S. Lakshminarayanan, University of Washington School of Medicine, Washington, Seattle, USA.
4th Oration	April 6, 2002	Dr S. Padmavati, President, All India Heart Foundation and Director, National Heart Institute, New Delhi.
5th Oration	April 7, 2003	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.
6th Oration	April 6, 2004	Prof. H.S. Randhawa, former Director, V.P. Chest Institute, University of Delhi, Delhi.
7th Oration	April 6, 2005	Prof. Naranjan S. Dhalla, Distinguished Professor and Director, Institute of Cardio-vascular Sciences, St. Boniface General Hospital and Research Centre, University of Manitoba, Winnipeg, Canada.
8th Oration	April 6, 2006	Prof. C.N. Deivanayagam, Former Medical Superintendent, Hospital for Thoracic Medicine, Chennai.
9th Oration	April 6, 2007	Prof. K.K. Talwar, Director, Postgraduate Institute of Medical Education and Research, Chandigarh.
10th Oration	April 6, 2008	Prof. C.R. Babu, former Pro-Vice-Chancellor, University of Delhi, Delhi.
11th Oration	April 7, 2009	Prof. Peter J. Barnes, Head of Respiratory Medicine, Imperial College, London and Professor of Thoracic Medicine and Head of Airway Disease at the National Heart and Lung Institute and Honorary Consultant Physician at Royal Brompton Hospital, London.
12th Oration	April 6, 2010	Prof. M.K. Bhan, Secretary, Government of India, Department of Biotechnology, New Delhi.
13th Oration	April 6, 2011	Dr Vishwa Mohan Katoch, Secretary to the Government of India, Department of Health Research, Ministry of Health and Family Welfare and Director-General, Indian Council of Medical Research, New Delhi.
14th Oration	April 6, 2012	Prof. Sami Bahna, Chief, Allergy and Immunology Section, Lousiana State University, LA, USA, and Past-President, American College of Allergy, Asthma and Immunology, USA.
15th Oration	April 6, 2013	Dr W. Selvamurthy, Former Distinguished Scientist and Chief Controller (R and D) (LS and IC), DRDO, Ministry of Defence, Government of India, New Delhi.
16th Oration	April 6, 2014	Prof. P.S. Shankar, Emeritus Professor of Medicine, Rajiv Gandhi Institute of Health Sciences, Bangalore, Karnataka.

The Institute started VPCI Oration from 1999 onwards. The VPCI Oration was re-named as Prof. R. Viswanathan-VPCI Oration in 2005.



16th Prof. Raman Vishwanathan-VPCI Oration was delivered by Prof. P.S. Shankar on 6 April 2014. Professor S.N. Gaur, VPCI addressing the audience on this occasion.

A Symposium was organised on contributions of Professor Autar Singh Paintal on 6 January 2015. In the memory of Prof. A.S. Paintal a museum was also inaugurated which is dedicated to his life and his contributions in the world of science which inspires young scientists, researchers and academicians.

Prof. A.S. Paintal Memorial Orations

1st Oration	September 24, 2005	Prof. M.S. Valiathan, Honorary Adviser, Manipal Academy of Higher Education, Manipal (Karnataka).
2nd Oration	September 24, 2006	Prof P.N. Tandon, President, National Brain Research Centre Society, Gurgaon.
3rd Oration	September 24, 2007	Prof. P.N. Srivastava, First Chancellor, Manipur Central University, Imphal and former Vice-Chancellor, Jawaharlal Nehru University, New Delhi.
4th Oration	September 24, 2008	Prof. Nanduri R. Prabhakar, Director, Centre for System Biology of Oxygen Sensing, Department of Medicine, University of Chicago, USA.
5th Oration	September 24, 2009	Prof. Arun Dharmarajan, Winthrop Professor, School of Anatomy and Human Biology, Faculty of Life and Physical Sciences, The University of Western Australia, Nedlands, Perth, Western Australia.
6th Oration	September 24, 2010	Prof. Chulani Tissa Kappagoda, Professor of Medicine, University of California, Davis, USA.
7th Oration	September 23, 2011	Prof. J.S. Guleria, Senior Consultant (General Medicine), Sitaram Bhartia Institute of Science and Research, New Delhi and former Professor and Head, Department of Medicine, and Dean, AIIMS, New Delhi.
8th Oration	September 24, 2012	Prof. S.K. Jain, Senior Consultant, Respiratory Medicine, Max Hospital, NOIDA, Coordinator, DNB (Respiratory Medicine), Metro Hospital, NOIDA, Ex-Advisor and Member, Scientific Advisory Committee, NIREH (ICMR), Bhopal and Ex-HOD, Cardio-respiratory Physiology, VPCI.
9th Oration	September 24, 2013	Prof. Samir K. Brahmachari, Director General, CSIR and Secretary, Government of India, Department of Scientific and Industrial Research, New Delhi
10th Oration	September 24, 2014	Prof. M. Fahim, former Professor & Head, Dept. of Physiology, VPCI and Adjunct Research Professor, Dept. of Physiology, Hamdard Institute of Medical Sciences & Research, Jamia Hamdard, New Delhi.

Prof. H.S. Randhawa Oration

1st Oration	January 12, 2015	Prof. Ziauddin Khan, Chairman, Department of Microbiology, Kuwait University, Kuwait.

On the occasion of 1st Prof. H.S. Randhawa Oration, Prof. Rajendra Prasad, Director, is presenting a memento to Prof. Ziauddin Khan.

THE INSTITUTE

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

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 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, Cardio-respiratory Physiology, Radiodiagnosis and Imaging, Respiratory Allergy and Applied Immunology, Pulmonary 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 the Faculty Members in the respective fields. 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 Section at Viswanathan Chest Hospital is controlled by the Nursing Sperintendent. 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. P.N. Tandon** President, National Brain Research Centre Society, 1, Jagriti Enclave, Vikas Marg Extn Delhi - 110092
MEMBERS	
Treasurer, University of Delhi (Ex-Officio)	**Mrs Janaki Kathpalia** *(till 21.08.2014)* **Mr T.S. Kripanidhi** *(22.08.2014 onwards)*
Two members nominated by the Executive Council, University of Delhi	**Prof. Anil Tyagi** *(till 01.07.2014)* **Prof. V.K. Chaudhary** *(02.07.2014 onwards)* **Prof. S.C. Bhatla** *(till 29.07.2014)* **Prof. Devesh K. Sinha** *(30.07.2014 onwards)*
Dean, Faculty of Medical Sciences, University of Delhi	**Prof. Reva Tripathi**
Three members nominated by the Ministry of Health and Family Welfare, Government of India, New Delhi	**Shri Gautam Guha** Additional Secretary and Financial Advisor **Mrs Vijaya Srivastava** *(w.e.f. from Feb. 2015)* Additional Secretary and Financial Advisor **Shri Anshu Prakash** Joint Secretary **Dr Jagdish Prasad** Director General of Health Services
One member, not connected with the University, nominated by the Executive Council, University of Delhi	**Dr Satyajit Rath** Staff Scientist, National Institute of Immunology, Aruna Asaf Ali Marg, New Delhi-110067 **Dr Yogendra Singh** *(07.03.2015 onwards)* Chief Scientist, CSIR-Institute of Genomics and Integrative Biology, Mall Road, Delhi-110007
One Professor of the Institute by rotation according to seniority for a period of one year	**Prof. S.K. Bansal** *(till 02.11.2014)* **Prof. Raj Kumar** *(03.11.2014 onwards)*
One Reader or Lecturer of the Institute by rotation according to seniority for a period of one year	**Dr Mandira Varma-Basil** *(till 02.11.2014)* **Dr Madhu Khanna** *(03.11.2014 onwards)*
Representative of Non-teaching Staff (as Special Invitee) of the Institute by rotation, according to seniority for a period of one year	**Mrs Saroj Bala** *(till 06.11.14)* **Mr R.C. Narang** *(07.11.14 onwards)*
MEMBER-SECRETARY	
Director Vallabhbhai Patel Chest Institute, University of Delhi, Delhi (Ex-Officio)	**Prof. Rajendra Prasad** *(till 28.02.2015)* **Prof. S.N. Gaur** *(01.03.2015 onwards)*

Standing Finance Committee

Additional Secretary and Financial Advisor — *Chairman*
Ministry of Health and Family Welfare
Government of India
Nirman Bhawan
New Delhi-110 001

Joint Secretary or Nominee — *Member*
Ministry of Health and Family Welfare
Government of India
Nirman Bhawan
New Delhi-110 001

Prof. K. Ravi — *Member*
Department of Physiology
V.P. Chest Institute
University of Delhi, Delhi -110 007

Joint Registrar — *Member*
V.P. Chest Institute
University of Delhi, Delhi-110 007

Director — *Member-Secretary*
V.P. Chest Institute
University of Delhi, Delhi-110 007

Scientific Advisory Committee

Prof. S.K. Jindal — *Chairman*
Head, Department of Pulmonary Medicine
Post Graduate Institute of Medical Education and Research
Chandigarh -160 012

DDG (M) — *Member*
Ministry of Health and Family Welfare
Government of India
New Delhi-110 001

Principal — *Member*
University College of Medical Sciences (UCMS)
Delhi-110 095

Prof. S.N. Gaur — *Member*
Department of Pulmonary Medicine
V.P. Chest Institute
University of Delhi, Delhi-110007

Prof. K. Ravi — *Member*
Department of Physiology
V.P. Chest Institute
University of Delhi, Delhi-110007

Director — *Member-Secretary*
V.P. Chest Institute
University of Delhi, Delhi-110 007

Prof. Y.K. Gupta — *Member*
Head, Department of Pharmacology
All india Institute of Medical Sciences
New Delhi -110029

Prof. Randeep Guleria — *Member*
Head, Department of Pulmonary Medicine
& Sleep Disorders
All india Institute of Medical Sciences
New Delhi -110029

Human Ethics Committee

Prof. S.K. Jain — *Chairman*
Senior Consultant (Pulmonology)
Mool Chand Hospital
New Delhi-110 024

Prof. Ashwani Kumar Bansal — *Member*
Dean, Faculty of Law
University of Delhi, Delhi-110 007

Prof. Manoj Kumar Jha — *Member*
Head, Department of Social Work
University of Delhi, Delhi-110 007

Prof. Naresh Gupta — *Member*
Head, Department of Medicine
Maulana Azad Medical College and
Associated LNJP and GB Pant Hospitals
B.L. Taneja Block, 1st Floor
New Delhi-110 002

Prof. S. Dwivedi — *Member*
Dean / Principal,
Hamdard Institute of Medical Sciences and Research (HIMSR),
Hamdard Nagar
New Delhi – 110062

Prof. Ashok Kumar Saxena — *Member*
Department of Anesthesiology and Critical Care
University College of Medical Sciences (UCMS)
Shahdara
Delhi-110 095

Prof. B.D. Banerjee — *Member*
Department of Biochemistry
University College of Medical Sciences (UCMS)
Shahdara
Delhi-110 095

Dr Ashima Anand — *Member*
Principal Investigator
DST Project
V.P. Chest Institute
University of Delhi, Delhi-110 007

Director — *Member-Secretary*
V.P. Chest Institute
University of Delhi, Delhi-110 007

Animal Ethics Committee

Prof. A. Ray — *Chairman*
Head, Department of Pharmacology
V.P. Chest Institute
University of Delhi, Delhi-110 007

Prof. K. Ravi — *Member-Secretary*
Head, Department of Physiology
V.P. Chest Institute
University of Delhi, Delhi-110 007

Dr Anuradha Chowdhary — *Member*
Associate Professor, Department of Medical Mycology
V.P. Chest Institute
University of Delhi, Delhi-110 007

Dr Ritu Kulshrestha — *Member*
Assistant Professor, Department of Pathology
V.P. Chest Institute
University of Delhi, Delhi-110 007

Dr D.N. Rao — *Main Nominee of CPCSEA*
Professor, Department of Biochemistry
All India Institute of Medical Sciences
Ansari Nagar
New Delhi - 110029

Dr Om Singh — *Link Nominee of CPCSEA*
National Institute of Immunology (in the event of non availability of
Aruna Asaf Ali Marg Dr D.N. Rao)
New Delhi - 110067

Dr B.B. Batra — *Nominee of CPCSEA*
A-316, Sarita Vihar (Non Scientific Socially Aware
New Delhi – 110076 Member)

Dr (Mrs) Promodkumari — *Nominee of CPCSEA*
Professor, Department of Pharmacology (Scientist from outside the
University College of Medical Sciences Institute)
University of Delhi, Delhi-110095

Dr Rajinder Bajaj — *Member*
Veterinarian
V.P. Chest Institute
University of Delhi, Delhi-110 007

ORGANISATIONAL STRUCTURE

DIRECTOR *(Acting)*

S.N. GAUR, MD, PhD (Medicine), FCCP (USA), FNCCP (I), FCAI *(01.03.2015 onwards)*

DIRECTOR

RAJENDRA PRASAD, MD, DTCD, FAMS, FCCP (USA), FNCCP, FCAI FIAB, FIMSA, FCCS, DSc (Hon. Causa) *(till 28.02.2015)*

Biochemistry

S.K. Bansal, MSc, PhD
Professor

Biostatistics

Mujeeb-ur-Rahman, MSc, PhD, PGDCP
Assistant Professor

Cardio-respiratory Physiology

S.K. Chhabra, MD
Professor

Clinical Biochemistry

Vishwajeet Rohil, MD
Assistant Professor

Medical Mycology

(Mrs) Anuradha Chowdhary, MD
Associate Professor

Microbiology

(Mrs) Malini Shariff, MD, PhD
Associate Professor

(Mrs) Mandira Varma-Basil, MD, DNB
Associate Professor

Pathology

(Mrs) Ritu Kulshrestha, MS (Biomedical Sciences), DNB (Pathology), MNAMS
Assistant Professor

Pharmacology

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

(Mrs) Anita Kotwani, MSc, PhD
Associate Professor

(Mrs) Kavita Gulati, MSc, PhD
Associate Professor

Physiology

K. Ravi, MSc, PhD
Professor

Vishal Bansal, MD, DNB, PhD, MNAMS, FCCP (USA)
Assistant Professor

Pulmonary Medicine

Rajendra Prasad, MD, DTCD, FAMS, FCCP (USA), FNCCP(I), FCAI, FIAB, FIMSA, FCCS, DSc (Hon. Causa)
Director- Professor (till 28.02.2015)

S.N. Gaur, MD, PhD (Medicine), FCCP (USA), FNCCP (I), FCAI
Director- Professor (w.e.f. 01.03.2015)

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

Dr Shweta Bansal, MD
Assistant Professor (Adhoc)

Respiratory Allergy and Applied Immunology

Raj Kumar, MD, MNASc, FNCCP (I), FCAI, MIAOH, MAAAAI
Professor

Balakrishnan Menon, MD, DMRD
Associate Professor

Dr Nitin Goel, MD
Assistant Professor (Adhoc)

Respiratory Virology

(Mrs) Madhu Khanna, MSc, PhD
Associate Professor

Viswanathan Chest Hospital

Officer-in-Charge

Rajendra Prasad *(till 28.02.2015)*
Director

S.N. Gaur *(w.e.f. 01.03.2015)*
Director (Acting)

Library

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

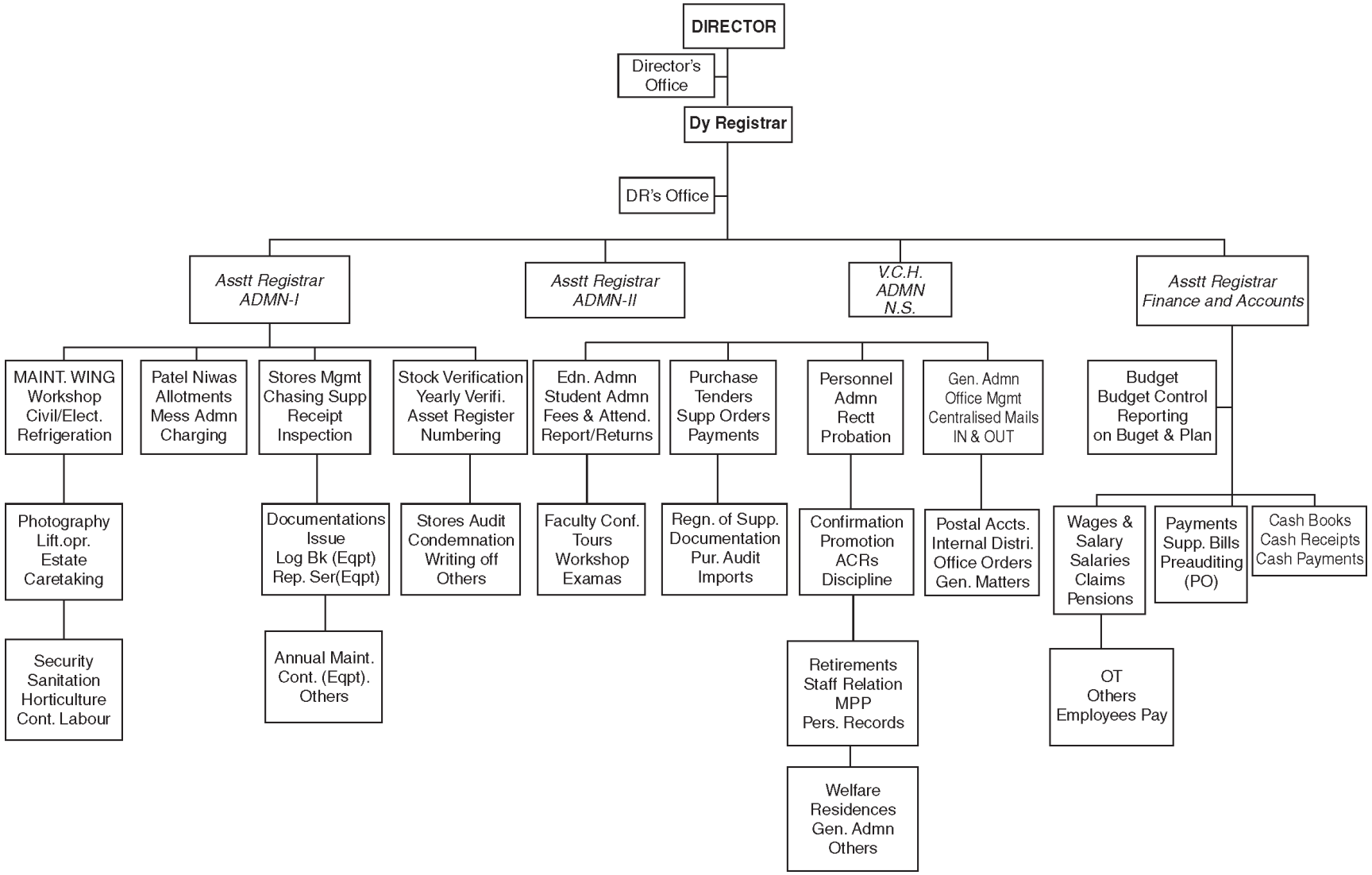
Animal House

Rajinder Bajaj, BVSc and AH
Veterinarian

Administration

P.R. Santhanam, MA (Publ Admn), MHRM, MBA, LLB, PGDPM
Deputy Registrar (till 08.06.2014)
Joint Registrar (09.06.2014 onwards)

ADMINISTRATIVE STRUCTURE



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. It provides specialised investigations and treatment to patients referred to this Institute.

- Pulmory Medicine
- Radiodiagnosis and Imaging
- Clinical Laboratories of Biochemistry and Microbiology
- Anaesthesia
- Thoracic Surgery

Facilities at Viswanathan Chest Hospital

- Outpatient Department
- In-patient Facility with 128 beds
- 24 Hours Respiratory Emergency
- 8 bedded Respiratory Intensive Care Unit (with facilities of 6 ventilators),
- Pulmonary Function Laboratory
- Sleep Laboratory
- ECG
- Allergy and Applied Immunology Laboratory
- Clinical Hematology and Pathology Laboratory
- Clinical Biochemistry Laboratory
- Radiology Unit
- 64 Slice MDCT Scan Center
- Microbiology Laboratory
- Tobacco Cessation Clinic
- Yoga Therapy and Research Centre
- Cardio-pulmonary Rehabilitation Clinic
- Picture Archiving and Communication Systems (PACS)
- Medical Records Section

Specialized investigations at VCH

- Pulmonary function tests
- Arterial blood gases
- Electrocardiogram
- Polysomnograms (Sleep Laboratory)
- Fibreoptic bronchoscopy
- Medical thoracoscopy
- Respiratory allergy skin tests
- Clinical immunology
- Computed tomography
- Plain radiography

- Ultrasound
- Guided FNAC / Biopsy
- BACTEC System for tuberculosis

Detailed data of patients attending VCH during the year:

Number of new patients attending OPD	:	12293
Number of follow up patients visiting OPD	:	55642
Total		**67935**

Number of indoor patients

General Wards	:	2417
Emergency Wards	:	2112
Total		**4529**
Emergency treatment provided	:	18148
Total number of patients treated in ICU	:	406

Number of routine and specialised investigations done at various VCH during the year

Pulmonary function tests	:	21084
Arterial blood gases	:	12820
Bronchoscopy	:	342
Bronchoalveolar lavage	:	75
CT scans	:	3571
X-rays	:	23404
Electrocardiogram	:	6268
Polysomnograms	:	167
HIV testing	:	668
Clinical biochemistry	:	59948
Skin tests	:	1711
Serum Ig E test	:	2280
ANA	:	162
c-ANCA	:	89
p-ANCA	:	88
SCL-70	:	98
HBsAg	:	75
HCV	:	72

Mycology (VPCI and other hospitals)

Nature of Specimen		*No.*
Sputa	:	1266
Blood specimen	:	1140
Bronchial lavage / aspirate / washings / Endotracheal aspirate / pleural fluid	:	670
Tissue biopsies / nasal polyps / skin scrapings	:	61
Blood culture	:	102
Miscellaneous (swabs / urine / CSF / FNAC)	:	269
Total	**:**	**3508**

Microbiology

i. Bacteriology Laboratory

Nature of Specimen		*No.*
Sputum	:	3356
Urine	:	337
Bronchial aspirate / Lavage	:	366
Pleural fluid	:	69
Blood	:	278
Endotracheal aspirate	:	241
Pus / (FNAC / Tips)	:	21
Throat swab	:	02
Total	:	4670

ii. Serology Laboratory

Test Performed		*No.*
Rheumatoid factor (RA)	:	404
C reactive protein (CRP)	:	105
Widal	:	06
Hbs Ag	:	01
Total	**:**	**516**

Pathology

Section		*No.*
Haematology	:	21078
Coagulation	:	1007
Histopathology	:	230
Cytopathology	:	792
Clinical pathlogy	:	448

Cell Culture Laboratory

The Cell Culture laboratory was made fully functional during this period. The A549 human alveolar epithelial cell line was successfully cultured and research work performed. The Insulin Growth factor signaling pathway, IGFBP5, IGF-1, SP-C, TGF-b levels were studied.

Molecular Pathology Laboratory

The molecular pathology of lung cancer was analysed in Molecular Pathology laboratory and the epidermal growth factor receptor (EGFR) mutations in non-small cell lung cancer tissues and plasma were detected using allele specific PCR assay.

Tobacco Cessation Clinic

According to Global Adult Tobacco Survey 2010 (G.A.T.S – 2010), estimated number of tobacco users in India is 274.9 million. In which 163.7 million users are smokeless. Whereas 68.9 millions are smokers and those who consumes both are 42.3 million. 8-9 lakh people die every year due to tobacco related diseases. Majority of cardiovascular disease, cancers and chronic lung diseases are directly attributable to tobacco consumption.

In order to control above situation, V.P.C.I Tobacco Cessation Clinic (TCC) is being operational since November 2001 under the supervision of Prof. Raj Kumar, from Monday to Friday 9 am to 5 pm. It has setup its own resource centre at reception counter of VPCI. Anybody who is willing to quit tobacco intake may register himself at the reception counter at free of cost. Counselling session, Medicine prescription and few tests such as CoHb Level, Pulmonary Function Test is being performed here. Registered subject is being called for regular follow up at an interval of two weeks followed by one month, two months, three months, six months and one year.

The TCC conducts workshops regularly in different parts of Delhi, to train the physicians, counsellors, volunteers and other stake holders involved in smoking cessation. Since inception, TCC conducted 55 educational programmes for physicians, paramedical professionals and general public. The activities of TCC were expanded in the year 2002 with the financial support from World Health Organization (WHO) and Ministry of Health and Family Welfare, Government of India, to make it a more comprehensive programme Centre. Further, the TCC was upgraded in the year 2009 as Resource Centre for Tobacco Control.

The TCC has prepared educational materials in the form of booklets, pamphlets, stickers, etc., for physicians and general public.

Till date, 6705 new tobacco users and 2622 follow up tobacco users were availed the services of TCC. The tobacco users seen during camps and various educational programmes have not been included here.

During the year, 847 new subjects came for tobacco cessation in TCC. 223 subjects came for follow up.

In association of Ministry of Health and Family Welfare, Govt. of India, a tobacco cessation camp for five days was organised during the *Ramleela* days from 28th of September 2014 to 2nd of October 2014 at Ramleela Ground, Ashok Vihar Phase I, near Major Dhyanchand Sports Complex. Approximately, 3000 participants were benefitted from this tobacco cessation camp.

The TCC is committed to help the people who want to quit smoking / tobacco use.

On the occasion of World No Tobacco Day, a public awareness programme – ***'No Smoking: Change Your Lifestyle'*** was organised by VPCI, Delhi in association with Society for Tobacco Control at Paintal Memorial Golden Jubilee Auditorium, VPCI, Delhi on 6th June 2014. Dr Raj Kumar, Head, National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, Delhi was the Organizing Secretary of the programme.

A Public Awareness Programme on the occasion of World No Tobacco Day was organised on 6 June 2014. Theme of this year programme was: No Smoking: Change Your Lifestyle. Prof. S.N. Gaur of the Institute was addressing the audience on this occasion.

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 Moday to Saturday from 8 AM to 4 PM at VPCI under the guidance of a Nodal Officer (Dr B.K. Menon) and VPCI Director. The Centre has a staff of four members with one yoga physician, two yoga instructors and an attendant.

Yoga classes runs in different batches from 8-9 AM (Training classes), 9-10 AM, 10-11 AM, 11 AM -12PM, 12-1 PM and 1-2 PM, 3-4 PM for therapy.

Yoga sessions are specially designed for the management of different health disorders, like bronchial asthma, hypertension, stress, obesity, etc. Patient first reports to yoga OPD at VCH of VPCI (9.00 AM -3.00 PM) every Tuesday, Wednesday, Thursday and Friday of the week. After obtaining case history of the patient, necessary counselling is given by the yoga physician. Then the patient is advised to undergo yoga training and educational session, according to individual's health status for a particular period. Once the training sessions are completed, the patient is re-examined to note the improvement made by him / her by the yoga physician. Then patient is advised for home programme with an advice to attend the training sessions once or twice a week at the Yoga Centre for better health and quality of life and to keep their records. Special yoga sessions for staff of VPCI are also arranged time to time.

A training programme on Yoga in collaboration with Morarji Desai National Institute for Yoga was held on from 14th July–13th August 2014. Certificate for participation in this programme was given by Prof. Rajendra Prasad, Director of the Institute.

Following numbers of patients were attended the Yoga Therapy and Research Centre during the year:

Outdoor Patients	1033
Indoor Patients	1205
Promotional Health Programme	592
Total	**2830**

Outdoor Patients

Bronchial asthma	164
Stress	83
Chronic obstructive pulmonary disease	132
Hypertension	102
Obesity	210
Cervical spondylitis	24
Migraine	15
Backache	148
Allergic rhinitis	52
Arthritis	38
Diabetes	61
Tuberculosis	05

Indoor Patients

Bronchial asthma	331
Chronic obstructive pulmonary disease	615
Interstitial lung disease	82
Sinusitis	77
Pneumonia	22
Tuberculosis	78

Cardio-pulmonary Rehabilitation Clinic

Cardio-pulmonary Rehabilitation Clinic at Viswanathan Chest Hospital, VPCI is involved in helping chronic respiratory patients who have exercise limitation and are often disabled in activities of daily living (ADL) due to shortness of breath despite being on optimal medical treatment regain their functional capacity and reduce disability in activities of daily living.

Patients are encouraged to enroll in supervised rehabilitation program which includes topics on energy conservation, lung health, bronchial hygiene, chest physiotherapy, nutrition, optimization of medication intake, domiciliary oxygen usage, stress management, breathing retraining, inspiratory muscle training and strength & endurance training of upper and lower limbs.

Clinic Timings:· **Monday to Friday: 9.00 A.M. to 1.00 P.M.**

Numbers of patients attended in Cardio-Pulmonary Rehabilitation Clinic: (1st April 2014 - 31st March 2015)

- **Breathing Retraining and Education : 174**
- **Chest Physiotherapy : 572**
- **Supervised Rehabilitation Programme : 56** (Intensive and Maintenance)

Division of Sleep Medicine

Sleep disorders and sleep therapy are cross-disciplinary areas concerned with the psychological and physical health conditions related to sleep disorders and conventional and advanced sleep therapies.

VPCI has started the Division of Sleep Medicine in 2001 and since then there has been dramatic growth in clinical activity. The number of patient visits has increased approximately five-fold from the year 2002 to the present period. It caters to the need of all in-patients and out-patients with three diagnostic machines.

The Division is managed by experienced staff under the headship of Prof Raj Kumar from 23 August 2013 with able guidance of the Director Prof. S.N. Gaur of the VPCI and provide a broad range of studies: overnight sleep studies, split overnight sleep study, watch-pat diagnostic sleep study, OSA screener and auto CPAP.

The mission at the Sleep Division is to provide comprehensive diagnostic evaluation to individuals having symptoms occurring during sleep or while awake and management to respiratory patients of age 18 years and above.

Technical staff of the Sleep Medicine Division are fully equipped with knowledge required for recording and interpreting sleep studies. They take responsibility for patient safety, quality of the studies, scoring studies, and training medical persons in the field of sleep study acquisition.

VPCI have trained technical staff dedicated to the diagnosis and treatment of sleep / wake disorders in adults and develop research to lead to a better understanding of normal and abnormal sleep.

The expanded Sleep Medicine Division, located on the first floor of the Viswanathan Chest Hospital of the Institute and is spacious enough for patients to spend the night and has attached private bathroom with shower. The Division is equipped with new, state-of-the-art equipment. The Division continues to see with a wide variety of sleep complaints during the period under report.

A Sleep study is in progress in the Division of Sleep Medicine at VPCI.

Past clinical research projects include “Prevalence of obstructive sleep apnoea syndrome in Delhi, India”; “A study of sleep-related breathing disorders in chronic obstructive pulmonary disease patients with or without cor-pulmonale”; “Obstructive sleep apnoea, oxidative stress and renal function”; “Obstructive sleep apnoea, oxidative stress and liver function”; “Role of some inflammatory markers in obstructive sleep apnoea: effects of grape seed extract”.

Clinical care for the full spectrum of sleep disorders is provided to the outpatient also. Number of sleep studies performed has increased from 12 in the year 2002 to 1180 studies till the year 2015 March and 176 studies alone for the year 2014-2015.

The Division of Sleep Medicine at present has the following aims and objectives:

1. To provide exceptional health-care and support through quality service to all patients with sleep disorders.
2. To provide well-structured and up-to-date training programmes for doctors and technicians in sleep medicines.
3. To conduct high quality research related to sleep disorders (with emphasis on local disease and disorders).

