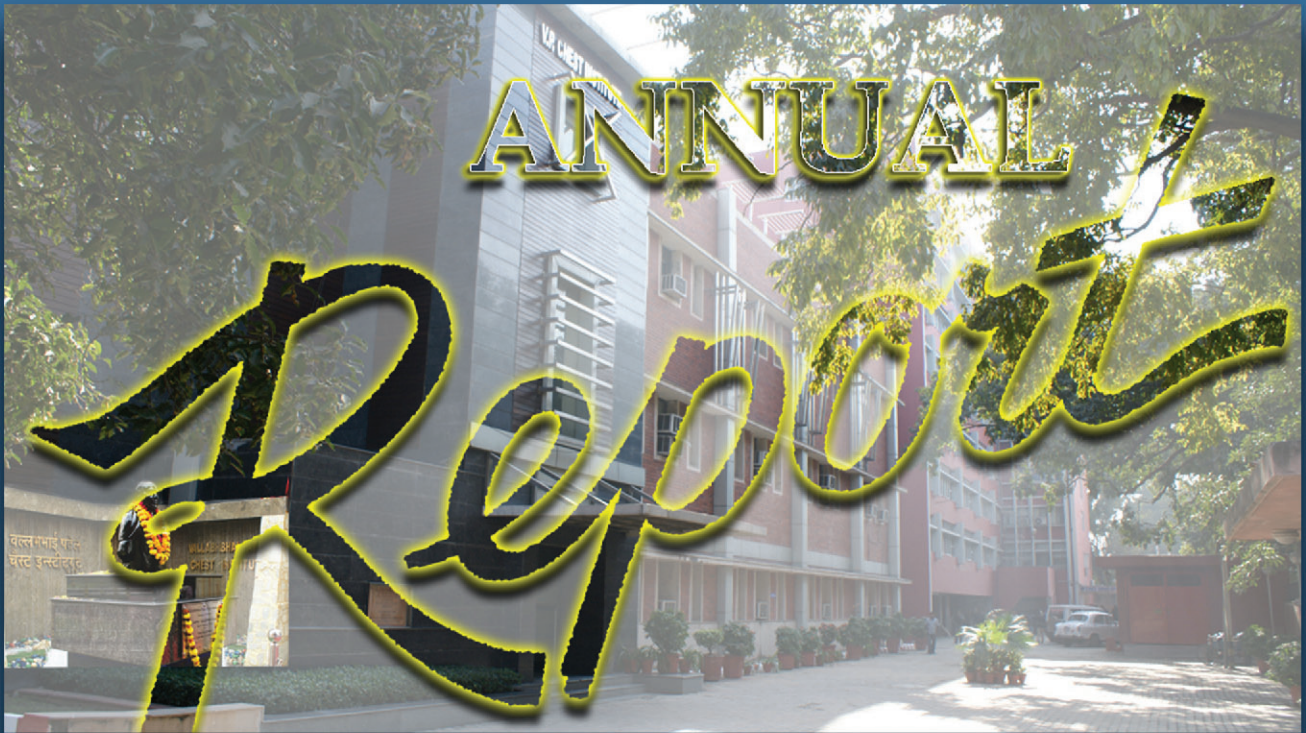


# Annual Report 2016-17



Vallabhbhai Patel Chest Institute  
University of Delhi, Delhi, India



Golden Jubilee National Conference of Indian College of Allergy, Asthma and Applied Immunology (50<sup>th</sup> ICAAIION-2016) was held at Institute from October 22-25, 2016. Dr Harsh Vardhan, Honourable Union Minister of Science and Technology and Earth Science, Government of India, was addressing the participants of the Conference (upper left panel); Dr Jaspal Singh Sandhu, Secretary, UGC and Guest of Honour of the function sharing his views with the audience (below left panel); Several eminent speakers from USA, Europe, Bangladesh, Sri Lanka, Japan participated and share their experiences in the field of asthma, allergy and Immunology (upper right panel) and a Book titled "Guidelines for Practice of Allergen Immunotherapy in India: A 2017 Update" by Prof. S.N. Gaur, *et al* was released (below right panel) during the conference.

# ANNUAL REPORT

## 2016-17



**Vallabhbhai Patel Chest Institute**  
University of Delhi, Delhi, India

**Published by**

Professor S.N. Gaur, Director (Acting), Vallabhbhai Patel Chest Institute, University of Delhi, Delhi-110 007;  
Phone: 27402435, 27667102, 27667441, 27667667, 27666182

**Compiled and Edited by**

Publication Division, VPCI

**Cover Design by**

Photography Division, VPCI

**Printed at**

Bengal Offset Works, 335, Khajoor Road, Karol Bagh, New Delhi-110 005 (Phone: 23610455, 23674614)

*This Annual Report can be accessed at website: [www.vpci.org.in](http://www.vpci.org.in)*

## From the Director's Desk



I feel privileged to bring out the Annual Report of the Vallabhbhai Patel Chest Institute (VPCI) for the year 2016-17. 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.

As a part of educational programme, the Institute also organised number of Orations, Conferences, Workshops, Public Lectures and other programmes during the period. These include; the 18<sup>th</sup> Prof Raman Vishwanathan VPCI Oration was held on 6<sup>th</sup> April 2016 and was delivered by Prof SK Jindal, former Head, Department of Pulmonary Medicine, PGIMER, Chandigarh, the 12<sup>th</sup> Autar Singh Paintal Memorial Oration was delivered by Dr Ashima Anand on 23<sup>rd</sup> September 2016. Prof. Rakesh Bhatnagar, School of Biotechnology, JNU and Chairman Governing Body, VPCI, delivered an invited lecture on "Genetically engineered vaccine against Anthrax: From clone to clinical trial" on 6<sup>th</sup> August 2016. A QUIZ programme for Post Graduate Students of Respiratory Medicine & General Medicine was organized on 19<sup>th</sup> August 2016. ICAAICON – 2016, Golden Jubilee National Conference of the Indian College of Allergy, Asthma & Applied Immunology was organized by VPCI from 22<sup>nd</sup> to 25<sup>th</sup> October 2016. The 2<sup>nd</sup> Dr VK Vijayan Oration was held on 26<sup>th</sup> October 2016 and was delivered by Prof. D. Behera, HoD, Pulmonary Medicine, PGIMER, Chandigarh. The 13<sup>th</sup> International Conference on Geriatrics and Gerontology, was organized by VPCI from 10<sup>th</sup>-11<sup>th</sup> December 2016. The Institute organised an International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Disease [9<sup>th</sup> Annual Conference of International Academy of Cardiovascular Sciences (India Section)] from 9<sup>th</sup> – 11<sup>th</sup> February 2017.

In addition to these academic activities, several other events also marked during the period at VPCI. The Institute celebrated Azadi 70 - Yaad Karo Qurbani by mass Tree Plantation by VPCI Students at the VPCI Lawn on 17<sup>th</sup> August 2016 and Mass Singing of National Anthem by all the staff members on 23<sup>rd</sup> August 2016. Teachers Day was celebrated with great enthusiasm on 5<sup>th</sup> September 2016. A Postal Envelope, designed with the photographs of Sardar Vallabhbhai Patel and Vallabhbhai Patel Chest Institute's building was released on 30<sup>th</sup> September 2016 at "Neelambari-2016", a District Level Philately Exhibition organized by Sr. Superintendent of Post Offices, Delhi. The Vigilance Awareness Week was observed from 31<sup>st</sup> October 2016 to 5<sup>th</sup> November 2016 with the theme of "Public participation in promoting integrity and eradicating corruption". The Institute observed Swachhata Action Plans (SAP) fortnight starting from 1<sup>st</sup> -15<sup>th</sup> February 2017.

National Tobacco Quit Line service, which functions from VPCI, for the whole country was inaugurated by Shri J.P. Nadda, Union Minister of Health and Family Welfare, Govt. of India in May 2016, and approximately 25, 000 calls have been answered so far.

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 & 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.

In addition to these academic activities, several other events also marked the year 2016 at VPCI. We had a Sports and Culture festival in the first week of January 2017, wherein, the members of our staff and students participated with great zeal. A new VPCI Indoor Games Centre was inaugurated on 20<sup>th</sup> February 2017.

I hope this presentation of our activities will be able to provide an overview into the progress made during the year 2016-17.

**Prof. S.N. Gaur**

# ANNUAL REPORT (2016-17)

## CONTENTS

	<i>Pages</i>
<b>Milestones of Institute</b>	7
<b>Orations</b>	
<b>Prof. R. Viswanathan-VPCI</b>	11
<b>Prof. A.S. Paintal Memorial</b>	13
<b>Prof. H.S. Randhawa</b>	14
<b>Dr V.K. Vijayan</b>	14
<b>The Institute</b>	15
Objectives	15
Administration	15
Organisation and Management	15
Governing Body	16
Standing Finance Committee	17
Scientific Advisory Committee	18
Human Ethics Committee	19
Animal Ethics Committee	20
Organisational Structure	21
<b>Viswanathan Chest Hospital</b>	23
<b>Multidisciplinary Research Unit</b>	31
<b>National Centre of Respiratory Allergy, Asthma and Immunology</b>	32
<b>National Tobacco Quitline</b>	34
<b>Animal House</b>	35
<b>Library</b>	36
<b>Publication Division</b>	37
<b>Departmental Activities</b>	38
Biochemistry	38
Biostatistics	40
Microbiology	41
Pathology	49
Pharmacology	52
Physiology	58
Pulmonary Medicine	59
<b>Postgraduate Training and Teaching</b>	61
MD Degrees (Awarded)	61
MD Theses (Submitted)	62

MD Theses (Pursued)	..	63
MD (Ist Year)	..	64
DM Theses (Awarded)	..	65
DM Theses (Submitted)	..	65
PhD Awarded/Submitted	..	66
PhD Theses (Pursued)	..	68
Faculty Members Associated as Co-supervisors for MD/PhD Theses of Other Institutions	..	71
<b>Distinguished Visitors</b>	..	74
<b>Awards/Honours</b>	..	75
<b>Sponsored Research Projects</b>	..	80
<b>Fellowships</b>	..	83
<b>Conferences/Symposia/Seminars/Workshops/CMEs</b>	..	86
<b>Participation in Advanced and Specialised Training Programme by Faculty Members</b>	..	101
<b>Short-term Specialised Trainings Imparted by Faculty Members</b>	..	102
<b>Cultural and Sports Activities</b>	..	105
<b>List of Publications</b>	..	107

## 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 lakhs.
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	<i>The Indian Journal of Chest Diseases</i> , a Quarterly Journal, was started under the joint auspices of the V.P. Chest Institute and the Indian Association for Chest Diseases.
	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 were 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 installed and started.
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	Website of the Institute was started ( <a href="http://www.vpci.org.in">www.vpci.org.in</a> ).

September 24,	2005	Prof. Autar Singh Paintal Memorial Oration was started.
January 10,	2006	An 8-bedded Intensive Care Unit was started.
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 was re-named as "Viswanathan Chest Hospital" in honour of the Founder-Director of the Institute and the Golden Jubilee Auditorium was 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 started.
September 18,	2007	Cardio-pulmonary Rehabilitation Clinic was started.
September 17,	2009	Approval by the University of Delhi to start Superspeciality DM Course in Pulmonary and Critical Care Medicine with an intake of two students 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 students per year.
February 12,	2011	National Centre of Respiratory Allergy, Asthma and Immunology was started.
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 started.
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".
August 23,	2013	New Ward (44 beds) was started. VPCI Newsletter was started.
September 15,	2014	VPCI Gym was inaugurated.
January 6,	2015	In the memory of Prof. A.S. Paintal, a museum was opened, which was dedicated to Prof. Paintal's life and contributions in the world of science, inspiring young scientists, researchers and academicians.
May 30,	2016	National Tobacco Quit Line service, which functions from V.P. Chest Institute, University of Delhi, Delhi, was inaugurated by Shri J.P. Nadda, Union Minister of Health and Family Welfare, Govt. of India, during the "World No Tobacco Day" programme organized by WHO-India, Ministry of Health and Family Welfare, Govt. of India and the National Heritage City Development and Augmentation Yojana ( <i>HRIDAY</i> ), at New Delhi.
September 30,	2016	Release of VPCI Postal Envelope by Prof. S.N. Gaur, Director (Acting), VPCI at "Neelambari-2016", a District Level Philately Exhibition organized by Sr. Superintendent of Post Offices, Delhi.
February 20,	2017	VPCI Indoor Games Center was inaugurated.



18<sup>th</sup> Prof. R. Viswanathan-VPCI Oration was delivered by Professor S.K. Jindal, Former Professor and Head, Department of Pulmonary Medicine, Postgraduate Institute of Medical Education and Research, Chandigarh. Dignitaries of the function on the dais: Prof. S.N. Gaur, Director (Acting), VPCI, Prof. Sudha Prasad, Dean, FMS, University of Delhi, Prof. S.K. Jindal, Orator and Prof. S.K. Bansal, Professor and Head, Department of Biochemistry, VPCI. Prof. S.N. Gaur, Director (Acting) of the Institute, Presenting a memento to Prof. S.K. Jindal on the occasion.



12<sup>th</sup> Prof. A.S. Paintal Memorial Oration was delivered by Dr Ashima Anand, Principal Investigator, DST Research Project. Dignitaries on the dais: Prof. S.N. Gaur, Director (Acting), Prof. O.P. Kalra, Vice-Chancellor, Pt. B.D. Sharma PGIMS, Rohtak, Dr Ashima Anand, Orator and Prof. S.K. Bansal, Professor and Head, Department of Biochemistry, VPCI

## 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, Louisiana 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&D (LS&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.

17th Oration April 6, 2015	Prof. K.C. Mohanty, former Director-Professor, Department of Chest and TB, K.J. Somaiya Medical College and Hospital, Mumbai.
18th Oration April 6, 2016	Prof. S.K. Jindal, former Head, Department of Pulmonary Medicine, Post Graduate Institute of Medical Education and Research, Chandigarh.

---

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

## Prof. A.S. Paintal Memorial Orations

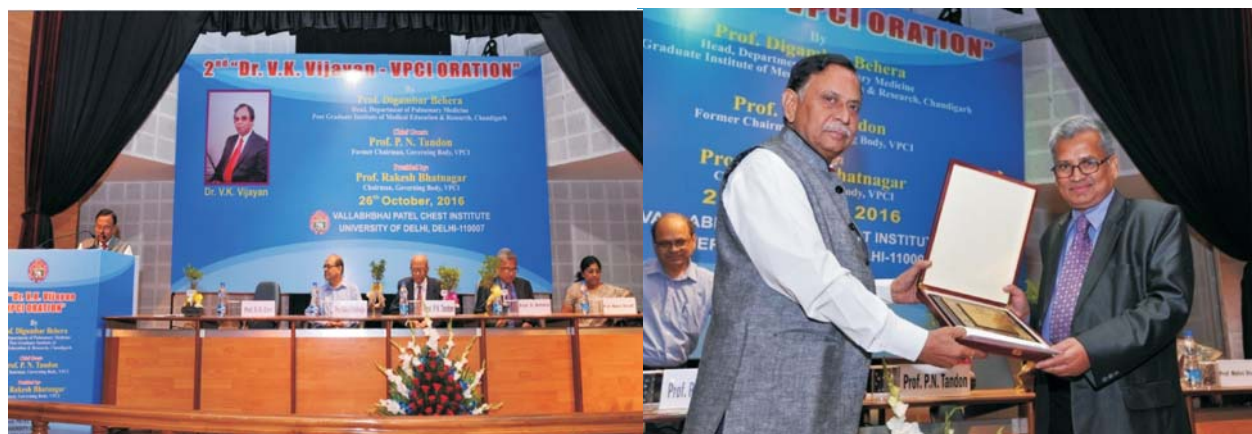
- 1st Oration September 24, 2005 Prof. M.S. Valiathan, Honorary Adviser, Manipal Academy of Higher Education, Manipal (Karnataka).
- 2nd Oration September 24, 2006 Prof. P.N. Tandon, President, National Brain Research Centre Society, Gurgaon.
- 3rd Oration September 24, 2007 Prof. P.N. Srivastava, First 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, Secretary, Government of India, Department of Scientific and Industrial Research, and Director-General, CSIR, New Delhi.
- 10th Oration September 24, 2014 Prof. M. Fahim, Adjunct Research Professor, Department of Physiology, Hamdard Institute of Medical Sciences and Research, Jamia Hamdard, New Delhi and former Professor and Head, Department of Physiology, VPCI.
- 11th Oration September 24, 2015 Prof. A.K. Prasad, Chairman, Influenza Foundation of India, and President, Indian Virological Society and former Professor and Head, Department of Respiratory Virology, VPCI.
- 12th Oration September 23, 2016 Dr Ashima Anand, Principal Investigator, DST Research Project, V.P. Chest Institute, University of Delhi, Delhi.

## Prof. H.S. Randhawa Orations

1st Oration	January 12, 2015	Prof. Ziauddin Khan, Chairman, Department of Microbiology, Kuwait University, Kuwait.
2nd Oration	January 12, 2016	Prof. Indira Nath, former Faculty Member, Department of Pathology, All India Medical Institute of Medical Sciences, New Delhi.
3rd Oration	January 12, 2017	Prof. Subrata Sinha, Director, National Brain Research Centre, Gurugram, Haryana.

## Dr V.K.Vijayan Orations

1st Oration	October 26, 2015	Dr Soumya Swaminathan, Secretary, Department of Health Research, Ministry of Health and Family Welfare, Government of India, and Director-General, ICMR, New Delhi.
2nd Oration	October 26, 2016	Prof. Digambar Behera, Head, Department of Pulmonary Medicine, Post Graduate Institute of Medical Education and Research, Chandigarh.