Evaluation and Treatment Options

- CPAP / BiPAP, Mask fitting / Desensitization
- Sleep consultation / Evaluation / Sleep Counseling
- Sleep studies
- Polysomnography (Includes: EEG, EOG, chin and leg EMG, respiratory monitoring, oxygen saturation, and EKG)
- CPAP titration
- Split night polysomnography

Research in Sleep Medicine Division

Research activities continued to be a major part of the Division since the year 2002. Thirteen scientific papers were read and published in national and international medical meetings and journals from this Division.

Multidisciplinary Research Unit

The Government of India, approved the scheme for establishment of multidisciplinary research units in the Government Medical Colleges / Research Institutions during the 12th Plan period as a path-breaking initiative to develop / strengthen the health research infrastructure in the country to fulfil the newly allocated function of the department related to the "Promotion, Coordination and Development of Basic, Applied and Clinical Research. The scheme was implemented by the Department of Health Research (DHR) with the technical support of Indian Council of Medical Research (ICMR). The objectives of the scheme are: (i) to encourage and strengthen the environment of research in medical colleges; (ii) to bridge the gap in the infrastructure which is inhibiting health research in the medical colleges by assisting them to establish multi-disciplinary research facilities with a view to improve the health research; (iii) to ensure the geographical spread of health research infrastructure, in order to cover un-served and under-served medical colleges and other institutions; and (iv) to improve the overall health status of the population by creating evidence based application of diagnostic procedures / processes / methods.

Accordingly along with the other medical colleges in India, the Vallabhbhai Patel Chest Institute was also chosen for starting of the multi-disciplinary research unit (MRU). Under this scheme, financial assistance of upto 5.25 crores is to be provided.

The major functions of the VPCI-ICMR-MRU will be: (i) to undertake research in non-communicable diseases and other need-based research employing newer tools, as recommended by the local research committee / expert committee of the DHR; (ii) to promote and encourage quality medical research at VPCI; and (iii) to constitute the local research committees for identifying the research priorities and projects with participation of the state health systems.

To start with, two research proposals one by Dr Vishwajeet Rohil, Department of Clinical Biochemistry and another by Dr Ritu Kulshrestha, Department of Pathology have already been approved by a two tier review by a technical screening committee and evaluation committee of the ICMR in the first year of establishment of MRU.

Augmentation of the Post-graduate Teaching and Research Facility

To augment the Post-graduate Teaching and Research facility at Departments of Pulmonary Medicine and Pharmacology, the Department of Science and Technology (DST), Government of India has sanctioned a grant of an amount of Rs.29.50 lakhs.

Bharat Tobacco Quit Line

Keeping in view the growing tobacco use in India and its related diseases and to guide people to quit tobacco use, the Ministry of Health and Family Welfare, Government of India has approved establishment of a pilot service at VPCI, namely "Bharat Tobacco Quit Line", Professor Raj Kumar, Professor and Head, Department of Respiratory Allergy and Applied Immunology and Head National Centre of Respiratory Allergy, Asthma and Immunology will be the Coordinator for this service at VPCI.

Specialised Centre

National Centre of Respiratory Allergy, Asthma and Immunology

The National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI) was established in February 2011. The aim of the Centre is to conduct research and training on various aspects of allergy and asthma (aetiopathogenesis, diagnosis and treatment). A brief description about the activities of NCRAAI during the year is given below;

The **'NCRAAI – Pollen Count Station'** continues to collect samples from airborne pollens. The pollen data has been collectted from air sampler and the data has been analysed on daily basis. Seven-day sampler's 178 days slides and 365 slides of 24hrs sampler's (total 543 slides) have been studied for the pollen count during the period. The research study **"Atmospheric pollen count in North Delhi region"** done with the Pollen Count Station has been accepted for publication in the *Indian Journal of Allergy, Asthma and Immunology*.

The NCRAAI continues its **study in villages** research project; **"Indoor air pollution and asthma exacerbation in children: a population based study"**, population based study on indoor air pollution and asthma exacerbation in children. A total of 1525 people were surveyed by detailed questionnaires. During the survey, pulmonary function tests, fine particulate matter *i.e.* $PM_{10,}$ $PM_{2.5}$, and PM_{1} monitoring, indoor particulate matter £2.5µm ($PM_{2.5}$) monitoring and volatile organic compounds were performed/ measured by the NCRAAI staff. Further, the research work in the villages is being continued.

Quiz Programme

A Quiz Programme for Post-graduate Students of Respiratory Medicine (MD/DNB/DM/DTCD) and General Medicine was organized at 3:30 pm on 17th April 2014 at Paintal Memorial Golden Jubilee Auditorium, of the Institute. More than 30 physicians were participated from different medical institutions of Delhi and NCR. Winners were awarded with prizes. Prof. Raj Kumar is the Organizing Secretary of the programme.

Update on Chronic Obstructive Pulmonary Disease (COPD)

An Update on Chronic Obstructive Pulmonary Disease (COPD) was organized by VPCI and Society for Tobacco Control, at Paintal Memorial Golden Jubilee Auditorium of the Institute on 30th July 2014. The Update covered the topics like; epidemiology and type of tobacco use, COPD: a systemic disorder, diagnosis of COPD, Management of COPD, smoking cessation, pulmonary rehabilitation, etc. Eminent speakers from Delhi and NCR delivered their lectures on these above topics. Prof. Raj Kumar, Head, National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, Delhi was the Organizing Secretary of the programme.

Inaugurating the programme by lighting the lamp. During the programme Certificate Course in Smoking Cessation Modules (1, 2 & 3) were released.

Workshop on Bronchial Asthma

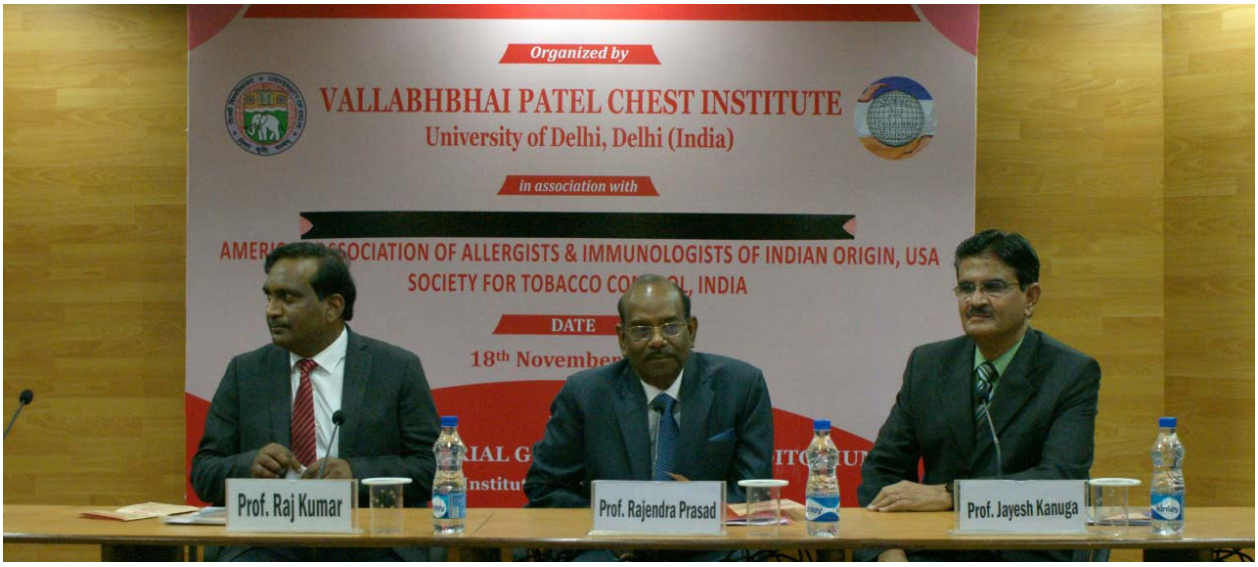
A Workshop on Bronchial Asthma was organized by National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI in association with Society for Tobacco Control (STC), Delhi during 18th–19th October 2014 at Paintal Memorial Golden Jubilee Auditoriumof the Institute. Prof. Raj Kumar, Head, National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, Delhi was the Course Coordinator of the Workshop.

Dignitaries on the Dias: Dr Rajendra Prasad, Director, VPCI; Dr D. Behera, PGIMER, Chandigarh and Dr Raj Kumar, Head, NCRAAI, VPCI, Delhi . Faculty with participants during the workshop.

During the workshop, following the distinguished faculties from renowned organization and different parts of India were present and delivered their guest lecturers *i.e. Dr Rajendra Prasad*, Director, VPCI; *Dr GC Khilnani and Dr Anant Mohan*, All India Institute of Medical Sciences, New Delhi, *Dr D Behera*, Professor, Dept. of Pulmonary Medicine, PGIMER, Chandigarh, *Dr AK Janmeja*, Head, Dept. of Pulmonary Medicine, Govt. Medical College, Chandigarh; Dr SK Luhadia, Udaipur, Rajasthan and *Dr SN Gaur, Dr Ashok Shah, Dr SK Chhabra, Dr Raj Kumar, and Dr BK Menon* of VPCI faculties were also delivered the guest lecturers during the programme. Medical Professionals from different parts of Delhi, Punjab, Haryana, and J&K were trained during the programme.

Allergy and Immunology Educational Symposium

Allergy and Immunology Educational Symposium was organized by National Centre of Respiratory Allergy, Asthma & Immunology (NCRAAI), VPCI in association with American Association of Allergists & Immunologists of Indian Origin (AAAIIO), USA and Society for Tobacco Control (STC), Delhi, at Paintal Memorial Golden Jubilee Auditorium of the Institute on 18th November 2014.



Dignitaries on the Dias (from Right): Dr Jayesh G. Kanuga, Diplomat of American Board of Allergy & Immunology, Clinical Assistant Professor, Division of Allergy and Immunology, USA; Dr Rajendra Prasad, Director, VPCI; and Dr Raj Kumar, Head, NCRAAI, VPCI, Delhi

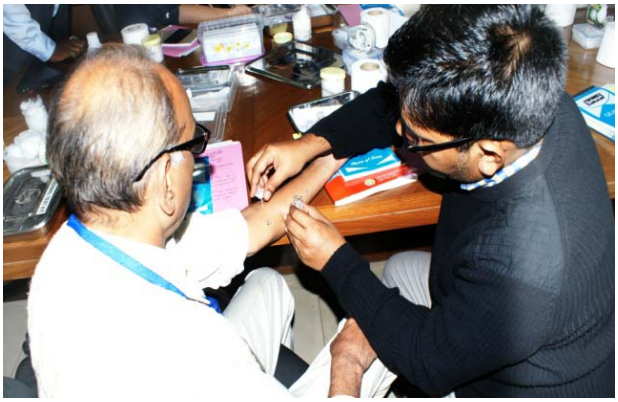
Five eminent speakers from different Institutions of USA delivered their lectures in this Symposium. Prof. Bobby Quentin Lanier, Executive Medical Director, American College of Allergy, Asthma and Immunology (ACAAI), Clinical Professor: Paediatrics, University of North Texas, spoke on the 'Severe Asthma and Therapy with Biologics'. Dr Jay. M. Portnay, Chief, Section of Allergy, Asthma & Immunology, Kansas City, MO, spoke on 'Climate Change and Respiratory Allergy including Asthma'. Dr Bryan L. Martin, President-Elect, ACAAI, and Associate Dean, Graduate Medical Education, The Ohio State University in Columbus, Ohio, spoke on 'Anaphylaxis'. Dr Leonard Bielory, Director, STARx Allergy & Asthma Center, LLC, and former Director of UMDNJ - Asthma and Allergy Research Center (Professor of Medicine, Pediatrics and Ophthalmology), New Jersey, spoke on 'Management of Rhino Sinusitis' and Prof. Sami Bahna, Professor of Paediatrics and Medicine, Chief, Allergy / Immunology Section, Louisiana State University Health Sciences Center, Shreveport, LA, spoke on 'Food Allergy'.

Dr Jayesh G. Kanuga, Diplomat of the American Board of Allergy & Immunology and the American Board of Pediatrics and Dr Mauli Desai, President, America Association of Allergists & Immunologists of Indian Origin (AAAII) were also participated in this Symposium. The Symposium was well attended by the physicians of Delhi & NCR.

The symposium were attended by medical professionals, research scholars, students from institutes of Delhi and NCR, The symposium was concluded with vote of thanks. Prof. Raj Kumar, Head, National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, was the Organizing Secretary of the Symposium.

40th Allergy Workshop - 2015

The 40th Workshop on *"Respiratory Allergy: Diagnosis and Management"* was organized by National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, Delhi in association with Institute of Genomics & Integrative Biology, Delhi, organized at VPCI Auditorium, on 23rd – 27th February 2015. Prof.



Faculty with participants of the 40th Allergy Workshop 2015

Raj Kumar, Head, National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, was the Organizing Secretary of the Workshop.

Research Activities: The Centre is also engaged with the following research activities:

- A study of skin sensitivity to various aeroallergens in patients having bronchial asthma and/ or allergic rhinitis in India.
- To study food allergy and food intolerance in patients having bronchial asthma and chronic obstructive pulmonary diseases (COPD).
- Prevalence of food intolerance in bronchial asthma in India.
- Indoor air pollution and asthma exacerbation in children: a population-based study in the villages of Delhi.

Animal House

The Animal House of the Institute provide optimum environment for experimental animals, which is essential for obtaining reliable and reproducible experimental result in research. 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 different species and strains of small laboratory animals are bred and maintained to supply the quality animals as per the requirement. Institute Animal Ethical Committee (IAEC) keeps a check to promote the humane approach of animal experimentation with the basic objective of providing specifications that will enhance animal care and quality in the pursuit of advancement of scientific knowledge that is relevant to humans and animals.

The Animal House 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 to follow the ethical principles adopted by CPCSEA for use of animals in scientific experiments.

The Animal House is managed by a team of well qualified Veterinarian, Technical Assistant and Attendants who are experienced and trained in modern methods of animal care, breeding and husbandry.

Library

The VPCI Library is providing patient care information support and catering to the academic needs of the faculty members, resident doctors, researchers and students alike for research purposes. It forms a part of Institute support services and acquires thought process, collect and disseminates global information in the field of Biomedical Sciences with specialization in pulmonary diseases and allied sciences. The library started in 1955, but it has back volumes of several journals more than 100 years old. Most of the journals have complete sets of volumes originating right from their treatises of medicine which are readily available for basic and historical insights. It also has a very good comprehensive collection of serial publications like Annual Reviews, Years books, Recent advances. The Institute has one of the best library in the field of Pulmonary Disease and Allied Sciences having 10,046 Books; 23,157 bound Journals; 155 CD's; 516 Thesis and 125 National and International Reports. A total of 112 Journals (105 International and 07 National) are being subscribed by the library; 17 Journals (06 International and 11 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. To cover the need for daily coverage of news related to the medical field, Library is also subscribing four English and four Hindi newspapers. This has encouraged the inculcation of reading habits of all alike.

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, reference 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 services have been provided right on the desktop of each Faculty Member through LAN and Leased line connectivity of 2 Mbps form MTNL. 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 equipment's 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 services 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 4.0'' consists of modules on acquisition, cataloguing, circulation, serials, article indexing and OPAC. The library OPAC (Online Public Access Catalogue) can be accessed through web via http://192.168.1.129:8080/jopacv11/html/SearchForm.

The Library facilities are available to Members / Users of Delhi University from Monday to Friday from 8:30 AM to.7:00 PM & on Saturday's from 9.00 AM to 5:00 PM.

PUBLICATION DIVISION

Publication Division of the Institute has been publishing a quarterly periodical, ***the Indian Journal of Chest Diseases and Allied Sciences*** **(IJCDAS)**, in collaboration with the National College of Chest Physicians (India). The Journal was started in 1959 by (late) Prof. R. Viswanathan, Founder-Director of VPCI. The Journal has a wide national and international circulation and is indexed in PubMed, 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**

The Division is also responsible for documentation and dissemination of research output through Annual Report and other publications of the institute.

DEPARTMENTAL ACTIVITIES

Biochemistry

(Including Biochemistry and Clinical Biochemistry)

Research

1. Studies on erythrocyte membrane protein profile and oxidant and antioxidant status of blood in bronchial asthma

This study aimed at exploring the variations in protein profile and imbalance in oxidative and antioxidative metabolites in erythrocyte membranes. Our earlier studies have shown changes in protein profile of erythrocyte membranes in bronchial asthma. In this study, sixty asthmatic subjects (15 mild intermittent, 15 mild persistent, 15 moderate persistent and 15 severe persistent) as compared to 15 controls have shown increased oxidative stress which was evidenced by increased protein carbonyls ($P<0.05$) and increased lipid peroxidation products ($P<0.05$). This is accompanied by alterations in several antioxidants in blood, including decreased glutathione peroxidase activity in red blood cells ($P<0.05$), increased total glutathione ($P<0.05$), decreased SOD activity ($P<0.01$) and decreased red blood cell catalase activity in asthmatic patients ($P<0.05$). The protein profile of the erythrocytes membrane in 2-D electrophoresis study showed down-regulation and up-regulation of some proteins in bronchial asthma as compared to controls, which may be correlated to the oxidative imbalance.

2. A study on CRHR1 and GR gene polymorphism and their correlation with the expression of various inflammatory cytokines in asthma in North Indian population

The CRHR1 gene sequencing was continued further as in the previous year. We performed sequencing in 15 more asthmatic patients and a novel SNP was observed in the intron 3 at position 42069(C>G) in 12 cases. The sequencing in control subjects and other asthmatic patients is in progress. Besides this, the study on polymorphism in GR gene has also been initiated and the conditions for amplification of various exons by way of designing 17 primers have been optimized and their annealing temperature established.

3. Role of innate immune response mechanisms in development of bleomycin induced lung fibrosis

Pulonary fibrosis is a progressive lung disorder characterized by an excessive accumulation of extracellular matrix (ECM) leading to stiffening and / or scarring of the tissue. Therefore, we planned to study biochemical and functional changes in bleomycin induced rat model of lung fibrosis. Biochemical changes in collagen will be studied with ELISA and correlated with functional changes on plethysomgraphy. Presently standardization of the ELISA and whole body plethysmography in control and bleomycin administered animals is being performed. Role of the innate immune system in causing the pathological alterations will be studied.

4. To investigate the role of calreticulin transacetylase mediated histones hyperacetylation induced epigenetic modulation by polyphenolic acetates in genes implicated in lung tumorigenesis

Human Non Small Cell Lung Cancer, NSCLC (A549) cell line treated with various groups before and after transfection with Human Calreticulin gene was subjected to Microarray Profiling. The results of first Microarray Profiling are highly encouraging and it will be repeated after treatment removing hypermethylation patterns which might cause under-expression so to be able to study specifically the acetylation mechanism even in hypermethylated genes. The transcription product of the selected genes after Micro Array Profiling is being validated, confirmed and quantified by Real Time - PCR.

Biostatistics

The Department of Biostatistics plays a vital role and forms a supportive department of the research activities of the Institute. This department provides the statistical needs of all the research activities i.e. from planning stage of studies or surveys, protocol development designing study schedules / forms, sample size and power determination, collection and validation of data, collation, compilation, generating tables & graphics, analyses of data, and interpretation of the results of various research studies, in order to quantify the effect of risk factors and health interventions on individuals or population. The statistical analysis is being carried out using Statistical Package for Social Sciences (SPSS).

The Department of Biostatistics conducts regular teaching programs for the postgraduate (MD / DTCD) and doctoral (DM / PhD) students.

This department has also been entrusted with the responsibility of preparing various reports (monthly, quarterly, half yearly and yearly) of VPCI (pertaining to patients care, patients investigations, patient status, morbidity pattern, communicable and non-communicable diseases; students, faculty and staff, income, expenditure, infrastructure, etc.) and their timely submission to various governmental agencies such as, Ministry of Health & Family Welfare, Government of India; The Directorate of Health Services, Government of Delhi; University of Delhi, UGC etc.

This wing also shoulders the responsibility of online reporting of vital events (death registration) of VPCI.

This section also take on the responsibility of documenting and maintaining the database of various research protocols of DM / PhD / MD students.

The Department has identifiable and collaborative research projects with other departments of the Institute.

Research

1. To assess the prevalence, screening and recognition of anxiety and depression in COPD patients

Chronic Obstructive Pulmonary Disease (COPD) is a disease with multiple co-morbidities. Two of the most common and least treated co-morbidities of COPD are 'Anxiety and Depression'. However, only a few prospective studies have addressed how to diagnose and manage these disorders and determine their impact on health status among patients with COPD. No studies in India have examined the joint occurrence of anxiety and depression together in the COPD patients.

A total number of 325 COPD recognized patients with age ranged 40 to 82 years (61.00 ± 9.74) were screened for anxiety and depression, using Generalised Anxiety Disorder (GAD-7) and Patient Health Questionnaire (PHQ-9)] schedules. It was found that the severity of anxiety and depression varies by age, sex, smoking status and socio-economic status. The prevalence of anxiety and depression in COPD patients was found to be 87.08% and 94.15%, respectively.

2. To translate and validate the psychometric profile of 'Hindi' version of depression, anxiety and stress scales 42-item (DASS-42) in COPD patients

The Depression Anxiety Stress Scales (DASS) has been used across the world as research instrument to measure psychological aspects such as depression, anxiety and stress. This instrument has been translated in 28 other international languages. In this study, DASS-42 was translated from English to Hindi as per the guidelines US Census Bureau and the same were pretested before administration.

A total number of 513 patients with age ranged from 40 to 86 years (59.01 ± 9.62) were administered Hindi version of the Depression Anxiety Stress Scales 42-items (DASS-42) questionnaire to the patients with COPD. The reliability (internal consistency) was measured through Cronbach's alpha of each subscale and was found to be high (DASS42-D subscale 0.87; DASS42-A subscale 0.79; DASS42-S subscale 0.78). The overall score, which includes all items, also had high consistency (Cronbach's alpha = 0.92). Mean and standard deviation of scores were 17.70±8.73, 20.97±7.36, and 21.72±7.17 for subscales depression, anxiety and stress respectively. Overall, score which includes all the three subscales were 60.39±20.86.

Microbiology

(Including Microbiology, Medical Mycology and Respiratory Virology)

Research

1. Characterisation of virulence properties of *Pseudomonas aeruginosa* isolates from hospitalised patients

Introduction: *Pseudomonas aeruginosa* is implicated in severe infections, most importantly hospital acquired, because of its natural and acquired resistance to many antimicrobial classes leading to treatment failures. For these reasons, the present study was undertaken to determine the resistance pattern, to delineate common mechanisms of resistance and to type the isolates by molecular methods.

Objectives: The objective of the present study was to *1.* To isolate and identify *Pseudomonas aeruginosa* from various clinical and surveillance samples of hospitalised patients at VPCI. *2.* To isolate and identify *Pseudomonas aeruginosa* from environmental samples from ward and Intensive Care Unit at VPCI. *3.* To study antibiotic sensitivity of the isolates to various classes of antibiotics. *4.* To identify various virulence factor genes apr, lasB, exoS, exoT, exoU, exoY and Exotoxin A, as well as biofilm formation in these isolates. *5.* To correlate the virulence factors of *Pseudomonas aeruginosa* isolated from patients with various host factors and antibiotic susceptibility pattern. *6.* To type the *Pseudomonas aeruginosa* isolates by random amplification of polymorphic DNA.

Methodology: *Samples:* Patients hospitalized at Vishwanathan Chest Hospital with a positive culture for *Pseudomonas aeruginosa* from the respiratory tract, urinary tract, blood or surveillance samples etc., have been included in the study. Surveillance samples like nasal swab, pharyngeal swab, stool and urine have been taken from all the patients at the time of admission. Other relevant clinical samples like sputum, bronchial aspirate, endotracheal tube aspirate, blood, etc., sent for routine cultures from these patients have also been included. Surveillance samples have been collected at weekly intervals. Environmental samples from ward and ICU viz., samples from sink, mattress, bed railings, oxygen ports, water samples etc., have been taken at monthly intervals.

The samples were processed by standard microbiological methods. However, for sputum, bronchial aspirate, endotracheal aspirate and urine, semiquantitative method was used . More than or equal to 10^5cfu / ml for sputum, endotracheal aspirate, urine and more than or equal to 10^3cfu / ml for bronchial aspirate / lavage was considered significant. *P. aeruginosa* was identified by a combination of tests - A gram negative bacillus which grows as non lactose fermenting colonies on MacConkey agar and is motile, oxidase positive, catalase positive, shows growth at 42°C and produces pigment.

The isolates are being maintained in the laboratory as: Stab culture in Nutrient Agar and suspension in Nutrient Broth with 16% glycerol, kept at -20°C & -80°C. Susceptibility of isolates to various antibiotics was tested by Kirby Bauer's disk diffusion method. The diameters of the zones of inhibition have been recorded and interpreted as sensitive, intermediate sensitive or resistant by CLSI guidelines [*Performance Standards for Antimicrobial Susceptibility Testing; Twenty-Second Informational Supplement* (M100-S22)].

Results: 281 Patients hospitalized at Vishwanathan Chest Hospital with a positive culture for *Pseudomonas aeruginosa* from the respiratory tract, urinary tract, blood or surveillance samples etc., have been included in the study. Susceptibility of 32 isolates to various antibiotics tested by Kirby Bauer's disk diffusion method have been performed. Other objectives are being pursued.

2. Hospital infection control surveillance

Routine surveillance of the hospital is performed at regular intervals to screen for the presence of pathogens. Various samples from ICU and ward like suction ports, oxygen masks and ports, mattresses, airbed, bed railings, hand swabs from health professionals working in these units, environment samples etc. were collected on July, October 2014 and January and February 2015. The reports were submitted along with the recommendations.

3. Efflux mechanisms in *Mycobacterium tuberculosis*: to study the effect on drug susceptibility profile

Resistance to anti-TB drugs has mainly been attributed to spontaneous mutations. However, a proportion of drug resistant isolates have been observed without characteristic mutations. The lack of information on drug resistance in these isolates has led to the possibilities of existence of alternative mechanisms of drug resistance such as drug efflux pumps in *M. tuberculosis*. In this context, the present study proposes to investigate the expression analysis of efflux related genes under drug pressure to investigate the role of efflux pumps in drug resistance of *M. tuberculosis* isolates obtained from patients of pulmonary tuberculosis.

For this study, 96 well characterized (at biochemical and molecular level) and genotyped (using MIRU-VNTR typing and IS*6110* typing) mycobacterial clinical isolates were selected. Drug resistance was determined by proportion drug susceptibility testing and the minimum inhibitory concentrations were calculated for the drugs streptomycin, isoniazid, rifampicin, ethambutol, kanamycin and ciprofloxacin by Alamar Blue Assay. Subinhibitory doses of these drugs were further used for studying the activity of efflux pumps under drug stress. The expression profile of 20 putative efflux genes (10 genes selected for this study and the other 10 already being worked upon in our laboratory) was studied in 5 drug susceptible and 5 drug resistant clinical isolates by RT-PCR using two house-keeping genes *sigA* and *rrs* for normalization. Out of the significantly overexpressed genes, *Rv0194* (upregulated under RIF and EMB stress) and; *Rv1686* and *Rv1687* (both genes overexpressed only in EMB resistant isolates and none of the EMB susceptible isolates) were selected for protein analysis. The gene *Rv0194* has been successfully cloned, protein purification and confirmation of overexpression is in process. Cloning of the genes *Rv1686* and *Rv1687* is in process. Changes (if any) in the MICs of the overexpressed strains will be studied for the 6 selected drugs with and without the presence of inhibitors verapamil and CCCP.

4. Development of aminocoumarins as candidate drugs for the treatment of multi-drug resistant (MDR) tuberculosis

Coumarins are widely known for different physiological properties including anti-cancer, anti-oxidant, anti-inflammatory, anti-HIV, anticoagulant and anti-bacterial. Earlier observations suggested their anti-mycobacterial activity, possibly targeting cell wall synthesis. The present study aims to further validate anti-mycobacterial activity of different derivatives of aminocoumarins and to characterize their mechanism of action. Different derivatives of aminocoumarin are synthesized and tested for anti-mycobacterial activity by Alamar Blue Assay. *Ex-vivo* efficacy of the compound was tested in THP-1 cell line infected with *M. tuberculosis*. Expression profile of few genes associated with mycolic acid synthesis was also analyzed by qRT- PCR. Results showed aminocoumarins as possible potential drug for *M. tuberculosis*, further experimentation will explore its mechanism of action.

5. To study the role of biotin in the biology of *M. tuberculosis*

Biotin (vitamin H) is an essential vitamin that is required by all organisms. Humans cannot synthesize biotin and are dependent upon external sources. On the other hand majority of prokaryotes can synthesize biotin on their own. In *M. tuberculosis* biotin acts as cofactor and is required for trans- carboxylation activity of the two important enzymes namely Acyl CoA Carboxylase (ACC) and Propionyl CoA Carboxylase (PCC). Biotin biosynthesis has been well studied in *E. coli*. Though not much is known about biotin biosynthesis in mycobacteria, genetic studies have suggested that biotin is essential during active as well as latent phase of infection.

Most antibiotics are effective against actively growing *Mycobacterium* as they target metabolic processes required for the primary progressive stage of infection. Conversely, dormant bacilli are more difficult to treat as they have evolved complex mechanisms that assist them to evade both antibiotics and patient's immune system. One novel strategy to treat TB is to pharmacologically target metabolic pathways essential in both active and latent form of *M. tuberculosis*. The biotin biosynthesis pathway is potentially an example of such a pathway. Bioinformatic analyses have suggested possible homologues of biotin biosynthetic genes in the genome of *M. tuberculosis*. Hence, we are working on the elucidation of the biotin biosynthetic pathway of *M. tuberculosis* in order to understand its therapeutic advantage.

6. Comparison of two in-house developed assays for the identification of *M. tuberculosis* complex

Early identification of tuberculosis (TB) followed by adequate treatment is important to prevent both morbidity and mortality. Even though the conventional technique of direct smear examination for the presence of acid fast bacteria (AFB) with Ziehl-Neelsen staining is inexpensive, rapid and easy to perform its sensitivity is low *i.e.* 57-63%. Also, the laboratory gold standard "culture" with specificity of 98% and subsequent identification by biochemical tests with sensitivity of 40-60% takes around 4-6 weeks. However, commercially available GeneXpert MTB/RIF and Hain's Line Probe Assay (LPA) give results within a day, but they are too expensive and require technical expertise.

In this study, we compared a new in-house developed Duplex PCR Assay with a previously developed assay, *i.e.* PCR Restriction Analysis (PRA), for the identification and differentiation of *M. tuberculosis* from Non-tuberculous Mycobacteria (NTM). We performed both the assays on 449 clinical isolates obtained from the patients suspected of pulmonary tuberculosis. Out of 449 isolates, 320 isolates were identified as MTBC, 106 were NTM and remaining 23 were not of *Mycobacterium* genus. Both the assays gave same results, which validates our new assay. Also, duplex PCR assay was easy to perform, rapid and inexpensive.