2<sup>nd</sup> V.K. Vijayan Oration was delivered by Prof. D. Behera on 26<sup>th</sup> October, 2016. Dignitaries on the dais: Prof. S.N. Gaur, addressing the audience, Prof. Rakesh Bhatnagar, Chairman, GB, VPCI, Prof. P.N. Tandon, Chief Guest of the function, Prof. D. Behera, Orator and Dr Malini Shariff, Associate Professor and Head, Department of Microbiology, VPCI. Prof. S.N. Gaur is facilitating Dr Behera with a memento.

# 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 to 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 Respiratory Emergency section are housed in Viswanathan Chest Hospital. The other Departments of the Institute include Biochemistry, Clinical Biochemistry, Biostatistics, Medical Mycology, Microbiology, Pathology, Pharmacology and 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 Joint Registrar who reports to the Director.



Institute Day was celebrated on 12<sup>th</sup> January 2017 and Prof. H.S. Randhawa oration was given by Prof. Subrata Sinha, Director, National Brain Research Centre. On the occasion former faculty, staff and students were felicitated.

# GOVERNING BODY

## CHAIRMAN

The Vice-Chancellor, University of Delhi  
(Ex-Officio) or a person nominated by him

**Prof. Rakesh Bhatnagar**  
School of Biotechnology  
Jawaharlal Nehru University  
Delhi - 110067

## MEMBERS

Treasurer, University of Delhi (Ex-Officio)

**Shri T.S. Kripanidhi**

Two members nominated by the Executive  
Council, University of Delhi

**Prof. V.K. Chaudhary**  
**Prof. Devesh K. Sinha** (*till 08.06.2016*)  
**Prof. M.K. Pandit** (*09.06.2016 onwards*)

Dean, Faculty of Medical Sciences,  
University of Delhi

**Prof. Sudha Prasad** (*till 19.10.2016*)  
**Prof. A. Ray** (*20.10.2016 onwards*)

Three members nominated by the Ministry  
of Health and Family Welfare, Government  
of India, New Delhi

**Mrs Vijaya Srivastava**  
Additional Secretary and Financial Advisor

**Shri Sudhir Kumar**  
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 Yogendra Singh**  
Chief Scientist, CSIR-Institute of Genomics &  
Integrative Biology, Mall Road, Delhi-110007

One Professor of the Institute by rotation  
according to seniority for a period of one year

**Dr Malini Shariff** (*till 02.11.2016*)  
**Dr Mandira Varma-Basil** (*03.11.2016 onwards*)

One Reader or Lecturer of the Institute by  
rotation according to seniority for a period  
of one year

**Dr Vishwajeet Rohil** (*till 02.11.2016*)  
**Dr Vishal Bansal** (*03.11.2016 onwards*)

Representative of Non-teaching Staff  
of the Institute by rotation (as Special Invitee)  
according to seniority for a period of one year

**Mrs Sushil Batra** (*till 06.11.16*)  
**Mrs Chanchal Rajput** (*07.11.16 to 28.02.2017*)  
**Shri Parvinder Kumar** (*01.03.2017 onwards*)

## MEMBER-SECRETARY

Director Vallabhbhai Patel Chest  
Institute, University of Delhi, Delhi (Ex-Officio)

**Prof. S.N. Gaur**

## Standing Finance Committee

**Additional Secretary and Financial Advisor**

Ministry of Health and Family Welfare  
Government of India  
Nirman Bhawan  
New Delhi-110 001

*Chairman*

**Joint Secretary or Nominee**

Ministry of Health and Family Welfare  
Government of India  
Nirman Bhawan  
New Delhi-110 001

*Member*

**Prof. S.K. Bansal**

Department of Biochemistry  
V.P. Chest Institute  
University of Delhi, Delhi -110 007

*Member*

**Joint Registrar**

V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

**Director**

V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member-Secretary*

## Scientific Advisory Committee

**Prof. S.K. Jindal**

Former Head, Department of Pulmonary Medicine  
Post Graduate Institute of Medical Education and  
Research  
Chandigarh-160 012

*Chairman*

**DDG (M)**

Ministry of Health and Family Welfare  
Government of India  
New Delhi-110 001

*Member*

**Principal**

University College of Medical Sciences (UCMS)  
Delhi-110 095

*Member*

**Prof. S.N. Gaur**

Department of Pulmonary Medicine  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

**Prof. K. Ravi**

Department of Physiology  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

**Director**

V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member-Secretary*

**Prof. Y.K. Gupta**

Head, Department of Pharmacology  
All india Institute of Medical Sciences  
New Delhi-110 029

*Member*

**Prof. Randeep Guleria**

Head, Department of Pulmonary Medicine  
and Sleep Disorders  
All india Institute of Medical Sciences  
New Delhi-110 029

*Member*

## Human Ethics Committee

<b>Prof. S.K. Jain</b> Senior Consultant (Pulmonology) Mool Chand Hospital New Delhi-110 024	<i>Chairman</i>
<b>Prof. Ashwani Kumar Bansal</b> Dean, Faculty of Law University of Delhi, Delhi-110 007	<i>Member</i>
<b>Prof. Manoj Kumar Jha</b> Head, Department of Social Work University of Delhi, Delhi-110 007	<i>Member</i>
<b>Prof. Naresh Gupta</b> Head, Department of Medicine Maulana Azad Medical College and Associated LNJP and GB Pant Hospitals B.L. Taneja Block, 1 <sup>st</sup> Floor New Delhi-110 002	<i>Member</i>
<b>Prof. S. Dwivedi</b> Dean/Principal, Hamdard Institute of Medical Sciences and Research (HIMSR), Hamdard Nagar New Delhi-110 062	<i>Member</i>
<b>Prof. Ashok Kumar Saxena</b> Department of Anesthesiology and Critical Care University College of Medical Sciences (UCMS) Shahdara Delhi-110 095	<i>Member</i>
<b>Prof. B.D. Banerjee</b> Department of Biochemistry University College of Medical Sciences (UCMS) Shahdara Delhi-110 095	<i>Member</i>
<b>Dr Ashima Anand</b> Principal Investigator DST Project V.P. Chest Institute University of Delhi, Delhi-110 007	<i>Member</i>
<b>Director</b> V.P. Chest Institute University of Delhi, Delhi-110 007	<i>Member-Secretary</i>

## Institutional Animal Ethics Committee

**Prof. A. Ray**

Head, Department of Pharmacology  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Chairman*

**Prof. K. Ravi**

Head, Department of Physiology  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member-Secretary*

**Dr Anuradha Chowdhary**

Associate Professor, Department of Medical Mycology  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

**Dr Ritu Kulshrestha**

Assistant Professor, Department of Pathology  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

**Dr D.N. Rao**

Professor, Department of Biochemistry  
All India Institute of Medical Sciences  
Ansari Nagar  
New Delhi-110 029

*Main Nominee of CPCSEA*

**Dr Om Singh**

National Institute of Immunology  
Aruna Asaf Ali Marg  
New Delhi-110 067

*Link Nominee of CPCSEA  
(in the event of non availability  
of Dr D.N. Rao)*

**Dr B.B. Batra**

A-316, Sarita Vihar  
New Delhi-110 076

*Nominee of CPCSEA  
(Non Scientific Socially Aware Member)*

**Dr (Mrs) Promodkumari**

Professor, Department of Pharmacology  
University College of Medical Sciences  
University of Delhi, Delhi-110 095

*Nominee of CPCSEA  
(Scientist from outside the Institute)*

**Dr Rajinder Bajaj**

Veterinarian  
V.P. Chest Institute  
University of Delhi, Delhi-110 007

*Member*

# ORGANISATIONAL STRUCTURE

## DIRECTOR (*Acting*)

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

### **Biochemistry**

S.K. Bansal, MSc, PhD

*Professor*

### **Biostatistics**

Mujeeb-ur-Rahman, MSc, PhD, PGDCP

*Assistant Professor*

### **Cardio-respiratory Physiology**

S.K. Chhabra, MD

*Professor* (V.R.S. taken on 30.09.2016)

### **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), PhD, 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**

S.N. Gaur, MD, PhD (Medicine), FCCP (USA), FNCCP (I), FCAI  
*Director Professor*

Ashok Shah, DTCD, MD, FNCCP (I), FCAI  
*Professor (Superannuated on 31.08.2016)*

## **Respiratory Allergy and Applied Immunology**

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

Balakrishnan Menon, MD, DMRD  
*Associate Professor*

Nitin Goel, MD  
*Assistant Professor (Adhoc)*

## **Respiratory Virology**

(Mrs) Madhu Khanna, MSc, PhD  
*Associate Professor*

## **Viswanathan Chest Hospital**

### **Officer-in-Charge**

S.N. Gaur  
*Director (Acting)*

### **Library**

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

### **Animal House**

Rajinder Bajaj, BVSc and AH  
*Veterinarian*

### **Administration**

P.R. Santhanam, MA (Public Admn), MHRM, MBA, LLB, PGDPM  
*Joint Registrar*

# Viswanathan Chest Hospital

The Viswanathan Chest Hospital (VCH) attached to the Vallabhbhai Patel Chest Institute has the following Departments/Facilities to provide specialised investigations and treatment to patients referred to this Institute.

## Clinical Facilities

The Viswanathan Chest Hospital (VCH), formerly known as Clinical Research Centre, is the hospital wing of the Institute with the following Departments:

- Pulmonary Medicine
- Radiodiagnosis and Imaging
- Clinical Laboratories of Biochemistry, Microbiology and Pathology
- Anaesthesia
- Thoracic Surgery

## Facilities available at Viswanathan Chest Hospital

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

## Specialized investigations available at VCH

- Fiberoptic bronchoscopy
- Guided FNAC/Biopsy
- Medical thoracoscopy
- Respiratory allergy skin tests
- Clinical immunology
- BACTEC system for tuberculosis

**Detailed data of patients attending VCH during the year are as follows:**

<b>Number of new patients attending OPD</b>	<b>:</b>	<b>11884</b>
Number of follow up patients visiting OPD	:	56823
<b>Total Outdoor Patients</b>		<b>68707</b>

**Number of indoor patients**

General Wards	:	1825
Emergency Wards	:	2433
<b>Total Indoor Patients</b>		<b>4258</b>
Emergency treatment provided	:	22899
Total number of patients treated in ICU	:	357

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

Arterial blood gases	:	9972
Bronchoscopy	:	176
Bronchoalveolar lavage	:	129
Pulmonary function tests	:	22640
CT scans	:	3116
Ultrasounds	:	100
X-rays	:	22097
Electrocardiogram	:	5770
Polysomnograms	:	318
HIV testing	:	829
Clinical biochemistry	:	52574
Skin tests	:	2125
Serum IgE test performed	:	5432
ANA	:	567
c-ANCA	:	380
p-ANCA	:	380
SCL-70	:	303
HBsAg	:	545
HCV	:	540
Serum ACE	:	262
Vitamin D	:	91
Thyroid profile	:	100

## Microbiology

### 1. Bacteriology Laboratory

Clinical specimens processed for isolation and identification of aerobic pathogens

<i>Nature of Specimen</i>		<i>Nos.</i>
Sputum	:	2677
Urine	:	429
Bronchial Aspirate/Lavage	:	243
Pleural Fluid	:	65
Blood	:	362
Endotracheal Aspirate	:	141
Pus/(FNAC/Tips)	:	25
Others	:	1
<b>Total</b>	<b>:</b>	<b>3943</b>

### 2. Serology Laboratory

<i>Tests Performed</i>		<i>Nos.</i>
Rheumatoid factor (RA)	:	427
C reactive protein (CRP)	:	328
Widal	:	5
<b>Total</b>	<b>:</b>	<b>760</b>

3. Anaerobic Culture : 5

### 4. Mycobacteriology Laboratory

<i>Nature of Specimen</i>	<i>LJ medium</i>	<i>No. of Specimen MGIT</i>	<i>GeneXpert</i>
Sputum	8645	533	1625
Bronchial aspirate	263	16	202
Pleural fluid	111	9	86
ET aspirate	167	2	50
CSF	34	3	27
Pus/Biopsy	26	8	14
FNAC	39	6	30
<b>Total</b>	<b>9285</b>	<b>577</b>	<b>2034</b>

Test for Filarial antigen: 10

Line Probe assay for first line drugs: 30

Line probe assay for *Mycobacterium* sp. 80

5. *Mycology (VPCI and other hospitals)*

<i>Nature of Specimen</i>		<i>No.</i>
Sputa	:	2118
Blood specimens	:	1230
Bronchial lavage/aspirate/washings/ Endotracheal aspirate/pleural fluid	:	571
Blood culture	:	219
Tissue biopsies/nasal polyps/skin scrapings/nail scrapings	:	262
CSF	:	45
Urine	:	19
Miscellaneous (swabs/nasal polyp/FNAC/discharge/pus)	:	2153
<b>Total</b>	:	<b>6617</b>

Besides, referral service for identification of clinical isolates of fungi was extended to other institutions on request.

### **Pathology**

<i>Section</i>		<i>No.</i>
Haematology	:	30,856
Coagulation	:	2116
Histopathology	:	109
Cytopathology	:	521
Clinical Pathology	:	871

### *Cell Culture Laboratory*

Research work on the A549 human alveolar epithelial cell line was performed. The insulin growth factor signalling pathway, IGFBP5, IGF-1, SP-C, TGF- $\beta$  levels were studied by immunocytochemistry, semi quantitative PCR and real time PCR.

### **Tobacco Cessation Clinic**

The Institute started Tobacco Cessation Clinic (TCC) in November 2001. 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 Institute's Tobacco Cessation Clinic has been providing their services since November 2001 in out patient department at hospital wing from Monday to Friday at 9:00 am to 5:00 pm to the smokers and tobacco chewers who are willing to quit smoking and tobacco chewing. The services offered at the clinic in the form of Counselling, NRT (nicotine replacement therapy), non-NRT including CoHb monitoring, quit date plan follow-up, telephonic follow-up and pulmonary function test are being performed here. The

clinic is also trying to create awareness among the general public and OPD patients about the negative effects of tobacco and about tobacco cessation through power point presentation, booklet, and videos. Registered person is being called for regular follow-up at an interval of 2 weeks followed by 1 month, 2 months, 3 months, 6 months and 1 year.

Moreover, TCC conducts workshops regularly in different parts of Delhi and NCR to train the physicians, counsellors, volunteers and other stake holders involved in smoking cessation. Since inception, TCC conducted 56 educational programmes for physicians, para-medical professionals and general public.

TCC supplies educational materials in the form of booklets, pamphlets, stickers, etc, for physicians and general public. Since the inception of TCC to 31st March, 2017, 7404 new tobacco users and 2913 follow-up tobacco users availed the services. 398 new and 172 follow-up subjects user came for tobacco cessation in TCC, from 1<sup>st</sup> April 2016 to 31<sup>st</sup> March 2017.

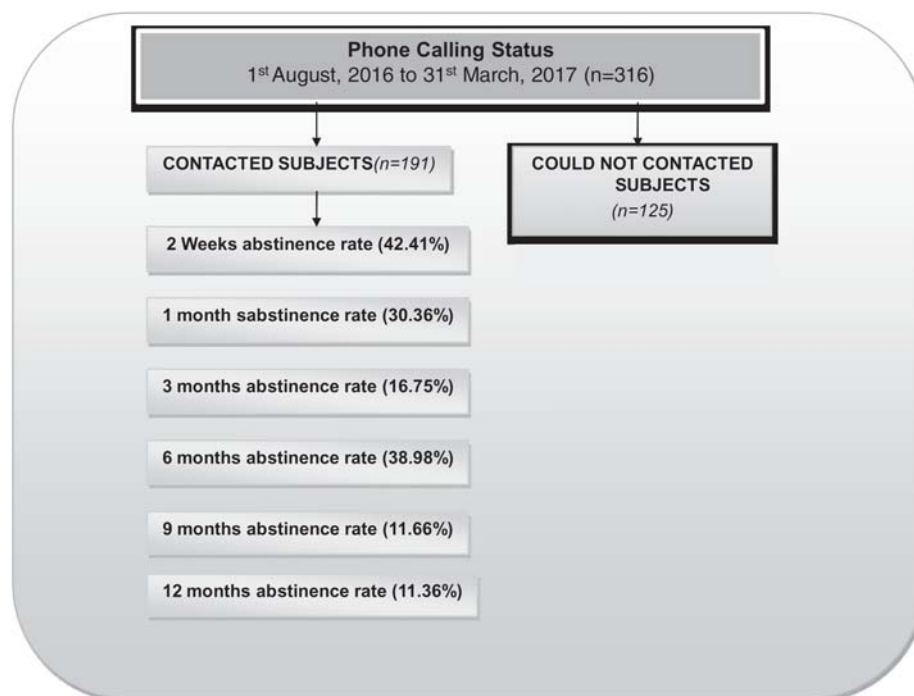
Follow up telephonic calls made to 316 subjects (Tobacco Users) registered between 1<sup>st</sup> August 2016 to 31<sup>st</sup> March 2017 to access their present abstinence rate. Out of these 191 subjects contacted, rest could not be contacted due to switch off, person not available, expire, call not answering, out of station, caller busy, number does not exist etc. In these follow up calls we found that 81 (42.41%) subjects have the continuous abstinence rate of 2 weeks, 58 (30.36%) subjects have the continuous rate of 1 month, 32 (16.75%) subjects have the continuous rate of 3 months, 12 (38.98%) subjects have the continuous rate of 6 months, 7 (11.66%) subjects have the continuous rate of 9 months and 5 (11.36%) subjects have the continuous rate of 12 months. (Table 1, 2 & 3).

**Table 1 : Quitting Status (Telephonic Calls)**

Month	2 weeks	1 months	3 months	6 months	9 months	12 months	Contacted
April 2016	1	1	1	1	1	1	5
May	3	3	2	2	1	1	5
June	2	2	2	2	0	0	10
July	8	8	4	2	2	2	11
Aug	5	4	4	1	1	1	13
Sep	10	7	4	3	2	N.A	16
Oct	9	7	7	0	N.A	N.A	18
Nov	3	2	1	1	N.A	N.A	17
Dec	14	12	5	N.A	N.A	N.A	26
Jan, 2017	6	3	1	N.A	N.A	N.A	18
Feb	6	3	1	N.A	N.A	N.A	18
Mar	14	6	N.A	N.A	N.A	N.A	34
<b>Total</b>	<b>81</b>	<b>58</b>	<b>32</b>	<b>12</b>	<b>7</b>	<b>5</b>	<b>191</b>

**Table 2 : Abstinence Rate of Tobacco Users**

Abstinence rate	Subjects	%
<b>2 week abstinence rate (n=191)</b>	81	42.41%
<b>1 month abstinence rate (n=191)</b>	58	30.36%
<b>3 month abstinence rate (n=191)</b>	32	16.75%
<b>6 month abstinence rate (n=95)</b>	12	38.98%
<b>9 month abstinence rate (n=60)</b>	7	11.66%
<b>12 month abstinence rate (n=44)</b>	5	11.36%



*World No Tobacco Day*

During the year, on the occasion of World No Tobacco Day - a public awareness programme was organized by Vallabhbhai Patel Chest Institute, Delhi in association with Society for Tobacco Control & National College of Chest Physicians (India) on 3<sup>rd</sup> June 2016 at Paintal Memorial Golden Jubilee Auditorium, VPCI, Delhi. The aim of this function was to bring awareness among people about the harmful effects of tobacco on health and environment, and about the launch of National Tobacco Quitline Service (NTQLS) among the people. NTQLS staff participated through a play named "Pati Patni Aur Woh" here "woh" refers to tobacco, through this play they shown that how a family member who use tobacco get benefited by the TQLS. They covered almost all things in the play which is important and related to tobacco such as health consequences, peer pressure, environmental factors, second hand smoke, family problems etc. They also show the process that how a tobacco user can register for free telephonic tobacco cessation counselling and Quitline counsellor help him to quit tobacco.

## Yoga Therapy and Research Centre

The Yoga Therapy and Research Centre conducted yoga classes in collaboration with the Morarji Desai National Institute of Yoga (MDNIY), New Delhi from Monday to Saturday during 8 AM to 4 PM at VPCI under the guidance of VPCI Nodal Officer, Dr B.K. Menon and Director, Prof. S. N. Gaur in association with the Centre staff of three members, one Yoga ARO and two Yoga therapists.

Yoga training classes run in different batches from 8 AM to 4 PM daily to teach different Yoga therapy to heal the diseases of patients come to attend these therapy classes.

Yoga sessions are specially designed for the management and eradication of different health disorders, like bronchial asthma, hypertension, stress, obesity etc. The patients first reports to yoga OPD at VPCI during the period 9.00 AM to 3.00 PM Monday to Friday by Doctors and Yoga staff there after obtaining the case history of the patient, necessary counselling is given by the yoga ARO. Then the patient is advised to undergo yoga training and educational session according to individual's health problems for a particular period till the healing of disease. The patient is re-examined to note the improvement made by him/her by the Yoga therapist. Then patient is advised for a regular 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 them healthy. Special Yoga sessions for staff of VPCI are also arranged time to time.

Yoga Therapy and Research Centre, Vallabhbhai Patel Chest University of Delhi in collaboration with Morarji Desai National Institute of Yoga, New Delhi, Department of Ayush, Govt. of India under the supervision of Dr B. K. Menon, Nodal Officer and Prof. S. N. Gaur, Director and Mr Manoj Kumar, Yoga Therapist conducted the Second International Day of Yoga programme on 21<sup>st</sup> June 2016 at Paintal Memorial Golden Jubilee Auditorium of VPCI, Delhi University in which yoga team follow the common yoga protocol and imparted training to all staff and students VPCI and yoga students and Children. The total strength was 195 of persons participated in this event of Yoga remained very successful.

**The following numbers of patients were attended for healing different categories of diseases by Yoga at the Yoga Therapy and Research Centre during the year 2016-17:**

Outdoor Patients	1701
Indoor Patients	1435
Promotional Health Programme	710
<b>Total</b>	<b>3846</b>
<i>Outdoor Patients</i>	
Bronchial asthma	200
Stress	100
Chronic obstructive pulmonary disease	150
Interstitial lung disease	72
Hypertension	121
Obesity	250
Cervical spondylitis	40
Migraine	20
Allergic rhinitis	61
Arthritis	47
Diabetes	75
Backache	170
Depression	80
Coronary heart disease	45
Irritable bowel syndrome	95
Tuberculosis	10

<i>Indoor Patients</i>	
Bronchial asthma	375
Chronic obstructive pulmonary disease	640
Interstitial lung disease	95
Sinusitis	90
Pneumonia	35
Tuberculosis	85
Allergic rhinitis	115



2<sup>nd</sup> International Yoga Day was observed on 31<sup>st</sup> June 2016 in collaboration with Morarji Desai National Institute of Yoga and Department of Ayush, Government of India. Faculty, staff, student and others from outside Institute participated in yoga programme.

## Cardio-pulmonary Rehabilitation Clinic

Cardio-pulmonary Rehabilitation Clinic at Vishwanathan Chest Hospital, VPCI is involved in management of chronic respiratory patients who have disability in activities of daily living and exercise limitation due to shortness of breath despite being on optimal pharmacological treatment.

Patients are advised to enroll in supervised rehabilitation programme which can help them regain their functional capacity, reduce breathlessness and help them get their life back. A comprehensive pulmonary rehabilitation includes education on disease information, 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:**  
(1<sup>st</sup> April 2016 - 31<sup>st</sup> March 2017)
  - o **Breathing retraining & education** : **291**
  - o **Completed Supervised Rehabilitation programme** : **97**  
(Intensive & Maintenance)

## Multi-disciplinary Research Unit

MRU Project-I

### **I (a). Extracellular matrix remodelling and expression of matrix metalloproteinases and growth factors in pulmonary fibrosis**

Pulmonary fibrosis is characterized by progressive and irreversible parenchymal remodelling with extracellular matrix deposition and destruction of lung architecture. The matrix metalloproteinases (MMPs) and growth factors such as TGF- $\beta$ , bFGF, FGFR are suggested to play an important role in the development of pulmonary fibrosis. Targeting these factors by nanoparticle mediated drug delivery may prove to be promising therapeutic alternatives to conventional drug therapy as they circumvent pulmonary clearance mechanisms and may provide enhanced therapeutic efficiency and controlled drug release. For this, Wistar rats were divided into two groups: Control Group I (Intratracheal saline, n=12) and Group II (bleomycin instilled, 7U/kg b.w, n=12). Animals were euthanized on day 0, 7, 14 and 28 days after bleomycin/saline intratracheal instillation. MMP-8, bFGF, FGFR1 and FGFR2 mRNA expression was determined by RT-PCR at each time point. FGFR1 and FGFR2 expression was up-regulated at the gene level on day 7 upto day 28 respectively in Group II lung tissues. An upregulation of MMP-8 protein expression was seen in bleomycin instilled animals by immunohistochemistry (IHC) in regions of irregular lung architecture, including alveolar epithelial cells, interstitial macrophages and inflammatory cells. The upregulated MMP-8, FGFR1, FGFR2 levels correlated with increased total lung collagen from day 14 to day 28 and were indicative of MMP-FGF-FGFR signalling axis in regions of lung parenchymal remodelling.

### **I (b). Synthesis of polymeric nanoparticles for pulmonary drug delivery**

The biodegradable polymers such as polycaprolactone (PCL) and Poly(D,L-Lactide) (PLA) were selected for synthesis of polymeric nanoparticles by Double emulsion–solvent evaporation method. Varying concentration of surfactants such as Pluronic F-127, Tween-80, Span 20 and Tween-20 were used. The nanoparticle size was seen to decrease with increasing surfactant concentration. The polymers were solubilized in solvents such as Ethyl acetate, acetonitrile and Dichloromethane, either individually or in combination. After complete evaporation of solvent, nanoparticle emulsion was dialyzed against water and the size and shape of nanoparticles was characterized by Nanosight size analyzer and Transmission Electron Microscopy (TEM) respectively. These nanoparticles will be further loaded with Pirfenidone and their efficacy on attenuation of parenchymal remodelling caused by bleomycin will be assessed.

MRU Project-II

### **To elucidate the role of Ellagic acid and its derivative *via* CRTAase in the gene expression**

The Human NSCLC, lung adenocarcinoma A549 cell line has been maintained using DMEM media in a biosafety cabinet under strict aseptic precautions. Highly concentrated and purified (endotoxin free) plasmid DNA required for efficient transfection was obtained. Transfection efficiency was validated in untreated A549 Cell-line by Fluorescent Microscopy using Label Plasmid IT® Cy®3 Plasmid Delivery Control and the validation has been further confirmed by Western Blot elucidating the over-expression of CALR gene in transfected A549 cells in comparison to the control. In the study conducted IC<sub>50</sub> of Ellagic Acid (EA), Ellagic acid peracetate (EAPA) and Valproic Acid was obtained by MTT 72 hr Assay at 595nm. The Apoptotic activity of EA and EAPA has been validated by DAPI stain in A549 cells. RNA isolation followed by CDNA synthesis was done in A549 Cells using commercially available kit. Basal CT value of the lung cancer associated genes was obtained successive to the Melt Curve analysis confirming the absence of non-specific products in real-time PCR. A panel of lung cancer associated genes were selected; primers were designed and screened using RT-PCR. The results obtained were encouraging.

# National Centre of Respiratory Allergy, Asthma and Immunology

The National Centre of Respiratory, Allergy, Asthma and Immunology (NCRAAI) was started in the year 2011 with an aim 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;

**Study in Villages:** The NCRAAI is conducting a study entitled, 'Indoor air pollution and asthma exacerbation in children: a population-based study' in the village Dujana, Gautam Budh Nagar, Tehsil – Dadri and Block-Bisrak of Uttar Pradesh. The study is funded by Indian Council of Medical Research (ICMR), New Delhi. During the period, 895 houses were surveyed (2294 children, 1795 adult females and 1683 adult males), 3849 pulmonary function tests (PFT) and 1808 PEFr tests were performed. Indoor particulate matter (PM10, PM2.5, PM1) was measured in 359 houses (152 severe asthmatics + 207 controls). Asthmatic children have been 1-year followed up at three-three month's intervals for the morbidity measurement

## Pollen Count Station at VPCI

The pollens station has been established at the roof of the VPCI multistoried building, in which we have installed two "Burkard Air Samplers" one is seven days sampler and the other is one day sampler. Both the samplers are running continuously and air samples are collected and studied on daily bases. A total of 699 slides (338 Seven day and 361 One-day) were mounted and analyzed during the period. Pollen data has been presented at conferences and published in national/international periodicals during the year.

Table - Mean Pollen Count, Temperature and Humidity during April 2016-March 2017

Month	Pollen 1 Day	Pollen 7 Day	Temperature (p C)	Humidity
April, 2016	478.3	476.6	28.8	55.8
May	242.1	246.0	31.7	55.4
June	154.5	149.1	32.0	60.9
July	69.5	65.2	29.0	82.0
August	49.7	49.5	28.7	82.2
September	119.4	118.6	28.4	71.6
October	156.5	158.5	25.0	62.7
November	84.6	87.1	19.0	63.6
December	50.3	51.6	13.9	71.0
January, 2017	51.4	51.9	13.9	76.2
February	236.8	214.2	17.0	70.0
March	312.3	312.9	21.8	63.9

**The NCRAAI is engaged with the following research activities:**

- Allergic bronchopulmonary aspergillosis presenting as lobar or total lung collapse

- Indoor air pollution and asthma in children at Delhi, India
- Inflammatory response to subcutaneous allergen-specific immunotherapy in patients with bronchial asthma and allergic rhinitis
- Atmospheric pollen count in North Delhi region
- A comparative study of skin prick test versus serum-specific IgE measurement in indian patients with bronchial asthma and allergic rhinitis
- Hypersensitivity to Pigeon allergens in asthma
- Correlation of exhaled nitric oxide and atopic status in non-obese and obese bronchial asthma patients
- To measure the effect of environmental tobacco smoke exposure on the respiratory health of children in rural area of Delhi-NCR
- Association of socio-economic status and indoor air pollution level on respiratory health of children in rural area of Delhi-NCR
- Relationship between pollens numbers and hospital visits of patients in North Delhi region
- Lifestyle factors and asthma in India

## National Tobacco Quitline

National Tobacco Quit Line Service is a unique telephone base call services devoted to provide Tobacco Cessation Counselling through to a toll free number **1800-11-2356** free of cost across the country. This is the prestigious pilot project of Ministry of Health and Family Welfare, Government of India and maintained by Vallabhbhai Patel Chest Institute under the supervision of Professor Raj Kumar, Department of Pulmonology Medicine, and Head, National Centre of Respiratory Allergy Asthma & Immunology (NCRAAI), V.P. Chest Institute, University of Delhi, Delhi.

**30<sup>th</sup> May 2016**, Celebrating World No tobacco Day, *Honorable Health minister Shri J.P. Nadda*, Launched and inaugurated the National Tobacco Quitline Services at Le Meridian Hotel, New Delhi. The Quitline Centre is located in the premises of Vallabhbhai Patel Chest Institute at the 7<sup>th</sup> floor Multistoried Building, located in the heart of the main campus of the University of Delhi, providing the requisite academic environment.

The main objective is to help tobacco users quit. Services offered by quitlines include counselling, referrals, mailed materials, training to healthcare providers, web-based services. Research has shown that quitlines are highly effective in helping tobacco users to quit. Due to their effectiveness and ability to reach and serve tobacco users, regardless of location, quitlines have spread quickly across the country. The quitline center has a total strength of 25 well qualified and trained staffs (Supervisor, Counsellors, and Attendants). To begin with, the pilot project has started from **8:00 am – 8:00pm** on all day except Monday.

The programme was started with the presentation of Dr Raj Kumar, In-charge, National Tobacco Quitline Services & Professor, Department of Pulmonary Medicine, and Head, National Center of Respiratory Allergy, Asthma & Immunology, V.P. Chest Institute, Delhi. He spoke about tobacco quit line existence, functioning, benefits, etc. Dr Kumar said, “reaching 275 Million users for providing tobacco cessation services – not possible through the health care delivery system THERE IS A HUGE GAP. A toll free telephone helpline can address this gap and reach tobacco users at their door step at their convenience”.

Further he added, as a citizen of India and as a faculty of Vallabhbhai Patel Chest Institute, it is a proud moment for me today to give a presentation on the Tobacco Quit Line programme that is Inaugurated Today. Finally, Dr Kumar, thanks the MoHFW, Govt. of India for selecting V.P. Chest Institute as the pivoted Centre and for giving us opportunity to interact with our fellow country peoples to help them quit tobacco consumption.

*Honourable* Health Minister Shri J.P. Nadda expressed his view on tobacco quit line and congratulated the dignitaries and people of India to witness the launch of tobacco quit line.

A short film on National Tobacco Quit line was launched by *Honourable* Health Minister Shri J.P. Nadda. It was focused on National Tobacco Quit Line toll free number and all the people who have given their contribution in making tobacco quit line a reality.

After great round of applause Shri J.P. Nadda launched the tobacco quit line by unveiling the tobacco quit line toll free number **1800-11-2356** for public.

Prof. Raj Kumar represented himself as a tobacco user stating Shyam and smoking bidi for last 20 years. On the other side Mr Naveen Kumar, a tobacco quit line counsellor receive this call. First of all he introduced himself and National Tobacco Quit Line as in the following wording “*Namaskaar, Rashtriyatambakumukti helpline me swagathai, main Naveen Kumar aapkikistarah se sahaaytakarsaktahoon*”. After the introduction Counsellor did a brief assessment and counselling. At the same time media personality air the launch on DD News.

It went viral and reached to the mass, even small villages of our country. Hundreds of call were hitting at our I.V.R in a single minute till the next day. It was very difficult to handle all the calls, as there are only six seating capacity of quit line counsellour. It was the pride moment for us to stands among those countries that have their own national tobacco quit line. World Health Organization was also awaiting this for longer years, and now their wait is over.

## **Animal House**

The Institute Animal House is registered for breeding and experiment on animals with Committee for the Purpose of Control and Supervision of Experiments on Animals (CPCSEA), Animal Welfare Division, Government of India, for breeding and conducting experiment on small Laboratory Animals vide registration no. 170/GO/ReBi/S/99/CPCSEA.

The Animal House of the Institute provide optimum environment for experimental animals, which is essential for obtaining reliable experimental research. The most reliable result will be obtained from animals that are healthy, unstressed and at ease with their surroundings

The Animal House of the Institute is being maintained under controlled environment conditions as specified in CPCSEA guidelines with maintained temperature, relative humidity, timer controlled light dark cycle and air change per hour with 100% fresh air.