7. Expression analysis of an array of genes of *M. tuberculosis* clinical isolates from pulmonary tuberculosis and lymph node tuberculosis: search for mycobacterial factors associated with differential clinical manifestation

Tuberculosis (TB), one of the oldest recorded human afflictions, is still one of the biggest killers among the infectious diseases, despite the worldwide use of a live attenuated vaccine and several antibiotics. Tuberculosis can be pulmonary as well as extra pulmonary. Extra pulmonary TB may co-exist with pulmonary TB as well. Lymph node tuberculosis called lymphadenitis is the most common extra pulmonary manifestation of tuberculosis. Tubercular lymphadenopathy is a diagnostic as well as therapeutic challenge because it mimics other pathologic processes and yields inconsistent physical and laboratory findings. Diagnosis is difficult often requiring biopsy. Additionally, it is still not clear why *M. tuberculosis* causes pulmonary TB in some individuals and extra pulmonary TB in others. In the present study, clinical isolates of *M. tuberculosis* from pulmonary TB (PTB) and lymph node TB (LNTB) were analyzed to address this question.

Ten *M. tuberculosis* clinical isolates from PTB patients, ten from LNTB patients and one reference strain were included in the study. Clinical isolates and laboratory reference strain of *M. tuberculosis* were grown under various stress conditions. Mycolic acid from each culture has been extracted and TLC has been performed. Each spot will be further quantified using densitometry. We are also analyzing expression of different genes associated with lipid metabolism, *in vitro* and *ex vivo*. This will lead us to identify the differential pattern of gene expression and mycolic acid content of *M. tuberculosis* obtained from LNTB and PTB patients.

8. Phenotypic and genotypic indicators of pre MDR tuberculosis

The emergence of multidrug resistant tuberculosis (MDR-TB) in recent times is posing a threat to control of tuberculosis. So there is a need to monitor the trends in drug resistance in *M. tuberculosis* in order to timely implement appropriate interventions to curb the menace of MDR-TB. This study is designed to determine the precise prevalence rate of pre-MDR/MDR strains and pattern of drug resistance in previously treated and new smear positive cases. We further propose to investigate the propensity of pre-MDR to develop in to MDR strains of *M. tuberculosis.* Sputum specimens were obtained from 425 patients suspected of pulmonary tuberculosis. The specimens were subjected to microscopy and culture for *M. tuberculosis.* We performed drug susceptibility testing (DST) on 211 culture isolates obtained using standard proportion method for Isoniazid, Rifampicin, Ethambutol and Streptomycin. Of these, 28 (13.5%) have been identified as pre MDR and 17 (8.25%) were identified as MDR The pre MDR and MDR strains were subjected to minimum inhibitory concentration determination against streptomycin, isoniazid, rifampicin, ethambutol, kanamycin and ciprofloxacin by Alamar Blue Assay. Mutation analysis has been done for *katG* and *rpoB genes.* Mutations at *inhA*, *rpoB*, *embB*306, *embB*407, *embB*497, *rpsL*, *rrs*, *eis* and *tlyA* loci will be studied next.

9. Utilisation of cholesterol by *mce4A* (*Rv3499*) overexpressed and *mce1A* (*Rv0169*) overexpressed *M. tuberculosis* H37Rv and the effect of calcium channel blockers

Mycobacterium tuberculosis (MTB) is an intracellular pathogen which utilizes host derived lipids for its persistent survival and virulence. Researchers have been targeting this lipid based property of MTB inside the host cell to shape the modern drug therapy. The host cholesterol has been found to be an important source of carbon for MTB and helps in prolonged survival. *mce4* operon in MTB encodes for this cholesterol uptake system. Cholesterol is further catabolized by MTB by two different pathways, *i.e.* methyl citrate cycle (MCC) and methylmalonyl pathway (MMP). Our laboratory has previously observed *mce4A* gene of *mce4* operon to have strong affinity for cholesterol and is involved in uptake of cholesterol.

Our study aimed to derive the relationship between *Mce4A* mediated cholesterol utilization by MTB through different cholesterol catabolic pathways and subsequently its effect on calcium channel blocking. This may provide a new understanding of pathogenesis of tuberculosis and open a novel therapeutic approach for the treatment of tuberculosis. In this study we monitored difference in growth of different recombinants, *i.e. mce4A* (Mtb: *mce4A*'!)and *mce1A* (Mtb: *mce1A*'!) overexpressing *M. tuberculosis* H37Rv and wild type (*M. tuberculosis* H37Rv) grown in the presence of glycerol and cholesterol as carbon sources. Cholesterol level in infected THP-1 cells was also measured to understand the host cholesterol utilisation by mycobacteria. We have also extracted total lipid to observe the free lipid accumulation. Further, we have designed primers for genes involved in MCC and MMP and will be performing RT-PCR to see the effect of *mce4A* overexpression mediated increased cholesterol uptake on genes (coding for enzymes) of cholesterol catabolic pathway.

10. Characterisation of genotypic indicators of ethambutol resistance in clinical isolates of *M. tuberculosis*

Ethambutol (EMB), an anti-TB drug inhibits the polymerization of the cell wall component-arabinogalactan. Mutations in genes encoding the arabinose tranferases, namely *embCAB* are responsible for only 40-60% of resistant cases, but studies from different parts of the world have shown the same mutations in EMB- susceptible isolates as well. This opens a window to investigate the role of other genes that might confer resistance to EMB. Also, efflux mechanisms may be functional to provide additional or singular resistance towards the drug. In the study undertaken, EMB resistant and susceptible clinical isolates were to be selected from 150 *M. tuberculosis* isolates after their biochemical and molecular characterization, followed by drug susceptibility testing by proportion method. A total of 16 EMB resistant and 10 EMB susceptible clinical isolates have been selected for further study. The minimum inhibitory concentration (MIC) of the selected isolates was determined using microplate alamar blue assay (MABA) and agar dilution method. To test the presence / absence of resistance related mutations in these isolates, primers were designed for 9 genes present in the arabinogalactan synthesis pathway, namely: *embB*, *embC*, *embA*, *aftA*, *aftB*, *aftC*, *ubiA*, *dprE1* and *dprE2*. Amplification of DNA from the clinical isolates with these primers followed by Sanger sequencing is in process. The novel mutations found significant will be overexpressed in H37Rv followed by determination of its MIC. Further, primers of efflux genes previously associated to EMB resistance were designed and standardized. Drug exposure to the selected clinical isolates with subinhibitory concentration of EMB is in process. It will be followed by RNA isolation and expression studies of the efflux genes.

11. Comparison of the broth microdilution methods of the European Committee on Antimicrobial Susceptibility Testing and the Clinical and Laboratory Standards Institute for testing Isavuconazole, Posaconazole and Amphotericin B against molecularly identified species of Mucorales

Mucormycosis is a life-threatening fungal infection caused by fungi belonging to the subphylum Mucormycotina, order Mucorales. The etiologic agent of mucormycosis includes the genera *Rhizopus*, *Mucor*, *Lichtheimia*, *Cunninghamella*, *Rhizomucor*, and *Apophysomyces*, among others. The disease is the second-most-common mold infection in hematologic malignancies and organ transplantation and is increasingly reported in patients with uncontrolled diabetes or ketoacidosis. Primary antifungal therapy for mucormycosis is amphotericin B lipid formulations whereas open-label-salvage studies suggest posaconazole as an option for patients who are refractory to or intolerant of polyenes. The species of mucorales show differences in *in vitro* susceptibility to AMB, POS and voriconazole. In addition to CLSI-BMD method, the other international standard method for antifungal susceptibility testing and surveillance of antifungal resistance is that of the

European Committee on Antimicrobial Susceptibility Testing (EUCAST). The limited EUCAST AFST data and the lack of comparison of the two reference BMD methods for mucorales prompted us to examine in the present study the essential agreement (EA) between the 2 standardized methods for testing AMB and triazoles against mucorales. We compared EUCAST and CLSI antifungal susceptibility testing (AFST) methods for triazoles and amphotericin B by testing 124 mucorales clinical isolates. The EUCAST method yielded higher MIC values of 1-3 fold dilution than CLSI for amphotericin B. The essential agreement for triazoles was high, *i.e.* 99.1% (voriconazole), 98.3% (isavuconazole) and 87% (posaconazole) whereas it was significantly lower for amphotericin B (66.1%). Strategies for harmonization of the two methods for mucorales AFST are warranted.

A Postgraduate Education Course of the European Society of Clinical Microbiology and Infectious Diseases (ESCMID) was conducted from 19-21 March 2015. Theme of the course: Diagnosis and Management of Fungal Infections both in the West and the East. Eminent Scientists from all over the world share their experiences during the course.

12. Prevalence and mechanism of triazole resistance in *Aspergillus fumigatus* in VPCI Delhi, India

Aspergillus fumigatus causes varied clinical syndromes ranging from colonization to deep infections. The mainstay of therapy of *Aspergillus* diseases is triazoles but triazole resistance hampers the management of aspergillosis. We studied the prevalence of resistance in clinical *A. fumigatus* isolates during 4 years in VPCI Delhi, India. *Aspergillus* species (n=2117) were screened with selective plates for azole resistance. The isolates included 45.4% *A. flavus*, followed by 32.4% *A. fumigatus*, 15.6% *Aspergillus* species and 6.6% *A. terreus.* Azole resistance was found in only 12 (1.7%) *A. fumigates*isolates. These triazole resistant *A. fumigatus* (TRAF) isolates were subjected to *(a) calmodulin* and ъ *tubulin* gene sequencing, *(b) in vitro* antifungal susceptibility testing against triazoles using CLSI M38-A2, *(c)* sequencing of *cyp51A* gene and real-time PCR assay for detection of mutations, and *(d)* microsatellite typing of the resistant isolates. TRAF harbored TR_{34}/L98H mutation in 10 (83.3%) isolates with a pan-azole resistant phenotype. Among the remaining 2 TRAF isolates, one had G54E and the other had three non-synonymous point mutations. The majority of patients were diagnosed as invasive aspergillosis followed by allergic bronchopulmonary aspergillosis and chronic

pulmonary aspergillosis. The Indian TR_{34}/L98H isolates had a unique genotype and were distinct from the Chinese, Middle East and European TR_{34}/L98H strains. This resistance mechanism has been linked to the use of fungicide azoles in agricultural practices in Europe as it has been mainly reported from azole naïve patients.

13. Molecular epidemiology and *in vitro* antifungal susceptibility of *Aspergillus terreus* species complex isolates in Delhi, India

Aspergillus terreus is emerging as an etiologic agent of invasive aspergillosis in immunocompromised individuals in several medical centers in the world. Infections due to *A. terreus* are of concern due to its resistance to amphotericin B, *in vivo* and *in vitro*, resulting in poor response to antifungal therapy and high mortality. Herein we examined a large collection of molecularly characterized, geographically diverse *A. terreus* isolates (n=140) from clinical and environmental sources in India for the occurrence of cryptic *A. terreus* species. The population structure of the Indian *A. terreus* isolates and their association with those outside India was determined using microsatellite based typing technique and Amplified Fragment Length Polymorphism analysis. Additionally, *in vitro* antifungal susceptibility of *A. terreus* isolates was determined against 7 antifungals. Sequence analyses of the calmodulin locus identified the recently described cryptic species *A. hortai*, comprising 1.4% of *Aspergillus* section *Terrei* isolates cultured from cases of aspergilloma and probable invasive aspergillosis not reported previously. The presence of high genetic diversity revealing 75 distinct genotypes among 101 Indian *A. terreus* isolates was evident. Furthermore, no correlation between a particular genotype and amphotericin B susceptibility was observed. Overall, 8% of the *A. terreus* isolates exhibited low MICs of amphotericin B. All the echinocandins and azoles (voriconazole, posaconazole and isavuconazole) demonstrated high potency against all the isolates. The study emphasizes the need of molecular characterization of *A. terreus* species complex isolates to better understand the ecology, acquisition and transmission of this species.

14. Evaluation of virus like particle (VLPs) and bacterial toxin adjuvants as vaccine candidate for influenza A virus

Virus-like particles (VLPs) are highly effective type of subunit vaccines which resemble infectious virus particles that mimic the overall structure of virus particles without the requirement of containing infectious genetic material. For the construction of the VLP, viral RNA have been extracted from A/Puerto Rico/8-V24/1934(H1N1) influenza virus followed by reverse transcription, polymerase chain reaction (RT-PCR) with specific oligonucleotide primers for gene HA and M1 gene. The produced fragments were visualized by agarose gel electrophoresis. The PCR-amplified genes containing appropriate restriction sites are being cloned for its expression under *in vitro* conditions.

15. Profile of antibody responses and duration of protection following influenza vaccination for adults >65 years old

Annual epidemics and occasional pandemics of influenza virus are affecting millions of lives world-wide. Vaccination is the only way for protecting individuals from influenza infections and saving economical loss. Vaccination is essential for children, elders, health care workers, pregnant women etc. The above said project involves vaccination of ^{3}60 year's elders with trivalent inactivated influenza vaccine and the study of vaccine efficacy via antibody response study. During the study 57 individuals of 60 years and above, with their written consent, were enrolled in the study at two specialized hospitals of Delhi, All India Institute of Medical Sciences (AIIMS) and V. P. Chest Institute (VPCI) where they were vaccinated. Pre-vaccinated serum samples were tested for antibody titer with WHO HAI kit. It was observed by HAI Assay that the older age individuals have sufficient amount of antibodies in the serum even before vaccination.

16. Study of antigenic diversity and cross reactive antibody generation to influenza virus in human samples

As per the project objectives and protocol, a total of 1118 respiratory samples were collected from patients with influenza like symptoms at Base Hospital, Delhi Cantonment, Kalawati Saran Children Hospital, Delhi, All India Institute of Medical Sciences, Delhi, and Viswanathan Chest Hospital, VPCI, Delhi throughout the year and also some samples were collected during the endemic period of northern India. The viral RNA from all the clinical samples was isolated and screened for influenza virus by real-time PCR. Of the 1118 samples screened, 230 were found positive for influenza A virus of which 41 were positive for pandemic H1N1 and

189 for seasonal influenza strain. The positive samples were amplified by conventional PCR for HA gene of influenza A virus and further sequenced for phylogenetic analysis by MEGA with NJ method having 100 bootstraps. Hemagglutination inhibition (HAI) assay was performed on the patient sera collected 21 day after infection. The antigens used for this assay were H1 (2009)-A / California / 7 / 2009, H1-A / N.Caledonia / 20 / 99 and H3-A / Panama / 207 / 99, which are the control antigens provided by WHO. HAI was performed to check the cross reactivity of antibodies against influenza A virus in serum samples. It was found that mostly the patients had a sufficiently high antibody titer against infected strain and less cross-reactivity to other strains. While the serum antibodies of patients infected with pH1N1 / 09 virus or seasonal H1N1 virus were found to cross-react with the H3 and / or sH1 antigen at 2 to 4- fold lower titers, the cross reactive antibody titer of the H3N2 positive sample was 4- fold higher with sH1 antigen.

17. Evaluation of antiviral activity of medicinal plant extracts against influenza A virus

Influenza viruses are respiratory pathogens of major concern globally, contributing to high rates of morbidity and mortality annually. The viruses continuously evolve through antigenic changes bypassing the host's acquired immunity against them. Due to frequent antigenic and genetic changes, vaccines need to be formulated yearly and old vaccines are not effective against newly emerging viruses. Moreover, these vaccines have to be administered annually in order to prevent influenza. Hence, there is a growing need for developing new and effective chemotherapeutic agents to treat influenza. Natural products, derived from medicinal plants have shown to be of great value in preventing and or / ameliorating viral diseases in preclinical and clinical trials. The study aims at evaluating the antiviral efficacy of medicinal plant extracts, having expected antiviral activity for the development of an alternative and effective therapy against influenza A viruses. Appropriate parts of certain plants, known to have medicinal properties, have been procured from the local vendors, and the extracts prepared in 100% commercial grade ethanol at room temperature. The extracts were filtered using 0.22µM syringe filter and aliquoted at -20° C for future use. The percentage yield was calculated accordingly. MTT assay was performed at different time points in A549 and MDCK cells at different concentration and IC_{50} value was calculated. Further evaluation of the anti-influenza activity of the extracts under *in vitro* conditions was done. The extracts of *Trachyspermum ammi* were found to have anti-influenza activity. Approximately 56% inhibition of influenza A virus RNA was observed in presence of the extract.

18. Nano-therapeutic application of small interfering RNA and micro RNA against human influenza virus

Influenza A virus causes the most prevalent infection of the respiratory tract in humans. Influenza is an infectious disease that infects birds and mammals. It is considered a relatively benign disease slightly worse than cold. The most characteristic features are weakness, fatigue, muscle ache, headache, fever etc. Every year, almost 10–20% of the world population suffers from influenza virus, resulting in up to 0.5-1 million deaths. Many recent reports indicates that the level of XO in plasma is elevated in ARDS and that XO mediates lung injury by neutrophil-elastase and hyperoxia. These suggestive data prompted to hypothesize that XO causes O2 generation, which could produce highly toxic –OH in the pathogenesis of influenza virus infection. The potential siRNA has been designed against Xanthine Oxidase gene which is up regulated during influenza virus infection. Currently the HeLa cell line is being established for down-regulation studies and maintained in exosomes free serum media. The siRNA was designed against xanthine oxidase and the cloning of PB1 gene of influenza virus has been done. For delivery of siRNA and miRNA, exosome isolation procedure is under standardization.

19. Generation, characterisation and biological relevance of human monoclonal antibodies against pandemic influenza 2009 (H1N1) and seasonal influenza virus

Antibodies are a major component of specific immune protection against influenza and remain the established immune correlate of protection for influenza vaccines. Human antibodies obtained from the patients of influenza provide an important role in immunotherapy for human influenza virus infection. Monoclonal antibodies against influenza viruses have been studied for decades, but their potential–and thus development–as 'passive' immunotherapy for influenza has been inhibited by the lack of availability of the human monoclonal antibodies. The hemagglutinin glycoprotein is the primary target of antibodies that

confer protective immunity to influenza viruses. Antibodies to other influenza proteins likely act in: Fc-receptor mediated uptake of virus particles, antibody-dependent cell cytotoxicity, delay of replication kinetics and, in aggregate, they may contribute to virus neutralization. On a monoclonal level, however, only antibodies specific for the viral hemagglutinin have been shown to block / neutralize infection. In this study, neutralizing human monoclonal antibodies against A(H1N1)pdm2009 and seasonal H3N2 influenza virus were generated from influenza sero-positive patients. The blood samples of thirteen influenza positive patients was collected and profiled for presence of antibodies to influenza virus by ELISA and hemagglutination inhibition reaction. The PBMCs were isolated and transformed by Epstein Barr virus,

A two days workshop on 'Epidemiology and Control of Influenza' was held on 7-8 November 2014, in collaboration with the Asia Pacific Alliance for the Control of Influenza. Eminent Scientists from all over the world share their experiences in control and management of influenza, especially H5N1 and H7N9. A Souvenir was also released on this occasion.

before fusion with human X mouse heteromyeloma HMMA2.5 cells. These fusion clones were screened by microneutralization assay against A(H1N1)pdm2009 and seasonal H3N2 influenza virus for the detection of neutralizing antibody secreting clones. Total of 5 stable fusion clones were established out of which four secreted monoclonal antibodies against A(H1N1)pdm2009 and one clone secreted antibody against seasonal H3N2 virus. These five monoclonal antibodies were characterized by various *in vitro* and *in vivo* assays, and it was concluded that all the antibodies bound to their respective viruses and neutralized them, although the degree of neutralization varied according to the antibody being used. In the *in vivo* model (Balb / c mice), the monoclonal antibodies delayed death of the animals and were found to be effective, both prophylactically and therapeutically. These monoclonal antibodies may be used in future in human population for protection against influenza virus.

20. Construction and characterisation of functional ScFv antibodies against NP and NS1 proteins of pandemic influenza H1N1 (2009) virus

The study aimed at developing recombinant single chain variable fragment (scFv) antibodies against the recombinant (nucleocapsid) NP and non-structural (NS1) proteins of the pandemic influenza H1N1 (2009) virus for development of an ELISA-based sero-diagnostic test, which efficiently differentiated among the vaccinated and influenza A virus infected individuals. NP is a type-specific and relatively conserved antigen, which is distinct for each of the influenza A, B and C viruses. The antibodies expressed against NP protein will be detected in both virus infected and vaccinated individuals. The other protein, NS1, of influenza A virus is expressed only in the virus infected cells. The antibodies against it will be generated only in the virus infected individuals. The scFv antibodies were developed from spleen cells of the mice, hyper-immunized with pandemic influenza H1N1 (2009) virus. The antibody genes were amplified from the isolated mRNA and cloned in a phagemid vector for generation of phage display antibody library against the viral proteins. The antigen-specific scFv- phages were selected by bio-panning against the respective antigens. The

recombinant phage clones, showing high yield in phage ELISA, were used for production and purification of functional scFv antibodies in bacterial cells, by transfer of the scFv cassette from the positive phagemid clones into the plasmid vector. The antibodies were purified and analyzed for their antigen binding efficacy. We observed that the reactivity of soluble scFv antibodies was higher in the antigen capture ELISA format than the antigen tracing one. This observation led us to utilize the phage displayed antibodies for development of an competitive inhibition-enzyme linked immunosorbent assay (CI-ELISA) test. For diagnosis and differentiation of influenza A virus infected and vaccinated individuals, a total of 31 samples were tested, of which 18 samples were from patients, who acquired natural infection of influenza A (H1N1) virus, 7 from individuals vaccinated against influenza virus and 6 as healthy controls. Anti- NS1 antibodies were detected only in the influenza virus infected patients, except 3 H3N2 samples, whereas anti- NP antibodies were found in both virus infected and vaccinated samples. Our findings suggest that the recombinant anti-NS1 and anti-NP scFv antibodies developed in this study prove to be significant for sero-diagnosis of influenza A virus infection among human population. The data generated from the test may be used for evaluation of existing immunity, thereby determining the efficacy of vaccines in providing immune protection against the emerging or re-emerging influenza virus strains.

21. Generation, characterisation and epitope mapping of recombinant monoclonal antibodies against pandemic influenza 2009 (H1N1)

The project aimed to generate influenza virus neutralizing antibodies using phage display technology. The antibody phage display library was constructed from B cells of Balb/c mice hyperimmunized with inactivated pandemic H1N1 influenza virus. The antibody expression was localized in the bacterial cells and the respective fractions were purified by metal affinity chromatography under native or denaturating conditions. The antibodies were used for mapping B-cell epitopes on the HA antigen of influenza A virus by peptide ELISA and a commercially available phage display epitope mapping kit. The antibodies showed potent neutralizing activity as observed in microneutralization and hemagglutination inhibition assays.

22. Evaluation of ER stress inhibitor on chikungunya virus infection

Chikungunya virus infection is known to induce ER stress pathways in the host cell, which help in folding of viral protein and ultimately assist viral replication. We are targeting ER stress pathways with specific inhibitors to evaluate their effect on viral replication. MTT assay for these inhibitors has been done to study the toxicity of these compounds. PCR primes has been standardize for all the important gene involves in UPR pathways.

23. To study the heterosubtypic immunity provided by pandemic influenza A H1N1 (2009) virus infected cells

Dendritic cells are professional antigen presenting cells. In the current study, *in vitro* influenza primed dendritic cells will be studied for their protection against different influenza A virus strains. Protocol has been standardized for differentiation of bone marrow derived stem cells to dendritic cells in the presence of murine GM-CSF. Characterization of differentiated dendritic cells has been done with FACS. Expression of dendritic cells maturation markers and type 1 inteferon has been compared between influenza infected and non infected cell using real time PCR

24. Role of microRNA on influenza pathogenesis

We have found some microRNA, differentially expression during influenza infection. Few of them are known to regulate innate immune response. We are studying the association of these microRNAs with influenza pathogenesis. Expression of immunoregulatory microRNAs has been compared between influenza infected and non infected cells by real time PCR. Experiments on microRNA transfection in lung epithelial cell lines and association of these microRNAs with interferon expression are still ongoing.

Pathology

Research

1. N-Acetylcysteine modulates apoptosis in bleomycin induced lung fibrosis

The lung is exposed to multiple air borne pollutants and recurrent sub lethal oxidative stress. Oxidative lung injury, caused by the free oxygen radicals activates several genes related to cell growth, fibroblast proliferation and cell death. Targeting apoptosis might be an important therapeutic strategy for pulmonary fibrosis. Therefore, the efficacy of N-Acetylcysteine (NAC) monotherapy in modulating apoptotic cell death and the inflammatory response was studied in bleomycin induced lung fibrosis model. Male Wistar rats were divided into four groups: Group I, (saline control), Group II, (bleomycin), Group III, Bleomycin+NAC (low dose), and Group IV, Bleomycin+ NAC (high dose). The ascending grade of lung fibrosis after bleomycin injury, was seen to be associated with an increased caspase-3 expression by the alveolar epithelial cells, inflammatory cells, alveolar macrophages, bronchial epithelial cells and endothelial cells from day 7 onwards till day 28. NAC therapy had a protective effect on alveolar epithelial cells and bronchiolar epithelial cells and showed reduced caspase-3 expression. This was associated with reduction in inflammatory infiltrate and restoration of alveolar architecture in both the early cellular and late fibrotic phases of bleomycin induced pneumonitis.

2. Pathology of smoking related interstitial fibrosis

Cigarette smoking is related to the development of several ILD's including desquamative interestitial pneumonia (DIP), respiratory bronchiolitis- associated interstitial lung disease (RBILD), pulmonary Langerhans cell histiocytosis (PLCH) and IPF. The prevelance of current or prior smokers with IPF, ranges from 4-83%. These patients are at higher risk of development of PAH, leading to a poorer prognosis and increased mortality. We studied the parenchymal and vascular remodeling in cigarette smoke induced model of pulmonary fibrosis and assesed the pathological changes by morphometry. Cigarette smoke exposure increased the reactive oxygen species (ROS) levels, xanthine oxidase (XO) levels, lipid peroxidation (LPO) levels in the lung tissue. Cigarette smoke induced alveolar epithelial injury and was associated with inflammatory infiltrate in the interstitium and peribronchiolar region. The molecular basis for the development of interstitial fibrosis is further being evaluated.

3. Molecular diagnosis of lung cancer

The rate of lung cancer is increasing among men and women, in India as well as globally. In the last decade, there has been an impetus in the identification of the molecular basis of lung cancer as well as in their role in stratifying patients for personalised cancer therapy. There is need for systematic multidisciplinary lung cancer research comprising of clinical research, molecular laboratory research, and a combination of these. The detection of epidermal growth factor receptor (EGFR) mutations in non-small cell lung cancer is necessary for effective treatment with EGFR tyrosine kinase inhibitors. However, tumor tissues may not be available in all situations. Therefore, we have standardized the detection of EGFR mutations from lung tissue as well as from plasma of lung cancer patients using allele specific real time PCR assay and their correlation with clinical and pathological features is being done. The EGFR mutations analysis showed deletions in exon 19 (S768i, T790M) in 3 samples (75%) and insertions on exon 20 in 3 samples (75%). Mutation on exon 18 (G719X) was observed in one sample (20%). Further studies are being done with more sample numbers.

4. Innate immune response and role of toll like receptor-4 in pulmonary fibrosis

Bleomycin-induced lung injury / pneumonitis is a major cause of pulmonary toxicity in cancer patients undergoing chemotherapy, and significantly impacts quality of life and five year survival rates.The host innate immune response has been shown to play an important role in induced lung injury. Therefore, we studied the time course of TLR-4 mRNA expression, in the experimental bleomycin model of pulmonary fibrosis. Bleomycin treatment resulted in decrease in TLR-4 mRNA levels from day 14 to day 28. This correlated with an ascending grade of lung fibrosis and morphometric evidence of parenchymal remodelling. The role of TLR4 mediated basal immunity in the resolution of fibroproliferative diseases is further being studied.

The Armamentarium of Molecular Diagnosis in Lung Diseases - A CME was held on 11 July 2014, in association with QIAGEN India and Pulmonary Pathology Society of India. Students of the Institute speaking on this occasion.

Pharmacology

Research

1. Experimental studies with chelidonic acid, a molecule of plant origin with possible therapeutic potential in bronchial asthma

Chelidonic acid (CA) is a secondary metabolite present in many medicinal plants and has the potential to modulate the pharmacological actions of other active ingredients, *e.g.* alkaloids. Further, a preliminary study indicated that CA may have mast cell stabilizing property and could be useful in allergic disorders. Hence, it was deemed necessary to evaluate the effects of CA on immune parameters, markers of inflammation and airway hyperreactivity and airway resistance effects of the molecule per se, with a view to assess its efficacy in experimental models of bronchial asthma in rats. Our studies showed that chelidonic acid (3, 10 and 30 mg/kg) dose dependently attenuated histamine release from rat peritoneal mast cells (*ex vivo*) in ovalbumin immunized + challenged animals – thereby confirming the initial preliminary observations. Anaphylactic mortality 24h post challenge was also reduced as compared to controls and comparable with prednisolone. Further, compound 48/80 induced histamine release was also inhibited by CA (*in vitro*) in a dose dependent manner. In tests for adaptive immunity, chelidonic acid suppressed SRBC induced antibody responses and also reduced the number of plaque forming cells in the spleen – suggestive of humoral immune suppression. In tests for cell mediated immunity, CA showed a tendency to suppress CMI responses as assessed in the foot pad thickness test, but the effects were not as consistent as seen in the humoral immune parameters. Chelidonic acid also reduced the levels of IgE and total eosinophil counts in blood samples of ovalbumin immunized+ challenged rats. In experiments of airway inflammation, CA reduced the absolute eosinophil counts of both BAL fluid and blood with the maximal effect being seen with the dose of 10 mg/kg of the agent. In addition, CA reduced levels of pro-(TNF-a, IL-6, IL-1b) and anti-inflammatory (IL-13, IL-5) cytokines in both BAL fluid and blood, which was also comparable to prednisolone effects. Levels of IL-4 and IgE were also lowered in BAL fluid and blood after CA treatments. In models of airway hyperreactivity, CA reduced the *P-enh* vales as compared to controls in conscious rats *in vivo* as measured by whole body plethysmography. TGB-b and hydroxyproline levels in blood and BAL fluid samples were also lowered by the drug suggestive of anti-remodeling effects of CA. Histopathological examination of lung tissue supported these findings. These results are strongly suggestive of an immunomodulatory, anti-inflammatory, bronchorelaxant and anti-remodeling effect of chelidonic acid, which could emerge as an important plant derived product for the treatment of allergic disorders like bronchial asthma.

2. Pharmacological studies on the possible mechanisms involved in theophylline induced cardiotoxicity in rats

Theophylline induced cardiotoxicity is a major therapeutic problem in patients of obstructive airway disease like bronchial asthma and COPD, and this aspect was investigated in experimental models for possible strategies to counteract it. Experiments were conducted in albino rats and aminophylline was administered in graded doses (50, 100 and 150 mg/kg, ip) and heart rate and BP were recorded and ECG tracing taken by using the software based BIOPAC device. Blood was collected for assay of oxidative stress markers. The results showed that aminophylline dose relatedly induced dose dependent tachycardia, and marginal increases in BP, the most prominent effect being seen after a dose of 150 mg/kg. Additionally, ECG tracing showed that at this dose level T wave inversions were also seen - suggestive of myocardial ischemia was also apparent. These changes were accompanied by increases in blood MDA and reductions in GSH levels. An elevation in the SGOT levels was also noted in most rats after the drug. Pretreatment with the antioxidant, alpha tocopherol (20 and 40mg/kg) differentially attenuated the aminophylline induced changes in hemodynamic, ECG and biochemical markers. Similar changes in aminophylline induced cardiac parameters were seen after l-arginine pretreatment. The results are suggestive of possible involvement of oxidative stress and nitric oxide (NO) in aminophylline induced tachycardia and cardiac ischemia.

3. Pharmacological studies on stress-induced modulation of inflammation and immunity in rats

The possible role of nitric oxide (NO) and its signalling pathways were investigated in stress induced changes in markers of inflammation and immunity with reference to lung diseases. Experimental data showed that acute and chronic restraint stress (RS) influenced markers of both innate and adaptive immunity in a complexly differential manner. Chronic RS increased the neutrophil counts in blood and BAL fluid, and this was reversed by L-arginine (NO mimetic), whereas the NO synthase inhibitors did not show any consistent. In tests for cell mediated immunity, chronic RS induced marked suppression in the DTH response which was attenuated by L-arginine pretreatment, whereas NO synthase inhibitors showed opposite effects. In models of allergy and inflammation, NO synthase inhibitors, potentiated suppression of mast cell degranulation when combined with acute RS, whereas, L-arginine was ineffective. Interestingly, chronic RS enhanced the mast cell degranulation, and NOS inhibitors (7-NI and aminoguanidine) differentially inhibited this phenomenon. Further, both acute and chronic RS reduced glutahthione (GSH) levels in blood and these changes were only influenced by pretreatments with either L-arginine or L-NAME. However, chronic RS induced markedly greater suppressions in GSH levels which were attenuated by L-arginine pretreatment. Chronic RS increased MDA levels as compared to the control values, which were attenuated with L-arginine and aggravated by the NOS inhibitors. A suppression in the NO metabolite (NOx) levels was seen in blood after chronic RS which were reverted back to near normalcy in the presence of L-arginine. The results are suggestive of RNS-ROS interactions during stress induced inflammation and immunity and could have an impact on inflammatory airway disease.

4. Experimental studies on the role of nitric oxide (NO) and NO-signalling pathways in cognitive changes during emotional and environmental stress

Hypobaric hypoxia results from reduced oxygen delivery to brain on ascent to high altitude which results in cognitive and non-cognitive behavioural changes. The pharmacological basis of such changes were evaluated in experimental models with specific reference to nitric oxide (NO). Non-cognitive functions (anxiety) was assessed by the elevated plus maze (EPM) and cognitive function was measured by the Morris Water Maze (MWM) test. Brain homogenates of different treatment groups were assayed for oxidative stress markers (MDA and GSH). Exposure to hypobaric hyopoxia (simulated high altitude in a hypoxia chamber), at 8000 ft (H-I) and 12000 ft (H-II), both resulted in increase in anxiety-like behaviour in the EPM test with the effect of H-II being greater than H-I. These effects were potentiated when combined with restraint stress (RS. These anxiogenic responses were neutralized by L-Arginine (NO precursor) pretreatment, whereas, NOS inhibitors aggravated the same. Hypoxia induced behavioral changes were accompanied by assay for brain oxidative stress parameters showed that MDA levels were found to be highest in the group treated with RS + HII and lowest in the group treated with HII+ L-Arginine. GSH levels were found to be highest in the group treated with HII + L-Arginine and lowest in the treatment group of RS+ HII+ L-NAME.

Studies for cognitive function in the Morris Water Maze showed that learning and memory was affected by chronic exposure to hypobaric hypoxia and restraint stress. The mean escape latency time on Day 4 was found to be reduced when compared to their Day 1. This shows that there was spatial learning during the conduction of the trials. However, the mean escape latency time (ELT) varied among the treatment groups. The mean increase in the ELT indicates reduction in learning ability of the particular treatment group.

Studies for cognitive function showed that learning and memory was influenced by acute exposure to hypobaric hypoxia and/or RS. The mean escape latency time on Day 4 was found to be reduced when compared to their Day 1. Cognitive function as assessed by the mean ELT, was lowest in group treated with RS+HI group. The mean ELT increase shows reduction in learning ability of the particular group and *vice versa*. Probe trial was conducted on Day 5 of each study, probe trial showed reduced time spent in the target quadrant in the group treated with HII + L-NAME and increased time spent in target quadrant in the group treated with HII+ L-Arg. MDA levels were found to be highest in the group treated with HII + L-NAME and lowest in HII+L-Arg. GSH levels were also found to be reduced in HII + L-NAME group and to be increased in HII+ L-Arg group. The results of transfer latency (TL) studies in the elevated plus maze showed that the TL in the HI exposed group shows was 22.62% as compared to 22.12% of the control group on day 2 . The comparisons were made with the corresponding day 1 data which was taken as 100%. On the other hand, the

HII exposed group had a transfer latency of 29.12%. On pretreatment with l-arginine, the effects of HII on TL were reversed and was 26.75% *vs* respective controls. However, pretreatment with 7-NI further aggravated the TL to 30.66%. These results suggest that NO may be involved as a regulator during in hypoxia induced anxiogenesis and cognitive dysfunction that interactions between reactive nitrogen and reactive oxygen species may play a crucial role in this phenomenon. Further, gene expression studies are being conducted for studying genetic basis of these changes.

A programme on "Bioethics in Medical Research" on International Clinical Trial Day was held on 19 May 2014, in collaboration with the Indian Society for Clinical Research and Indian Pharmacological Society (Delhi Branch).

5. Calcium phosphate nanoparticles co-encapsulating neurotherapeutic gene and drug for targeted therapy of neurodegenerative disorders

This is a collaborative project operated jointly by the Dept. of Chemistry, University of Delhi, and Department of Pharmacology, VPCI. CPNP nanoparticles were synthesized as per standard techniques and injected into rats for assessing *in vivo* toxicity. Female Wistar rats (180-220 g) were used for *in vivo* acute toxicity studies. For this, rats were divided into two groups each having five rats - one acted as vehicle control while the other received CPNP. The drug was dissolved in distilled water and administered by oral route at the dose of 2000 mg / kg (single dose) and then these rats were observed daily for 14 days, as per the OECD guidelines. The following parameters were assessed: physical signs like gross animal appearance, salivation, lacrimation, vocalisation, rearings, sedation, and convulsions were observed. Body weight changes were measured by animal weighing balance, motor coordination by Rota rod apparatus and locomotor activity by a Photoactometer (both from INCO, Ambala). Mortality was also noted during the experimental period. The data were analysed by using Student's t-test and a p value of at least 0.05 was considered as the level of statistical significance. The results of the *in vivo* toxicity studies showed that there were no overt physical signs like animal appearance, salivation, lacrimation, vocalisation, rearings, sedation, or convulsions in CPNP treated animals. Further, no significant differences were observed in body weight changes, locomotor activity (in photoactometer), motor coordination (in rota rod) in CPNP treated group in comparison to vehicle control rats ($p>0.05$). Further, no mortality was observed during 14 days observation period. Macroscopic examination of vital organs did not show any change in stomach, liver, lungs, heart or ovary in either control or CPNP group. These results demonstrate the CPNP nanoparticles are non-toxic and have potential for effective use for imaging and drug delivery. More exhaustive *in vivo* toxicity and biodistribution studies are currently underway.

6. Experimental studies on the association between Alzheimer's disease and diabetes mellitus: a novel approach to possible therapeutic strategies

Alzheimer's disease (AD) is characterized by progressive loss of memory, declining cognitive function and, ultimately, leads to decreasing physical functions and death. Elevated levels of Aь are believed to

contribute to the cognitive impairments associated with AD. Inspite of several neurochemical hypotheses proposed there is still no consistent and sustainable forms of therapy are available and the drugs currently used are far from satisfactory. Recent studies have indicated that cognitive decline and Type 2 Diabetes Melitus (T2DM) are co-morbidities and there is a strong possibility that there may be a strong association between such neurobehavioral deficits of AD and poor glycemic control seen in T2DM. Insulin resistance plays a role in the onset and development of AD and, AD has been considered as an "insulin resistant brain state (IRBS). Currently, the basis for the association between AD and T2DM is poorly defined. Nitric oxide (NO) is a neuromodulator with a complex array of pharmacological functions. In view of its role on influencing several neurobehavioral paradigms and its reported association with both HDAC-2 and BDNF, it is possible that NO may play a key role in redefining the treatment modalities of AD associated with T2DM by modifiying some of the biomarkers for such co-morbidity (CTGF, g-secretase, HDAC-2, BDNF). Hence, the present study will investigate the role of NO in AD associated with T2DM in experimental models. Cognition impairment will be induced by intraventricular injection of streptozotocin (STZ) to normal and T2DM rats (induced by STZ and high fat diet). Neurobehavioral, biochemical, molecular and histopathological parameters will be assessed in both groups. The effects of NO modulators on above parameters, NOS gene expression (hippocampus and prefrontal cortex), and brain NO metabolites (NOx) will be observed in both groups. Experiments have been initiated to standardize techniques to study neuroendocrinal basis of behavioral changes associated with AD and are likely to throw light on the possible role of NO and use of NO modulators as potential therapeutic strategies in AD associated with T2DM and provide leads to translate these findings in humans.

7. Experimental studies to evaluate the time dependent changes in stress responses and their regulation by nitric oxide

Stress and stress related disorders are among the leading causes of morbidity and mortality worldwide. Stress mechanisms need to be studied to devise strategies to cope with such stress related pathophysiological changes. Complex neurochemical pathways regulate stress reactions and Nitric Oxide (NO) is a key neuromodulator during stress. Time dependent effects of stressors are not only important for devising optimal stress protocols for research but also has translational value in devising strategies to cope with stressful situations. It is hypothesized that NO by virtue of its widespread distribution in the brain and periphery and also its ability to interact with other signalling pathways, could play a significant role in the time dependent changes in stress responsiveness. This could be studied by observing the effects of NO modulators on time dependent changes in neurobehavioral, endocrinal, biochemical and cellular / molecular parameters. Therefore, the present study has been designed to critically evaluate the time dependent effects of both acute and chronic stress on well documented stress markers. Restraint stress (RS), which is a widely used model for emotional stress and its impact at different time intervals post stress will be studied ion neurobehavioral, endocrinal and oxidative stress parameters in rats, various stress gene *viz*., iNOS, nNOS, eNOS and NRF2 expression level during acute and chronic stress and time dependend changes in the above parameter due to post stress response and their regulation by NO in rats. Preliminary experiments show that NO may influence stress effects in a time dependent manner.

8. Awareness of antibiotic resistance and antibiotic prescription for treatment of acute upper respiratory tract infection and diarrhoea in children: a qualitative study among primary care doctors and community pharmacists in NCT, Delhi

The indiscriminate consumption of antibiotics in India, as in most developing countries, is increasingly leading to Antimicrobial Resistance (AMR), which could render simple treatable infections difficult to manage in future. One of the major causes is overuse of antibiotics and more so out of order prescriptions of antibiotics for self-limiting viral infections, like acute diarrhoea and acute upper respiratory tract infections (URTIs). To reduce undue prescriptions of antibiotics, behavioural and attitude change is needed apart from education and awareness on AMR and treatment guidelines. Therefore, a qualitative study was undertaken with primary care doctors and paediatricians to elicit their behaviour on the use of antibiotics in acute diarrhoea and URTIs in children. Community pharmacists were included in the study too as they are also important stakeholders who prescribe and antibiotics for common ailments in the community.

Focus Group Discussions (FGDs) involving primary care doctors and pediatricians working in different medical setting- public and private, across all 11 districts of Delhi were conducted. Each FGD consisted of 8-12 participants and elicited information on prescribing patterns, views on antimicrobial resistance and practical interventions. The data so generated were supplemented by face-to-face semi- structured interviews where the participants from different stakeholder's group were contacted and interviewed at the place of their practice (dispensary / clinic or pharmacy shop). After duly transcribing and translating all the recorded FGDs and interviews, the data analysis was done through 'grounded theory'.

This study brings out various dimensions of antibiotics overuse in Indian population through qualitative data gathering methods which highlight the perceptions and practices of various health-care personnel like public and private sector doctors, paediatricians and pharmacists.

9. Effect of Indian almond and sweet almond in diabetes induced nephropathy and cataract in rats

Diabetes mellitus is a chronic disease and the incidence of diabetic patients is increasing in India. Adherence to medication is a big challenge for chronic diseases like diabetes. Uncontrolled diabetes mellitus leads to various serious complications such as retinopathy, neuropathy, nephropathy and cardiomyopathy. There is a need to have medicines which our Indian population will not be reluctant to use chronically and this medicine can be used as mono or adjuvant to the presently available medicines for diabetes.

Almonds have been used and promoted for centuries in India for good health. *Prunus amygdalus* (sweet almond), has been shown to decrease blood sugar in normal rats. *Terminalia catappa* (Indian almond) has shown to decrease blood sugar in diabetic rats. There is little data indicating effect of sweet almond and Indian almond in diabetes, not much work is reported regarding their mechanism of action and effect on diabetes induced complications. Therefore, the present work is planned to study the effect of two types of almonds in diabetes and their effect on diabetes induced cataract (retinopathy) and nephropathy.

Objectives

To study the effect of *Terminalia catappa* (Indian almond) and *Prunus amygdalus* (Sweet almond) on

- Blood sugar level in diabetic rats
- Various biochemical parameters of diabetes induced nephropathy in rats
- Diabetes induced cataract in rats
- Antioxidant status and oxidative stress, to find the role of free radicals in diabetes and diabetes induced complications

Standardization of induction of diabetes, control experiment, diabetic control experiments have been done. Blood sugar, weight of the animal, cataract development through slit lamp technique has been done from 0 week to 12 weeks. Blood, urine and kidneys have been stored for various biochemical and histological studies.

10. To evaluate the effect of *Terminalia catappa* fruit and seed extract in streptozotcin induced diabetic retinopathy in rats

Diabetes mellitus is a group of common metabolic disorder characterized mainly by hyperglycemia. The progression of diabetes in India is increasing at an alarming rate and has gained the status of potential epidemics. With the increasing prevalence of diabetes, the associated microvascular and macrovascular complications are also increasing. Diabetic retinopathy is the most common microvascular complication of diabetes that leads to progressive damage to small blood vessels of eye, subsequently leading to vision loss and blindness. The oxidative stress induced by hyperglycemia is a key pathogenic factor for diabetic complications. *Terminalia catappa* contains a rich amount of polyphenols and has good antioxidant and radical scavenging activity. Therefore, we hypothesized that it may have beneficial effect in treatment of diabetes induced retinopathy.

Objectives

- To investigate the effect of *Terminalia catappa* fruit extract in streptozotocin induced diabetic retinopathy in rats.
- To investigate the effect of *Terminalia catappa* seed extract in streptozotocin induced diabetic retinopathy in rats.
- To investigate the role of glycaemic, inflammatory, oxidative stress and angiogenic mechanisms in the genesis of diabetic retinopathy and to examine the effect of *Terminalia catappa* fruit and seed extract on these pathways.
- To investigate the effect of *Terminalia catappa* fruit and seed extract in streptozotocin induced diabetic retinopathy in rats by examining histopathological changes in retinal tissue.

Experiments have been conducted in diabetic rats and effect of hydro alcoholic extract of *Terminalia catappa* fruit in a dose of 40 mg/kg p.o. and 30 mg/kg p.o. has been studied on blood sugar, fundus evaluation and the anterior chamber evaluation in diabetic rats at 2^{nd}, 4^{th} , 6^{th} , 8^{th} , 10^{th} and 12^{th} week.

11. To assess the price and availability of essential medicines in Delhi after the implementation of the National Pharmaceutical Pricing Policy 2012 - phase II study

Access to essential medicines is viewed as an integral component of right to health. Medicines make most of the share (around 80%) for health care expenditure and up to 80% of the population in India have to buy medicines through out-of-pocket payments. Therefore, the price of essential medicines really does matter – not only to patients, but also to the government that has embraced the responsibility to provide healthcare to their citizens.

The National Pharmaceuticals Pricing Policy (NPPP 2012) has brought all the medicines in the dosage form and strength mentioned in the National essential medicine list (NLEM)-2011 under price control but instead of cost based pricing system the new policy is proposed to have market-based-pricing (MBP). Department of Pharmaceuticals had revised the Drug Price Control Order (DPCO) and the new DPCO 2013 was notified to bring all the medicines under NLEM-2011 under price control.

In Phase I of the study, a quick survey was done in 2013 to collect prices of commonly used essential medicines from the list of NLEM-2011 to find out the prices of medicines before implementation of NPPP-2012.

In the phase II part of our study, the following is being studied in detail,

- Comparison of price and availability for 120 medicines (surveyed in phase 1 of the study) and the impact of the policy, DPCO 2013, if any on the prices and availability of these essential medicines in the private sector.
- Compare the price and availability of 50 essential medicines surveyed in 2011 (which will be aligned with the list of 40-50 essential medicines being prepared by central government) according to WHO/HAI methodology in public and private sector to see the impact of DPCO 2013.
- A dissemination workshop will be held for key stakeholders to advocate the key recommendations and learning from the study.

12. Pharmacological studies on the possible role of nitric oxide (NO) and NO-mediated signalling pathways in the regulation of stress induced immunological changes in rats

The effects of different NO modulators were during stress as there is evidence for the role of NO as a neuromodulator in CNS and also because of reported differences in gene expression for different NO synthase. The results of the current study showed that exposure to both chronic predictable and unpredictable stress significantly altered the number of entries of open arm entries (OAE) as well as time

spent in the open arms (OAT) during the 5 minutes exposure to the EPM test. Acute RS induced suppressions in both % OAE and OAT as compared to controls and the values were 12.7 ± 1.5 and 5.8 ± 1.9 respectively for acute RS, as compared to 30.2 ± 4.2 (% OAE) and 12.0 ± 1.5 (% OAT) of the controls. Exposure to CPS and CUS induced differential nature of responses in the EPM parameters. Whereas CUS induced significant reductions in both OAE ($p<0.05$) and OAT ($p<0.05$) as compared to control (no stress) group, no significant differences were observed after CPS exposure. Interestingly comparison of % OAE between CPS and CUS showed that the reduction in OAE was more in the CUS group as compared to CPS group. Biochemical analysis of the brain homogenates showed that exposure to CUS resulted in *(a)* increased MDA levels and *(b)* reduction in NOx levels, in brain homogenates compared to control values ($p<0.05$, in each case). However, no such changes were seen in the oxidative / nitrosative stress parameters after CPS. Further, as observed in neurobehavioral studies, comparison of these biochemical markers between CUS and CPS showed that elevations of MDA levels and reduction in NOx levels were more in CUS group as compared to CPS exposed rats. Exposure to chronic CPS resulted in adaptation to neurobehavioral suppression in the EPM (as observed after acute RS), which was not seen after CUS. These behavioral changes after CPS and CUS were closely paralleled by alterations in the levels of brain MDA and NOx. These results suggest that CPS and CUS results in differential modulation of the neurobehavioral profile and oxidative / nitrosative stress markers in the brain.

13. Experimental studies on the possible role of nitric oxide (NO) during acute and chronic morphine in normal and stressed rats

The effects of morphine were evaluated on neurobehavioral endocrinal, oxidative stress, cellular and immunological parameters. Further, opioid-NO interactions were studied by co-administration of morphine with NO modulators in both normal and restraint stressed rats. The data obtained from the present study shown that acute restraint stress (RSx1) suppressed NOx levels as compared to their controls. Pretreatment with morphine (5 mg / kg), increased brain NOx levels markedly. On the other hand, decreases in brain NOx levels were seen with naltrexone after RS. Pretreatment with the NO precursor, L-Arginine (500 and 1000 mg / kg), significantly increased RS-induced suppression of brain NOx levels in dose dependent manner, whereas, L-NAME (30mg / kg) showed opposite effects. RS induced suppression of behavioral activity was attenuated by morphine while naltrexone showed opposite effects. RS induced anxiogenic responses were associated with suppression of anti-oxidant defense marker, elevations of chaperones, Hsp70 and Hsp90 in brain homogenates. Morphine administration reversed the RS induced changes in both oxidative and cellular stress markers. Chronic RS (CRS) induced changes in behavioral activity were associated with elevations in brain NOx, MDA and reduced GSH levels which were modulated by morphine and NO.

In SRBC immunized rats, chronic stress (RSx15) suppressed antibody titers as compared to controls suggestive of compromised humoral immune functions. Pretreatment with morphine (1mg / kg) attenuated such immunosuppression. Co-administration of L-arginine and morphine had synergistic effect in reversing the immunosuppression to CRS. Chronic RS also suppressed cell mediated immunity (CMI) as cytokines levels IFN-ɡ(Th1 cytokine) and IL-4 (Th2 cytokine) were reduced as compared to controls. Pretreatments, with morphine (1mg / kg) reversed the response. Concurrent administration of L-arginine potentiated this effect of morphine. Taken together, this study showed that morphine differentially modulated various neurobehavioral (EPM and OF tests) and endocrinal (plasma corticosterone) responses during acute and chronic stress. Further, interactions involving NO, ROS and Hsp exert complex regulatory influences on these responses. These results are of translational value as NO and Hsp70 levels can be used as an effective marker / target for stress induced anxiety and anxiolytic agents.

14. Experimental studies on the possible mechanisms involved in the effects of UNIM-352, a polyherbal, anti-asthmatic, Unani preparation

UNIM-352 is a polyherbal preparation which has been used in the traditional Unani system of medicine for the treatment of bronchial asthma. Earlier studies have shown that UNIM-352 has an anti-inflammatory and immunomodulatory activities in experimental model of asthma. The purpose of the present study was to evaluate the effects of UNIM-352 treatment in bronchial airway remodelling in experimental model of allergic asthma.

Female Wistar rats were immunized on day 1 with ovalbumin and $Al(OH)_3$ and challenged with aerosolized ovalbumin from day 15 to 21. Ovalbumin immunized and challenged rats were treated with vehicle, UNIM-352 (200 and 400 mg / kg) or prednisolone (10 mg / kg). After 24 h of last challenge, blood, BAL fluid and lungs were collected and assayed for *(a)* cytokine levels (TGF-b and IL-13); *(b)* hydroxyproline content; and *(c)* histopathology and drug treatment effects were compared with vehicle controls. Analysis of the results showed that 21 days treatment with UNIM-352 at both the doses (200 mg / kg and 400 mg / kg) and prednisolone in ovalbumin immunized and challenged rats reduced the levels of TGF-b in both blood and BAL fluid, as compared to vehicle treated control group. The reduction in TGF-b levels were significantly marked with the higher dose of UNIM-352 and prednisolone. Assay for IL-13 showed that 21 days treatment with UNIM-352 at both the doses (200 mg / kg and 400 mg / kg) and prednisolone in ovalbumin immunized and challenged rats reduced the levels of IL-13 in both blood and BAL fluid, as compared to vehicle treated control group. The reduction in IL-13 levels were significantly marked with the higher dose of UNIM-352. Analysis of the data showed that the changes in hydroxyproline content of lung homogenate after different treatments were significant across all groups. Intergroup analysis revealed that, in ovalbumin immunized and challenged rats, UNIM-352 at both the dose levels (200 and 400 mg / kg) significantly reduced the lung hydroxyproline content in a dose dependent manner, when compared with the vehicle treated control group rats. The reductions were also comparable with the standard drug, prednisolone. UNIM-352 (200 mg / kg and 400 mg / kg) decreased the hydroxyproline content of lung homogenate, and prednisolone induced suppression was 174.2 ± 14.07µg / g tissue,.

15. Experimental studies on the cellular and molecular mechanisms in the effects of *Withania somnifera* during chronis stress responses in rats: possible role of nitric oxide

Withania somnifera (WS) is extensively used as Rasayana in Ayurveda for various immune related indications. Exploring plant-derived anti-inflammatory and immuno-modulatory agents is a high priority area in natural products research. Some of the clinical trials and preclinical research support the use of *W. somnifera* for neurological and behavioral disorders. Immune homeostasis requires the differential and regulated expression of cytokines and their receptors. Also, it has been shown that modulation of the Th1 / Th2 balance by administration of recombinant cytokines or cytokine antagonists alters the outcome of the diseases. Restraint stress was used as an experimental stressor and the rats were immobilized in adjustable plexiglas restrainers (INCO, Ambala) for 1 h at room temperature. The animals were sacrificed, their brains were dissected out, cleaned with ice cold saline and stored at — 80 °C. Brain samples were thawed and homogenized in a proportion of 1:10 (w / v) ice cold phosphate buffer (0.1 M, pH 7.4). Aliquotes of homogenates were used for determination. The results showed that restraint stress resulted in significant decrease (58.9%) in anti-SRBC antibody response as evidenced by the low hemagglutination titre as compared to controls (no stress) group. Pretreatment with *Withania somnifera* (100 and 400mg / kg) L-arginine (500mg / kg) resulted in non-significant attenuations in the RS-induced suppression of antibody response. Pretreatment with L-arginine (500mg / kg) resulted in significant reversal (79.4%) of the RS-induced suppression of antibody response. L-NAME (50 mg / kg) administered prior to RS, resulted in (51%) suppression of the anti-SRBC antibody responses as compared to that seen with RS alone. In the interaction studies, combined treatment with sub threshold doses of *Withania somnifera* (100 mg / kg) and L-arginine (500 mg / kg) resulted in no significant change in the hemagglutination scores (82%) as compared to RS. DTH response was measured, after 5 days of immunization and various drug treatments, animals were challenged on day 6^{th} by injection of SRBC into the right foot while saline injected into left hind foot pad. Footpad thickness was measured using plethysmometer (Ugo Basile 7140). Oedema as percentage increase in paw thickness (DT) was calculated from the formula: $DT = (T_r - T_l) / T_l * 100$; where T_r = right hind paw thickness (mm), T_l = left hind paw thickness (mm). Exposure to RS(x5) decreased the GSH levels (67.4%) as compared to controls (no RS). Pretreatment with the WS (100, 400 mg / kg) dose dependently reversed this RS induced suppression. L-arginine (500 mg / kg) elevated GSH levels (115.6%) in these immunized rats, whereas, L-NAME (50 mg / kg) further aggravated (54%) the GSH suppression by RS. In the interaction studies, combined treatment with sub-effective doses of L-arginine (500 mg / kg) and WS (100 mg / kg) tended to show synergistic effects on GSH content in such interactions.

16. Studies on the anti-inflammatory and immunomodulatory effects of *Albizia lebbeck* and *Solanum xanthocarpum* in experimental models of bronchial asthma

In recent decade, complementary and alternative medicine approach using medicinal plants for prevention and treatment of diseases have been gaining importance. Herbal drugs are rapidly emerging as safer alternatives / adjuncts in several chronic diseases and this has been shown in some inflammatory disorders. The study has been designed to evaluate the effects of *Albizia lebbeck* and *Solanum xanthocarpum* in experimental models of airway inflammation, bronchial hyperreactivity and airway remodelling and possible cellular and molecular mechanisms involved therein. Rats were actively sensitized with an intraperitoneal injection of a suspension containing 40 mg of ovalbumin (OVA) and 2mg of aluminium hydroxide**.** Fifteen days after sensitization, rats were challenged by exposure to a 1% OVA in saline aerosol once daily for 20 min per day for 8 consecutive days. Blood and bronchoalveolar lavage (BAL) were collected and measurement of various biochemical and immunological markers were performed to validate the model. BALF was obtained by intratracheal instillation, and the lungs were lavaged three times with 0.8ml of sterile saline. The BALF from each sample was centrifuged and supernatants were stored at — 80 ^{o}C for subsequent analysis of cytokine levels. Analysis of serum MDA, GSH and NOx data revealed that there was significant difference across all groups. The ovalbumin sensitized and challenged rats have higher MDA and NOx and lowered GSH level in comparison to normal rats. The administration of reference drug, prednisolone significantly attenuated these level in comparison to that in positive control (OVA sensitized and challenged) rats. Administration of *Albizzia lebbeck* at different doses (100, 200 and 400 mg / kg) significantly reduced the level of MDA and enhanced GSH in these groups in comparison to positive control rats, and the maximum reduction was seen at the dose of 200 mg / kg rats.

Physiology

Research

1. Function of anterior hypothalamus in high altitude pulmonary edema

Objectives: The present study was performed in rats to investigate the role of anterior hypothalamus in high altitude pulmonary edema and to correlate its function with the renal sympathetic nerve activity (RSNA).

Methodology: Adult male Wistar rats were divided into four experimental groups: Sham, Lesion, Sham+High Altitude (HA) and Lesion+HA. Electrodes were implanted in the pre-optic area (POA) of the four groups and lesions of POA were made in Lesion and Lesion+HA. Rats from Sham+HA and Lesion+HA groups were placed in high altitude simulation chamber at an altitude 24000 ft. for 24 h for causing pulmonary edema. Each rat was anesthetized, and after routine cannulations the baseline RSNA was recorded in all the groups. The animals were perfused and lungs were removed to determine pulmonary edema. Brain was also removed for histological verification of cannulae track of target areas.

Results: Lesion in the POA by itself resulted in a significant increase in RSNA, a significant increase in mean arterial BP and caused pulmonary edema (wet / dry weight ratio and Evans Blue assay). HA by itself significantly increased all the above parameters. Exposure to HA with lesion of POA did not result in any further increase in these parameters.

Conclusions: This study demonstrates that in normoxia, the POA in the anterior hypothalamus prevents the occurrence of pulmonary edema. It is likely that at HA, there is inhibition in the activity of POA which leads to pulmonary edema. Further studies are being conducted to elucidate the role of nitric oxide in the responses.

2. Modulation of hypoglossal motoneuron activity by NMDA receptors in rats exposed to chronic intermittent hypoxia (CIH)

Objectives: We hypothesised that CIH, modelling the hypoxia-reoxygenation patterns alone of severe Obstructive Sleep Apnea (OSA), there is oxidative stress which would result in decreased glutamatergic excitation of the hypoglossal nerve leading to collapsibility of upper airway muscles. In this study, we established the CIH model, determined the oxidative stress parameters and investigated the ameliorative effects of the antioxidant N-acetylcysteine (NAC) on them.

Methodology: Adult male Wistar rats were randomly divided into four experimental groups: 1) Control, 2) Control with NAC supplementation, 3) CIH exposed, and 4) CIH exposed with NAC supplementation. CIH model was established by alternating between air, *i.e.* 21% O_2 (8 min) and 99% N_2 (2 min) for 8 h per day, for 35 days. At the end of the exposure, the rats were anesthetized and hypoglossal nerve activity was recorded before and after unilateral administration of serotonin, glutamate and glutamate antagonist MK801 into the hypoglossal nucleus. At the end of the experiment, plasma samples were collected for measurement of oxidative stress markers and whole brain was processed for hematoxylin staining for verification of cannulae track, and immuno-histochemical study of glutamate NMDA receptor NR1.

Results: In the CIH group, the GSH levels were decreased and MDA levels were increased significantly. These effects were significantly ameliorated in 'CIH exposed with NAC supplementation' group. CIH also induced an increase in the NMDA NR1 expression in the hypoglossal nucleus. Experiments are in progress to observe the effects of NAC supplementation on hypoglossal nerve activity, NMDA NR1 expression and transcriptional factors in the hypoglossal nucleus.

3. Effect of chronic intermittent hypoxia (CIH) on contractile properties of the upper airway muscles in rats

Objectives: The purpose of the present investigation was to determine the effects of CIH, simulating the characteristic hypoxia-reoxygenation pattern observed in Obstructive Sleep Apnea (OSA) patients during sleep, on the UA geniohyoid muscle structure and function in rats.