All experiments involving animals are approved by the Institute Animal Ethics Committee (IAEC), which is constituted by CPCSEA. Institute Animal Ethics 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 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, collate 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 10,064 Books, J-24,429 bound Journals, 170 CD's, 566 Thesis and 20 National and International Reports. A total of 115 Journals (110 International and 05 National) are being subscribed by the library, 16 Journals (05 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 render 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 with 2 Mbps form MTNL. Library also provides inter-library loan facilities and reprographic services on demand.

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

The Library facilities are available to Members/Users of Delhi University from Monday to Friday {8:30 AM to 7:00 PM} & Saturday 9.00 to 5:00 P.M. (Reference & Reading Purpose).

## 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>](http://www.vpci.org.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

The protein profile of erythrocyte membrane of asthmatics and healthy subjects was determined by 2-D gel electrophoresis. Of the several spots, we identified 11 protein spots to be distinctly resolved and differentially expressed in various groups of asthmatic patients as compared to healthy groups. Their molecular weight ranged from 16.3 to 28.4 and PI ranged from 5.4 to 6.8.

#### 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 sequencing of *CRHR1* gene was done (using 14 primer sets designed by us for 14 exons) in asthmatics and healthy controls. The data showed presence of 12 SNPs in *CRHR1* gene, of which three were novel, at positions: 34170 (10-TC, 32-TT), 50229 (26-AC, 6-CC), 50300 (25-CC, 5-AC). We also assessed the TGF- $\beta$  levels in plasma and observed a significant reduction in asthmatics than healthy controls ( $P = 0.0057$ ).

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

The biochemical and immunological changes underlying pulmonary fibrosis were studied in bleomycin induced rat model. Gene and protein expression of TLR-2 and 4 was studied by qRT-PCR and immunohistochemistry respectively, on day 0,7,14 and 28. After bleomycin instillation, TLR-4 increased on day 7 and declined from day 14 onwards, while TLR-2 increased upto day 14 and declined on day 28. Expression of TLRs was correlated with TGF- $\beta$ 1, protease (MMP-9) and anti-proteases (TIMP-1 and 3) involved in extracellular matrix remodelling.

#### 4. A study on 5'-nucleotidase, adenosine deaminase and adenosine level in serum, lymphocytes and erythrocytes of COPD patients

The study shows that adenosine levels are considerably increased in the serum, lymphocytes and erythrocytes of COPD patients, which have negative correlation with FEV<sub>1</sub> (% of predicted) suggesting that the adenosine levels are increased with the increased airway obstruction or the severity of COPD. Further, there is increase in 5'-nucleotidase activity and simultaneous decrease in adenosine deaminase activity in serum, lymphocytes and erythrocytes of COPD patients, suggesting that the magnitude of these two enzymes is mainly responsible for maintenance of adenosine levels. Additionally, increase in 5'-nucleotidase activity and concomitant decrease in ADA activity are correlated with deterioration of COPD, which clearly highlights the importance of these two enzymes in COPD patients.

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

The multi-institutional research study has been successfully completed. This was the first such study showing the effect of histone hyperacetylation, induced by Calreticulin Transacetylase (CRTAase) by the Acetyl CoA independent novel mechanism on the expression of genes *in vitro*. Human non-small cell lung cancer A549 cell line culture was maintained to accomplish the research study. First step being establishing

the transacetylation activity of calreticulin using histone protein as target by Western blotting using specific anti-acetyl Histone Antibodies (anti acetyl H3 & anti acetyl H4 antibodies). Hyperacetylation has been induced in the cell-line by treating the CRTAase (Human CAL gene) transfected cells with Polyphenolic Acetate, PA (7,8-Diacetoxy-4-methyl coumarin, DAMC) and HDI (Valproic acid, VA). MicroArray Profiling I was performed prior to and MicroArray Profiling II after demethylation removing hypermethylation patterns which might cause under-expression in order to study specifically the acetylation mechanism even in hypermethylated genes. The transcription product of the selected genes after MicroArray Profiling (I & II) along with the genes of interest had been validated, confirmed and quantified by Applied Biosystems, StepOnePlus Real-Time PCR. The above all findings strengthened that the therapeutic perspectives shown were merely due to acetylation mechanism induced by CAL gene in presence of DAMC and VA. The histone hyperacetylation induced modulation of gene expression of various genes (Tumor suppressor, Cell cycle arrest and apoptotic genes) were thus studied by MicroArray Profiling and Real time-PCR. Apoptosis was also studied in A549 Cancer cell line before and after the transfection of CRTAase gene along with treatment of tumor cells with DAMC & VA by using Annexin V-FITC Detection Kit and analyzed using BD Accuri™ C6 flow cytometer.

The MicroArray as well as flow cytometry results enlightened the increased therapeutic perspectives of the drug DAMC relative to VA including the increase in DAMC therapeutic potential when synergized with CAL gene and VA.

The results obtained highlighted the mighty role of acetylation mechanism induced by DAMC and VA with and without Cal gene in comparison to the negligible role of hypermethylation, thus proving DAMC and VA as potential candidates for target oriented, more effective and less toxic chemotherapeutic as well as chemo preventive drugs for lung cancer treatment in future.

#### **6. To elucidate the role of Ellagic acid and its derivative *via* CRTAase in the gene expression profile of lung carcinogenesis**

The human NSCLC, lung adenocarcinoma A549 cell line has been maintained using DMEM media in a biosafety cabinet under strict aseptic precautions following standard protocol and the Homo sapiens Calreticulin (CALR) as transfection-ready DNA (pCMV6-AC Vector) was used for transformation into DH5 $\alpha$  *E. coli* cells using heat shock method. PCR was performed using CALR gene primer to directly analyze the positive transformants. The plasmid was analyzed by agarose gel electrophoresis to confirm the presence and correct orientation of the insert using the DNA Ladder as a reference. The amplified plasmid DNA was extracted and purified from bacterial culture using commercially available kit. Highly concentrated and purified (endotoxin free) plasmid DNA required for efficient transfection was obtained. The transient transfection of CALR gene in A549 cell-line was performed by commercially available kit following manufacturer's protocol. Transfection efficiency was validated in untreated A549 Cell-line by Fluorescent Microscopy using Label Plasmid IT® Cy®3 Plasmid Delivery Control and the validation has been further confirmed by Western Blot elucidating the over-expression of CALR gene in transfected A549cells in comparison to the control.

The drugs were screened for IC50 values as *in-vitro* IC50 is a very basic starting point in determining the potential efficacy of a developmental drug. IC50 is inversely proportional to the efficacy or potency of the drug. In the study conducted IC50 of Ellagic Acid and Valproic Acid was obtained by MTT 72 hr Assay at 595nm.

RNA isolation followed by CDNA synthesis was done in A549 cells using commercially available kit. Basal CT value of the Lung Cancer associated genes was obtained successive to the Melt Curve analysis confirming the absence of non-specific products in 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 and 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 conducts regular teaching programmes for the postgraduates (MD) and doctoral (DM/PhD) students.

The 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 and Family Welfare, Government of India; Directorate of Health Services, Government of Delhi; University of Delhi, UGC etc.

The Department shoulders the responsibility of online reporting of vital events such as mortality and morbidity of notifiable diseases, in Viswanathan Chest Hospital, VPCI to the Municipal Corporation of Delhi in stipulated time period.

The Department also undertake 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 department of the Institute.

# Microbiology

(Including Microbiology, Medical Mycology and Respiratory Virology)

## Research

### 1. Analysis of antimicrobial susceptibility and molecular characterization in clinical isolates of *Klebsiella pneumoniae* from VPCI, Delhi

Production of various beta-lactamases is the main cause of resistance in gram-negative bacteria. *Klebsiella pneumoniae* is known to produce varied infections especially in hospitalized patients. The study aimed to determine the resistance pattern of *Klebsiella pneumoniae* in clinical isolates including the presence of various  $\beta$ -lactamases among resistant isolates of *Klebsiella pneumoniae*.

A total of 361 isolates of *Klebsiella pneumoniae* from as many as 13,404 clinical specimens were collected at VPCI. Antibiotic susceptibility of the isolates was determined and interpreted as per CLSI guidelines. 124 non-repetitive multidrug resistant *Klebsiella pneumoniae* isolates were further screened for various  $\beta$ -lactamases and were confirmed phenotypically by PCR. Isolates were typed using randomly amplified polymorphic DNA (RAPD) Typing and Multi locus sequence typing (MLST).

More than 85% resistance was observed to most classes of antibiotics with a 100% resistance to ceftazidime and cefotaxime. However, only 1.6 % were resistant to colistin. *Klebsiella pneumoniae* were positive for ESBLs, MBLs and AmpC by confirmatory phenotypic test. Beta lactamases like  $bla_{TEM}$ ,  $bla_{OXA-48like}$ ,  $bla_{SHV}$ ,  $bla_{NDM}$ ,  $bla_{OXA-IIlike}$ ,  $bla_{CTXM-G-1}$ ,  $bla_{SPM}$ , DHA,  $bla_{KPC}$ ,  $bla_{CTXM-G-9}$ ,  $bla_{GES}$ ,  $bla_{VEB}$ ,  $bla_{CTXM-G-2}$ , MOX and  $bla_{PER}$  were identified by PCR. RAPD showed 43 clonal types. Five new sequence types were observed which have been submitted to PUB MLST data base for assignment of new STs.

Varied percentage of resistance was found in *Klebsiella pneumoniae*. Beta lactamases found were ESBLs > MBLs > AmpC > KPC carbapenemases. Better antibiotic stewardship and infection control will prevent further spread of  $\beta$ -lactamases in Enterobacteriaceae.

### 2. Microbiome of human lung in COPD patients attending VPCI, Delhi

Human microbiome consists of a large species of bacteria residing in and on the Human body majority of which cannot be cultured by standard microbiological techniques. With the availability of a new generation of genome sequencing platforms, it is now possible to sequence and identify complex microbial communities, fast and efficiently. It has been observed that patients with chronic obstructive pulmonary disease (COPD) harbor organisms which are not normally seen in normal lung. Hence it would be interesting to see the variation of microbiota of the lung seen in COPD and other conditions. This information will help to study the effect of the microbiota on disease progression and thereby help in taking preventive measures and also better management of the patients.

Bronchial aspirates from 40 patients each of COPD and controls were collected. Metagenome DNA was isolated from the bronchial aspirate and microbiome was analysed after sequencing with Illumina platform. 61/80 samples having at least 1,994 OTUs per sample were included. Various microbial groups with a dominance of *Proteobacteria* among all samples were observed. The sequence data was processed for diversity analysis to identify sequence, diversity, richness and evenness. During these analysis a higher microbial diversity and microbial richness but lower evenness was observed with COPD positive samples in comparison to COPD negative samples. Also, various microbial groups were identified to be specific for COPD case samples.

Microbial markers associated with COPD cases were deciphered, which could be used harnessed to develop a therapeutic solution for treatment of COPD cases.

### 3. 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 October & November 2016 and , March 2016. The reports were submitted along with the recommendations.

### 4. Isolation and antimicrobial susceptibility testing of clinically relevant rapidly growing mycobacteria in a clinical mycobacteriology laboratory

Rapidly growing mycobacteria (RGM), a group of Non-tuberculous Mycobacteria (NTM), is emerging as potential human pathogens that are known to cause numerous infections in healthy and immunocompromised subjects. Isolates from patients of suspected tuberculosis (n=1079) were collected from North Delhi region. The isolates were identified by conventional methods and by PCR Restriction Analysis (PRA) with the enzymes NruI and BamHI. Further speciation of NTM was done by PRA using the enzymes Sau96I and CfoI. Antimicrobial susceptibility testing (AST) was carried out for the clinically relevant RGM by Microplate Alamar Blue Assay against streptomycin, rifampicin, ethambutol, isoniazid, amikacin, cefoxitin, levofloxacin, sulfamethoxazole, clarithromycin, ciprofloxacin, tetracycline, clofazimine, tigecycline, doxycycline, linezolid and imipenem. Out of 1079 isolates, NTM were identified in 299/1079 (27.71%) cases. Of these, clinical relevance was attributed to 96/299 NTM that were repeatedly isolated from the same patients and these were further speciated. RGM were identified in 45 isolates. Of these, 12/45 (26.66%) isolates were *Mycobacterium abscessus*, 31/45 (68.88%) were *Mycobacterium fortuitum* and 2/45 (4.44%) were identified as *Mycobacterium mucogenicum*. Finally, clinical relevance was attributed to 7 isolates of *M. abscessus* obtained from 4 patients based on guidelines for clinical relevance of NTM provided by the American Thoracic Society (ATS). Similarly, one isolate of *M. fortuitum* from a single patient and 2 isolates of *M. mucogenicum* from the same patient were found to be clinically relevant. All the isolates were susceptible to linezolid. Resistance to amikacin and clarithromycin was observed in 16.6% (1/6) isolates each. Resistance to clofazimine was seen in 33.3% (2/6) isolates. Maximum resistance was observed for doxycycline, sulphamethoxazole, tetracycline and fluoroquinolones. Thus, RGM were found in 46.87% of clinically relevant isolates of NTM, which clearly demonstrates the increasing incidence of infections due to RGM. Most of the isolates were susceptible to amikacin, which is in concordance with other studies from various parts of the world. Resistance to mostly available drugs, as also seen in our results make RGM especially *M. abscessus* a difficult-to-treat NTM pathogen.

### 5. Comparison of an in-house duplex PCR assay with the MGIT TBc ID assay for identification of *Mycobacterium tuberculosis* complex

Routinely, identification of *M. tuberculosis* complex (MTBC) and Non tuberculous Mycobacteria (NTM) is achieved by their growth characteristics in culture and biochemical tests, which are labour-intensive, time-consuming and often inconclusive. The high costs of commercially available assays have restricted their use in most clinical laboratories, especially in high burden countries endemic for tuberculosis. In our attempt to develop a simple and cost effective assay to rapidly differentiate MTBC from NTM, we explored a duplex PCR assay using the *hsp65* gene and *Rv1458c* and compared the assay with the MGIT TBc Identification Test (TBc ID) for identification of *Mycobacterium tuberculosis* complex.

Growth positive MGIT tubes (n=125) were randomly collected from the Dept. of Microbiology, Vallabhbhai Patel Chest Institute, Delhi and subjected them to TBc Identification test (TBc ID) as per the manufacturer's recommendation. The culture specimens were further subjected to Ziehl-Neelsen staining followed by in-house Duplex PCR assay. The NTM species were then identified by Genotype *Mycobacterium* CM/AS.

The positive MGIT tubes (n=125) were tested by TBc ID and categorised as: TBc ID Positive (n=10), TBc ID Faint band (n=43) and TBc ID Negative (n=72). Upon ZN staining of the positive cultures, 10/10 TBc ID positive, 23/43 TBc ID faint and 42/72 TBc-ID negative cases were AFB smear positive. All the AFB smear positive cultures were further evaluated for the presence of mycobacteria by Duplex PCR. The results indicated that 10/10 (100%) TBc ID positive cases, 11/23 (47.8%) TBc ID faint cases and 5/42 (11.9%) TBc ID negative cases were found to be MTBC by the duplex PCR assay. The remaining AFB smear positive cultures were identified as NTM. The NTM were further identified to species level by Genotype *Mycobacterium* CM/AS assay. Excellent concordance (100%) was observed between the in-house PCR assay and the positive TBc Id test. In addition, the duplex PCR assay also identified MTBC in 11.9% TBc Id negative cultures.

#### **6. Contribution of polymorphisms in Rv3806c (*ubiA*) and the upstream region of *embA* to ethambutol resistance in clinical isolates of *Mycobacterium tuberculosis* from North India**

Many cases of drug resistant tuberculosis (TB) can be detected through the identification of resistance associated genetic polymorphisms in the *Mycobacterium tuberculosis* genome. Mutations at codon 306 in *embB* are the most prevalent polymorphisms associated with ethambutol (EMB) resistance. However, these mutations are responsible for only 40-60% of EMB resistant clinical TB cases. The present study was performed to discover additional mutations associated with EMB resistance in the *embB*, *embC*, *embA* and Rv3806c (*ubiA*) genes in clinical isolates of *M. tuberculosis* from North India. We studied 29 EMB resistant and 29 EMB susceptible *M. tuberculosis* cultures selected from 360 patients with TB. The entire *ubiA* gene, mutational hotspot regions of *embB*, *embC*, and the upstream region of *embA* were screened for polymorphisms by DNA sequencing and the results correlated with minimum inhibitory concentrations (MIC) of EMB. The most common polymorphism identified in *ubiA* was at codon 149 (GAA to GAC), occurring in 5/29 (17.24%) resistant isolates and 7/29 (24.13%) sensitive isolates. Mutations in *embB* were most common at codon 306 (ATG to ATC/GTG), occurring in 20/29 (68.96%) resistant isolates but in none of the susceptible isolates. Mutations in the upstream region of *embA* at -8, -11, -12 and -60 codons occurred only in EMB resistant strains (7/29; 24.13%) of which 6/7 (85.71%) were observed in isolates with MIC of EMB  $\geq 16$   $\mu\text{g/ml}$ . This investigation failed to identify polymorphisms in *ubiA* that were associated with EMB resistance. However, polymorphisms upstream to *embA* may contribute to high level EMB resistance.