Hypothesis: Long-term intermittent hypoxic episodes induce decreased oxygen availability and enhanced production of free radicals, which trigger adaptive molecular and cellular mechanisms in the upper airway motoneurons and skeletal muscles as they have high oxidative demand to remodel their structural and functional properties.

Methodology: Adult male Wistar rats were exposed to CIH for 8 h per day with an automated CIH system, or room air, for 35 days. After the exposure, the geniohyoid muscles along with the hypoglossal nerve were removed for contractile studies. Following nerve or muscle stimulation, isometric twitch tension, tetanic tension, twitch / tetanic tension ratio, contraction time, half-relaxation time, the tension-frequency relationship, fatigue, and recovery from fatigue were measured.

Results: CIH had no apparent effect on geniohyoid muscle force production but, there was a considerable increase in geniohyoid muscle fatigue and decrease in its recovery from fatigue, consistent with changes in fiber-type distribution, *i.e.*, CIH subjected rats had significantly reduced type 1 (slow, fatigue-resistant) fibers and increased type 2B (fast, fatigable) fibers. Also, after the stipulated CIH exposure, there was a considerable imbalance in redox status of the geniohyoid muscle, in terms of decreased glutathione levels and increased lipid peroxidation.

Conclusion: CIH-induced oxidative stress leads to upper airway muscle dysfunction, causing increased fatigability of the geniohyoid muscles leading to recurrent collapse of the upper airway during sleep.

4. Continuation of the studies on higher nervous control of pulmonary renal reflex

Objectives: In our previous findings, we observed that the increase in urine volume that occurred during pulmonary lymphatic obstruction (PLO) was attenuated by lesioning of the paraventricular nucleus (PVN) of the hypothalamus. In this study, it was decided to observe the changes in urine volume during PLO after activating the GABA-ergic system and inhibiting the glutamatergic system in the PVN.

Methodology: Experiments were performed on anesthetized and artificially ventilated New Zealand white rabbits. After creating an isolated venous pouch in the right external jugular vein in the neck for causing PLO and after cannulating the urinary bladder for collection of urine, the rabbit was placed on stereotaxic apparatus; the, cranium was exposed and the PVN on either side was approached (AP= 15.5, L= 1.6, H= 12.0) using rabbit brain atlas. Cannulae were placed in the PVN for microinjection of $GABA_a$ agonist (Muscimol) and glutamate receptor antagonist (kynurenic acid).

Results:

a. Effect of microinjection of muscimol into the PVN on urine flow: Before muscimol, during PLO the urine flow increased significantly from 8.4 ± 0.4 ml / 10 min to 13 ± 0.6 ml / 10 min. After muscimol, the basal urine flow was 11 ± 0.8 ml / 10 min. PLO caused a further significant increase in urine flow (29.7 ± 4.8 %) but, the response was significantly lower from that elicited before muscimol ($P<0.01$).

b. Effect of microinjection of kynurenic acid into the PVN on urine flow: Before kynurenic acid, pulmonary lymphatic obstruction increased urine flow from 8.0 ± 0.28 to 11.8 ± 0.44 ml / 10 min. After kynurenic acid, the basal urine flow was 8.33 ± 0.44 ml / 10 min. No significant change was observed in urine flow after PLO.

Conclusion: The results show that *(1)* PVN is the main integrating centre of this pulmonary renal reflex and *(2)* the reflex is attenuated by the GABA-ergic system and is mediated through the glutamatergic system in the PVN. Further studies are being carried out to establish the spinal pathway of this reflex.

5. To investigate the role of Juxta-pulmonary capillary (J) receptors in reduction of exertional breathlessness with supplemental O_2 routinely received by class of ILD patients who desaturate on exertion

Interstitial lung diseases (ILD) are a diverse group of lung diseases that are characterized by chronic inflammation and progressive fibrosis of the pulmonary interstitium. Clinically, it is characterized by early fatigue, non-productive cough, exercise limitation and exertional dyspnea and desaturation. ATS (American

Thoracic Society) recommends use of supplemental oxygen to patients who have documented exertional desaturation. Supplemental oxygen has been shown to increase functional capacity and reduction in dyspnea and leg fatigue.

The mechanisms of reduction in exertional breathlessness after supplemental oxygen depend upon multiple factors and are poorly understood. One of the proposed mechanisms is alteration in the central perception of dyspnea which could be due to alteration in threshold of 'J' receptor sensitivity. Since earlier studies have not investigated this aspect, present study is planned to examine whether improvement in oxygen saturation in ILD patients influences 'J' receptor output.

Pulmonary Medicine

(Including Pulmonary Medicine, Respiratory Allergy and Applied Immunology and Cardo-respiratory Physiology)

The Department is involved in the patient care (Outdoor and Indoor) at Viswanathan Chest Hospital (VCH), the clinical wing of VPCI. The faculty is involved in individual research and thesis work on different aspects of respiratory diseases as well as teaching of the postgraduate students in the subject – Pulmonary Medicine (DM, MD and DTCD) of University of Delhi. The Department conducts routine lectures, clinical demonstrations along with seminars, clinical meetings and journal clubs, ICU meetings, mortality meetings etc., regularly, as a part of teaching curriculum.

Research

1. Comparison of clinical characteristics, quality of life and sleep in patients with allergic rhinitis when categorised as "sneezers and runners" and "blockers"

Background: Patients with allergic rhinitis (AR), as per their predominant symptoms, can be classified into "sneezers and runners (SR)" and "blockers". [*Ann Allergy Asthma Immunol*. 2005;94:60-4.] Since these two groups have distinct profiles, they were assessed and compared in terms of quality of life (QoL) and sleep disturbances.

Methods: The study comprising 106 consecutive patients (males:60 / females:46), 18 to 60 years with AR, diagnosed as per ARIA guidelines, were enrolled from outpatients department of VP Chest Institute, University of Delhi. Patients were categorised into "SR" (group1) and "blockers" (group2) with the help of a visual analog scale (VAS) of 10 centimetres with 0 being "no symptoms" and 10 being "symptoms extremely bothersome". Scores for global VAS, sneezing, runny nose, nasal congestion, post nasal drip and loss of smell were recorded and patients classified as "SR" and "blockers". Impact on QoL was assessed with Sinonasal Outcome Test 22 (SNOT-22) and sleep was assessed by Nocturnal Rhinoconjunctivitis Quality of Life Questionnaire (NRQLQ), the Epworth Sleepiness Scale (ESS) and the Pittsburgh Sleep Quality Index (PSQI) instruments.

Results: Just over two thirds (n=73:68.9%) of the patients, were categorised as "SR"(group1) while remaining third (n=33:31.1%) were categorised as "blockers"(group2). The significant features in group1 were: age at onset lower than 20 years (n=60:82.2% P=0.002); birth dates were between June and September (n=42:57.5% P=0.003); family history of atopy (n=59:80.8% P=0.001); itching of skin (n=25:34.2% P=0.002), eye (n=30:41.1% P=0.001), ears (n=28:38.4% P=0.002), and throat and palate (n=42:57.5% P=0.001); and aggravation with dust (n=65:89.1% P=0.001). History of breathlessness (n=28:84.8% P=0.002), mouth breathing (n=28:84.8% P=0.003), loss of smell (n=13:39.4% P=0.004), and prior nasal surgery (n=8:24.2% P=0.001) were significantly higher in group2. Patients in group1 were significantly more sensitised to seasonal allergens like pollens [Kigelia (P=0.045); Salvador (P=0.005)] while patients in group2 had more sensitisation to perennial allergens like house dust (P=0.001), house dust mite (P=0.044) and fungus including *Aspergillus* species (P=0.001). Mean SNOT-22 scores (group1:60.89;group2:61.66 P=0.763) and mean NRQLQ scores (group1:47.66;group2:50.91 P=0.238) were not significantly different between the groups, while mean ESS (group1:10.52;group2:12.30 P<0.001) and mean global PSQI scores (group1:9.71; group2:11.27 P=0.009) were significantly higher in group2.

Conclusions: The two groups differ significantly in terms of their respective profiles, whether be demographic or clinical. Further, the sensitivity patterns to allergens differ significantly between the groups. "Blockers" experienced significantly more sleep disturbances as compared to "sneezers and runners".

2. Characterisation of nocturnal hypoxaemia in chronic obstructive pulmonary disease

Prevalence of significant nocturnal desaturation (NOD) in non-apnoeic patients with Chronic Obstructive Pulmonary Disease (COPD) varies widely from 27 to70% with limited information on its

predictors and impacts. A study was carried out to determine the prevalence and predictors of NOD in non-apnoeic COPD and evaluate its impacts. Sixty patients with COPD with daytime oxygen saturation (SaO_2) $\geq$ 90% were categorized as "desaturators" and "non-desaturators" after overnight pulse oximetry, with desaturation defined as $SaO_2 \leq 90\%$ occurring for > 30% of time with a nadir $\leq$ 85%. Investigations included a 6-minute walk test, lung function study, high resolution computed tomography (HRCT Chest), and measurement of Pittsburgh Sleep Quality Index and health-related quality of life. Sleep apnoea was ruled out using Epworth Sleepiness Score and Apnea-Hypopnea Index (AHI) on sleep screening. The prevalence of NOD was 25%. These patients had greater dyspnea, higher GOLD severity, lower FEV_1 and diffusion capacity, higher BODE index, greater frequency of exercise desaturation, and a poorer quality of sleep and health-related quality of life but were similar to non-desaturators for age, gender distribution, AHI and frequency of emphysema on HRCT. Multiple regression analysis identified exercise desaturation and lower daytime PaO_2 as significant predictors of NOD. Thus, NOD is common in non-apnoeic COPD, is associated with disease severity and adversely impacts sleep quality and health-related quality of life**.** Exercise desaturation and low daytime PaO_2 predict its occurrence.

An update on Non-Small Cell Lung Cancer (NSCLC) was held on 9 July 2014. Eminent speakers from Rajiv Gandhi Cancer Institute and VPCI enlightened the audience about the disease.

3. Clinical-radiological and functional characteristics of pulmonary sarcoidosis and effect of one year corticosteroid treatment

No treatment is known to alter the natural history of sarcoidosis although corticosteroids are extensively used. Studies on their efficacy are conflicting in results. Functional effects have been studied using mainly spirometry. Studies evaluating changes in diffusion capacity are scarce. We carried out a study to examine the clinical-radiological and functional characteristics of sarcoidosis and evaluate the effect of one year treatment with steroids on multiple parameters. A retrospective analysis of confirmed cases of sarcoidosis diagnosed over a period of 7 years (2006-2013) in whom treatment was indicated and follow-up data was available for at least one year was carried out. The effect of one year treatment with steroids on symptoms, radiological changes, serum ACE, spirometry and DLCO was evaluated. There were 29 males and female subjects each that were matched for age and nutritional status. Mean age was 46.66±11.00 yrs. Cough and dyspnoea were the commonest symptoms present in a majority (> 90%) of patients. Overall, 44 (77.6%) patients had increased SACE levels, higher in stages I and II compared to stage III, and 6 (12.5%) had a positive mantoux test. On spirometry, pure obstruction was seen in 7 (12.1%), mixed pattern in 8 (13.1%), restrictive in 24 (41.4%) and normal in 19 (32.8%). Hypercalcemia was found in 1 (2.6%), hypercalciuria in 2 (8.3%) and hypovitaminosis D in 10/12 (83.3%). Majority of patients showed clinical and radiological improvement and decreased ACE levels. In all, 53 patients maintained FVC or showed improvement while only 5 deteriorated. 5/32 patients had a deterioration in DLCO while 27 maintained or showed improvement. We concluded that majority of patients respond to corticosteroids with clinical and radiological improvement and maintained or improved lung function including diffusion capacity. Only a small proportion of patients deteriorate. Corticosteroids are efficacious drugs for sarcoidosis.

4. Effect of air pollution and weather changes on exacerbation of asthma: a cohort study

A prospective study was conducted in a cohort of sixty-one asthma patients recruited from Out Patient Department for one year in collaboration with the Department of Community Medicine, University College of Medical Sciences, New Delhi. Socio-demographic profile and details regarding indoor risk factors were recorded using an interviewer administered questionnaire. Each patient was contacted every fortnight to enquire about acute episode of asthma for a period of one year. Data for air pollution and weather parameter was provided by Department of Environmental Studies, University of Delhi from civil lines monitoring station of DPCC and IMD respectively. Primary outcome of study was to observe effect of air pollution and variability in weather parameters on occurrence of acute episodes of asthma. No significant association found between weather parameters (Temperature, Relative humidity and precipitation) and occurrence of asthmatic attacks. Concentration of NO, SO failed to show any significant association with occurrence of asthma exacerbation attacks. RSPM was found to be significantly associated with asthmatic attacks though the regression coefficient was small. Close follow up and regular monitoring of patients in this study may have increased awareness in study participants and prompted better compliance with the advised treatment and control guidelines being provided to them from time to time. This might have led to better control of asthma in study participants even on exposure to air pollutants and weather variables. The study shows that adequate treatment of asthmatics is largely able to counter any increased tendency for exacerbations due to worsening air pollution and weather variables.

5. Evaluation of discriminative properties of GOLD 2011 classification of chronic obstructive pulmonary disease

Patient-centered outcomes play a major role in determining the impact, manifestations, the overall morbidity and the course of the disease. Hence, a unidimensional classification of Chronic Obstructive Pulmonary Disease that was GOLD 2006 was replaced by a multidimensional classification into four groups in the GOLD 2011 guidelines based on FEV_1, mMRC grade of dyspnea or CAT score, and number of exacerbations or hospitalizations in the previous year. We carried out a study in 400 patients to assess the frequency distribution of subjects attending a tertiary care hospital using GOLD 2011 categories and compared that with the older classification on the same patients to determine the agreement between the two. We also aimed to study the discriminative properties of the new classification with respect to patient-centered outcomes (exercise tolerance, health-related quality of life and dyspnea), pulmonary function, radiological extent of emphysema, pulmonary hemodynamics and right ventricular function on echocardiography, systemic inflammation and extra parenchymal involvement including vascular properties, nutritionals status and comorbidities. Sixty seven subjects went under detailed examination for assessment of cardiovascular function including echocardiography and evaluation of vascular properties, nutritional status, lung function and patient-centered outcomes. The study showed that the frequency distribution according to the GOLD 2006 staging of severity was 9%, 39%, 42% and 10% in stages I to IV, respectively. Using the GOLD 2011 mMRC classification the distribution of the same patients from groups A to D was 7%, 31%, 4% and 58% respectively and when GOLD 2011 CAT was used the distribution was somewhat different at 9%, 29%, 4% and 58% classified as A to D respectively. The new classification tended to classify patients in higher grades of severity than the older classification. The concordance and agreement between GOLD 2006 and 2011 classifications was poor, irrespective of whether CAT or mMRC scores were used. Also it was noted that the agreement between the symptom (mMRC and CAT) and risk (FEV_1 and exacerbations) assessment tools in the new classification was moderate to good but these were not identical. There was no difference seen between the two classifications in the assessment of dyspnoea, emphysema, systemic inflammation, cardiovascular risk and right heart dysfunction. The 2006 and 2011 severity groups differed in terms of spirometry and diffusion capacity impairments but air trapping increasing with severity was found only with 2011 classification. We concluded that even though the new GOLD 2011 classification is a multidimensional tool that assesses COPD patients beyond spirometry and is a step ahead than the previous GOLD 2006 classification, it fails to be a perfect one and has limitations.

6. Impact of obesity on bronchial asthma in Indian population

Obesity and asthma are common inflammatory conditions, having presence of both local and systemic inflammation and this relationship is not well understood. This study was undertaken to compare pulmonary function parameters, inflammatory marker like C-reactive protein (hs-CRP), exhaled nitric oxide (FE_{NO}) and atopic profile between non-obese and obese bronchial asthma patients in Indian population. The study aims to elucidate the association between the systemic and local inflammatory response relating to obesity in asthmatics. Sixty bronchial asthma patients were recruited for the study, and were divided equally into obese (BMI>30 kg / m2) and non-obese (BMI<25 kg / m2) groups. These were assessed for pulmonary function parameters, blood hs-CRP levels, exhaled breath analysis of nitric oxide and skin prick testing for atopic profile. The study was approved by Institutional Ethical Committee. The mean body mass index (BMI) for the non-obese and obese group was 21.64 kg / m2 and 34.1 kg / m2 respectively ($P = 0.001$). The functional residual capacity (FRC% predicted) (100.9 ± 4.21 *vs* 80.40 ± 4.03; $P = 0.009$) and expiratory reserve volume (ERV% predicted) (95.13 ± 6.71 *vs* 67.03 ± 4.54; $P = 0.001$) both were significantly lower in the obese group. The non-obese and obese group had hs-CRP levels of 3.01 mg / L and 4.07 mg / L, respectively; the difference being statistically insignificant ($P = 0.15$). Similarly, FE_{NO} levels of non-obese and obese group were 63.20 ppb and 63.75 ppb, respectively; difference was not statistically significant ($P = 0.95$). Atopic profile of both the groups did not differ significantly. Obesity does not appear to increase the local and systemic inflammatory responses in bronchial asthma patients in Indian population.

Allergy and Immunology Education Symposium was organised on 18 November 2014, in association with American Association of Allergists and Immunologists of Indian Origin (AAAIIO), USA and Society for Tobacco Control (STC).

7. Correlation of exhaled nitric oxide, nasal nitric oxide and atopic status: a cross-sectional study in bronchial asthma and allergic rhinitis

Exhaled nitric oxide (FE_{NO}) and nasal nitric oxide (n NO) measurement is an area of ongoing research in the study of airway inflammation. The atopic status is known to influence the levels of FE_{NO} and n NO. This study was undertaken to study the relationship between nitric oxide measurements in bronchial asthma and allergic rhinitis along with their correlation with atopic profile of Indian population. Ninety subjects were recruited for the study comprising of 25 each of bronchial asthma (BA), allergic rhinitis (AR), bronchial asthma with allergic rhinitis (BA-AR) and 15 healthy controls. These were assessed for atopy and exhaled breath analysis of nitric oxide. The measurements of FE_{NO} and n NO levels were done using NIOX chemiluminescence analyzer. Atopy was assessed by skin prick testing (SPT) against 58 common aero-allergens and subjects with ≥1 positive SPT were labeled as atopic. The BA-AR and BA groups had higher FE_{NO} levels in comparison to the control ($P < 0.05$) and AR group ($P < 0.05$). The AR and BA-AR groups had

higher n NO levels compared to the control group ($P < 0.05$) and BA group ($P < 0.05$). The increasing FE_{NO} levels significantly correlated with the increase in the number of allergen sensitization in patients suffering from BA-AR ($P < 0.05$). However, the BA group showed a weaker positive correlation ($P = 0.07$). FE_{NO} is a non-invasive marker of airway inflammation. Also, FE_{NO} levels correlate with presence and degree of atopy in BA and AR. Simultaneously, n NO could be a surrogate marker of rhinitis.

8. Monitoring of indoor particulate matter during burning of mosquito coil, incense sticks and dhoop

Indoor combustion source, like incenses, are commonly used for aesthetic and religious purposes in various indoor as well as outdoor environments. The combustion leads to the production of a large amount of smoke, which can pose a health risk due to inhalation exposure of particulate matter (PM). Monitoring of PM (PM10, PM2.5, and PM1) during the preburning, burning and postburning phases of incenses (agarbatti and dhoop) and mosquito coil in the indoor environment. The monitoring of PM was carried out using the Grimm Portable Laser Aerosol Spectrometer and dust monitor model 1.108 / 1.109. The substances used were mosquito coil, incense (sandal), incense (floral sticks) and dhoop. The data were analyzed using the SPSS statistical package version 14.0 for windows (SPSS, Chicago, IL, USA), using one way analysis of variance to compare the PM10, PM2.5 and PM1 concentration levels. The mean concentrations of PM10 (1879.7 µ / m3), PM2.5 (1775.4 µ / m3) and PM1 (1300.1 µ / m3) during burning phase were highest for dhoop. The mean concentrations of PM10, PM2.5 and PM1 during burning of mosquito coil were 259.2 µ / m3, 232.4 µ / m3 and 214.0 µ / m3 respectively. The burning of incense (flora) had PM10 (854.1 µ / m3), PM2.5 (779.8 µ / m3) and PM1 (699.8 µ / m3), which were higher, in comparison to burning of incense (sandal). The particulate emission during the burning of dhoop (PM10, PM2.5, PM1) was significantly higher ($P < 0.05$) than incense (sandal and flora) and mosquito coil. The concentrations of PM10, PM2.5 and PM1 even during postburning phase were significantly higher for dhoop in comparison to other three products, resulting in prolonged exposure even after the cessation of burning phase. The study suggests burning of dhoop, incense sticks and mosquito coil in the indoor environment emit quiet higher respirable PM, which may accumulate on prolonged exposure and lead to respiratory illnesses

9. Evaluation of Vitamin D in bronchial asthma and its effect on asthma severity and control

Background: There is an increasing number of researches linking vitamin D [serum 25(OH)D3] to various immune-related conditions including allergy. Higher Vitamin D levels are associated with decreased airway hyperresponsiveness and decreased inflammatory markers. It has been hypothesized that low levels of vitamin D are associated with poor asthma control and increased severity of asthma. This study evaluates the levels of Vitamin D in subjects of asthma, the association of Vitamin D levels with asthma control and the effect of Vitamin D supplementation on severity and control of asthma.

Methods: Forty-two subjects of asthma were recruited from the OPD of Viswanathan Chest Hospital, VPCI. Spirometry was performed and they were classified as per GINA guidelines. The Asthma Control Test (ACT) score was calculated. Vitamin D (25 OH Cholecalceferol) was estimated by enhanced chemiluminiscence method. Subjects were randomly assigned to two groups - the Study group and the Control group. Twenty one patients of the study group received standard therapy along with oral vitamin D (chole-calciferol; 1000 IU) for 8 weeks. Subjects of control group received standard medications without supplementation with Vitamin D. ACT scores and Vitamin D levels were reassessed at the end of study.

Results: The mean value of Vitamin D in study group was 18.16 ± 5.32ng / ml which improved to 27.16 ± 7.61ng / ml after supplementation. The value in control group was 18.79 ± 6.07 at the start and 19.14 ± 5.81 at end of study. The difference was found to be highly significant ($p<0.01$). There was significant improvement in asthma control and severity in the study group subjects after supplementation with Vitamin D. The mean value of ACT score in study group was 16.62 ± 3.18 at baseline which improved to 22.08 ± 1.17 after treatment. The difference was found to be highly significant ($p<0.001$). In the control group, it was 17.57 ± 6.86 at the start and 19.78 ± 2.39 at the end of study ($p<0.05$). Further, it was observed that those with lower Vitamin D levels had lower ACT scores and improvement of Vitamin D levels after supplementation resulted in significant improvement in ACT scores ($p<0.05$).

Conclusion: Vitamin D levels were low in patients of asthma. Supplementation with Vitamin D improves control in patients of asthma. Screening asthmatics for Vitamin D and supplementation if levels are found inadequate may be beneficial.

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 MD and PhD courses in Pulmonary Medicine, Biochemistry, Microbiology, Pharmacology and Physiology, and DTCD. The Institute is also running DM course in Pulmonar Medicine. The students currently enrolled in these courses are shown below.

DTCD

Session 2013 - 2015	Session 2014 - 2016
Dr Harish Bhatia	Dr Gulnar Begum
Dr Saurabh Burman	Dr Sarfaraz Jamal
Dr Tinu Garg	Dr Kavita Kumari
Dr Manish	Dr Kiran Nilugal
Dr Ajay L. Parmar	Dr Gurmeet Singh

An Alumni Meet was held on 18 September 2014, Prof. H.S. Randhawa, an Alumni of VPCI and former Director, VPCI, sharing his experiences of life at VPCI on this occasion.

Teachers Day was celebrated on 5 September 2014 on the birth Anniversary of Dr S. Radhakrishnan.

MD Degrees (Awarded)

(Session: 2011-2014)

Name	Discipline
Dr Devi Jyoti Das	Pulmonary Medicine
Dr Gaki Nima	Pulmonary Medicine
Dr Nitesh Gupta	Pulmonary Medicine
Dr Shweta Paul	Biochemistry
Dr Anshu Mittal	Microbiology
Dr Poornima Sen	Microbiology
Dr Sandeep Madhukar Wankhede	Microbiology
Dr Santosh Kumar	Pharmacology

MD Theses (Submitted)

(Session: 2012-2015)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Punit Agarwal (Pulmonary Medicine)	Utility of high attenuating mucus (HAM) and other radiologic features (ORF) in diagnosed cases of allergic bronchopulmonary aspergillosis: a retrospective and prospective study	Dr Anuradha Chowdhary and Prof. S.N. Gaur
2.	Dr Kamal Kumar (Pulmonary Medicine)	To study the effect of nasal polyposis on nocturnal sleep disturbances, daytime sleepiness and sleep specific quality of life disturbances in patients presenting with allergic rhinitis	Prof. Ashok Shah
3.	Dr Ankit Mittal (Pulmonary Medicine)	Correlation of inflammatory markers and vitamin D levels with the severity of disease and frequency of acute exacerbations of chronic obstructive pulmonary disease	Prof. S.N. Gaur and Dr B.K. Menon
4.	Dr Jayanthi G. (Microbiology)	Phenotypic and molecular characterization of drug resistant *Pseudomonas aeruginosa* isolates from clinical samples	Dr Malini Shariff
5.	Dr Ruby Stella R. (Physiology)	Phenotypical variations in cardio-respiratory responses and gait characteristics during sub-maximal exercise in chronic obstructive pulmonary disease	Dr Vishal Bansal and Prof. S.K. Chhabra

MD Theses (Pursued)
(Session: 2013-2016)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Viswesvaran B (Pulmonary Medicine)	A study of clinico-pathological profile of patients with lung cancer (2014-16)	Prof. Rajendra Prasad and Dr Ritu Kulshrestha
2.	Dr Gaurav Bhati (Pulmonary Medicine)	A prospective study to assess the role of N-acetylcysteine and comparison with pulmonary rehabilitation on quality of life in patients on chronic obstructive pulmonary disease	Prof. S.N. Gaur and Dr Vishal Bansal
3.	Dr Richa Mittal (Pulmonary Medicine)	Evaluation of discriminative properties of GOLD 2011 classification of chronic obstructive pulmonary disease	Prof. Rajendra Prasad Prof. S.K. Chhabra, and Dr Vishal Bansal
4.	Dr Muhammed Noufal Poongadan (Pulmonary Medicine)	Dietary pattern and lifestyle in bronchial asthma and their influence on bronchial asthma control	Prof. Raj Kumar
5.	Dr Archana Bhandekar (Microbiology)	Contribution of efflux pumps to rifampicin resistance in clinical isolates of *M. tuberculosis*	Dr Mandira Varma-Basil, Dr B.K. Menon and Dr Mujeeb-ur-Rahman
6.	Dr Stuti Gupta (Microbiology)	Role of respiratory viruses in exacerbations of chronic obstructive pulmonary disease	Dr Madhu Khanna, Dr Malini Shariff, Prof. S.K. Chhabra, Prof. S.N. Gaur and Prof. Raj Kumar
7.	Dr Sachinkumar Pancham Gajbhiye (Pharmacology)	A clinical study to monitor adverse drug reaction profiles in patients of bronchial asthma and COPD	Dr Kavita Gulati and Prof. A. Ray
8.	Dr Raman Ghai (Physiology)	Effect of chronic intermittent hypoxia on contractile properties of the upper airway muscles in rats	Prof. K. Ravi and Prof. A. Ray

MD-Ist Year
(Session: 2014-2017)

Name	Discipline
Dr Prakhar Garg*	Pulmonary Medicine
Dr Sekhar Kunal	Pulmonary Medicine
Dr Manu Madan	Pulmonary Medicine
Dr Nipun Malhotra	Pulmonary Medicine
Dr Harsh Vardhan	Pulmonary Medicine
Dr Aditi	Microbiology
Dr Rashi Khanna	Microbiology
Dr Goutam Arora	Pharmacology

*: Left in 2015

DM Theses (Awarded)

(Session: 2011-2014)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Vikas Dogra (Pulmonary Medicine)	Body mass index and quality of life in different CT phenotypes in male patients of COPD : a comparative study	Prof. S.N. Gaur and Dr B.K. Menon

DM Theses (Submitted)

(Session: 2012-2015)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Pawan Gupta (Pulmonary Medicine)	Characterisation of nocturnal hypoxemia in chronic obstructive pulmonary disease	Prof. S.K. Chhabra
2.	Dr Mandeep Singh (Pulmonary Medicine)	Effect of obesity and metabolic syndrome on severity, quality of life, sleep quality and inflammatory markers in patients of bronchial asthma	Prof. Rajendra Prasad Prof. Raj Kumar and Prof. S.N. Gaur

DM Theses (Pursued)

(Session: 2013-2016)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Mohd Yousoof Dar (Pulmonary Medicine)	Study of inflammatory markers in sputum positive patients of pulmonary tuberculosis and its response to anti-tubercular treatment	Dr B.K. Menon
2.	Dr Vikas Chandra Pilaniya (Pulmonary Medicine)	Occurrence of bronchial anthracofibrosis in respiratory symptomatics with history of exposure to biomass fuel smoke	Prof. Ashok Shah

(Session: 2014-2017)

1.	Dr Chandrakant Tarke (Pulmonary Medicine)	Occurrence of bronchiectasis in patients with COPD: smokers *versus* never smokers and the association of upper airway symptoms with quality of life in these patients	Prof. Ashok Shah
2.	Dr Supreet Batra (Pulmonary Medicine)	An association of depression in asthma and role of pulmonary rehabilitation *versus* anti-depressant drug therapy in patients with moderate and severe asthma	Prof. S.N. Gaur

PhD Awarded/Submitted

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Ms Kushal Garima (Microbiology)	Expression analysis and protein profiling of drug efflux transporters in clinical isolates of *M. tuberculosis*	Prof. Mridula Bose and Dr Mandira Varma-Basil	Awarded
2.	Ms Latika (Microbiology)	Generation, characterisation and biological relevance of human monoclonal antibodies against pandemic H1N1 (2009) and seasonal influenza virus	Dr Madhu Khanna and Dr Sunil K. Lal (ICGEB, New Delhi)	Awarded
3.	Ms Nisha Rathor (Microbiology)	Regulation of expression of *mce4* operon of *M. tuberculosis*: search for upstream promoter activity and regulatory proeins	Prof. Mridula Bose and Dr Mandira Varma-Basil	Awarded
4.	Ms Roopali Rajput (Microbiology)	Construction and characterisation of functional scfv antibodies against nucleocapsid protein and non-structural protein1 proteins of pandemic influenza H1N1 (2009) virus	Dr Madhu Khanna and Dr H.K. Pradhan (WHO, New Delhi)	Awarded
5.	Mr Ravindra Sharma (Physiology)	Hypothalamic regulation of high altitude pulmonary oedema	Prof. K. Ravi Prof. A. Ray and Dr P.K. Reddy (DIPAS, Delhi)	Awarded
6.	Mr Rishabh Charan Choudhary (Physiology)	Higher nervous control of the pulmonary renal reflex	Prof. K. Ravi and Dr Kavita Gulati	Awarded
7.	Mrs Shallu Kathuria (Microbiology)	*Histoplasma capsulatum*: a study of its natural reservoirs and role in respiratory and systemic infections in immunocompromised patients	Dr Anuradha Chowdhary and Prof. H.S. Randhawa	Submitted
8.	Mr Jagdish Chander Joshi(Pharmacology)	Experimental studies on the possible role of nitric oxide during acute and chronic morphine in normal and stressed rats	Dr Kavita Gulati and Prof. A. Ray	Submitted

PhD Theses (Pursued)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
1.	Mr Manoj Kumar (Biochemistry)	Studies on erythrocyte membrane protein profile and oxidant and antioxidant status of blood in bronchial asthma	Prof. S.K. Bansal Prof. Rajendra Prasad and Prof. S.K. Chhabra	2013
2.	Ms Apoorva Pandey (Biochemistry)	Role of innate immune response mechanisms in development of bleomycin induced lung fibrosis	Prof. S.K. Bansal and Dr Ritu Kulshrestha	2014
3.	Mr Anil Meena (Biochemistry)	A study on CRHR1 and GR gene polymorphism and their correlation with the expression of various inflammatory cytokines in asthma in North Indian population	Prof. S.K. Bansal, Prof. S.K. Chhabra and Dr B.K. Menon	2015
4..	Mr Anupam Prakash (Microbiology)	A study of *Cryptococcus* species in immunocompromised patients	Dr Anuradha Chowdhary and Prof. H.S. Randhawa	2010
5.	Ms Anshika Narang (Microbiology)	Efflux mechanism in *Mycobacterium tuberculosis:* to study the effect on drug susceptibility profile	Dr Mandira Varma-Basil and Prof. Mridula Bose	2011
6..	Mr Dibya Ranjan Pati (Microbiology)	Nano-therapeutic application of small interfering ribonucleic acid (RNA) and micro RNA against human influenza virus	Dr Madhu Khanna and Dr A.C. Banerjee (NII, New Delhi)	2012
7.	Mr Naresh Kumar (Microbiology)	Expression analysis of an array of genes of *M. tuberculosis* clinical isolates from pulmonary tuberculosis and lymph node tuberculosis: search for mycobacterial factors associated with different clinical manifestations	Dr Mandira Varma-Basil and Prof. Mridula Bose	2012
8.	Ms Pooja Singh (Microbiology)	Utilisation of cholesterol by *mce4A* (Rv3499) overexpressed *M. tuberculosis* H37Rv and the effect of calcium blockers	Dr Mandira Varma-Basil and Prof. Mridula Bose	2012
9.	Ms Cheshta Sharma (Microbiology)	Molecular mechanisms of triazole antifungal resistance in *Aspergillus fumigatus* and *Aspergillus flavus* originating from clinical and environmental sources	Dr Anuradha Chowdhary	2013

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
10	Mr Gaurav Tyagi (Microbiology)	To study the role of biotin in the biology of *Mycobacterium tuberculosis*	Dr Mandira Varma-Basil, Prof. Mridula Bose and Prof. Ashok Prasad (Dept. of Chemistry, University of Delhi)	2013
11.	Mr Pradeep Kumar Singh (Microbiology)	Phenotypic and molecular characterisation, antifungal susceptibility profiles and clinical significance of *Basidiomycetes* molds occurring in patients with respiratory disorders	Dr Anuradha Chowdhary and Prof. S.N. Gaur	2013
12.	Ms Shraddha Porwal (Microbiology)	Phenotypic and genotypic indicators of pre MDR tuberculosis: prediction of the development of MDR tuberculosis	Dr Mandira Varma-Basil and Prof. Rajendra Prasad	2013
13.	Ms Astha Giri (Microbiology)	Characterization of genotypic indicators of ethambutol resistance in clinical isolates of *Mycobacterium tuberculosis*	Dr Mandira Varma-Basil	2014
14.	Mr Dhirendra K. Singh (Pharmacology)	Experimental studies with chelidonic acid, a molecule of plant origin, with possible therapeutic potential in bronchial asthma	Prof. A. Ray and Dr Kavita Gulati	2010
15.	Ms Meenakshi Sharma (Pharmacology)	Studies on the possible role of nitric oxide in high altitutde stress induced neurobehavioural and immunological changes in rats	Prof. A. Ray, Prof. K. Ravi and Dr Kavita Gulati	2011
16.	Mr Nishant Rai (Pharmacology)	Experimental studies on the cellular and molecular mechanisms of action of UNIM-352, a polyherbal Unani preparation to validate its use in bronchial asthma	Dr Kavita Gulati and Prof. A. Ray	2011
17.	Mr Md. Shamsuzzaman (Pharmacology)	Pharmacological studies on the possible mechanisms involved in theophylline induced cardiotoxicity in rats	Prof. A. Ray and Dr Kavita Gulati	2012
18.	Mr Tarun Takhur (Pharmacology)	Pharmacological studies on the possible role of nitric oxide (NO) and NO mediated signalling pathways in the regulation of stress-induced immunomodulation in rats	Prof. A. Ray and Dr Kavita Gulati	2012

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
19.	Ms Sulekha Chaudhary (Pharmacology)	Studies on the anti-inflammatory and immunomodulatory effects of *Albizia lebbeck and Solanum xanthocarpum* in experimental models of bronchial asthma	Dr Kavita Gulati and Prof. A. Ray	2013
20.	Mr Harikesh Dubey (Pharmacology)	Experimental studies on the association between Alzheimer's disease and diabetes mellitus: a novel approach to possible therapeutic strategies	Prof. A. Ray and Dr Kavita Gulati	2014
21.	Mr Shiv Prakash (Pharmacology)	Experimental studies to evaluate the time dependent changes in stress responses and their regulation by nitric oxide	Prof. A. Ray and Dr Kavita Gulati	2015
22.	Dr Ritu Kulshrestha (Physiology)	Pathophysiological studies in bleomycin induced pulmonary hypertension and fibrosis in rat model	Prof. K. Ravi and Prof. A.K. Dinda (AIIMS, New Delhi)	2009

The VPCI Honour Lecture was held on 16 December 2014. Prof. Qmar Rahman, Director and Dean (Research), Amity University, Lucknow, Uttar Pradesh and Prof Avinash C. Pandey, Vice-Chancellor, Bundelkhand University, Jhansi, enlightened the audience with their talks on *The Epoch of Nano-therapy Cutting Edge* Advanced Theranostics and its Threat, and Nano-material and Futuristic Medicine.

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

Sl No.	Name (Discipline) and Institution's Name	Title of Theses	Supervisor(s)	Status
1.	Ms Anju Sharma (Biochemistry)	To investigate the effect of histone hyperacetylation on the expression of genes involved in lung carcinogenesis	Prof. Jayashree Bhattacharjee (Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi) and Dr Viswajeet Rohil	Awarded
2.	Dr Kakasaheb H. Bhosale (MD Medicine) Ram Monahar Lohia Hospital, New Delhi	Cryptococcal antigenemia in anti-retroviral therapy naïve patients with human immunodeficiency virus infection	Dr Brijesh Sharma (Dept. of Medicine, RML Hospital, PGIMER & RML Hospital, New Delhi) and Dr Anuradha Chowdhary	Submitted
3.	Mr Jamal Ali Moiz (PhD Physiotherapy) Jamia Millia Islamia, New Delhi	Effect of the addition of balance training to pulmonary rehabilitation for patients with COPD	Prof. M. Ezaj Hussain Prof. S.N. Gaur and Dr Vishal Bansal	Pursued
4.	Ms Karuna Sharma (PhD Biochemistry) Faculty of Medical Sciences, University of Delhi, Delhi	Genetic polymorphism of matrix metalloproteinases-9 (MMP-9) and its correlation with the maternal serum level of biomarkers (PAPP-A, free ь-hCG) and proinflammatory cytokines in preeclampsia in north Indian population	Prof. Ritu Singh (Dept. of Biochemistry, Lady Harding Medical College, New Delhi, Prof. Jayashree Bhattacharjee (Vardhman Mahavir Medical College and Safdarjung Hospital, New Delhi) and Dr Viswajeet Rohil	Pursued
5.	Mr Kaushik Bhattacharya (MSc-PhD combined Programe in Biomedical Sciences) Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Novel non synonymous mutations in a multi-drug resistant isolate of *M. tuberculosis*	Dr Vani Brahmachari (Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi) and Dr Mandira Varma-Basil	Pursued

Sl No.	Name (Discipline) and Institution's Name	Title of Theses	Supervisor(s)	Status
6.	Dr Nisha Yadav (MD Medical Microbiology) Lady Hardinge Medical College, New Delhi	Study of vulvovaginal candidiasis in pregnant females	Dr V.S. Randhawa (Dept.of Microbiology, LHMC, New Delhi) and Dr Anuradha Chowdhary	Pursued
7.	Ms Ramandeep Kaur (PhD Microbiology) Baba Farid University of Health Sciences, Faridkot, Punjab	Molecular epidemiology of *M. tubrerculosis* isolated from cases of pulmonary tuberculosis in Punjab	Prof. Neerja Jindal (Dept. of Microbiology, Baba Farid University of Health Sciences, Faridkot, Punjab) and Dr Mandira Varma-Basil	Pursued
8.	Dr Sulabh Saini (MD Community Medicine) University College of Medical Sciences, Delhi	Effect of air pollution and weather changes on exacerbation of asthma: a cohort study	Prof A.K. Sharma (University College of Medical Sciences, Delhi) and Prof. S.K. Chhabra	Pursued

Distinguished Visitors

- Dr Bob Lanier, Executive Medical Director, American College of Allergy Asthma and Immunology, Clinical Professor: Pediatrics University of North Texas HSC 6310 Southwest Blvd Fort Worth, Texas 76109, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr Jay M. Portnoy, Chief, Section of Allergy, Asthma & Immunology The Children's Mercy Hospital 2401 Gillham Road Kansas City, MO 64108, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr Bryan L. Martin, Vice President, American College of Allergy Asthma and Immunology Program Director, Allergy Immunology Fellowship Associate Dean, ADM-Medicine Administration The Ohio State University The Wexner Medical Center 125 Doan Hall 410 West 10th Avenue Columbus, OH 43210, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr Leonard Bielory, Director, STARx Allergy and Asthma Center, LLC Medicine, Pediatrics, Ophthalmology and Visual Sciences Rutgers University Center for Environmental Prediction 400 Mountain Avenue Springfield, New Jersey 07081, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr Sami Bahna, Professor of Pediatrics & Medicine, YK Reddy Professor of Allergy & Immunology; Chief of Allergy & Immunology Section Louisiana State University Health Sciences Center Shreveport, Louisiana, USA, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr Jayesh G. Kanuga, Adult and Pediatric Allergist of Central Jersey STARx Research Center, LLC; Diplomat of American Board of Allergy & Immunology Clinical Assistant Professor, Division of Allergy and Immunology, USA, visited the Department of Respiratory Allergy and Applied Immunology, Department of Pulmonary Medicine on 18th November 2014.
- Dr H.K. Pradhan, WHO India Office, New Delhi, visited VPCI, to review the work done by PhD student, as co-supervisor.
- Prof. Deepak Sehgal, Prof. & Head, Dept. of Life Scinces, Shiv Nadar University, Gautam Budh Nagar, Uttar Pradesh, visted VPCI for Project Collaboration.

Awards/Honours

Prof. Rajendra Prasad

- **Vigyan Gaurav Award**, Council of Science and Technology, Government of Uttar Pradesh.
- **LMA Transformation Leadership Award 2014**, Lucknow Management Association (LMA), Lucknow, Uttar Pradesh.
- **Vice-Chairman**, National Task Force RNTCP for involvement of medical colleges.
- **Vice President**, Uttar Pradesh Tuberculosis Association.
- **Chairman**, Standing Technical Committee, Tuberculosis Association of India.
- **Editor-in-Chief and Publisher**, *Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India) (Up to 28.02.2015).
- **Editorial Advisor**, *Journal of Clinical Epidemiology and Global Health* of IndiaClen.
- **Member**, Diagnosis and Management of TB under RNTCP, Govt. of India.
- **Member**, Sub-Committee for Drug Regimen for TB and HIV, Health and Family Welfare, Govt. of India.
- **Member**, Indian Initiative on Obstructive Sleep Apnea Guidelines, Department of Health Research, Ministry of Health and Family Welfare, Govt. of India.
- **Member**, Developing Curriculum and Training Module on High Altitude Mountain Medicine, Govt. of India.
- **Member**, Indian Standard of TB Care, Govt. of India.
- **Chairman**, Ethical Committee, National Institute of TB and Respiratory Diseases, New Delhi,
- **Member**, Selection Committee, AIIMS, New Delhi, for the post of Assistant Professor.
- **Member**, Selection Committee, Hamdard University, New Delhi, for Assistant Professor in Pulmonary Medicine.
- **Member**, Selection Committee, National Institute of Tuberculosis and Respiratory Diseases, New Delhi, for the posts of Medical Officer and Assistant Superintendent.

Prof. S.N. Gaur

- **Secretary**, National College of Chest Physicians (India).
- Nominated **Member** of various sub committee of American Academy of Allergy Asthma and Immunology (AAAAI) 2014-2015.
- **Executive Council Nominee**, Governing Council, V.K.R.V. Rao Hostel, University of Delhi, for 2013-2015.
- **Chairman**, Ethics Committee, New Delhi Tuberculosis Centre, New Delhi.
- **Editor-in-Chief**, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Editor-in-Chief and Publisher**, *Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India) (w.e.f. 01.03.2015).

- **Advisor**, Editorial Board, *Indian Journal of Geriatric Care*, Delhi.
- **Member**, Programme Advisory Committee for Environment Research Programme (EnvRP), Ministry of Environment and Forest, Govt. of India, NewDelhi.
- **Member**, Committee of experts on Standardization of Commercial Allergens Used for Diagnosing in respect of Cockroach and Moth, National Institute of Biologicals, MOH & FW, Noida.

Prof. A. Ray

- **Secretary**, Society for Nitric Oxide and Allied Radicals (SNOAR).
- **Expert Member** of several academic, scientific decisions / policy making committees / selection committees of ICMR, DBT, DRDO, AYUSH, CDSCO / DCG-I, CDRI-CSIR, Central Universities (JNU, Jamia Hamdard, BHU, GGIPU).

Prof. Ashok Shah

- Nominated as **Indian Editorial Advisor**, *European Respiratory Journal*.
- **Editor**, *Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **National Advisor**, *Indian Journal of Tuberculosis*, an official publication of the Tuberculosis Association of India.
- **Associate Editor**, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Section Editor** (Infectious Diseases), *Lung India*, an official publication of the Indian Chest Society.
- **Member**, Editorial Board, *European Respiratory Journal* of the European Respiratory Society.
- **Member**, Editorial Board, *European Respiratory Reviews* of the European Respiratory Society.
- **Member**, Editorial Board, *Asian Pacific Allergy Journal* of the Asia Pacific Association of Allergy, Asthma and Clinical Immunology (APAAACI).
- **Member**, Editorial Board, *Open Allergy Journal.*
- **Member**, Editorial Board, *Current Medical Trends.*
- **Member**, National Committee on "*Bibliographic Biomedical Database from Indian Literature*", Indian Council of Medical Research - National Informatics Centre, New Delhi.
- **Technical Advisor**, Standing Selection Committee, for the post of Assistant Professor of Pulmonary Medicine and Sleep Disorders, All India Institute of Medical Sciences, New Delhi March 2014.
- **External Expert**, Technical Committee –National Institute of Tuberculosis and Respiratory Diseases, New Delhi for the purchase of bronchoscopes 2014-15.

Prof. S.K. Chhabra

- **Editor**, *Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Associate Editor**, *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Section Editor** (Pulmonary Circulation), *Lung India*, an official publication of the Indian Chest Society.
- **Expert**, Selection Committee. Defence Research and Development Organization, Government of India.

- **Expert**, Technical Evaluation Committee, National Institute of Tuberculosis and Respiratory Diseases, New Delhi.
- **Expert**, Technical Evaluation Committee, Rajan Babu Institute of Pulmonary Medicine and Tuberculosis, Delhi.

Prof. K. Ravi

- **Member,** Expert committee for the advancement of physiological sciences (ICMR).
- **Member,** Project review committee, ICMR.

Prof. S.K. Bansal

- **Joint Secretary,** Indian College of Allergy and Applied Immunology (ICAAI).
- **Vice President**, Delhi Chapter, Association of Clinical Biochemists of India.

Prof. Raj Kumar

- **Shiksha Gaurav Puraskar 2014** for outstanding and Exemplary Contribution towards higher education from Centre for Education Growth and Research (CEGR), New Delhi.
- **Member,** Formulating Strategies for Intensified TB Control Campaign by Revised National Tuberculosis Control Programme (RNTCP), New Delhi.
- **Member,** Exploring Quitlines: Exploration of Quitlines in the Asia Pacific Region to better serve smokers at Chinese Center for Disease Control & Prevention, Beijing, China.
- **Associate Editor**, Editorial Board, *Indian Journal of Chest Diseases and Allied Sciences*, an official publication of the V.P. Chest Institute and the National College of Chest Physicians (India).
- **Section Editor** (Occupational Disorders and Research Methods), *Lung India*, an official publication of the Indian Chest Society.
- **Assistant Editor,** *Indian Journal of Allergy, Asthma and Immunology*, an official publication of the Indian College of Allergy, Asthma and Applied Immunology.
- **Editor**, *Tobacco Control Bulletin*, an official publication of the Society for Tobacco Control, Delhi.
- **Member**, Editorial Board, *Current Allergy and Asthma Reports Journal* published by Springer (Philadelphia).
- **Member**, Editorial Board**,** *International Journal of Occupational and Environmental Health*, USA.
- **Advisor,** *Respire*, Sri Lanka (Official publication of the Sri Lanka College of Pulmonologists).
- **Secretary**, Society for Tobacco Control.
- **Treasurer,** South Asia Associacion of Asthma, Allergy and Clinical Immunology.

Dr Malini Shariff

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

Dr Madhu Khanna

- **Editor**, *Journal of Virology Research.*
- **Editor**, *International Journal of Immunology Research.*
- **Secretary General**, Biotechnology Society of India.

- **Joint Secretary**, International Association of Medical and Pharmaceutical Virologists.
- Awarded **Travel Grant** to attend the 4th ISIRV-AVG Conference in Austin, USA.
- **CPCSEA -IAEC Member,** Link Nominee for Indira Gandhi National Open University, New Delhi.
- **CPCSEA- IAEC Member** for Bio-Med Pvt. Ltd, Bulandshahr, Ghaziabad.
- **CPCSEA- IAEC Member,** Link Nominee for Amity University Campus, Noida.
- **CPCSEA -IAEC Member,** Link Nominee for Jamia Hamdard University, New Delhi.
- **CPCSEA -IAEC Member** for Vardhman Mahavir Medical Collage and Safdarjung Hospital, New Delhi.

Dr Mandira Varma-Basil

- **Expert**, Societal Research Fellowship Scheme – Disha Programme Group Monitoring Workshop (GMW), DST.
- **Member**, Ethics Committee, Rajan Babu Institute of Pulmonary Medicine and Tuberculosis.

Dr Anuradha Chowdhary

- **Fellow**, Infectious Diseases Society of America.
- **Director**, Board of Asia Pacific Society of Medical Mycology.
- **Deputy Editor**, *Mycoses*, an official Journal of the Europeon Confedration of Medical Mycology.
- **Academic Editor**, *PLoS One* an international, peer-reviewed, open-access, online publication from public library of Science.

Dr Anita Kotwani

- **Member,** Core Group of Antimicrobial Stewardship Programme (AMSP) and **Nodal Person** for planning the studies to understand the prescription practices in hospitals as well as community to present the proposal for carrying out such studies in different states of India, ICMR, New Delhi.
- **Member**, Steering Committee to Assess, Review and form Guidelines on Antimicrobial Resistance, under "National Programme on Containment of Antimicrobial Resistance", DGHS, Ministry of Health and Family Welfare, Govt. of India.
- **Member**, Task Force Committee constituted to assess, review and suggest measures on Antimicrobial Resistance, and develop a National Antibiotic Policy, DGHS, Ministry of Health and Family Welfare, Govt. of India.
- **Member**, National Working Group of the Global Antibiotic Resistance Partnership (GARP)-India.

Dr Kavita Gulati

- **Visiting Scientist**, Department of Biomedical Sciences, University of Western Cape, Cape Town, South Africa 2014.
- **Visiting Scientist**, Department of Medical Bioscience, Faculty of Science, Henkel West Cape University, South Africa 2014.
- **Treasurer**, Society for Nitric Oxide and Allied Radicals (SNOAR).
- **Subject specialist** for Interview panel for recruitment of the Group C (Non-gazetted) paramedical post in the field of tuberculosis for Delhi Subordinate Services Selection Board (DSSSB), Govt. of NCT of Delhi.

- **Expert** for review of M.Pharma projects of Gujarat Technological University during Reserch Week 2015, Ahmedabad, Gujarat.
- **Expert** for review of projects and progress at Central Council for Research in Homeopathy, AYUSH (Govt. of India).

Dr Vishwajeet Rohil

- **External Expert**, DIPAS in the First Executive Board Project Monitoring and Review Committee Meeting to review the progress of XIIFYP Projects in Defence Institute of Physiology & Allied Sciences (DIPAS), DRDO, Ministry of Defence, Govt. of India.

Dr Vishal Bansal

- **Member**, Editorial Board, *Journal of Krishna Institute of Medical Sciences University*, an official publication of Krishna Institute of Medical Sciences University, Karad, Maharashtra.
- Awarded Best Poster in Pulmonary Rehabilitation category for a Poster paper presentation on "Psycosocial burden of caregivers is a hurdle for adherence to pulmonary rehabilitation program in a resource-scarce setting" (Authors: Robert RS, Bansal V, Malik A, Prasad R), European Respiratory Society International Congress 2014 held at Munich, Germany on 6th-10th September 2014.

Dr M. Rahman

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

Dr Ritu Kulshrestha

- Awarded **First Prize** for a Poster paper presentation on "N-Acetylcysteine modulates apoptosis in bleomycin induced lung fibrosis" (Authors: Kulshrestha R, Kotarkonda L, Pandey A, Singh H, Soundarya D, Manaswita S, Dinda AK, Ravi K), An Update in Pulmonary Pathology held at TN Medical College and BYL Nair Hospital, Mumbai on 23rd January 2015.

Dr Jayanthi Gunesekharan (MD Student)

- Dr Jayanthi Gunesekharan received the **Best Free Poster Award** for her poster entitled "Phenotypic and molecular charaterization of drug resistant Pseudomonas aeruginosa isolates from clinical samples. AUTHORS: Dr Jayanthi G and Dr Malini Shariff presented at the 6th Annual conference of IAMM- Delhi chapter (Micro-D-Con 2014) held on 28th -29th November 2014 at India Habitat center.

Mr Dibya Ranjan Pati (PhD Student)

- Awarded **Travel Grant** to attend the 4th ISIRV-AVG Conference in Austin, USA.

Sponsored Research Projects

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
1.	Dr Vishwajeet Rohil (Clinical Biochemistry)	To investigate the role of calreticulin transacetylase mediated histones hyperacetylation induced epigenetic modulation by polyphenolic acetates in genes implicated in lung tumorigenesis	D.B.T. November 6, 2013 (Two years)	24.16 Lakhs
2.	Dr Malini Shariff (Microbiology)	Microbiome of human lung in COPD patients attending VPCI, Delhi	D.B.T. March 19, 2015 (Two years)	2.18 Lakhs
3.	Dr Mandira Varma-Basil (Microbiology)	Expression profile of efflux related pumps in drug resistant *M. tuberculosis*	D.B.T. October 21, 2011 (Three years & six months)	34.93 Lakhs
4.	Dr Mandira Varma-Basil (Microbiology)	Development of aminocoumarins as candidate drugs for the treatment of multi-drug resistant (MDR) tuberculosis	D.B.T. October 30, 2013 (Two years)	41.21 Lakhs
5.	Dr Mandira Varma-Basil (Microbiology)	A point of care diagnostic tool for tuberculosis	D.S.T. September 3, 2014 (Three Years)	20.09 Lakhs
6.	Dr Mandira Varma-Basil (Microbiology)	Phenotypic and genotypic indicators of drug resistant tuberculosis: can they be used as early warning system for MDR and XDR tuberculosis	I.C.M.R. March 31, 2015 (Three years)	9.32 Lakhs
7.	Dr Anuradha Chowdhary (Medical Mycology)	*Histoplasma capsulatum*: a study of its natural reservoirs and role in respiratory and systemic infections in India	I.C.M.R. August 1, 2012 (Three years)	23.49 Lakhs
8.	Dr Anuradha Chowdhary (Medical Mycology)	Multi-laboratory evaluation of a synthetic peptide based ELISA (AfuPEPLISA) for detection of *Aspergillus fumigatus* specific antibodies in patients of asthma and pulmonary tuberculosis	D.B.T. September 24, 2012 (Three years)	8.99 Lakhs
9.	Dr Madhu Khanna (Respiratory Virology)	Study of antigenic diversity and cross-reactive antibody generation to influenza virus in human samples	D.R.D.O. April 6, 2011 (Three years & three months)	42.71 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
10.	Dr Madhu Khanna (Respiratory Virology)	Profile of antibody responses and duration of protection following influenza vaccination in adults >65 years of age	Asia-Pacific Alliance for the Control of Influenza (APACI) December 19, 2012 (Two years)	17.65 Lakhs
11.	Dr Madhu Khanna (Respiratory Virology)	To study the heterosubtypic immunity provided by pandemic influenza A H1N1 (2009) virus infected cells	C.S.I.R. December 10, 2013 (Three years)	9.59 Lakhs
12.	Dr Madhu Khanna (Respiratory Virology)	Evaluation of antiviral activity of medicinal plant extracts against influenza A virus	AYUSH / Central Council for Research in Ayurvedic Sciences (CCRAS) January 25, 2014 (Three years)	8.61 Lakhs
13.	Dr Ritu Kulshrestha (Pathology)	The study of molecular mechanisms of epithelial myoepithelial transition in pathogenesis of pulmonary fibrosis	C.S.I.R. April 2, 2012 (Three years)	34.74 Lakhs
14.	Dr Ritu Kulshrestha (Pathology)	Molecular mechanisms of pulmonary vascular hypertension associated with respiratory diseases and hypoxia	I.C.M.R. August 23, 2012 (Three years)	26.86 Lakhs
15.	Prof. A. Ray (Pharmacology)	Calcium phosphate nano-particles co-encapsulating neurotherapeutic gene and drug for targeted therapy of neurodegenerative disorders	D.B.T. June 24, 2011 (Three years and six months)	2.11 Lakhs
16.	Prof. A. Ray (Pharmacology)	Pharmacological studies on the effects of stress on inflammation and immunity in rats	U.G.C. June 29, 2011 (Three years & six months)	9.13 Lakhs
17.	Prof. A. Ray (Pharmacology)	Experimental studies on the association between Alzheimer's disease and diabetes mellitus: a novel approach to possible therapeutic strategies	D.S.T. October 17, 2013 (Three years)	15.80 Lakhs
18.	Dr Anita Kotwani (Pharmacology)	Effect of Indian almond and sweet almond in diabetes induced nephropathy and cataract in rats	AYUSH / Central Council for Research in Ayurvedic Sciences (CCRAS) January 25, 2014 (Two years)	12.08 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
19.	Dr Anita Kotwani (Pharmacology)	Awareness of antibiotic resistance and antibiotic prescription for treatment of acute upper respiratory tract infection and diarrhea in children: a qualitative study among primary care doctors and community pharmacists in NCT, Delhi	W.H.O. July 30, 2014 (Five months)	3.10 Lakhs
20.	Dr Anita Kotwani (Pharmacology)	To asses the price and availability of essential medicines in Delhi after the implementation of the National Pharmaceutical Pricing Policy 2012 phase II	W.H.O. December 5, 2014 (One year)	2.26 Lakhs
21.	Dr Kavita Gulati (Pharmacology)	Experimental studies on the cellular and molecular mechanisms of action of UNIM-352, polyherbal Unani formulation, to validate its use as a drug for bronchial asthma	C.C.R.U.M. April 28, 2011 (Three years plus extention upto 25.03.2016)	26.10 Lakhs
22.	Dr Kavita Gulati (Pharmacology)	Studies on the anti-inflammatory and immunomodulatory effects of *Albizzia lebbeck* and *Solanum xanthocarpum* in experimental models of bronchial asthma	D.B.T. March 10, 2014 (Three years)	20.88 Lakhs
23.	Prof. K. Ravi (Physiology)	Higher nervous control of the pulmonary renal reflex	C.S.I.R. March 1, 2012 (Three years)	11.75 Lakhs
24.	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	Genetic association study of polymorphisms related to chronic obstructive pulmonary disease (COPD) and its measures in north Indian population: COPD Genetics Consortium	D.B.T. September 29, 2011 (Three years)	7.30 Lakhs
25.	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	Comparision of pulmonary function test: skin testing to common aero allergens and food allergens:an inflammatory markers in obese and non-obese bronchial asthma patients	U.G.C.-B.S.R. June 23 2014 (One year & six months)	6.30 Lakhs
26.	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	Indoor air pollution and asthma in children: a population based study	I.C.M.R. February 1, 2015 (Three years)	96.10 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
27.	Dr Rajendra Singh Post-doctoral Fellow (Biochemistry) *(Supervisor: Prof. S.K. Bansal)*	Erythrocytic membrane proteins: expression proteomics and their significance in bronchial asthma	U.G.C.-Dr D.S. Kothari Post-Doctoral Fellowship April 18, 2013 (Three years)	11.28 Lakhs
28.	Dr Preeti Solanki (Post-doctoral Fellow) *(Supervisor: Prof. K. Ravi)*	Modulation of hypoglossal motoneuron activity by NMDA receptors in rats exposed to chronic intermittent hypoxia	U.G.C.-Dr D.S. Kothari Post-Doctoral Fellowship August 28, 2012 (Three years)	16.57 Lakhs
29.	Dr Vishal Jain (Postdoctoral Fellow) *(Supervisor: Prof. K. Ravi)*	Effect of hypobaric hypoxia on synaptic plasticity and strength: role of Ca2+ signalling	D.S.T. May 22, 2013 (Two years)	13.44 Lakhs
30.	Dr Rashmi Anand (Research Associate) *(Supervisor: Dr Kavita Gulati)*	Experimental studies on the cellular and molecular mechanisms in the effects of *Withania somnifera* during chronic stress responses in rats: possible role of nitric oxide	I.C.M.R. December 5, 2012 (Three years)	7.44 Lakhs
31.	Ms Latika Sharma (Senior Research Fellow) *(Supervisor: Dr Madhu Khanna)*	Study of gentic changes in the HA gene of influenza virus and their effects on the efficiency of viral neutralisation	C.S.I.R. May 18, 2009 (Five years)	13.97 Lakhs
32.	Mr Manoj Kumar (Senior Research Fellow) *(Supervisor: Prof. S.K. Bansal)*	Studies on erythrocyte membrane protein profile and oxidant and antioxidant status of blood in bronchial asthma	D.B.T. April 18, 2011 (Five years)	11.54 Lakhs
33.	Ms Anshika Narang (Senior Research Fellow) *(Supervisor: Dr Mandira Varma-Basil)*	The role of efflux pumps in drug resistance of *M. tuberculosis*	I.C.M.R. August 11, 2011 (Three years)	10.16 Lakhs
34.	Ms. Cheshta Sharma (Senior Research Fellow) *(Supervisor: Dr Anuradha Chowdhary)*	Molecular mechanisms of triazole antifungal resistance in *Aspergillus fumigatus* and *Aspergillus flavus* originating from clinical and environmental sources	U.G.C. February 27, 2012 (Five years)	8.38 Lakhs
35.	*Ms Roopali Rajpoot (Senior Research Fellow)* *(Supervisor: Dr Madhu Khanna)*	Construction and characterisation of functional ScFv antibodies against NP and NSI proteins of pandemic influenza H1N1 (2009) virus	I.C.M.R. June 7, 2012 (Three years)	8.51 Lakhs
36.	Mr. Gaurav Tyagi (Senior Research Fellow) *(Supervisor: Dr Mandira Varma-Basil)*	To study biotin metabolism in the biology of *M. tuberculosis*	I.C.M.R. September 14, 2012 (Five years)	7.04 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
37.	Mr. Anupam Prakash (Senior Research Fellow) *(Supervisor: Dr Anuradha Chowdhary)*	Molecular characterisation of *Cryptococcus neoformans* species complex originating from immunocompromised patients and from their environment	I.C.M.R. December 3, 2013 (Two years)	1.18 Lakhs
38.	Ms. Pooja Singh (Senior Research Fellow) *(Supervisor: Dr Mandira Varma-Basil)*	Cholesterol utilisation by *MCE4A* overxpressed *M. tuberculosis* H37RV and effect of verapapamil	I.C.M.R. January 1, 2014 (Three years)	2.36 Lakhs
39.	Ms. Anju Gautam (Senior Research Fellow) *(Supervisor: Dr Madhu Khanna)*	Evaluation of virus like particle (VLPs) and bacterial toxin adjuvants as vaccine candidate for influenza A virus	I.C.M.R. January 17, 2014 (Three years)	5.26 Lakhs
40.	Mr. Dibya Ranjan Pati (Senior Research Fellow) *(Supervisor: Dr Madhu Khanna)*	Nano-therapeutic application of small interfering RNA and micro RNA against human influenza virus	I.C.M.R. August 19, 2014 (Three years)	1.50 Lakhs
41.	Mr. Naresh Kumar (Senior Research Fellow) *(Supervisor: Dr Mandira Varma-Basil)*	Expression analysis of genes of liquid metabolism in clinical isolates of *M. tuberculosis* from patients of pulmonary and lymph node tuberculosis	I.C.M.R. January 05, 2015 (Two years)	1.18 Lakhs
42.	Md. Shamsuzzaman (Senior Research Fellow) *(Supervisor: Dr Kavita Gulati)*	Innovation in science prusuit for inspired research (inspire)	D.S.T.-Inspire July 20, 2011 (Five years)	12.44 Lakhs
43.	Ms. Sulekha Chaudhary (Senior Research Fellow) *(Supervisor: Dr Kavita Gulati)*	Studies on the anti-inflammatory and immunomodulatory effects of albizia labbeck and solonam xanthocarpum on the experimental model of brochial asthma	U.G.C. July 31, 2012 (Five years)	5.14 Lakhs
44.	Mr. Dhirendra Kumar Singh (Senior Research Fellow) *(Supervisor: Prof. A. Ray)*	Experimental studies with chelidonic acid, a molecule of plant origin, with possible therapeutic potential in brochial asthma	I.C.M.R. November 8, 2011 (Three years)	9.07 Lakhs
45.	Ms. Meenakshi Sharma (Senior Research Fellow) *(Supervisor: Prof. A. Ray)*	Experimental studies on the role of nitric oxide (NO) and NO-mediated signalling pathways in cognitive changes during emotional and environmental stress	I.C.M.R. January 1, 2014 (Two years)	3.00 Lakhs