#### **7. Mutations in Rv3805c (*aftB*): a probable cause of high-level ethambutol resistance in clinical isolates of *Mycobacterium tuberculosis***

Resistance against ethambutol (EMB), a first line anti-TB drug, is accounted for only in 40-60% cases where mutations in *embB* codons 306, 406 and 497 are most common. Reports regarding the presence of these mutations in EMB sensitive clinical isolates, hint towards exploring genes apart from the *embCAB* operon. Recent studies have found association of *ubiA* mutations with EMB resistance in some regions of the world. The gene *aftB*, present upstream to *ubiA*, encodes for arabinofuranosyl transferase similar to *embCAB* and is involved in arabinogalactan biosynthesis pathway. The present study explores polymorphisms in *aftB* for their association with EMB resistance in clinical isolates of *Mycobacterium tuberculosis*. Well-characterized clinical isolates of *Mycobacterium tuberculosis* (n=360) were subjected to drug susceptibility testing (DST) by 1% proportion method. Of these, 26 EMB resistant and 24 EMB sensitive isolates were screened for polymorphisms in *aftB*, *ubiA*, *embB*, *embC* and upstream *embA* region and further correlated with the minimum inhibitory concentration (MIC).

Non synonymous polymorphisms in *aftB* were found in 7/26 (26.92%) EMB resistant strains but none of the EMB sensitive isolates. The association of the polymorphism with EMB resistance was found to be statistically significant ( $p=0.0101$ , Fischer exact test). Interestingly, the presence of this mutation was observed in high-level EMB resistance (MIC  $\geq 16$   $\mu\text{g/ml}$ ). However, our study did not find any *ubiA* mutations associated with resistance. This preliminary data proposes *aftB* as a candidate gene for studying polymorphisms leading to EMB resistance. It is also projected that, accumulation of mutations at *embB*, *embA* upstream region and *aftB* may lead to a phenotype with high-level of EMB resistance.

## 8. Contribution of efflux pumps to rifampicin resistance in clinical isolates of *M. tuberculosis*

Despite the consideration of chromosomal mutations as the major cause of rifampicin (RIF) resistance in *M. tuberculosis*, the role of other mechanisms such as efflux pumps cannot be ruled out. We evaluated the role of four efflux pumps viz., *Rv0507*, *Rv0676c*, *Rv0194* and *Rv1250* in providing RIF resistance in *M. tuberculosis*. The real time expression of the efflux pumps was analyzed in 17 RIF resistant and 10 RIF susceptible clinical isolates of *M. tuberculosis* after exposure to RIF. Expression of efflux pumps in these isolates was also correlated with mutations in the *rpoB* gene and MICs of RIF in the presence and absence of efflux pump inhibitors. Under RIF stress, *Rv0676c* was induced in 7/17 (41%) RIF resistant and 1/5 (20%) RIF susceptible isolates; *Rv0194* was induced in 9/17 (53%) RIF resistant and 1/5 (20%) RIF susceptible isolates; *Rv1250* in 5/17 (29%) RIF resistant and 1/5 (20%) RIF susceptible isolates; and *Rv0507* was upregulated in 2/17 (12%) RIF resistant and 1/5 (20%) RIF susceptible isolates. Alterations in MIC of RIF in the presence of efflux pump inhibitors verapamil and CCCP were studied in a subset of isolates (5 RIF susceptible and 7 RIF resistant) and revealed 4-64 fold reduction in both RIF resistant and RIF susceptible isolates. This study, for the first time, suggests an association of *Rv0676c* with RIF resistance in *M. tuberculosis*. Extensive studies are needed to determine the role of efflux pump inhibitors as adjunct therapy in tuberculosis.

## 9. RV0089: Does it have a role in growth and pathogenesis of *M. tuberculosis*?

Biotin is an essential micronutrient required by all domains of life. In *Mycobacterium tuberculosis* it acts as a cofactor for many essential enzymes. It has been shown that exogenous biotin present in the host serum is not sufficient for bacterial growth, hence *M. tuberculosis* synthesizes biotin on its own. To understand the role of *Rv0089* gene in biotin biosynthesis & its effect on lipidomic profile, pathogenicity and biotin concentration in *Mycobacterium tuberculosis*. pKO vector was used for the construction of a knockout strain *MtbΔRv0089* using allelic replacement method. It was grown on Sauton's medium with or without biotin for growth kinetic, stress, colony morphology & electron microscopic studies. Lipid quantification and lipidomic profiles were studied using the phosphovanillin assay and Thin Layer Chromatography (TLC) respectively. RAW 264.7 cell line was infected with *MtbΔRv0089* and H37RV. Immunoprecipitation was performed to quantify the biotinylated proteins in recombinant strain.

Deletion of *Rv0089* gene rendered the bacteria with a stationary phase growth defect and altered colony morphology. *MtbΔRv0089* had lower lipid content as compared to H37Rv. Addition of biotin improved the lipid composition and cell wall dynamics of *MtbΔRv0089*. The mutant was attenuated in macrophages and had a lower concentration of biotinylated proteins. The results suggest that *Rv0089* gene facilitates the survival of *M. tuberculosis* during stationary phase and is required when there is no exogenous biotin present in the medium.

## 10. Phenotypic and genotypic indicators of pre MDR tuberculosis: prediction of the development of MDR tuberculosis

Multidrug resistant tuberculosis (MDR-TB) poses a threat to control of tuberculosis. Hence, 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. The present study was designed to determine the precise prevalence rate of pre-MDR/MDR strains and pattern of primary and acquired drug resistance in Delhi. We further propose to investigate the propensity of pre-MDR to develop into MDR strains of *M. tuberculosis*.

Sputum specimens were obtained from 450 patients suspected of pulmonary tuberculosis. The specimens were subjected to sputum microscopy and culture for *M. tuberculosis*. We have obtained 325 smear positive and 211 culture positive isolates of *M. tuberculosis* till date. The isolates have been characterized by phenotypic and genotypic methods. We performed drug susceptibility testing (DST) for these isolates using standard proportion method for Isoniazid, Rifampicin, Ethambutol and Streptomycin. Till date we have isolated 29 (13.7%) pre MDR and 20 (9.4%) MDR cases. These pre MDR and MDR strains were selected

for minimum inhibitory concentrations determination for the drugs streptomycin, isoniazid, rifampicin, ethambutol, kanamycin and ciprofloxacin by Microplate Alamar Blue Assay and mutation analysis in the *katG*, *inhA*, *rpoB*, *embB306*, *embB407*, *embB497*, *rpsL*, *rrs*, *eis* and *tlyA* loci that lead to drug resistance in *M. tuberculosis* isolates using Sanger sequencing.

#### **11. Molecular and matrix-assisted laser desorption ionization-time of flight mass spectrometry characterization of clinically significant melanized fungi in India**

Melanized or black fungi are considered to be rare etiologic agents of human infections worldwide, primarily attributed to difficulties in their classical identification. Although these fungi are ubiquitously distributed and are often isolated in microbiology laboratories, their clinical significance is not yet entirely elucidated. Consequently, infections caused by melanized fungi (MF) are frequently underestimated, and clinical experience with these fungi is limited. Notably, these MF isolates also exhibited resistance to antifungal drugs. The fungal diseases caused by these agents are of serious concern because MF can infect and kill apparently healthy individuals. The spectrum of clinical infections caused by these fungi is broad, ranging from allergic respiratory manifestations, keratitis, and subcutaneous involvement to systemic diseases involving lung, brain, and paranasal sinuses. The accurate identification of MF is important, because different species may vary with regard to tropism to the lungs, brain, or other organs and susceptibility to antifungal agents. In recent years, matrix-assisted laser desorption ionization–time of flight mass spectrometry (MALDI-TOF MS) has emerged as a rapid and accurate identification tool for filamentous molds. In this study, we examined the diversity of MF isolated from patients in 19 medical centers in India, using molecular methods and MALDI-TOF MS. Overall, during a 4-year period, 718 (5.3%) clinical specimens yielded MF. Of these, 72 (10%) isolates had clinical significance and were identified primarily by sequencing the internal transcribed spacer (ITS) and large subunit (LSU) regions. MF represented 21 genera comprising 29 species, the majority of them belonging to the orders Pleosporales (50%) and Chaetothyriales (22%). Among the 29 fungal species identified, only 6 (20%) species were identified by the MALDI-TOF MS due to the limited commercial database of Bruker Daltonics for MF. However, a 100% identification rate was achieved for 20 additional species identified in this study by constructing an in-house database using 24- to 96-h-old liquid cultures. Further, the CLSI broth microdilution method revealed low MICs for posaconazole (1µg/ml) and voriconazole (2µg/ml) in 96% and 95% of isolates, respectively. Skin/subcutaneous and sinonasal and pulmonary phaeohyphomycosis due to MF were diagnosed in 21.4% (n=15) and 28.5% (n=20) of cases. Also, 10% of patients had central nervous system involvement (n=7), and 3 cases of fungal osteomyelitis due to *Cladophialophora bantiana* and *Corynespora* spp. were observed.

#### **12. Identification by molecular methods and matrix-assisted laser desorption ionization-time of flight mass spectrometry and antifungal susceptibility profiles of clinically significant rare *Aspergillus* species in a referral chest hospital in Delhi, India**

*Aspergillus* species cause a wide spectrum of clinical infections, ranging from allergic to chronic and life-threatening invasive diseases. The most common pathogenic species implicated in aspergillosis are *A. fumigatus*, *A. flavus*, *A. terreus*, and rarely, *A. niger*. However, in the last decade, several reports have pointed to a shift in the etiology of aspergillosis and highlighted the emergence of cryptic and rare *Aspergillus* species in various clinical settings in both immunocompromised and immunocompetent hosts. This shift is mainly linked to the application of multilocus DNA sequence analysis in various studies, leading to the description of previously unknown “cryptic” *Aspergillus* species. These species exhibit high *in vitro* MICs to multiple antifungal drugs, including azoles and amphotericin B. Both azoles and amphotericin B antifungals are agents of choice to treat *Aspergillus* infections; thus, high MICs to these agents pose a serious therapeutic challenge. We analyzed the distribution and *in vitro* antifungal susceptibility profiles of rare *Aspergillus* species in clinical samples from patients with suspected aspergillosis in 8 medical centers in India. Using  $\beta$ -Tubulin and calmodulin gene sequencing 45 rare *Aspergillus* isolates were identified to the

species level, except for a solitary isolate. They included 23 less common *Aspergillus* species belonging to 12 sections, mainly in *Circumdati*, *Nidulantes*, *Flavi*, *Terrei*, *Versicolores*, *Aspergillus*, and *Nigri*. Matrix-assisted laser desorption ionization–time of flight mass spectrometry (MALDI-TOF MS) identified only 8 (38%) of the 23 rare *Aspergillus* isolates to the species level. In-house database was created for the remaining 14 species not available in the Bruker database, the MALDI-TOF MS identification rate increased to 95%. Overall, high MICs of >2 µg/ml were noted for amphotericin B in 29% of the rare *Aspergillus* species, followed by voriconazole in 20% and isavuconazole in 7%, whereas MICs of >0.5 µg/ml for posaconazole were observed in 15% of the isolates. Regarding the clinical diagnoses in 45 patients with positive rare *Aspergillus* species cultures, 19 (42%) were regarded to represent colonization. In the remaining 26 patients, rare *Aspergillus* species were the etiologic agent of invasive, chronic, and allergic bronchopulmonary aspergillosis, allergic fungal rhinosinusitis, keratitis, and mycetoma.

### **13. *Candida haemulonii* species complex: an emerging species in India and its genetic diversity assessed with multilocus sequence and amplified fragment-length polymorphism analyses**

The epidemiology of *Candida* species-associated invasive fungal infections is evolving, and many uncommon *Candida* species have recently emerged as etiologic agents of bloodstream and other invasive infections. This emergence is attributable to the use of antifungal drugs, such as azoles, for prophylaxis and echinocandins among high-risk populations. Notably, these species exhibit decreased *in vitro* susceptibility to the antifungals used for therapy. In the last few years, clinical treatment failures for *Candida haemulonii* infections associated with resistance to amphotericin B (AMB) and reduced susceptibility to azoles and echinocandins have been reported. Members of the *Candida haemulonii* species complex are uncommon yeasts that cause bloodstream and deep-seated infections, and consist of two genotypically distinguishable species, that is, *C. haemulonii* and *C. duobushaemulonii*, and a variety, *C. haemulonii* var. *vulnera*. These species and other relatives of *C. haemulonii*, that is, *Candida auris* and *Candida pseudohaemulonii*, cannot be differentiated by the commercial yeast identification methods used in microbiology laboratories; thus, the true distributions of *C. haemulonii* and sibling species remain unknown. The study described the emergence of the *C. haemulonii* species complex in three hospitals in India. The isolates were presumptively identified as *C. haemulonii* with the VITEK2 system in local hospitals. However, matrix-assisted laser desorption ionization–time-of-flight mass spectrometry (MALDI-TOF MS) accurately identified the species and variety in the *C. haemulonii* species complex. These species included *C. duobushaemulonii* (n=8), *C. haemulonii* (n=6) and *C. haemulonii* var. *vulnera* (n=1). Molecular identification by ITS region sequencing confirmed the identification done by MALDI-TOF MS. Neighbour-Joining phylogenetic tree was constructed using concatenated sequences of ITS, D1/D2, RPB1 and RPB2 genes which revealed three major clades. Clades 1 and 2 contained *C. haemulonii* (n=3 each) and a solitary *C. haemulonii* var. *vulnera* suggesting strain variation. However, all of the *C. duobushaemulonii* clustered together in clade 3. The AFLP fingerprint analysis revealed markedly variable banding patterns with ~ 50 bands/strain comprising 25–425 bp overall. High geometric mean (GM) minimum inhibitory concentrations (MICs) for fluconazole (CLSI 12.7 mg/L; VITEK2 24.2 mg/L) and amphotericin B (CLSI 14.6 mg/L; VITEK2 6.6 mg/L) were observed via both the CLSI and VITEK2 methods. In contrast, all isolates exhibited low CLSI GM MICs for isavuconazole, posaconazole, itraconazole and voriconazole with the exception of a solitary *C. haemulonii* isolate that exhibited a high MIC for VRC (4 mg/L). Nine patients had chronic foot infections, and surgically debrided bone and soft tissues yielded *C. haemulonii* isolates that included *C. haemulonii* var. *vulnera* in five patients and *C. duobushaemulonii* in four. All nine patients had the major risk factor of uncontrolled diabetes and underwent foot amputations. Two of the nine patients also received azole antifungals.

### **14. 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. Western blot and immunofluorescence and real time result shows potential inhibition at 24 hr of time point in presence of *Trachyspermum ammi* and alteration of innate immune genes has also observed.

#### **15. Synergistic effect of immune modulatory antimicrobial peptides in regulation of influenza A virus infection**

The peptides are endogenous and non-toxic molecules having wide applications. Peptides act as a key component of host immune modulatory mechanism in various infections. Peptide shows potent microbicidal effects in bacterial and fungal infections. Study suggests, some viral replication is also altered by these immune modulatory peptides. The proposed hypothesis comprises in the field of antiviral research. The antiviral strategies to combat influenza virus by endogenous antimicrobial peptides is one of the area needs to be elucidated. Viruses modulates the signalling pathways are the main area of interest. The aim of our study is to elucidate the mechanism of actions of antimicrobial peptides against Influenza A virus and also elucidate the expression of host immune defensive genes and pathways involved in this mechanism. Peptides are much known as entry blocker molecules, thus incubation of influenza virus with peptides for longer period of time will be an added advantage to observe the inhibitory effect of peptides. The proposed work also involves investigate the inhibition of viral replication and alteration of signalling pathways in which we may investigate the key to suppress viral replication.

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

Dendritic cells are the professional antigen presenting cells. Mice dendritic cells primed with influenza virus were used to study the maturation of dendritic cells. Various maturation markers of DC were studied at transcriptional and proteomic level. *In vivo* experiments were performed to assess the protection provided by primed dendritic cells against H1N1 (pdm 2009) virus. Protection was observed against pdm 2009 strain. The study is still continue in our laboratory.

#### **17. Role of microRNA in pathogenesis of influenza virus infection**

MicroRNA play an important role in gene regulation, single microRNA may regulate multiple genes. We have studied the involvement of microRNA 155 and 141 in pathogenesis of influenza A virus infection. Further, the association of immunomodulatory RNAs with Non-structural gene (NS1) is also being studied. Viral NS1 gene was cloned and expression confirmed by western blotting and immunofluorescence. Expression pattern of miR-155 was studied at different time intervals after influenza infection. We found increase expression of miR-155 in viral infected A549, which in turn found associated with viral pathogenesis. Knock down the expression of miR-155 decrease virus replication, confirmed by rtime PCR and western blotting against viral NP gene. miR-141 is also found upregulated in influenza infected cell lines.

#### **18. Aptamer mRNA chimera – the next generation vaccine**

Targeted delivery of antigen encoding mRNAs is being studied using aptamer which facilitate the delivery of mRNA. Stability of mRNA and aptamer with different nucleotide modification is studied. Dendritic cell characterization using FACS, confocal is performed. Ligation of aptamer –mRNA is being standardized. The study is still continue in our laboratory.

## **19. Antigenic and genetic analysis of influenza virus isolated from clinical samples and exploring the potential antiviral target sites**

Influenza A virus (IAV) is highly variable virus due to frequent antigenic change in surface antigens by antigenic shift and drift, responsible for maximum mortality and hospitalization among the known respiratory viruses.

The current proposal aims at studying the antigenic and genetic analysis of influenza virus in clinical samples and study interactions of NS1 in order to design better antiviral strategies. NS1 is a conserved multifunctional protein that performs a number of activities, which may additionally contribute to efficient virus replication and virulence during infection. It plays a role in viral RNA synthesis, mRNA splicing and translation, suppression of host immune response, activation of phosphoinositide 3-kinase (PI3K) and involvement in strain-dependent pathogenesis. Due to numerous roles of NS1, it acts as a good potential target for antiviral drug design by disrupting the interactions of NS1 with cellular and viral factors. Inhibition of NS1 activated downstream signalling cascades like PI3K, could also be helpful in restricting influenza virus replication. This becomes more important when the numbers of drug resistance cases are increasing and vaccine needs frequent upgradation owing to the antigenic changes in the circulating viral strains.