Sl No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/Implementation and Duration	Budget (in Rs.)
46.	Mr Rishabh Charan Choudhary (Senior Research Fellow) *(Supervisor: Prof. K. Ravi)*	Higher nervous control of pulmonary renal reflex	U.G.C. August 10, 2010 (Five years)	15.48 Lakhs
47.	Mr Ravindra Sharma (Senior Research Fellow) *(Supervisor: Prof. K. Ravi)*	Localization and functions of anterior hypothalamus in high altitude pulmonary oedema	I.C.M.R. December 7, 2012 (Three years)	5.51 Lakhs
48.	Dr Ashima Anand (Principal Investigator)	Evaluation of a physiological intervention for reducing exercise induced breathlessness in healthy patients with interstitial lung disease (ILD) patients with Eisenmenger syndrome	D.S.T. November 16, 2010 (Four years and six months)	85.16 Lakhs
49.	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 (Fifteen years)	7.20 Lakhs

Conferences/Symposia/Seminars/Workshops/CMEs

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
1.	Prof. Rajendra Prasad	Lecture on: Overview of pulmonary rehabilitation	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
2.	Prof. Rajendra Prasad	Lecture on: Lung cancer scenario in India	V.P.C.I., University of Delhi	Personalized Therapeutics in Lung Cancer-The Path Ahead Delhi April 16, 2014
3.	Prof. Rajendra Prasad	Lecture on: Epidemiology of tobacco use	V.P.C.I., University of Delhi and Society for Tobacco Control	Public Awareness Programme on No Smoking – Change Your Lifestyle Delhi June 6, 2014
4.	Prof. Rajendra Prasad	Lecture on: Lung cancer in India-current status	V.P.C.I., University of Delhi	Update on NSCLC Delhi July 9, 2014
5.	Prof. Rajendra Prasad	Lecture on: Molecular epidemiology of lung cancer	V.P.C.I., University of Delhi	CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases Delhi July 11, 2014
6.	Prof. Rajendra Prasad	Lecture on: Epidemiology and type of tobacco use	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
7.	Prof. Rajendra Prasad	Lecture on: RNTCP: an overview	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
8.	Prof. Rajendra Prasad	Lecture on: Mangement of stable asthma	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014
9.	Prof. Rajendra Prasad	Lecture on: Benefits of influenza vaccination in COPD	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
10.	Prof. Rajendra Prasad	Lecture on: Smoking and the lung	V.P.C.I., University of Delhi	Public Lecture on Smoking and Health Delhi November 13, 2014
11.	Prof. Rajendra Prasad	Chaired sessions on Severe asthma and therapy with biologics and Climate change & respiratory allergy including asthma	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
12.	Prof. Rajendra Prasad	Lectures on:· • Epidemiology and types of tobacco use· • Adjunct treatment & host directed therapy in tuberculosis – advances and future prospects Chaired a session on Symposium on tuberculosis	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
13.	Prof. Rajendra Prasad	Lecture on: Allergy & asthma in India: my experiences	Indian College of Allergy, Asthma & Applied Immunologyand Dept. of Pulmonary Medicine, JSS Medical College & Hospital	48th National Conference of Indian College of Allergy, Asthma & Applied Immunology Mysore December 11-14, 2014
14.	Prof. Rajendra Prasad	Chaired the Plenary session Chaired the Interactive session on Pulmonologist and chest surgeon	Department of Pulmonary, Critical and Sleep Medicine, AIIMS in collaboration with CHEST, American College of Chest Physicians	AIIMS PULMOCRIT 2015 New Delhi January 31- February 01, 2015
15.	Prof. Rajendra Prasad	Lecture on: Current status in lung cancer in India	V.P.C.I., University of Delhi	Update on Lung Cancer Delhi January 28, 2015
16.	Prof. Rajendra Prasad	Lecture on: Approach to normal looking chest x-ray Chaired a session on Dr S.N. Tripathy Memorial Oration Chaired a symposium on Bronchogenic carcinoma	Tuberculosis Association of India and The Maharashtra State Anti Tuberculosis Association	69th National Conference on Tuberculosis and Chest Diseases 2014 (NATCON 2014) Mumbai February 6-7, 2015

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
17.	Prof. Rajendra Prasad	Lectures on:· • Nasobronchial allergy: clinical diagnosis· • Treatment of chronic stable asthma	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
18.	Prof. Rajendra Prasad	Lecture on: Allergies: causes, diagnosis and treatment	V.P.C.I., University of Delhi	Public Lecture on Allergies: Causes, Diagnosis and Treatment Delhi February 24, 2015
19.	Prof. S.N. Gaur	Lecture on: Pulmonary rehabilitation in COPD - personal experience	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
20.	Prof. S.N. Gaur	Lecture on: Health hazards of smoking	V.P.C.I., University of Delhi and Society for Tobacco Control	Public Awareness Programme on No Smoking – Change Your Lifestyle Delhi June 6, 2014
21.	Prof. S.N. Gaur	Lecture on: Allergen immunotherapy: my experience	Academy of Respiratory Medicine and Environmental Medical Association	20th National Conference of Environmental Science and Pulmonary Diseases (NESCON 2014) Mumbai June 27-29, 2014
22.	Prof. S.N. Gaur	Lecture on: COPD: a systemic disorder Chaired a session on Management of COPD	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
23.	Prof. S.N. Gaur	Chaired a session on RNTCP update	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
24.	Prof. S.N. Gaur	Chairman / Moderator	REALM India Scientific Programme	Symposium on ILD Clssification Update Delhi September 30, 2014
25.	Prof. S.N. Gaur	Chief Guest in the Inaugural ceremony	JROP Institute of Echo-cardiography Ultrasound and Vascular Doppler	30th Comprehensive Xourse on Echo Delhi October 11, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
26.	Prof. S.N. Gaur	Lecture on: Role of immunotherapy in bronchial asthma	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014
27.	Prof. S.N. Gaur	Chaired a sessions on Introduction to session on influenza, and Epidemiology and surveillance of disease - influenza	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014
28.	Prof. S.N. Gaur	Chaired scientific sessions on Severe asthma and therapy with biologics, and Climate change & respiratory allergy including asthma	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
29.	Prof. S.N. Gaur	Lectures on: • Immunotherapy • SCIT • Health benefits after cessation • Global warming and lungs Convenor of the workshop on Allergy testing & immunotherapy Guest / Foreign speakers session Chaired Prof. P.S. Shankar – Prof. K.C. Mohanty Oration seession Chaired a session on Respiratory allergy	National College of Chest Physicians (India) and Indian Chest Society, and Department of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
30.	Prof. S.N. Gaur	Lectures on: • Subcutaneous immunotherapy· • Guidelines for practice of allergen immunotherapy Participated in a panel discussion on Allergy practice in India – role of *in vitro* diagnostics for diagnosis and immunotherapy	Indian College of Allergy, Asthma & Applied Immunology and Dept. of Pulmonary Medicine, JSS Medical College & Hospital	48th National Conference of Indian College of Allergy, Asthma & Applied Immunology Mysore December 11-14, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
31.	Prof. S.N. Gaur	Lecture on: Immunotherapy- general principals, methods, assessment of therapeutic response and newer strategies	Metro Center for Respiratory Diseases, Metro Multi-speciality Hospital, Noida under the aegis of the Indian College of Allergy, Asthma and Applied Immunology	Certificate Course for Training in Respiratory Allergy and Clinical Immunology Noida December 21, 2014
32.	Prof. S.N. Gaur	Participated in a panel discussion on Managing refractory asthma	Department of Pulmonary, Critical and Sleep Medicine, AIIMS in collaboration with CHEST, American College of Chest Physicians	AIIMS PULMOCRIT 2015 New Delhi January 31- February 01, 2015
33.	Prof. S.N. Gaur	Chaired a session on Immunotherapy, allergen standardization and allergy diagnostic committee	National Institute of Biologicals	Immunotherapy, Allergen Standardization and Allergy Diagnostic Committee Meeting Noida February 21, 2015
34.	Prof. S.N. Gaur	Lecture on: Subcutaneous immunotherapy	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
35.	Prof. S.N. Gaur	Lecture on: Allergies: causes, diagnosis and treatment	V.P.C.I., University of Delhi	Public Lecture on Allergies: Causes, Diagnosis and Treatment Delhi February 24, 2015
36.	Prof. A. Ray	Lecture on: Gender based differences in stress induced anxiety and immunomodulation in rats	South African Society for Basic and Clinical Pharmacology (SASBCP)	WCP 2014, 17th World Congress of Basic and Clinical Pharmacology Cape Town, South Africa July 13-18, 2014
37.	Prof. A. Ray	Lecture on:Adaptogens: their role in health and disease	National Institute of Pharmaceutical Education and Research (NIPER)	International Conference on Drug Development from Natural Products and Traditional Medicines (DDNPTM) Chandigarh November 20-22, 2014
38.	Prof. A. Ray	Lecture on: Pharmacovigilance in respiratory medicine	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
39.	Prof. A. Ray	Lecture on: History and evolution of nitric oxideMember, National Advisory Committee	The Indian Pharmacological Society - Guwahati Chapter, Gauhati Medical College, and NIPER, Guwahati	47th Annual Conference of the Indian Pharmacological Society (IPSCON 2014) Guwahati December 28-30, 2014
40.	Prof. Ashok Shah	Chaired a session on: Pulmonary Rehabilitation in COPD	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
41.	Prof. Ashok Shah	Participated in a panel discussion on atopy - a disease or a trait	A Young Dermatology Society Initiative	Dermatology and Allied Specialities Summit New Delhi July 25-27, 2014
42.	Prof. Ashok Shah	Lecture on: Difference between COPD and asthma Chaired a session on Diagnosis of COPD	V.P.C.I., University of Delhi and Society for Tobacco Control	CME-Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
43.	Prof. Ashok Shah	Lecture on: Clinic management of bronchial asthma / COPD	Delhi Medical Association in association with National Heart Institute	CME on Pulmonary Medicine Delhi August 03, 2014
44.	Prof. Ashok Shah	Chaired a session on RNTCP update	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
45.	Prof. Ashok Shah	Lecture on: Plenary Lecture delivered on Bronchial anthracofibrosis: an emerging pulmonary disorder	Peradeniya Medical School Alumni Association, University of Peradeniya	12th International Medical Congress Peradeniya, Sri Lanka September 18-19, 2014
46.	Prof. Ashok Shah	Lecture on: Allergic rhinitis	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014
47.	Prof. Ashok Shah	Lecture on: Tobacco - a deadly trap	Daulat Ram College, University of Delhi, under the Star College Project	Science and Public Health Delhi October 27, 2014
48.	Prof. Ashok Shah	Lecture on: Rationale for ATT	Association of Physicians of India, Dehradun Branch	CME on Pulmonary Medicine Mussoorie November 07, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
49.	Prof. Ashok Shah	Chaired scientific sessions on Anaphylaxisand Management of rhinosinusitis	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
50.	Prof. Ashok Shah	Lecture on: Bronchial anthracofibrosis: an emerging pulmonary disorder	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
51.	Prof. Ashok Shah	Lecture on: Upper airways allergic inflammatory disorders	Indian College of Allergy, Asthma & Applied Immunologyand Dept. of Pulmonary Medicine, JSS Medical College & Hospital	48th National Conference of Indian College of Allergy, Asthma & Applied Immunology Mysore December 11-14, 2014
52.	Prof. Ashok Shah	Lectures on: • Allergic bronchopulmonary aspergillosis • Upper airways allergic inflammatory disorders	Metro Center for Respiratory Diseases, Metro Multi-speciality Hospital, Noida under the aegis of the Indian College of Allergy, Asthma and Applied Immunology	Certificate Course for Training in Respiratory Allergy and Clinical Immunology Noida December 21, 2014
53.	Prof. Ashok Shah	Lecture on: How do I approach a newly diagnosed patient with bronchiectasis?	Department of Pulmonary, Critical and Sleep Medicine, AIIMS in collaboration with CHEST, American College of Chest Physicians	AIIMS PULMOCRIT 2015 New Delhi January 31- February 01, 2015
54.	Prof. Ashok Shah	Lecture on: Upper airways allergic inflammatory disorders	Fortis Hospital, Shalimar Bagh	Asthma Workshop Delhi February 22, 2015
55.	Prof. Ashok Shah	Lecture on: Allergic bronchopulmonary aspergillosis (ABPA)	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
56.	Prof. Ashok Shah	Chaired a session on EBUS intensive	Department of Pulmonology and Sleep Medicine, Max Super Speciality Hospital, Shalimar Bagh	EBUS Intensive CME and Workshop Delhi February 28, 2015

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
57.	Prof. S.K. Chhabra	Lecture on: Dyspnoea and leg fatigue in COPD	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
58.	Prof. S.K. Chhabra	Lecture on: Diagnosis of COPD Chaired a seesions on Pulmonary rehabilitation and Smoking cessation	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
59.	Prof. S.K. Chhabra	Chaired a session on RNTCP update	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
60.	Prof. S.K. Chhabra	Lecture on: Pulmonary function test	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014
61.	Prof. S.K. Chhabra	Chaired a session on Anaphylaxis	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
62.	Prof. S.K. Chhabra	Lecture on: Impact of air pollution on human health	Ministry of Environment, Forests & Climate Change and Central Pollution Control Board in collaboration with SAARC and UNEP	Workshop on Capacity Building on Air Quality Management in South Asia New Delhi December 16-19, 2014
63.	Prof. S.K. Chhabra	Lecture on: Home noninvasive ventilation	Department of Pulmonary, Critical and Sleep Medicine, AIIMS in collaboration with CHEST, American College of Chest Physicians	AIIMS PULMOCRIT 2015 New Delhi January 31- February 01, 2015
64.	Prof. S.K. Chhabra	Lectures on: • Epidemiology of asthma • Asthma and COPD Practical demonstrations on Pulmonary function tests	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
65.	Prof. S.K. Chhabra	Lecture on: Overlap syndrome	Jaipur Golden Hospital	Sleep 2015: 5th National Conference on Sleep Disorders New Delhi March 7-8, 2015

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
66.	Prof. K. Ravi	Chaired a session on: Pulmonary rehabilitation in COPD	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
67.	Prof. K. Ravi	Chaired a session on Molecular basis of smoking related lung fibrosis	V.P.C.I., University of Delhi	CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases Delhi July 11, 2014
68.	Prof. K. Ravi	Lecture on: Cough reflex	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
69.	Prof. S.K. Bansal	Chaired a session on Lung cancer testing in India	V.P.C.I., University of Delhi	CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases Delhi July 11, 2014
70.	Prof. Raj Kumar	Lecture on: Smoking cessation	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
71.	Prof. Raj Kumar	Lecture on: Allergic bronchopulmonary aspergillosis	Indian Chest Society Bihar Chapter	Chest Update 2014 Patna May 25, 2014
72.	Prof. Raj Kumar	Organising Secretary Lecture on: Smoking cessation	V.P.C.I., University of Delhi and Society for Tobacco Control	Public Awareness Programme on No Smoking – Change Your Lifestyle Delhi June 6, 2014
73.	Prof. Raj Kumar	Lecture on: Smoking cessation Participated in a panel discussion on Asthma	Academy of Respiratory Medicine and Environmental Medical Association	20th National Conference of Environmental Science and Pulmonary Disease (NESCON 2014) Mumbai June 27-29, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
74.	Prof. Raj Kumar	Organising Secretary	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
75.	Prof. Raj Kumar	Lecture on: Role of smoking cessation: e-cigarette	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
76.	Prof. Raj Kumar	Chaired a session on RNTCP update Lectures on: • Importance of history in diagnosing naso-bronchial allergy and its triggers • Role of laboratory tests in the diagnosis of allergy Chaired sessions on Food allergy: practical approach and Role of allergen specific immunotherapy	Action Balalji Hospital	NORTH ALLERGICON 2014 New Delhi September 7, 2014
77.	Prof. Raj Kumar	• Immune diagnosis and immune therapy in allergic diseases – inflammasomes • Spectrum of allergic diseases of South Asia Resource Person of Workshop on PFT	Sri Lanka College of Pulmonologists	(RESPIRE-6) 6th Annual Academic Session of the Sri Lanka College of Pulmonologists Colombo, Srilanka September 26-27, 2014
78.	Prof. Raj Kumar	Organising Secretary Lecture on: Role of patient education	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014
79.	Prof. Raj Kumar	Lecture on: Smoking cessation	V.P.C.I., University of Delhi	Public Lecture on Smoking and Health Delhi November 13, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
80.	Prof. Raj Kumar	Organising Secretary Chaired sessions on Management of rhino sinusitis and Food allergy	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
81.	Prof. Raj Kumar	Lectures on: • Smoking cessation • Indoor air pollution including radon gas • Smoking cessation methodology and clinical aspects • Food allergy Member, Scientific Committee Convenor, Workshop on smoking cessation Chaired sessions on Respiratory allergy and advances in TB diagnosis	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
82.	Prof. Raj Kumar	Lecture on: Evaluation and management of food allergies in India	Indian College of Allergy, Asthma & Applied Immunologyand Dept. of Pulmonary Medicine, JSS Medical College & Hospital	48th National Conference of Indian College of Allergy, Asthma & Applied Immunology Mysore December 11-14, 2014
83.	Prof. Raj Kumar	Lecture on: Drug therapy for smoking cessation	Department of Pulmonary, Critical and Sleep Medicine, AIIMS in collaboration with CHEST, American College of Chest Physicians	AIIMS PULMOCRIT 2015 New Delhi January 31- February 01, 2015
84.	Prof. Raj Kumar	Organising Secretary Lecture on: Food allergy in bronchial asthma Hands on practical training – SPT	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
85.	Prof. Raj Kumar	Lecture on: Allergies: causes, diagnosis and treatment	V.P.C.I., University of Delhi	Public Lecture on Allergies: Causes, Diagnosis and Treatment Delhi February 24, 2015

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
86.	Prof. Raj Kumar	Lecture on: Tobacco health hazards	South Campus, University of Delhi	Hindi Scientific Seminar Delhi March 10, 2015
87.	Dr Balakrishnan Menon	Chaired a session on Pulmonary rehabilitation in COPD	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014
88.	Dr Balakrishnan Menon	Lecture on: Management of COPD Chaired a session on Diagnosis of COPD	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
89.	Dr Balakrishnan Menon	Organising Secretary	V.P.C.I., University of Delhi	CME - RNTCP Update Delhi August 13, 2014
90.	Dr Balakrishnan Menon	Preseted papers on • Evaluation of vitamin D in bronchial asthma and the effect of vitamin D supplementation on asthma severity and control: a randomised control trial • Evaluation of vitamin D levels in COPD and its correlation with disease severity and frequency of exacerbations • Evaluation of thoracic HRCT findings in sarcoidosis • Malanoyl dialdehyde (MDA) and hs-CRP: How are they linked to COPD? • Evaluation of paraoxonase1 activity and its relationship to the severity of lung impairment in COPD	European Respiratory Society	24th European Respiratory Society Annual Congress (ERS – 2014) Munich, Germany September 6-10, 2014
91.	Dr Balakrishnan Menon	Lecture on: Pharmacology of asthma drugs	V.P.C.I., University of Delhi and Society for Tobacco Control	Workshop on Bronchial Asthma Delhi October 18-19, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
92.	Dr Balakrishnan Menon	Chaired sessions on Management of rhino sinusitis and Food allergy	V.P.C.I., University of Delhi, American Association of Allergists & Immunologists of Indian Origin, U.S.A. and Society for Tobacco Control, India	Allergy and Immunology Educational Symposium Delhi November 18, 2014
93.	Dr Balakrishnan Menon	Lecture on: Hazards of radio imaging	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
94.	Dr Balakrishnan Menon	Organising Secretary	V.P.C.I., University of Delhi	Update on Lung Cancer Delhi January 28, 2015
95.	Dr Balakrishnan Menon	Lecture on: Pharmacology of asthma	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	40th Workshop on Respiratory Allergy: Diagnosis and Management Delhi February 23-27, 2015
96.	Dr Mandira Varma-Basil	Lecture on: Molecular epidemiology of tuberculosis	Miranda House, University of Delhi	Workshop on Biotechnology Delhi September 10, 2014
97.	Dr Mandira Varma-Basil	Lecture on: Relevance of NTM in clinical settings	Dept. of Microbiology, Dr Rajendra Prasad Medical College	CME-Workshop on Surveillance of Hospital Acquired Infection and Investigation and Management of Outbreaks in Health Care Setting Kangra, Himachal Pradesh September 27-28 2014
98.	Dr Mandira Varma-Basil	Chaired a session on Vaccine safety and effectiveness	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014
99.	Dr Mandira Varma-Basil	Lecture on: Recent advances in molecular diagnosis of tuberculosis	Association of Practising Pathologists (APP) and Indian Medical Association (IMA)	APP-IMA National PATHCON & LAB EXPO 2014 New Delhi December 14, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
100.	Dr Mandira Varma-Basil	Lecture on: Molecular methods of drug susceptibility of *Mtb*	Indian Association of Medical Microbiologists (Delhi Chapter)	CME on Antibiotic Policy Delhi February 21, 2015
101.	Dr Anuradha Chowdhary	Lecture on: Chronic vaginal candidiasis	European Society of Clinical Microbiology and Infectious Diseases	3rd European Confederation of Medical Mycology Educational Symposium on Diagnosis and Treatment of Rare Yeast Infections Amsterdam, the Netherlands May 15, 2014
102.	Dr Anuradha Chowdhary	Lecture on: Cryptococcosis in Asia Presented posters on • Microsatellite typing show mixed infections with multiple genotypes of *Cryptcoccus neoformans* var. *grubii* in Indian HIV positive patients with cryptococcosis • The global population structure of *Cryptococcus neoformans* as determined by multi-locus micro-satellite typing	European Society of Clinical Microbiology and Infectious Diseases	9th International Conference on Cryptococcus and Cryptococcosis (9th ICCC) Amsterdam, the Netherlands May 15-19, 2014
103.	Dr Anuradha Chowdhary	Lecture on: Taxanomy of mucorales: any changes?	International Forum on Zygomycosis	3rd International Forum on Zygomycosis Marathon, Attica, Greece September 19-21, 2014
104.	Dr Anuradha Chowdhary	Lecture on: Burden of cryptococcosis	European Society of Clinical Microbiology and Infectious Diseases (ESCMID) andV.P.C.I., University of Delhi	ESMID Post Postgraduate Education Course on Diagnosis and Management of Fungal Infections Both in the West and the East Delhi March 15-19, 2015
105.	Dr Madhu Khanna	Organising Secretary Lecture on: Influenza immunization in adults Chaired a session on Diagnosis and disease burden	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
106.	Dr Anita Kotwani	Chaired a session on Drug design and development	Dr B. R. Ambedkar Centre for Biomedical Research, University of Delhi	Symposium on Frontiers in Biomedical Research Delhi April 15, 2014
107.	Dr Anita Kotwani	Lecture on: Monitoring access and use of antibiotics to tackle antimicrobial resistance: experience from India	University of California, San Francisco (UCSF)	Global Health Seminar San Francisco, USA May 13, 2014
108.	Dr Anita Kotwani	Lecture on: Insight into India's pharmaceutical pricing policy: will the revised policy improve access to medicines?	Drug Information Association (DIA)	DIA India 2014- 9th Annual India Conference (The Future of Indian Healthcare: Patients, Access and Innovation) Mumbai October 16-18, 2014
109.	Dr Anita Kotwani	Balancing appropriate access to antibiotics in India	Global Healthcare Innovation Management Center, Fordham University	Emblem Health Value Initiative Lecture Series New York October 24, 2014
110.	Dr Anita Kotwani	Lecture on: Access to inhaled therapy in India: availability, price and affordability of asthma medicines	Respiratory Drug Delivery (RDD)	Respiratory Drug Delivery Asia 2014 Goa November 12-14, 2014
111.	Dr Anita Kotwani	Lecture on: Pricing and generic medicines in India	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
112.	Dr Kavita Gulati	Treasurer	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014
113.	Dr Kavita Gulati	Lecture on: Translational research in respiratory medicine	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
114.	Dr Kavita Gulati	Lecture on: Immunomodulation by herbal drugs: impact on health and disease	The Indian Pharmacological Society - Guwahati Chapter, Gauhati Medical College, and NIPER, Guwahati	47th Annual Conference of the Indian Pharmacological Society (IPSCON 2014) Guwahati December 28-30, 2014
115.	Dr Kavita Gulati	Lecture on: Involvement of nitric oxide in the toxico-dynamics of drugs and xenobiotics	Indian Academy of Biomedical Sciences	International Conference on Recent Advances in Research and Treatment of Human Diseases & 4th Annual Meeting of Indian Academy of Biomedical Sciences Hyderabad January 9-11, 2015
116.	Dr Kavita Gulati	Lecture on: Novel concepts in traditional medicine research: a translational approach	Delhi Institute of Pharmaceutical Sciences and Research (DIPSAR)	AICTE sponsored Quality Improvement Programme (QIP) Delhi February 26, 2015
117.	Dr Vishwajeet Rohil	Lectures on: • Xenobiotic metabolism and chemoprevention of cancer • Signal transduction and G proteins • Regulation of blood glucose, laboratory diagnosis of diabetes mellitus and acute & chronic complications of diabetes mellitus • Neurotransmitters and biochemical basis of neuro-psychiatry disorders	UGC - Acdemic Staff College, Sambalpur University	UGC - Acdemic Staff College, Sambalpur University Sambalpur, Odisha October 27-28, 2014
118.	Dr Vishwajeet Rohil	Lecture on: Current health perspectives	Dept. of Biochemistry, Sir Ganga Ram Hospital & ACBI Delhi Chapter & North Zone	4th Annual CME of Clinical Biochemistry-2015 New Delhi March 20, 2015
119.	Dr Vishal Bansal	Organising Secretary Lecture on: Components of pulmonary rehabilitation	V.P.C.I., University of Delhi	Symposium on Pulmonary Rehabilitation in COPD Delhi April 4, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
120.	Dr Vishal Bansal	Lecture on: Pulmonary rehabilitation	V.P.C.I., University of Delhi and Society for Tobacco Control	CME - Update on Chronic Obstructive Pulmonary Disease Delhi July 30, 2014
121.	Dr Vishal Bansal	Presented posters on • Psychosocial burden of caregivers is a hurdle for adherence to pulmonary rehabilitation program in a resource-scarce setting • Gait characteristics and energy expenditure during 6-minute walk test (6MWT) in phenotypes of COPD • Increased heart rate modulation, sympathetic dominance and systemic inflammation in chronic obstructive pulmonary disease	European Respiratory Society (ERS)	24th International Congress of European Respiratory Society (ERS) Munich, Germany September 6-10, 2014
122.	Dr Vishal Bansal	Lecture on: Physiological aspects of temperature regulation	Defence Institute of Physiology and Allied Sciences (DIPAS)Delhi	Continuous Education Program (CEP) entitled; 'Environmental Heat Stress and its Management' Delhi November 17, 2014
123.	Dr Vishal Bansal	Presented a poster on Balance training for chronic obstructive pulmonary disease	Physiotherapy Unit, JPN Apex Trauma Centre, All India Institute of Medical Sciences, New Delhi	IIIrd International Conference of Physical Therapy (INCPT AIIMS – 2014) Theme: Change, Challenge, Opportunity New Delhi December 17-21, 2014
124.	Dr Vishal Bansal	Lecture on: Exercise training and its applications for improving quality of life in chronic respiratory diseases	Defence Institute of Physiology and Allied Sciences (DIPAS)Delhi	Continuous Education Program (CEP) entitled; Advance Cardio Respiratory Physiological Monitoring Devices & Application in Military Physiology Delhi February 12, 2015

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
125.	Dr Ritu Kulshrestha	Organising Secretary	V.P.C.I., University of Delhi	CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases Delhi July 11, 2014
126.	Dr Ritu Kulshrestha	Lecture on: Update on asbestos related diseases in India Presented a paper on Role of toll like receptor-4 in progression of bleomycin induced pulmonary fibrosis	International Academy of Pathology	30th International Congress of the International Academy of Pathology (IAP 2014) Bangkok, Thailand October 5 -11, 2014
127.	Dr Ritu Kulshrestha	Presented a paper on Detection of EGFR gene mutations in plasma from non-small cell lung cancer patients	Tata Memorial Hospital	2nd Indian Cancer Genetics Conference and Workshop-2014 Navi Mumbai, November 1-2, 2014
128.	Dr Ritu Kulshrestha	Lectures on: • Cytology of infectious diseases of lungs • Classification of pulmonary tumors & cytology of benign tumors & non-neoplastic lesions (in the Thoracic Cytology Workshop)	Indian Academy of Cytologists	44th Annual Conference of Indian Academy of Cytologists (Cytocon-2014) Kota, Rajasthan November 13-16, 2014
129.	Dr Ritu Kulshrestha	Lecture on: Molecular pathogenesis of lung fibrosis and lung cancer	Kasturba Medical College, Manipal University	Cardiothoracic Path CME 2014 Mangalore September 27-28, 2014
130.	Dr Puneet Agarwal (MD Student) (Guide: Prof. S. N. Gaur)	Presented a paper on Utility of high attenuating mucus and other radiologic features in diagnosed cases of allergic bronchopulmonary aspergillosis	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014

Sl No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
131.	Gaurav Bhati (MD Student) (Guide: Prof. S. N. Gaur)	Presented a paper on Functional capacity and quality of life in different ct phenotypes in male patients of COPD: a comparative study	National College of Chest Physicians (India) and Indian Chest Society, and Dept. of TB and Respiratory Diseases, JNMC, Aligarh Muslim University	National Conference on Pulmonary Diseases (NAPCON-2014) [16th Joint National Conference of NCCP (I) & ICS] Agra November 20-23, 2014
132.	Ms Anju Sharma (PhD Student) *(Guide: Dr Vishwajeet Rohil)*	Presented a paper on Quercetin pentaacetate, 7,8-Diacetoxy-4-Methyl Coumarin and Valproic acid induce p21 expression and apoptosis in lung cancer	International Association for the Study of Lung Cancer (IASLC)	Asia Pacific Lung Cancer Conference (APLCC) Kuala Lumpur, Malaysia November 6-8, 2014
133.	Ms. Latika (PhD Student) *(Guide: Dr Madhu Khanna)*	Delivered a talk on Clinical presentation of patients infected with seasonal and pandemic (H1N1) 2009 influenza A viruses	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014
134.	Ms Renu Sharma (APACI Project Fellow) *(Guide: Dr Madhu Khanna)*	Presented a poster on Evaluation of respiratory pathogens from Influenza like illness cases from hospitals in Delhi	V.P.C.I., University of Delhi and Asia-Pacific Alliance for the Control of Influenza (APACI)	International Workshop on Epidemiology and Control of Influenza (ECI-2014) Delhi November 7-8, 2014
135.	Mr Anupam Prakash[1] Mrs Shallu Kathuria[2] (PhD Students) *(Guide: Dr Anuradha Chowdhary)*	Presented posters on • [1] Genotypic diversity within clinical and environmental *Cryptococcus neoformans* var. *grubii* population in India • [2] Correlation of CLSI and EUCAST *in vitro* antifungal susceptibility with clinical outcome of patients with AIDS associated cryptococcosis from India	European Society of Clinical Microbiology and Infectious Diseases V.P.C.I., University of Delhi	9th International Conference on Cryptococcus and Cryptococcosis (9th ICCC) Amsterdam, the Netherlands May 15-19, 2014
136.	Ms Apoorva Pandey (PhD Student) *(Guide: Prof. S.K. Bansal)*	Delivered a talk on Immunopathogenesis of lung fibrosis:role of toll like receptors		CME Programme on the Armamentarium of Molecular Diagnosis in Lung Diseases Delhi July 11, 2014

Participation in Advanced and Specialised Training Programme by Faculty Members

Sl No.	Participant (Department)	Course Title/ Topic	Training Duration	Host
1.	Dr Vishwajeet Rohil (Clinical Biochemistry)	4th Annual CME of Clinical Biochemistry-2015, "Current Health Perspectives"	March 20, 2015	Dept. of Biochemistry, Sir Ganga Ram Hospital, Delhi & ACBI Delhi Chapter & North Zone
2.	Prof. A. Ray (Pharmacology)	National Seminar on the Role of Unani Medicine in Non-Communicable Diseases	January 14-15, 2015	Ministry of AYUSH, Govt. of India, New Delhi
3.	Dr Kavita Gulati (Pharmacology)	Yoga training camp	July 14 – August 13, 2014	Yoga Therapy Research Centre, VPCI, University of Delhi, Delhi
4.	Dr Kavita Gulati (Pharmacology)	Workshop on Scientific Basis of Yoga for Weight Management	October 11-12, 2014	University of Patanjali, Haridwar, Uttarakhand
5.	Dr Kavita Gulati (Pharmacology)	National Seminar on the Role of Unani Medicine in Non-Communicable Diseases	January 14-15, 2015	Ministry of AYUSH, Govt. of India, New Delhi
6.	Dr Ritu Kulshrestha (Pathology)	Pre-conference Workshop on Advanced Techniques in Molecular & Genetic Analysis	October 27-31, 2014	Tata Memorial Hospital, Navi Mumbai

Short Term Specialised Trainings Imparted by Faculty Members

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
1.	Mr Gurjeet Singh B. Tech (Biotechnology) Ms Gresha Malhotra B. Tech (Biotechnology) Ms Mehak Salwan B. Tech (Biotechnology) Ms Sanchita Saxena B. Tech (Biotechnology) Amity Institute of Biotechnology, Amity University, Noida (Uttar Pradesh)	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	May 5 - June 17, 2014
2.	Mr Sekhar Suman M Sc (Life Sciences) Ms Sushmita Sinha M Sc (Life Sciences) Centre for Biological Sciences (Biotechnology), Central University of Bihar, BIT Campus, P.O.: B.V. College, Patna (Bihar)	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 5 - July 14, 2014
3.	Ms Falak Pahwa BSc (H) (Biochemistry) Ms Ridhima Goel BSc (H) (Biochemistry) Daulat Ram College, University of Delhi, Delhi	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 9 - July 8, 2014
4.	Ms Akansha Sharma B. Tech (Biotechnology) Maharishi Markandeshwar University, M.M Eng. College, Mullana, Ambala (Haryana)	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 18 - July 17, 2014

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
5.	Ms Leewanshi Chakrawarti B Tech (Biotechnology) Jaypee Institute of Information Technology, A-10, Sector 62, Noida (Uttar Pradesh)	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 26 - July 25, 2014
6.	Ms Moumita Ganguly MSc (Biomedical Science) Dr BR Ambedkar Centre for Biomedical Research (ACBR), University of Delhi, Delhi	Biochemistry, clinical biochemistry and biotechnology	Dr Vishwajeet Rohil (Clinical Biochemistry)	January 1 -June 30, 2014
7.	Ms Shalvi Sharma M.Sc. (Biomedical Science) Ambedkar Center for Biomedical Research, University of Delhi, Delhi	MIC determination and mutation analysis of INH drug resistance in clinical isolates of *M. tuberculosis*	Dr Mandira Varma-Basil (Microbiology)	January 1- May 30, 2015
8.	Ms Shivani Popli, M.Sc.(Microbiology) Kurukshetra University, Kurukshetra (Hariyana)	Cloning of putative efflux pump gene of *M. tuberculosis* in *E.coli* DH5µ strain	Dr Mandira Varma-Basil (Microbiology)	February 1- May 1, 2015
9.	Ms Swati Upadhyay M.Sc. (Biomedical Science) Ambedkar Center for Biomedical Research, University of Delhi, Delhi	Phenotypic and molecular detection of ethionamide resistance in clinical isolates of *M. tuberculosis*	Dr Mandira Varma-Basil (Microbiology)	January 1- May 30, 2015
10.	Mr Akshay[1], Ms Varsha[2] and Mr Piyush[3] M.Sc. (Biomedical Science) Ambedkar Center for Biomedical Research, University of Delhi, Delhi	[1]Generation of dendritic cell based therapy against H1N1 viral infection [2] Epitope mapping of haemagluttinin protein of pandemic influenza A 2009 (H1N1) [3] *In vitro* purification and localization of recombinant antibodies in different strains of *E.coli*	Dr Madhu Khanna (Respiratory Virology)	[1] July 1, 2014 – June 28, 2015 [2] January 1- June 30, 2014 [3] January 1- June 30, 2014

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
11.	Ms Bhawna Varma and Ms Shweta Varma MSc (Zoology) Department of Zoology, University of Delhi, Delhi	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	June 1 – July 31, 2014
12.	Ms Rubi Tiwari, Ms Shikha Agarwal* and Ms Yogita Sharma* MSc (Biotechnology) Dept. of Biotechnology, Amity University, Noida, Uttar Pradesh *Dept. of Biotechnology, Amity University, Gurgaon, Haryana	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	January 1 – June 30, 2015
13.	Ms Yogita Dixit (Laboratory Technician) Department of Pulmonary Medicine and Sleep Disorders, AIIMS, New Delhi	Training in cardio-pulmonary rehabilitation	Dr Vishal Bansal (Physiology)	November 3-28, 2014
14.	Ms Akanksha Gupta and Ms Kirti Dogra BSc (Physiotherapy) Pt. Deendayal Upadhyaya Institute for the Physically Handicapped, New Delhi	Final year clinical training in cardio-pulmonary rehabilitation	Dr Vishal Bansal (Physiology)	December 1, 2014 – January 31, 2015
15.	Ms Surbhi Kutiyal, Ms Shalin and Mr Saurabh Singh BSc (Physiotherapy) Pt. Deendayal Upadhyaya Institute for the Physically Handicapped, New Delhi	Final year clinical training in cardio-pulmonary rehabilitation	Dr Vishal Bansal (Physiology)	December 20, 2014 – February 19, 2015
16.	Ms. Kriti Sharma and Mr. Rahul Kumar BSc (Physiotherapy) Pt. Deendayal Upadhyaya Institute for the Physically Handicapped, New Delhi	Internship training in cardio-pulmonary rehabilitation	Dr Vishal Bansal (Physiology)	February 1-28, 2015

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
17.	Ms Tanvi Sharma B.Tech (Biotechnology) Ambala College of Engineering and Applied Research, Ambala, (Haryana)	Respiratory allergy and applied immunology	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	July 7- August 17, 2014
18.	Dr Malasha Kumari (Scientist C) Institute of Cytology and Preventive Oncology (ICMR), Sector 39, Noida, Uttar Pradesh	Tobacco cessation	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	July 15-18, 2014

Cultural and Sports Activities

A Gymnasium and Badminton Court were opened at the ground floor of of the multi-storey building of the Institute. It was inaugurated by Prof. P.N. Tandon, Chairman, Governing Body, VPCI on 15th September 2014. Faculty, Staff and Students of the Institute are actively using these recreation facilities and improves their quality of life.

The Institute conducted the VPCI Sports & Cultural Activity - 2014 programme from 1st to 4th January 2015. It was inaugurated by Prof. Rajendra Prasad, Director, VPCI. The Sports events include: Musical Chair, Table Tennis, Badminton, Carom and Chess; and the Cultural events include: Play, Dance, Vocal Music, Instrumental Music and Poem Recitation. Most of the staff members, students and family members of VPCI were participated in this programme. The Institute distributed Trophies and Certificates (First, Second and Third) to the winners. Mr Satish Sharma, Senior Assistant and In-charge, Purchase Section adjudged as the Best All Round Sportsman and Ms Baby Neeraja Anup (Daughter of Ms Jayalakshmi Anup, Staff Nurse) adjudged as the Best Cultural Performer. Prof. A. Ray, Dept. of Pharmacology, VPCI, was the Convener of this programme.

A Gymnasium was inaugurated by Prof. P.N. Tandon, Chairman, Governing Body of the Institute on 15th September 2014.

A Sports and Cultural Programme was organised at the Institute from 1-5 January 2015. Teachers, students and staff members participated in the events. Members of Administration and Accounts presented a mono-acting programme on this occasion.

Plantation of a tree by the Director, Faculty Members and staff of the Institute on World Environment Day.

Celebration of Independence Day and Republic Day at the Institute.

A farewell function was held for the retiring employees of the Institute.

List of Publications

Journals

1. Agarwal A, Prasad R, Garg R, Verma SK, Singh A, HusainN. Medical thoracoscopy: a useful diagnostic tool for undiagnosed pleural effusion. *Indian J Chest Dis Allied Sci* 2014;56:217-20.

2. Bansal V, Prasad R. Pulmonary rehabilitation in chronic respiratory diseases (Editorial). *Indian J Chest Dis Allied Sci* 2014;56:147-8.

3. Behl T, Kotwani A. *Terminalia catappa* in the treatment of diabetes mellitus. *Asian J Biochemical Pharmaceutical Res* 2014;3:1-10.

4. Behl T, Kotwani A, Kaur I, Goel H. Mechanisms of prolonged lithium therapy-induced nephogenic diabetes insipidus. *Eur J Pharmacol* 2015; 755: 27-33.

5. Chhabra SK, Dash DJ. Acute exacerbations of chronic obstructive pulmonary disease: causes and impacts. *Indian J Chest Dis Allied Sci* 2014;56:93-104.

6. Chhabra SK, Gupta M, Ramaswamy S, Dash DJ, Bansal V, Deepak KK. Cardiac sympathetic dominance and systemic inflammation in COPD. *COPD* 2014 Dec 11. [Epub ahead of print].

7. Chhabra SK, Kumar R, Gupta U, Rahman M, Dash DJ. Prediction equations for spirometry in adults from northern India. *Indian J Chest Dis Allied Sci* 2014;56:221-5.

8. Chowdhary A, Kathuria S, Agarwal K, Sachdeva N, Singh PK, Jain S, Meis JF. Voriconazole-resistant *Penicillium oxalicum:* an emerging pathogen in immunocompromised hosts. *Open Forum Infectious Diseases* 16; 1(2): 2014ofu029. [doi:10.1093/ofid/ofu029].

9. Chowdhary A, Kathuria S, Kshitij A, Meis JF. Recognizing filamentous basidiomycetes as agents of human disease: a review. *Medical Mycology* 2014;52:782-97. [doi: 10.1093/mmy/myu047]. Epub 2014 Sep 8.

10. Chowdhary A, Kathuria S, Singh PK, Sharma B, Dolatabadi S, Hagen F, Meis JF. Molecular characterization and in vitro antifungal susceptibilities of 80 clinical isolates of mucormycetes in Delhi, India. *Mycoses*, 2014; 57 Suppl 3:97-107. [doi: 10.1111/myc.12234]. Epub 2014 Sep 23].

11. Chowdhary A, Perfect J, de Hoog GS. Black moulds and melanised yeasts pathogenic to humans: *Cold Spring Harb Perspect Med* 2014 Nov 10. 517-37. [doi: 10.1101/cshperspect].

12. Chowdhary A, Sharma C, Hagen F, Meis JF. Exploring azole antifungal drug resistance in *Aspergillus fumigatus* with special reference to resistance mechanism. *Future Microbiol* 2014;9:697-711.

13. Chowdhary A, Sharma C, van den Boom M, Yntema JB, Hagen F, Verweij PE, Meis JF. Multi-azole resistant *A. fumigatus* in the environment of Tanzania. *J Antimicrob Chemother* 2014; 69:2979-83. [doi: 10.1093/jac/dku259].

14. Espinel-Ingroff A, Chakrabarti A, Chowdhary A. A multicenter evaluation of MIC distributions for ECV definition to detect amphotericin B, posaconazole and itraconazole resistance among the most clinically relevant species of Mucorales. *Antimicrob Agents Chemother* 2015;59:1745-50. [doi: 10.1128/AAC.04435-14]. Epub 2015 Jan 12.

15. Espinel-Ingroff A, Chowdhary A, Gonzalez GM, Guinea J, Hagen F, Meis J, Thompson GR 3rd, Turnidge J. Isavuconazole MIC distributions and epidemiological cutoff values for the *Cryptococcus neoformans-Cryptococcus gattii* species complex by the CLSI broth microdilution method (M27-A3 document): a multicenter study. *Antimicrob Agents Chemother* 2015;59:666-8. [doi: 10.1128/AAC.04055-14].

16. Garg T, Gera K, Modi N, Shah A. Intrathoracicgoitre associated with pulmonary tuberculosis. *Indian J Tuberc* 2015;62:117-20. [doi: 10.1016/j.ijtb.2015.04.002].

17. Garg T, Menon BK, Mittal A, Dar MY. Right sided aortic arch causing chronic obstructive airway disease and cor pulmonale. *Indian J Med Case Reports* 2014;3:61-4.

18. Garima K, Pathak R, Tandon R, Rathor N, Sinha R, Bose M, Varma-Basil M. Differential expression of efflux pump genes of *Mycobacterium tuberculosis* in response to varied subinhibitory concentrations of antituberculosis agents. *Tuberculosis* (Edinb). 2015;95:155-61. [doi: 10.1016/j.tube.2015.01.005].

19. Gaur SN, Bhati G. Anaphylaxis and immunotherapy.(Editorial). *Indian J Allergy Asthma Immunol* 2014;28:1-2.

20. Gaur SN, Bhati G. Successful allergen immunotherapy with horse dander allergy. *Indian J Allergy Asthma Immunol* 2014;28:47-8.

21. Gaur SN, Dogra V. Nutritional considerations in bronchial asthma.(Editorial). *Indian J Allergy Asthma Immunol* 2014;28:61-2.

22. Gera K, Gupta N, Ahuja A, Shah A. Acute alveolar sarcoidosis presenting with hypoxaemic respiratory failure. *BMJ Case Reports* 2014. [doi:10.1136/bcr-2013-202247].

23. Gera K, Panjabi C, Dash D, Shah A. Cavitary alveolar sarcoidosis complicated by an aspergilloma. *BMJ Case Reports* 2014; [doi:10.1136/bcr-2014-206280].

24. Gera K. Pilaniya V, Shah A. Silicosis: progressive massive fibrosis with eggshell calcification. *BMJ Case Reports* 2014; [doi:10.1136/bcr-2014-206376].

25. Gupta N, Goel N, Kumar R. Correlation of exhaled FeNO, nasal FeNO and atopic status: a cross channel study in bronchial asthma and rhinitis. *Lung India* 2014;31:342-7.

26. Gupta N, Kumar R, Prasad R. Reversed halo sign. *Indian J Chest Dis Allied Sci* 2014;56:247-8.

27. Joshi J, Ray A, Gulati K. Modulation of stress induced anxiogenesis by morphine involves interactions with nitric oxide (NO) and heat shock proteins (Hsp70) in rats. *Physiol Behav* 2015;139: 393-6.

28. Joshi JC, Ray A, Gulati K. Effects of morphine on behavioral, biochemical and cellular markers of stress in rats. *Basic Clin Pharmacol Toxicol* 2014;115:189.

29. Joshi R, Rohil V, Arora S, Manral S, Kumar A, Goel S, Priya N, Singh P, Ponnan P, Chatterji S, Dwarakanath BS, Saluja D, Rawat DS, Prasad AK, Saso L, Kohli E, DePass AL, Bracke ME, Parmar VS, Raj HG.The competence of 7,8-diacetoxy-4 methylcoumarin and other polyphenolic acetates in mitigating the oxidative stress and their role in angiogenesis. *Curr Top Med Chem* 2015;15:179 -86. [doi: 10.2174/1568026615666141209162446].

30. Kathuria S, Sharma C, Singh PK, Agarwal P, Agarwal K, Hagen F, Meis JF, Chowdhary A. Molecular epidemiology and *in vitro* antifungal susceptibility of *Aspergillus terreus* species complex isolates in Delhi, India: evidence of genetic diversity by amplified fragment length polymorphism and microsatellite typing. *PLOS One* 2015;10:1-17 [doi: 10.1371/journal.pone.0118997].

31. Kathuria S, Singh PK, Meis JF, Chowdhary A. *In vitro* antifungal susceptibility profile and correlation of mycelial and yeast form of molecularly characterized *Histoplasma capsulatum* from India. *Antimicrob Agents Chemother* 2014;58:5613-6. [doi: 10.1128/AAC.02973-14]. Epub 2014 Jun 30.

32. Khanna M, Rajput R, Kumar B, Singh A, Saxena L. Influenza virus induced cytokine responses: an evaluation of host-pathogen association. *Immunome Research* 2014;10:S2: 001. [doi: org/10.4172/1745-7580.S2.001].

33. Khanna M, Sharma S, Kumar B, Rajput R. Protective immunity based on the conserved hemagglutinin stalk domain and its prospects for universal influenza vaccine development. *BioMed Res Intl* 2014; 2014: [doi: 10.1155/2014/546274].

34. Khanna M, Saxena L, Rajput R, Kumar B, Prasad R. Gene silencing: a therapeutic approach to combat influenza virus infections. *Future Microbiol* 2015;10:131-40. [doi: 10.2217/fmb.14.94].

35. Khillan V, Rathore N, Kathuria S, Chowdhary A. A rare case of breakthrough fungal pericarditis due to fluconazole resistant *Candida auris* in a patient with chronic liver disease. *J Med Microbiol* 2014; [doi: 10.1099/jmmcr.0.T00018].

36. Kotwani A, Holloway K. Antibiotic prescribing practice for acute, uncomplicated respiratory tract infections in primary care settings in New Delhi, India. *Tropical Med Intl Health* 2014;19:761-8. [doi: 10.1111/tmi.12327]. Online published 22 April, 2014.

37. Kumar A, Babu R, Bijulal S, Abraham M, Sasidharan P, Kathuria S, Sharma C, Meis JF, Chowdhary A. Invasive mycosis due to species of *Blastobotrys* in immunocompromised patients with reduced susceptibility to antifungals. *J Clin Microbiol* 2014;52:4094-9.

38. Kumar A, Udayakumaran S, Babu R, Rajamma BM, Prakash A, Panikar D, Karim S, Chowdhary A. *Trichosporon asahii* infection presenting as chronic meningo-ventriculitis and intraventricular fungal ball: a case report and literature review *Mycoses* 2015;58:99-103. [doi: 10.1111/myc.12282].

39. Kumar R. Smoking and tuberculosis. *World Clin Pulm Crit Care Med* 2014;3:97-103.

40. Kumar R, Prasad R. Smoking cessation: an update. *Indian J Chest Dis Allied Sci* 2014;56:159-67.

41. Kumar R, Gupta N, Goel N. Spectrum of interstitial lung disease at a tertiary care centre India. *Pneumonol Alerqol Pul* 2014;82:218-26.

42. Kumar R, Singh M, Gupta N, Goel N. Bronchoscopy in immediate diagnosis of smear negative tuberculosis. *Pneumonol Alergo Pol* 2014;82;410-14.

43. Kumar R, Goel N, Gupta N, Singh K, Nagar S, Mittal J. Indoor air pollution and respiratory illness in children from rural India. *Indian J Chest Dis Allied Sci* 2014;56:79-83.

44. Kumar R, Gupta N, Kumar D, Mavi AK, Kumar M. Monitoring of indoor particulate matter during burning of mosquito coil, incense sticks and dhoop. *Indian J Allergy Asthma Immunol* 2014;28:68-73.

45. Kumar R, Gupta N. Role of bronchoscopy in evaluation of cases with sputum smear negative pulmonary tuberculosis, interstitial lung disease and lung malignancy: a retrospective study of 712 cases. *Indian J Tuberc* 2015;62:36-42.

46. Menon B, Kaur C, Nima G. Evaluation of the role of antioxidant enzyme paraoxonase 1 in COPD. *Intl J Basic Appl Med Sci* 2014;4:26-32.

47. Menon BK, Nima G, Dogra V, Kaur C. Association of inflammatory biomarker hs-CRP and oxidative stress marker malanoyl dialdehyde in COPD. *Research* 2014;1:1267-72.

48. Menon B, Nima G, Dogra V, Kaur C. Low level of Vitamin D is associated with poor asthma control: a randomized control trial of Vitamin D supplementation in asthma. *Research* 2014;1:1088 - 93.

49. Mir E, Sareen R, Kulshreshtha R, Shah A. Bronchioloalveolar cell carcinoma presenting as a "non-resolving consolidation" for two years. *Pneumonol Alergol Pol* 2015;83:208-11.

50. Nagar JK, Kumar R, Shrivastava JP. Association of heavy metals composition on particulate matter with environmental tobacco smoke and cooking fuels in indoor air of Delhi. *Intl J Nature Sci* 2014;5: 547-52.

51. Najafzadeh MJ, Sutton DA, Saradeghi Keisari M, Zarrinfar H, Sybren de Hoog G, Chowdhary A, Meis JF. *In vitro* activity of 8 antifungal drugs against 104 environmental and clinical isolates of *Aureobasidium pullulans*. *Antimicrob Agents Chemother* 2014;58:5629-31. [doi: 10.1128/AAC.03095-14].

52. Nimesh M, Joon D, Varma-Basil M, Saluja D. Development and clinical evaluation of *sdaA* loop-mediated isothermal amplification assay for detection of *Mycobacterium tuberculosis* with an approach to prevent carryover contamination. *J Clin Microbiol* 2014;52:2662-4.

53. Pasricha R, Saini NK, Rathor N, Pathak R, Sinha R, Varma-Basil M, Mishra K, Brahmachari V, Bose M. The *Mycobacterium tuberculosis* recombinant *LprN* protein of *mce4* operon induces Th-1 type response deleterious to protection in mice. *Pathogens Dis* 2014;72:188-96. [doi: 10.1111/2049-632X.12200].

54. Pathak R, Rathor N, Garima K, Sharma NK, Singh P, Varma-Basil M, Bose M. lspA gene of *Mycobacterium tuberculosis* co-transcribes with Rv1540 and induced by surface and acidic stress. *Gene* 2015;560:57-62. [doi: 10.1016/j.gene.2015.01.061] Epub 2015 Jan 30.

55. Prasad R, Gupta N, Singh M. Multidrug resistant tuberculosis: trends and control. *Indian J Chest Dis Allied Sci* 2014;56:237-46.

56. Rai N, Ray A, Jameel SS, Gulati K. Experimental studies on the mechanisms of action of UNIM-352, a polyherbal agent for the treatment of bronchial asthma: a reverse pharmacology approach. *Basic Clin Pharmacol Toxicol* 2014;115:301.

57. Rajesh V, Prakasha SR, Giridhar BH, Prasad R. An adult with haemoptysis: a rare case of congenital anomaly. *Indian J Chest Dis Allied Sci* 2015;57:31-3.

58. Rajput R, Khanna M, Pradhan HK. Phage-display technology for production of recombinant monoclonal antibodies. *Mater Methods* 2014;4:873. [http://dx.doi.org/10.13070/mm.en.4.873].

59. Shah A. Allergic rhinitis, chronic rhinosinusitis and nasal polyposis in Asia Pacific: impact on quality of life and sleep [Editorial]. *Asia Pac Allergy* 2014;4:131-3.

60. Shah A, Gera K. Immediate hypersensitivity reaction with mango. *Pneumonol Alergol Pol* 2014;82: 445-53.

61. Shah A, Gupta UA. Spontaneous resolution of pulmonary inflammatory pseudotumor. *Lung India* 2014;31:307-8.

62. Shah A, Behera S, Panjabi C. Middle lobe syndrome: a rare presentation of allergic bronchopulmonary aspergillosis. *Eur Ann Allergy Clin Immunol* 2014;46:147-51.

63. Sharma J, Menon BK, Vijayan VK, Bansal SK. Changes in adenosine metabolism in asthma. A study on adenosine, 5^{1}-NT, adenosine deaminase and its isoenzyme levels in serum, lymphocytes and erythrocytes. *Open J Respir Dis* 2015;5;33-49.

64. Sharma P, Gaur SN, Arora N. Immunotherapy with B – cell epitopes ameliorates inflammatory responses in Balb/c mice. *Clin Exptl Immunol* 2015;179:128-36. [doi: 10.1111/cei.12442].

65. Sharma P, Gaur SN, Goel N, Arora N. Engineered hypoallergenic variants of osmotin demonstrate hypoallergenicity with *in vitro* and *in vivo* methods. *J Mol Immun* 2015;64:46-54.

66. Sharma RK, Choudhary RC, Reddy MK, Ray A, Ravi K. Role of posterior hypothalamus in hypobaric hypoxia induced pulmonary edema. *Respir Physiol Neurobiol* 2015;205:66-76.

67. Singh P, Sinha R, Tandon R, Tyagi G, Khatri P, Chandra Shekhar Reddy L, Saini NK, Pathak R, Varma-Basil M, Prasad AK, Bose M. Revisiting a protocol for extraction of mycobacterial lipids. *Intl J Mycobacteriol* 2014;3:168-72.

68. Thakur T, Anand R, Ray A, Gulati K. Differential effects of chronic predicatble and chronic unpredictable stress on neuro-behavioral and biochemical responses in rats. *Therap Targ Neurol Dis* 2015; 2: e603. [doi: 10.14800/ttnd.603].

69. Yadav R, Nepal AK, Rohil V, Gelal B, Chaudhari RK, Jha P, Shrestha S, Baral MLN. Dyslipidemia associated with subclinical hypothyroidism in Eastern Nepal. *Asian J Med Sci* 2014;5:22-25. [http://dx.doi.org/10.3126/ajms.v5i3.9251].

Books

1. Prasad R, Gupta Nikhil. *Clinical Tuberculosis - Diagnosis and Treatment.* New Delhi: Jaypee Brothers Medical Publishers (P) Ltd. 2015.

2. Prasad R, Gupta Nikhil. *MDR & XDR Tuberculosis.* New Delhi: Jaypee Brothers Medical Publishers (P) Ltd. 2015.

Chapters in Books

1. Chhabra SK. Respiratory system: basic anatomy and physiology. In: Munjal YP, editor. *API Textbook of Medicine* 10th Ed; New Delhi: Jaypee Brothers, 2015:pp2290-99.

2. Gulati K, Ray A. The immune system as a target for chemical warfare agents. In: Gupta Ramesh, editor. *Handbook of Toxicity of Chemical Warfare Agents*. New York: Academic Press, 2014:pp639-55.

3. Kotwani A. Access to inhaled therapy in India: availability, price and affordability of asthma medicines. In: Dalby RN, Byron PR, Peart J, Young PM, Traini D, editors. *Respiratory Drug Delivery*. River Grove, IL: DHI Publishing; 2014:pp55-65.

4. Kumar Raj. Smoking and Tuberculosis. In: Jindal SK, Behera D, editors. *World Clinics Pulmonary and Critical Care Medicine: Tuberculosis.* New Delhi: Jaypee Brothers Medical Publishers. 2014:pp97-103.

5. Nagar JK, Shrivastava JP, Kumar R. Airborne SPM and its impact on human respiratory system – Mineralogical study from Shahdara and Shahzada Bagh industrial areas of Delhi. In: Shrivastava KL, Kumar A, editors. *Geo-Resources*, Scientific Publication, India; 2014:pp489-509.

The Institute in association with Daulat Ram College of University of Delhi organised an Interactive Lecture on Science and Public Health, on 27th October 2014.

Good Governance Day, an initiative of the Government of India was celebrated in the Institute on 26th December 2014. A Seminar on "Use of Technology in Promoting Good Governance" was also

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