## **20. 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 indicate 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 O<sub>2</sub> generation, which could produce highly toxic  $\cdot$ 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.

# Pathology

## Research

### 1. Heme oxygenase-1 expression in immunoregulation of lung fibrosis

Heme oxygenase (HOX-1) is the inducible isoform of heme oxygenase and plays a critical role in defending the lung against inflammatory and oxidant-induced cellular and tissue injury. HOX-1/ heat shock protein (HSP-32) acts as endogenous ligand of the host immune system and mediates release of proinflammatory cytokines such as TGF- $\beta$ , TNF- $\alpha$  and PDGF by the monocytes, macrophages and dendritic cells in pathogenesis of lung fibrosis. The role of HOX-1 in tissue injury is complex and is determined by its local concentration and temporal prominence. In the present study, the time course of HOX-1 expressed after bleomycin induced lung fibrosis and the effects of bosentan on it were studied. HOX-1 expression was strongly induced on day 14 after the initiation of bleomycin induced lung injury, in the alveolar epithelial cells, bronchiolar epithelial cells and perivascular fibroblasts as compared to control. The increased levels of tissue HOX occurred in response to oxidative injury and is thought to protect against cellular injury *in vitro* and *in vivo*. However, the HOX expressed in alveolar type II cells may be harmful, as suggested by studies in which targeted HOX expression has been shown to increase the degradation of heme, cytotoxic effects of products of heme catabolism and severity of lung injury mediated. Bosentan, an orally administered dual endothelin (ET-A and ET-B) receptor antagonist, was effective in reducing HOX-1 expression, as well as both the oxidative stress and nitrosative stress and indicated in the treatment of pulmonary fibrosis.

### 2. Bronchial anthracofibrosis and tuberculosis in transbronchial lung biopsies of diffuse parenchymal lung disease

Anthraco-sis has been recently identified as a cause of bronchitis and bronchial stenosis in both developing and developed countries in the world. However, its exact nature whether as an innocent bystander or pathogenic agent for parenchymal lung disease is unknown. Therefore, (i) we analysed the pathological features and parenchymal tissue reaction to anthracotic pigment deposition identified in transbronchial lung biopsies (TBLB), (ii) correlated the tissue pathology with potential underlying causes such as exposure to cigarette/beedi smoke/Chullah smoke/occupational exposure etc and (iii) identified coexisting tuberculosis if any in these cases. A retrospective analysis of 384 transbronchial lung biopsies (TBLB) received at department of Pathology, Vallabh-bhai Patel Chest Institute over a seven year period from August 2010 to August 2016 was done. 13 (3.38%) TBLBs showed normal lung parenchyma and were taken as control. These included 9 males and 4 females (15 to 85 years, mean age 56 years). Deposition of anthracotic pigment, with or without fibrosis was seen in 32 (8.33%) TBLBs. These included 21 males and 11 females (24 to 88 years, mean age of 56 years). The TBLBs were histopathologically categorized into four groups; Group 1: Control, normal lung parenchyma, (n=13, 3.38%), Group 2: Pigment deposition with fibrotic parenchymal reaction (n=11, 34.37%), Group 3: Pigment deposition with inflammatory parenchymal reaction (n=11, 34.37%), Group 4: With granulomatous parenchymal reaction (n=10, 31.25%). The higher male: female ratio (2:1) reflected the urban male population that presented to our hospital based study. History of cigarette/beedi smoking was elicited in 14/32 (32%). Well formed granulomas were identified in the TBLB in 31.25% cases. In these cases further special stains were needed to rule out infectious etiology and polarizing microscopy was helpful in ruling out mixed dust deposit. History of indoor air pollution was present in five elderly females who had been exposed to Chullah smoke in the past (5/32, 15.6%). The concurrent association of anthracotic deposits with granulomatous lung inflammation and exposure to cigarette/beedi/Chullah smoke was considered to play an important role in the disease progression leading to the development of parenchymal lung fibrosis.

### **3. Role of micro-RNAs (miR) in bleomycin induced lung injury**

A dysregulation of micro-RNAs expression has been identified in diseased tissues to represent a novel pool of therapeutic targets and biomarkers. We are studying the role of miRs in post transcriptional regulation lung remodelling in bleomycin induced model of pulmonary fibrosis. Bleomycin is a chemotherapeutic agent that induces alveolar epithelial cell damage, TGF- $\beta$  activation, bFGF expression resulting in epithelial mesenchymal transition (EMT) and parenchymal remodelling. The complexity of the inflammatory response makes it impossible to single out a certain cell type or mediator as the major regulatory system in the pathogenesis of the fibrotic process. Therefore, the role of miRs in affecting both the stability and translation of mRNA is being studied. The expressions of miRs let-7d, let-7f and miR-21 following intratracheal bleomycin instillation was assessed and correlated with bFGF, TGF- $\beta$ 1 mRNA levels and lung pathological changes. Bleomycin injury is associated with up-regulation of miR21, bFGF, let-7f and TGF- $\beta$ 1 and down-regulation of let-7d. This dysregulation of miRs from inflammatory phase onwards was associated with upregulation of bFGF and TGF- $\beta$ 1 expression, activation of pulmonary fibroblasts and their differentiation into myofibroblasts. The downregulation of let 7d and reduces apoptosis of parenchymal fibroblasts which further undergo EMT. The role of let-7 miR in regulating apoptosis signalling, in inflammatory phase by mediating the toll like receptor pathway is being studied further. The Let 7d inhibition affected the epithelial cell phenotype leading to significant increase in expression of mesenchymal markers such as vimentin, increased collagen deposition and thickening of alveolar septa. miR-21 was up-regulated by TGF- $\beta$ 1 and functions in an amplifying circuit to enhance the fibrogenic activity of TGF- $\beta$ 1 in human primary fibroblasts. This is being explored as a potential target for developing novel therapeutics in treating fibrotic lung diseases.

### **4. Hemorrhagic effusions in pleural tuberculosis and their correlation with pleural biopsy histopathological patterns**

Pleural tuberculosis is a major treatable cause of exudative pleural effusions that rarely presents as hemorrhagic effusion. Due to the similar constitutional symptoms, and the lack of well formed granuloma formation it becomes important to rule out malignancy in these patients by pleural biopsy. The histopathological features of pleural biopsies of tuberculosis patients who presented with hemorrhagic pleural effusion to the V.P. Chest Institute from January 2009 to January 2015 were retrospectively analyzed. These included 10 males and 2 females, age ranging from 33 to 80 years, mean of 65 years. The biopsies revealed, chronic lymphocytic pleuritis in 4 cases (44.44%), epithelioid granuloma formation in 3 cases (33.34%), necrosis in one case (11.12%) and fibrosis was seen in one case of nonresolving effusion (11.11%). The present study shows that the histopathological patterns of tubercular involvement of pleura vary depend upon the stage of involvement and immunological status of the patient. In tubercular pleurisy, the pleural biopsy demonstrates non-specific lymphocytic inflammation, granulomatous inflammation, caseation necrosis, or fibrosis. In the absence of characteristic granulomas the use of Ziehl Neelsen stain combined with culture studies yielded a confirmatory diagnosis in 88.89% cases. This is similar to previous studies in patients with tubercular pleural effusions which have shown that pleural biopsies in combination with culture have a diagnostic yield of 60 to 95%. Therefore in patients presenting with hemorrhagic pleural effusion, it is important to differentiate tubercular effusion from malignancy by pleural biopsy. The knowledge of the histopathological patterns is necessary to accurately identify these cases and improve patient outcome.

### **5. Therapeutic modulation of hypoxia inducible factor-1 $\alpha$ expression in the lung**

In this study, the role of hypoxia-inducible factor-1 $\alpha$  (HIF-1 $\alpha$ ), in the abnormal/dysregulated extracellular matrix deposition and remodelling during the development of pulmonary fibrosis and its therapeutic modulation was assessed. HIF-1 $\alpha$  is a heterodimeric transcription factor that is activated in the hypoxic lung tissues following reduction in oxygen concentration. Activated HIF-1 $\alpha$  further upregulates the expression of genes involved in the adaptation of organisms to hypoxic conditions. HIF-1

is a basic helix-loop-helix transcription factor composed of HIF-1 $\alpha$  and HIF-1 $\alpha$ . While under normoxia, HIF-1 $\alpha$  becomes hydroxylated at proline residues at positions 402 and 564 and degraded in the proteasome; under hypoxia, HIF-1 $\alpha$  becomes stabilized, translocates to the nucleus, and induces transcription of target genes. In this study, wistar rats weighing 250 g each were obtained from the animal house of V.P. Chest Institute. The animals were divided in two groups, group I control (n=16) and group II experimental (n=16). Group I were administered saline and group II were administered intratracheal bleomycin (7u/Kg of body weight). The animals were sacrificed at 0, 7, 14 and 28 days after the saline and bleomycin administration. Total protein was extracted from the lung tissue and was quantified on 10% SDS PAGE against PAGE ruler. The bands obtained were transferred on to a nitrocellulose membrane and were probed with HIF-1 $\alpha$  antibody. Bleomycin leads to increase in TGF-1 $\beta$ , PDGF, inflammatory cytokines (TNF- $\alpha$ , IL-1 and angiotensin II) in vascular smooth muscles and growth factors (epidermal growth factor, insulin, and insulin-like growth factor). These increase the transcriptional activation and protein expression of HIF-1 $\alpha$ . HIF-1 $\alpha$  activates the expression of a multitude of genes that encode proteins involved in energy metabolism, angiogenesis (VEGF), cell proliferation, differentiation, survival and matrix production which contribute to the fibroproliferative and collagen-inducing effects of bleomycin. Bosentan and sildenafil therapy significantly reduced the level of HIF-1 $\alpha$  in the lung tissue.

## **6. Epidermal growth factor receptor (EGFR) mutations from blood and tissue of stage 3 and 4 lung cancer patients from Indian population**

Molecular testing of lung cancer patients can lead to their stratification for specific personalized therapies with EGFR tyrosine kinase inhibitors, gefitinib, erlotinib etc. Epidermal growth factor receptor (EGFR) is a trans-membrane glycoprotein with an extracellular epidermal growth factor binding domain and an intracellular tyrosine kinase domain. EGFR receptor binding to its ligand results in autophosphorylation by intrinsic tyrosine kinase activity, triggering several signal transduction cascades that control cellular proliferation. Mutations in EGFR receptors that lead to constitutive or sustained activation of these sequences is thought to yield more aggressive tumour phenotypes. Lung adenocarcinomas with mutated EGFR have significant responses to tyrosine kinase inhibitors, although for unselected patients it does not appear to have a survival benefit. In present study, EGFR mutations are being assessed on biopsy/FNAB using immunohistochemistry, mutational analysis and sequencing. These are compared with EGFR mutations analysed on DNA isolated from blood, sputum and pleural fluid. Detection of EGFR mutations from the atypical cells that are circulating in the peripheral blood of stage 3 and 4 cases of lung cancer patients may prove to be a readily available substitute source of tumour DNA. The potential use of detecting EGFR mutations in serum in lung cancer patients needs to be investigated for its efficacy. So far, total 125 cases of lung adenocarcinomas presenting to Vallabhbhai Patel Chest Institute have been studied. These included 110 males and 15 females with a ratio of 7.33:1. Age ranged from 18 to 76 years. 100/110 (90.9%) males and 5/15 (30%) females had history of smoking. The EGFR RGQ PCR Kit that utilizes two real-time PCR based technologies: ARMS (Amplification Refractory Mutation System) and Scorpions was used for detection of EGFR mutations. EGFR mutations associated with TKI sensitivity and resistance (substitutions in G719X, L858R, deletions in exon 19 and T790M, S768I respectively) were identified. EGFR mutations were identified in 44/125 (35.2%) patients. The EGFR mutations were more frequent in male patients and smokers. EGFR-TKI sensitive mutation most commonly identified was in codon 719, followed by Del 19 and L858 R. EGFR-TKI resistant mutations identified included; T790M mutations, Insertions in Exon 20 and S768I. EGFR mutations were detected in both the blood and tissue samples of advanced lung cancer patients. In present study, circulating blood was found to contain tumour DNA in 68.02% cases. This DNA is either spontaneously released into the bloodstream by cells from the primary cancer site, metastases, or circulating tumour cells or by release of DNA from macrophages after they engulf apoptotic and necrotic cells. The circulating DNA, carries tumour-related genetic and epigenetic alterations that is useful to study cancer development, progression, and resistance to therapy.

# Pharmacology

## Research

### 1. To evaluate the effect of *Terminalia catappa* fruit and seed extract in streptozotocin induced diabetic retinopathy in rats

*Introduction:* Diabetic retinopathy is one of the most prevalent microvascular complication caused by diabetes that leads to damage to small blood vessels of the eye eventually leading to blindness. The increase in blood glucose level causes an accentuation in oxidative stress which plays a well-marked role in the pathogenesis of diabetic complications. *Terminalia catappa*, contains polyphenols in abundance which has good antioxidant and radical scavenging activity. Thus, we hypothesized that it may have beneficial effect in the treatment of diabetes induced retinopathy.

*Objective:* To evaluate the effect of *Terminalia catappa* fruit and seed extract in streptozotocin induced diabetic retinopathy in rats.

*Method:* Streptozotocin-induced chronic diabetic rat model was used. Fourteen groups (n=8) control, diabetic control, standard anti-diabetic drug- glibenclamide (10mg/kg), hydro-alcoholic fruit and seed extract of *Terminalia catappa* in three doses each (20mg/kg, 30mg/kg and 40mg/kg), *T. catappa* fruit and seed extract 40mg/kg plus glibenclamide and perse groups were studied for 12 weeks. Drugs were given orally every day for 12 weeks. Blood glucose, body weight and urine volume were measured weekly. Lenticular images, fundus images and retinal vessels tortuosity was evaluated at 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> week. Histological changes, glycosylated hemoglobin, inflammatory, angiogenic and oxidative biomarkers will be estimated at 12<sup>th</sup> week.

*Results:* *Terminalia catappa* fruit and seed extract have shown antihyperglycemic effect. Further results are being analysed.

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

*Introduction:* 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. 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.

*Objective:* To evaluate the effect of *Terminalia catappa* and *Prunus amygdalus* fruit extract in diabetes-induced nephropathy and cataract formation in rats.

*Methods:* Streptozotocin-induced chronic diabetic rat model for 12 weeks was used. Twelve groups (n=8) - control, diabetic control, hydro-alcoholic fruit extract of Indian almond and sweet almond, and with standard antidiabetic drug, glibenclamide were studied. Drugs were given orally every day for 12 weeks. Blood glucose, body weight and urine volume were measured weekly. Lenticular images for evaluation of cataract were taken at 2<sup>nd</sup>, 4<sup>th</sup>, 6<sup>th</sup>, 8<sup>th</sup>, 10<sup>th</sup> and 12<sup>th</sup> week. Glycated hemoglobin (HbA1c); anti-oxidant markers- lipid peroxidase (LPO), reduced glutathione (GSH), superoxide dismutase (SOD) and catalase; for nephrotoxicity - serum creatinine, serum cystatin-C, blood urea nitrogen (BUN) and total urinary protein were estimated at 12<sup>th</sup> week. Histopathology of kidney and retina was done at 12<sup>th</sup> week.

*Conclusion:* Hydro-alcoholic fruit extract of Indian almond and sweet almond showed anti-hyperglycemic action and these drugs could halt the progression and reverse diabetes-induced cataract formation in rat model.

### **3. 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**

Effects of two kinds of chronic stress *i.e.* predictable (CPS) and unpredictable (CUS) stress were evaluated on immunological responses and the role of nitric oxide and signalling pathways involved were explored. The results suggest that both CPS and CUS induced immunosuppression but the magnitude of suppression was more in the CUS relative to CPS, which suggests the differential degree of modulation of the delayed type hypersensitivity reaction depending on the predictability of the stress.

Chronic stress exposure induced changes in immune response were accompanied with elevated NO<sub>x</sub> levels and 3-nitrotyrosine in the periphery (blood) as well as center (brain). Further, these increases in levels were more in the CUS as compared to CPS; these parallel responses are suggestive of involvement of NO in such adaptive immune responses after chronic stress. Chronic stress exhibited behavioral suppression as evident from the reduced % open arm entries (OAE) and open arm time (OAT) in EPM test. The magnitude of anxiogenesis was clearly more in CUS as to CPS exposed rats. Prior administration of iNOS inhibitor, aminoguanidine (AMG) caused further reduction in IgG levels (humoral immune response) after both CPS and CUS. In addition, AMG also augmented the suppression of delayed type hypersensitivity (DTH) response, which is a cell mediated immune response (CMI). On the other hand, ISDN or 7-NI did not affect the adaptive immune response to both CPS and CUS to any appreciable extent. This may be due to the tolerance development associated with NO-donors or lesser involvement of nNOS in CMI. Thus, the data supported a role of iNOS in mediating adaptive immune response. There was attenuation of cytokines IL-1 $\beta$ , IFN $\gamma$ , IL-4 and IL-6 by AMG which was accompanied with suppressed levels of stable metabolites of nitric oxide (NO<sub>x</sub>) and peroxynitrite in both CPS and CUS groups. Thus, reemphasizing complex involvement of iNOS during inflammation and adaptive immunity. In contrast to aggravating immunosuppression on CPS/CUS exposure, interestingly AMG reversed the neurobehavioral suppression in EPM test. These results suggest that NO arising from iNOS may be differentially regulating the immune and neurobehavioral responses during chronic stress. There was no appreciable effect of ISDN or 7-NI on adaptive immune and neurobehavioral responses with no appreciable influences on NO<sub>x</sub> and peroxynitrite levels. This may be due to lack of modulatory effect of 7-NI and lesser role of nNOS in anxiety related behavior and immune responses during chronic stress.

### **4. Experimental studies on the possible mechanisms involved in the effects of UNIM-352, a polyherbal, anti-asthmatic, unani preparation**

The effects of UNIM-352, a polyherbal formulation being used in Unani system of medicine for asthma, were evaluated in experimental model of asthma to validate the efficacy and explore the pharmacodynamics. The various markers of (a) airway inflammation and immunity (b) airway remodelling, (c) bronchial hyperresponsiveness to spasmogens and (d) oxidative stress parameters in OVA sensitized and challenged rats were assessed.

Wistar rats were immunized on day 1 with ovalbumin and Al(OH)<sub>3</sub> 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 markers TGF- $\beta$  levels in blood and BAL fluid. TGF- $\beta$  is an important pro-fibrotic cytokine and one of the main mediators involved in tissue remodelling in the asthmatic lung. Results showed that administration of 200 and 400 mg/kg dose of UNIM-352 suppressed TGF- $\beta$  levels in both blood and BAL fluid, as compared to controls. The results were comparable with prednisolone, the positive control. The expression of TGF- $\beta$  is increased in the airways of patients with asthma and seems to correlate with disease severity and degree of subepithelial fibrosis. UNIM-352 treatment attenuated TGF- $\beta$  levels in both blood and BAL fluid as compared to control group indicates that it may reduce/control bronchial asthma.

Effects of UNIM-352 were also evaluated on IL-13, which is a key Th2 cytokine that directs airway inflammation and remodelling in allergic asthma. Results showed that treatment with UNIM-352 (200 and 400 mg/kg) for 21 days attenuated the levels of IL-13 in both blood and BAL fluid in a dose dependent manner, as compared to vehicle treated control group of rats. Prednisolone (10 mg/kg) treatment, also suppressed the IL-13 levels by 19% in blood and 19% in BAL fluid and the results were comparable with that of UNIM-352 group. It has been observed that T-bet knockout mice have defective production of IFN- $\gamma$  and also promote spontaneous airway hyperresponsiveness like allergic patients. The results of our experiment showed that the levels of IFN- $\gamma$  were elevated in both blood and BAL fluid, this ability to increase IFN- $\gamma$  levels adds to the anti-inflammatory function of polyherbal agent, UNIM-352 in bronchial asthma.

IFN- $\gamma$  is a Th1 cytokine that plays an important role in inhibiting the effects of Th2 cytokines that promote disease. In this experiment, the effect of polyherbal agent, UNIM-352 was assessed on IFN- $\gamma$  levels in both blood and BAL fluid in OVA sensitized rats. Results showed that at both the doses of UNIM-352 (200 and 400 mg/kg), IFN- $\gamma$  levels were increased in blood as well as in BAL fluid. This increase was comparable to that of standard drug, prednisolone. IgE is an antibody that plays an important role in allergic inflammation. In this experiment, administration of 200 and 400 mg/kg dose of UNIM-352 resulted in suppressions of OVA specific IgE levels and the results were comparable with prednisolone.

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

The study evaluated the effects of *Albizia lebbek* 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 ovalbumin (OVA) and aluminium hydroxide. Fifteen days after sensitization, rats were challenged by exposure to 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 study the efficacy and probable mechanisms involved therein. Effect of *Albizia lebbek* and *Solanum xanthocarpum* was evaluated on TNF- $\alpha$  levels. The levels were significantly higher in control group of sensitized and challenged rats as compared to normal group, thus validating the experimental model of asthma. Treatment with *Albizia lebbek* (100, 200 and 400 mg/kg) and *Solanum xanthocarpum* (50, 100 and 200 mg/kg) significantly reduced the levels of TNF- $\alpha$  in both blood and BAL fluids as compared to control groups. The reductions were also comparable with the standard drug, prednisolone. Further, assay for IL-6 showed that IL-6 levels were significantly higher in control group of rats as compared to normal group. Treatment with *Albizia lebbek* (100, 200 and 400 mg/kg) significantly reduced the levels of IL-6 in both blood and BAL fluids as compared to control groups. *Solanum xanthocarpum* (50, 100 and 200 mg/kg) administration significantly reduced the levels of IL-6 in blood as compared to control groups.

Effect of *Albizia lebbek* and *Solanum xanthocarpum* was evaluated on NF- $\kappa$ B levels. Rats were sensitized and challenged with ovalbumin and after 24 hours of last ovalbumin challenge; blood and BAL samples were collected and assay of NF- $\kappa$ B showed that NF- $\kappa$ B levels were significantly higher in control group of rats as compared to normal group. Treatment with *Albizia lebbek* (100, 200 and 400 mg/kg) and *Solanum xanthocarpum* (50 and 200 mg/kg) reduced the levels of NF- $\kappa$ B in both blood and BAL fluids as compared to control group of rats. The IL-4 levels showed significant increase in control group of rats as compared to normal group. Treatment with *Albizia lebbek* (100, 200 and 400 mg/kg) and *Solanum xanthocarpum* (50, 100 and 200 mg/kg) significantly reduced the levels of IL-4 in BALF as compared to control groups. The reductions were also found in blood samples after treatment with *Albizia lebbek* (100 and 200 mg/kg) and *Solanum xanthocarpum* (50, 100 and 200 mg/kg). The reductions were also comparable with the standard drug, prednisolone. The results of our experiment suggests the anti-inflammatory and immunomodulatory effect of *Albizia lebbek* and *Solanum xanthocarpum* as indicated by reduction in the levels of pro-inflammatory

cytokines (TNF- $\alpha$ , IL-6) and IL-4 which is important for Th2 cell activation and acts on B-cell to facilitate IgE production.

#### **6. A clinical study to evaluate the effects of yoga on pulmonary functions, cellular and molecular markers and quality of life in patients of bronchial asthma**

This is a prospective, open label, randomized, parallel design study, in patients of bronchial asthma, selected from the outpatients department of the Viswanathan Chest Hospital, Vallabhbhai Patel Chest Institute (VPCI), Delhi. The study is being carried out jointly by the Department of Pharmacology and Viswanathan Chest Hospital, VPCI. The study has been initiated after obtaining the approval of the Institutional Ethical Committee and will be conducted according to the ICH-GCP guidelines.

Patients with mild to moderate asthma as diagnosed by the physician on the basis of clinical history/symptoms and pulmonary functions test (PFT) findings, visiting OPD of Vishwanathan Chest Hospital, VPCI, Delhi are enrolled for the study and written informed consent as per performa is obtained prior to the commencement of study. At least 100 fresh patients of mild to moderate bronchial asthma will be enrolled for the study after taking into consideration the laid down exclusion and inclusion criteria. Assessment of symptoms, pulmonary functions, cellular and molecular markers and quality of life parameters are done in these patients on day 1 (baseline levels). The patients are informed about the aims and methods of the study, expected duration of their participation, the benefits that are expected from the research, and potential risks associated with the study. The asthmatic patients are randomized into two groups. In Group I patients are given conventional anti-asthma treatment and in Group II patients receive additionally Yoga intervention for 50 minutes daily. After recording the baseline parameters, the patients who are assigned to the yoga group undergo a comprehensive yogic intervention. The yogic intervention consists of yogasana (physical practices), pranayama (breathing techniques), meditation and shavasana (relaxation techniques). Monthly follow-up are done in both the groups (I and II) for a period of three months and blood samples from both the groups is taken at regular intervals *i.e.*, 4wk, 8 wk and 12 wk. Patients of both groups are asked to maintain a diary for recording details of the use of emergency (relief) medication, *viz.* short-acting  $\beta_2$  agonists to combat exacerbations, if any and the frequency of use. In addition, Group II patients are asked to maintain a record of their adherence to the Yoga schedule. Analysis of data showed that pulmonary functions (FEV<sub>1</sub>, FVC and FEV<sub>1</sub>/FVC) were improved in both the Groups I and II, but the magnitude of improvement was significantly more in Group II as compared to baseline levels. Levels of nitric oxide (NO) are known to increase in exhaled air in bronchial asthma, and decrease with appropriate anti-inflammatory treatment. Exhaled NO is a reproducible and totally non-invasive marker/measure of airway inflammation and has been suggested as a simple way of assessing asthma. The data showed that Fractional Exhaled Nitric Oxide (FeNO) levels were found to be reduced in both the groups and the reduction was about 18% and 30% respectively in Group I and II, suggesting better control of inflammation in Group II.

Bronchial asthma is associated with eosinophilic inflammation in the airways. Eosinophils are found in increased numbers in the circulation and sputum and are primary inflammatory cells resulting in airway obstruction and shortness of breath. The eosinophil counts were found to be significantly decreased in Group II as compared to controls. The quality of life was assessed by using the Asthma Quality of Life Questionnaire (AQLQ), which is an evaluative questionnaire to measure quality of life (QoL) in patients of asthma. It consists of 32 questions which are categorized under sub-domains; symptoms (SD), activity limitation (AL), emotional function (EF), and response to environmental stimuli (ES). At the baseline, there was no difference in QoL between both Groups (I and II). The marginal change in AQLQ score were observed in Group I after conventional treatment, whereas remarkable changes were found in Group II which was administered conventional treatment with yoga therapy. There was an increase in the score of Environment stimuli (ES) in AQLQ, *i.e.* it was increased by 40% in Group II after yoga therapy and significant improvement in resilience against environmental stimuli.



Department of Pharmacology of the Institute organised International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Disease on 9<sup>th</sup> February 2017. Prof. N.S. Dhalla, Executive Director, IACS, Winnipeg, Canada and Dr R.K. Goyal, Vice-Chancellor, SPSRU, New Delhi, were the Guests of Honours at this conference.

#### 7. A clinical study to evaluate the effects of yogic intervention on pulmonary functions, inflammatory markers, oxidative stress and health status in patients of COPD

There have been studies which evaluated the effect of yoga on COPD as well as on oxidative stress. But rarely has there been one elucidating exactly how yoga enhances the amelioration of the pulmonary inflammation during treatment of COPD as an adjunct to the existing pharmacological therapy and also how it improves quality of health status in patients with chronic obstructive pulmonary disease. COPD is a chronic inflammatory disorder with associated immunological changes and hence markers of inflammation, immunity, oxidative stress will be assessed in both controls as well as yoga practicing groups. Research methodology will be as per GCP guidelines. In subjects of COPD, the levels of Fractional exhaled nitric oxide (FeNO) is shown to have excellent correlation with eosinophilic airway inflammation as represented by blood, sputum, bronchoalveolar lavage (BAL) and mucosal eosinophilia. Therefore, the present study will evaluate the role of FeNO assessment to predict the response of COPD patients to yogic intervention. Further, the previous studies have not investigated the effects of yoga on pulmonary inflammatory markers in COPD which is one of the very important pathophysiological events of the disease. C-reactive protein, neutrophil-lymphocyte ratio, osteoprotegerin, CC-16 (Clara cell secretory protein- 16), TNF- $\alpha$ , 8-isoprostane, and SOD will be measured. These biomarkers will be correlated with the blood cell counts *i.e.* total and differential WBC counts and absolute neutrophil and eosinophil counts, which play an important role in the early and late phases of COPD. This study also aims to correlate the

improvement in Pulmonary Function Tests (PFT) with pulmonary inflammatory markers after the intervention of yoga. Finally the effect of yoga on quality health related status in patients with chronic obstructive pulmonary disease will be assessed. The project has been ethically cleared by the Institutional Ethical Committee (IEC) and patients from OPD of Viswanathan Chest Hospital, VPCI are being enrolled for the study.

#### **8. Experimental pharmacological studies for optimization of constituents UNIM-352, a polyherbal preparation, for efficacious and safe treatment of bronchial asthma**

The study has been designed to investigate the anti-inflammatory and immunomodulatory effect of various optimised versions of UNIM-352 and comparing the efficacy with classical preparation of UNIM-352 in experimental animals. The effects will be compared on several parameters *viz.* systematic anaphylaxis, levels of IgE and IL-4, eosinophil and neutrophil counts, in blood and BAL fluid and Cytokine. The effects of optimized version of UNIM-352 and original UNIM-352 will also be compared on oxidative and nitrosative stress markers. The rats were divided into six groups (6 rats per group): Control, UNIM-352 (200), UNIM-352 (400) and two versions of optimized UNIM-352 and Prednisolone. All groups were sensitized and challenged with ovalbumin as described above. Control group rats were administered with vehicle orally for 15 days. UNIM-352 (200) and UNIM-352 (400) group rats were administered with UNIM-352 orally for 15 days at the dose of 200 mg/kg and 400 mg/kg respectively. Prednisolone group rats were administered with prednisolone orally for 15 days at the dose of 10 mg/kg. The study is in progress and samples are being collected which will be analyzed after 15 days and will be compared.

#### **9. A comparative pharmacological evaluation of the adaptogenic and immunomodulatory effects of *Withania somnifera* - leaf and root extracts, in experimental animals**

The present study has been planned to evaluate the adaptogenic effects of *Withania somnifera* (Ashwagandha) leaf extract using pharmacological and biochemical techniques during stressful situations and to evaluate the possible cellular and molecular mechanisms of action. The effects of the leaf extract on efficacy parameters will be compared with the time tested effects of *W. somnifera* root extract on the above mentioned parameters. The project has been approved by the Institutional Animal Ethics Committee (IAEC) and work will be started.

# Physiology

## *Research*

### **1. Development of exercise protocol to improve hypoxic tolerance**

Advanced transport technology gives people opportunity to visit high altitude within short time. Therefore, not enough time is available for them to acclimatize to the hypoxic environment and this is typically associated with decreased arterial oxygen saturation and increased pulmonary artery pressures, both of which contribute to the impaired exercise performance experienced there. Significant portion of this impairment is attributed to hypoxic pulmonary vasoconstriction (HPV). This response leads to increased pulmonary arterial pressure resulting in increased right ventricular afterload and decreased cardiac output.

Recently, ischemic preconditioning (IPC), a procedure which is performed by repetitive occlusion of arterial blood flow to an organ or extremity (*e.g.*, 5 minutes occlusion, followed by 5 minutes of restored blood flow, repeated several times) has been shown to induce systemic effects that protect the myocardium and other organs from ischemic injury. It has also been demonstrated that the hypoxic increase in pulmonary artery systolic pressure during acute simulated altitude conditions is significantly attenuated by IPC.

Since IPC and HPV have similar mechanistic pathways *i.e.* hypoxia, but confer opposing effects, it is hypothesized that IPC exposure would attenuate HPV and improve hypoxic tolerance. Further, in view of the fact that exercise training is known to improve exercise capacity in chronic respiratory disease patients, this study intends to explore whether addition of IPC along-with exercise training imparts greater increase in exercise endurance in healthy and chronic respiratory disease patients. The work is in progress.

# Pulmonary Medicine

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

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. Effect of obesity and metabolic syndrome on severity, quality of life, sleep quality and inflammatory markers in patients of asthma in India

*Introduction:* The study aimed to compare the effect of obesity with and without metabolic syndrome on asthma severity, quality of life, sleep quality, sleep disordered breathing and inflammatory markers as compared to non-obese asthma patients.

*Material and methods:* 60 asthma patients recruited for the study were divided equally into non-obese (NOA), obese without metabolic syndrome (OANMS) and obese with metabolic syndrome (OAMS) groups. Study cohorts were assessed for severity of asthma, quality of life, quality of sleep using questionnaires and inflammatory markers (FENO, hs-CRP, IL-5, IL-6 and leptin). Institutional Ethical Committee approved the study.

*Results:* The results suggests OAMS patients may be a subtype of asthmatics having significantly severe asthma ( $p < 0.05$ ), poor quality of life ( $p < 0.05$ ), high risk of OSA ( $p < 0.05$ ), decreased lung volumes (FRC) ( $p < 0.05$ ), higher levels of inflammatory markers (leptin and IL-6) ( $p < 0.05$ ), and high incidence of sleep disordered breathing ( $p < 0.05$ ) in comparison to NOA and OANMS patients.

*Conclusions:* The present study has shown that obese asthmatics especially with metabolic syndrome represent a subtype of asthmatic population. Hence, the treatment of metabolic syndrome may be necessary in addition to asthma to achieve optimal control.

### 2. Dietary pattern and asthma in India

*Introduction:* The study aimed to evaluate the association between food consumption pattern and asthma in Indian population.

*Material and methods:* 125 asthma and corresponding age and sex matched healthy controls were recruited for the purpose of a study. A self-reported food-frequency questionnaire (NNR-Dietary Pattern in Asthma Questionnaire) comprising of 80 food and drink items, belonging to 15 groups, was developed based on routine dietary habits and ISAAC phase two and phase three questionnaires.

*Results:* There was no significant difference of gender, height, weight, BMI and socio economic status between asthma and control groups ( $p > 0.05$ ). The consumption of fast food, salted snacks, fried snacks; nuts and dry fruits were significantly higher in asthmatics ( $p < 0.05$ ). Similarly, there was a tendency to higher consumption of fats and oil, sugar and carbonated drink in asthmatics ( $p > 0.05$ ). On the contrary, consumption of cereals, milk and milk products, non-vegetarian food, fruits and fruit juice tends to be higher in healthy controls, though neither of them could reach a statistically significant ( $p > 0.05$ ).

*Conclusion:* Consumption of fast food, salted snacks, fried snacks, fats and oils nuts, dry fruits, carbonated drinks may be associated with asthma in India. Hence, it is imperative to reduce consumption and increase awareness of influence of fast food on asthma through public health policies.



Golden Jubilee National Conference of Indian College of Allergy, Asthma and Applied Immunology (50<sup>th</sup> ICAAION-2016) was held at Institute from October 22-25, 2016. Prof. K.B. Gupta, Professor and Head, Department of Pulmonary Medicine, Pt. B.D. Sharma PGIMS, Rohtak, sharing his view about this conference (upper left panel); Prof. Raj Kumar, Organizing Secretary of the Conference and Professor and Head, Department of Respiratory Allergy and Applied Immunology, giving a lecture on Food Allergy in Clinical practices (below left panel); Souvenir of the Conference was released (upper right panel) and a Book titled "Smoking Cessation and Guide for Physicians" By Dr Raj Kumar was released on this occasion (below right panel) during the conference.

### 3. Epidemiological profile of tobacco users at tobacco cessation centre: an Indian experience

*Objective:* Tobacco consumption continues to rise in India with about 34.6% of adult population being tobacco users. This study was done to evaluate the epidemiological profile of the tobacco users presenting to a Tobacco Cessation Centre (TCC) in Delhi.

*Methods:* This is a retrospective observational study of subjects seen over a period of 10 years (2001-2010) at TCC of Vallabhshai Patel Chest Institute, University of Delhi, Delhi, India. Information from a structured questionnaire filled by all tobacco users was pooled and analysed.

*Results:* Of a total of 4493 subjects seen in the TCC, 4370 (97.3%) were males. 2704 (60.2%) subjects were smokers and remaining were users of smokeless tobacco. The highest number of subjects attending the clinic was between the age of 31 to 40 years. The mean age of starting tobacco use was 21 years. 2518 subjects started tobacco use due to "peer group pressure", while family history of tobacco use was observed in 2912 subjects. 3065 number of subjects attending the clinic were without any co-morbidity.

*Conclusions:* Most of the subjects started tobacco use at a young age between 11 to 20 years. Peer pressure was the most common reason for initiation (56%). Most of the subjects (68.2%) had no co-morbidity. The present study observed that tobacco users probably want to quit smoking not only because of the consequences of co-morbidities but also because of the realisation of later harmful effects of continuing smoking.

## 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. The Institute is also running DM course in Pulmonary Medicine. The students currently enrolled in these courses are shown below.

### MD Degrees (Awarded) (Session: 2013-2016)

Name	Discipline
Dr Viswesvaran B	Pulmonary Medicine
Dr Gaurav Bhati	Pulmonary Medicine
Dr Richa Mittal	Pulmonary Medicine
Dr Muhammed Noufal Poongadan	Pulmonary Medicine
Dr Archana Bhandekar	Microbiology
Dr Stuti Gupta	Microbiology
Dr Sachinkumar Pancham Gajbhiye	Pharmacology
Dr Raman Ghai	Physiology



Teacher's Day was celebrated on 5<sup>th</sup> September, 2016 at the Institute.

## MD Theses (Submitted)

(Session: 2014-2017)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Sekhar Kunal Jha (Pulmonary Medicine)	Serum vitamin D levels in patients with allergic rhinitis, chronic rhinosinusitis and nasal polyposis, and its association with quality of life	Prof. Ashok Shah
2.	Dr Manu Madan (Pulmonary Medicine)	Factors determining outcomes in acute exacerbations of chronic obstructive pulmonary disease	Prof. S.K. Chhabra and Prof. Ashok Shah
3.	Dr Nipun Malhotra (Pulmonary Medicine)	Food and aeroallergens sensitization and airway inflammation in asthma	Prof. Raj Kumar and Prof. S.N. Gaur
4.	Dr Harsh Vardhan (Pulmonary Medicine)	Evaluation of markers of disease activity in patients of pulmonary sarcoidosis	Dr B.K. Menon
5.	Dr Aditi (Microbiology)	Characterization of virulence properties of <i>Pseudomonas aeruginosa</i> isolates from hospitalized patients	Dr Malini Shariff, Prof. S.K. Chhabra and Dr M. Rahman
6.	Dr Rashi Khanna (Microbiology)	Co-infection of <i>M. tuberculosis</i> and <i>Cryptococcus neoformans</i> species complex in HIV positive and negative patients	Dr Mandira Varma-Basil and Dr Anuradha Chowdhary
7.	Dr Goutam Arora (Pharmacology)	Pharmacological studies on possible role of neurosteroids during stress-induced immunomodulation in experimental animals	Prof. A. Ray and Dr Kavita Gulati

## MD Theses (Pursued)

(Session: 2015-2018)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Ambuj Kumar (Pulmonary Medicine)	Characterization of frequent exacerbator phenotype in COPD	Prof. S.K. Chhabra and Prof. Raj Kumar
2.	Dr Anshu Priya (Pulmonary Medicine)	Association of obstructive sleep apnea in patients of COPD and asthma	Prof. Raj Kumar
3.	Dr Arya Gopi (Pulmonary Medicine)	Evaluation of KL6 as a diagnostic and prognostic marker of pulmonary sarcoidosis	Dr B.K. Menon
4.	Dr Vidushi Rathi (Pulmonary Medicine)	A cross-sectional study to evaluate the association of iron deficiency with quality of life in patients with COPD	Prof. S.N. Gaur
5.	Dr Gulvir Singh (Pulmonary Medicine)	A cross-sectional study to characterize asthma-COPD overlap syndrome among patients with asthma and COPD	Prof. S.N. Gaur
6.	Dr Bhagwan Singh Patidar (Biochemistry)	A study on 5'-Nucleotidase, adenosine deaminase and adenosine level in serum, lymphocytes and erythrocytes of COPD patients	Prof. S.K. Bansal, Dr B.K. Menon and Dr V. Rohil
7.	Dr Gargi Upadhyaya (Microbiology)	Matrix assisted laser desorption ionization- time of flight mass spectrometry (MALDI-TOF MS) characterization and antifungal susceptibility pattern of non- <i>albican</i> <i>Candida</i> (NAC) and allied yeast like fungi from clinical specimens	Dr Anuradha Chowdhary
8.	Dr Abhyanchal Kishore Jha (Physiology)	Cardiac autonomic dysfunction in patients with chronic obstructive pulmonary disease and its association with depression	Dr Vishal Bansal and Prof. S.K. Chhabra

## MD-Ist Year (Session: 2016-2019)

Name	Discipline
Dr Lovika Lakhtakia	Pulmonary Medicine
Dr Naveen Vennilavan RA	Pulmonary Medicine
Dr Neha Kaushik	Pulmonary Medicine
Dr S. Praveen Raj	Pulmonary Medicine
Dr Kunj Panwar	Pulmonary Medicine
Dr Priyanka	Microbiology
Dr Ravinder Kumar Yadav	Pharmacology



Prof. Rakesh Bhatnagar, Chairman, Governing Body, VPCI delivered a lecture on “Genetically Engineered Vaccine against Anthrax: From Clone to Clinical Trial” on 5<sup>th</sup> August 2016. Dignitaries on the dais: Dr Madhu Khanna, Associate Professor, Department of Respiratory Virology, Prof. S.N. Gaur, Director (Acting), Prof. Rakesh Bhatnagar, Professor, School of Biotechnology, Jawaharlal Nehru University, Prof. A.K. Prasad, former Prof. and Head, Department of Respiratory Virology, VPCI and Prof. S.K. Bansal, Professor and Head, Department of Biochemistry, VPCI.

## DM Theses (Awarded)

(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

## DM Theses (Submitted)

(Session: 2014-2017)

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)
1.	Dr Chandrakant Tarke (Pulmonary Medicine)	Occurrence of bronchiectasis in patients with COPD: smokers <i>versus</i> 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 <i>versus</i> anti-depressant in patients with moderate and severe asthma	Prof. S.N. Gaur and Dr Vishal Bansal

## PhD Awarded/Submitted

Sl No.	Name (Discipline)	Title of Theses	Supervisor(s)	Status
1.	Ms Anshika Narang (Microbiology)	Efflux mechanism in <i>Mycobacterium tuberculosis</i> : to study the effect on drug susceptibility profile	Dr Mandira Varma-Basil and Prof. Mridula Bose	Awarded
2.	Ms Pooja Singh (Microbiology)	Utilisation of cholesterol by <i>mce4A</i> (Rv3499) overexpressed <i>M. tuberculosis</i> H37Rv and the effect of calcium blockers	Dr Mandira Varma-Basil and Prof. Mridula Bose	Awarded
3.	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	Awarded
4.	Ms Meenakshi Sharma (Pharmacology)	Studies on the possible role of nitric oxide in high altitude stress induced neurobehavioural and immunological changes in rats	Prof. A. Ray, Prof. K. Ravi and Dr Kavita Gulati	Awarded
5.	Mr Dharendra 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	Awarded
6.	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	Dr Kavita Gulati and Prof. A. Ray	Awarded
7.	Mr Anupam Prakash (Microbiology)	A study of <i>Cryptococcus</i> species in immunocompromised patients	Dr Anuradha Chowdhary and Prof. H.S. Randhawa	Submitted
8.	Mr Naresh Kumar (Microbiology)	Expression analysis of an array of genes of <i>Mycobacterium tuberculosis</i> 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	Submitted

<b>Sl No.</b>	<b>Name (Discipline)</b>	<b>Title of Theses</b>	<b>Supervisor(s)</b>	<b>Status</b>
9.	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)	Submitted
10.	Mr Md. Shamsuzzaman (Pharmacology)	Pharmacological studies on the possible mechanisms involved in theophylline induced cardiotoxicity in rats	Prof. A. Ray and Dr Kavita Gulati	Submitted
11.	Mr Lakshmi Kanth Kotarkonda (Physiology)	An insight into the mechanisms of bleomycin induced pulmonary fibrosis	Prof. K. Ravi	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.	Ms Cheshta Sharma (Microbiology)	Molecular mechanisms of triazole antifungal resistance in <i>Aspergillus fumigatus</i> and <i>Aspergillus flavus</i> originating from clinical and environmental sources	Dr Anuradha Chowdhary	2013
5.	Mr Gaurav Tyagi (Microbiology)	To study the role of biotin in the biology of <i>Mycobacterium tuberculosis</i>	Dr Mandira Varma-Basil, Prof. Mridula Bose and Prof. Ashok Prasad (Dept. of Chemistry, University of Delhi)	2013
6.	Mr Pradeep Kumar Singh (Microbiology)	Phenotypic and molecular characterisation, antifungal susceptibility profiles and clinical significance of <i>Basidiomycetes</i> molds occurring in patients with respiratory disorders	Dr Anuradha Chowdhary and Prof. S.N. Gaur	2013
7.	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
8.	Ms Astha Giri (Microbiology)	Characterization of genotypic indicators of ethambutol resistance in clinical isolates of <i>Mycobacterium tuberculosis</i>	Dr Mandira Varma-Basil	2014

Sl. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
9.	Mr Sanjesh Saini (Microbiology)	Role of microRNA in pathogenesis of influenza A virus infection	Dr Malini Shariff and Dr Madhu Khanna	2015
10.	Ms Tanushri Nandi (Microbiology)	Anti-influenza activity of immune modulatory peptides	Dr Madhu Khanna and Prof. Nirupama Trehanpati, Additional Professor, Dept. of Molecular Immunology, Institute of Liver and Biliary Sciences, New Delhi	2017
11.	Ms Sulekha Chaudhary (Pharmacology)	Studies on the anti-inflammatory and immunomodulatory effects of <i>Albizia lebbeck</i> and <i>Solanum xanthocarpum</i> in experimental models of bronchial asthma	Dr Kavita Gulati and Prof. A. Ray	2013
12.	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
13.	Mr Tapan Behl (Pharmacology)	To evaluate the effect of <i>Terminalia catappa</i> fruit and seed extract in streptozotocin induced diabetic retinopathy in rats	Dr Anita Kotwani	2014
14.	Ms Babita Kumari (Pharmacology)	A clinical study to evaluate the effects of yoga on pulmonary functions, cellular and molecular markers and quality of life in patients of bronchial asthma	Dr Kavita Gulati, Prof. A. Ray and Dr B.K. Menon	2015
15.	Mr Maaz Naqvi (Pharmacology)	Experimental pharmacological studies for optimization of constituents UNIM-352, a polyherbal preparation, for efficacious and safe treatment of bronchial asthma	Prof. A. Ray and Dr B.K. Menon	2015

Sl. No.	Name (Discipline)	Title of Theses	Supervisor(s)	Year of Registration
16.	Mr Anshul Tanwar (Pharmacology)	Experimental studies on the effects of <i>Withania somnifera</i> extract on type 2 diabetes mellitus induced Alzheimer's disease and the possible mechanisms in rats	Dr Kavita Gulati and Prof. A. Ray	2017
17.	Mr Suresh K. Thokchom (Pharmacology)	A clinical study to evaluate the effects of yogic intervention on pulmonary functions, inflammatory markers, oxidative stress and health status in patients of chronic obstructive pulmonary disease (COPD)	Dr Kavita Gulati, Prof. A. Ray and Dr B.K. Menon	2017
18.	Mr Anil Kumar Mavi (PhD Pulmonary Medicine)  Faculty of Medical Sciences, University of Delhi, VPCI	Biochemical and clinico-immunologic characterization of pigeon ( <i>Columba livia</i> ) allergens (feathers and droppings) in asthma patients	Prof. Raj Kumar and Prof. S.N. Gaur	2014

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

Sl. No.	Name (Discipline) and Institution's Name	Title of Theses	Supervisor(s)	Status
1.	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
2.	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 $\beta$ -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	Submitted
3.	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	Submitted
4.	Ms Nishtha Agarwal (PhD Microbiology)  Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi	Antigenic and genetic analysis of influenza virus isolated from clinical samples and exploring the potential antiviral target sites	Dr Gagan Dhawan (Dept. of Biomedical Sciences, ANDC, University of Delhi, Delhi) and Dr Madhu Khanna	Pursued
5.	Mr Jamal Ali Moiz (PhD Physiotherapy)  Jamia Millia Islamia University, 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

Sl. No.	Name (Discipline) and Institution's Name	Title of Theses	Supervisor(s)	Status
6.	Ms Smriti Gupta (PhD Biochemistry)	Understanding chronic obstructive pulmonary disease by studying single nucleotide polymorphism in Delhi-NCR population	Dr Ajit Kumar, Head, (Dept. of Chemistry, SRM University, Delhi- NCR, Sonapat, Haryana), Dr Anju Bhatnagar, (Rajan Babu Institute for Pulmonary Medicine & Tuberculosis [RBIPMT], New Delhi) and Dr Viswajeet Rohil	Pursued
7.	Ms Anita Singh (PhD Virology and Immunology)  Amity Institute of Virology and Immunology, Amity University, Noida	Characterization of recombinant outer membrane proteins of <i>L. interrogans</i> serovars	Dr M.M. Premlatha (Amity Institute of Virology and Immunology, Noida) and Dr Malini Shariff	Pursued
8.	Mr Kaushik Bhattacharya (MSc-PhD combined Programme 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 <i>M. tuberculosis</i>	Dr Vani Brahmachari (Dr B.R. Ambedkar Centre for Biomedical Research, University of Delhi, Delhi) and Dr Mandira Varma- Basil	Pursued
9.	Ms Ramandeep Kaur (PhD Microbiology)  Dept. of Microbiology, Baba Farid University of Health Sciences, Faridkot, Punjab	Molecular epidemiology of <i>M. tuberculosis</i> 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
10.	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

Sl. No.	Name (Discipline) and Institution's Name	Title of Theses	Supervisor(s)	Status
11.	Ms Kuldeep Patial (PhD Life Sciences)  Department of Life Sciences, Sambalpur University, Odisha	A case control study to investigate the utility of leptin and fasting blood glucose in prediction of obstructive sleep apnea	Dr R.K. Behera (Department of Life Sciences, Sambalpur University, Odisha) and Prof. S.N. Gaur	Pursued
12.	Dr Anamika (MS Otorhinolaryngology and Head and Neck Surgery)  Department of LHMC & Associated Kalawati Saran Children Hospital, New Delhi	Clinical profile, aeroallergen sensitivity and assessment of pulmonary function in pediatric chronic rhinosinusities	Dr A. Chakravarti (LHMC and Associated Hospitals, New Delhi) and Prof. Raj Kumar	Pursued

## Distinguished Visitors

- Study Tour by Sri Lanka Team [from the National Alcohol and Tobacco Authority (NATA) on Best Practice in Tobacco Control Legislation] visited the National Tobacco Quitline Services (TQLS), V.P. Chest Institute, Delhi on 15<sup>th</sup> February 2017.
- **Dr Chitra Dinakar**, Professor of Pediatrics, University of Missouri-Kansas City and Director, Food Allergy Research and Education Center of Excellence at Children's Mercy, Division of Allergy/ Immunology at Children's Mercy Hospital, Kansas City visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Jayesh G Kanuga**, Clinical assistant Professor, Division of Allergy and Immunology, Department of Medicine, New Jersey Medical School, Newark, NJ visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Luz Fonacier**, Head of Allergy in Winthrop-University Hospital, a Clinical Campus of Stony Brook University School of Medicine and serves as the Program Director the Allergy and Immunology Fellowship Program visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Mahendra P Dadhania**, Physician, Marlton & Cape May Court House, New Jersey visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Rohit Katial, Professor**, Medicine at National Jewish Health and the University of Colorado, visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Shailen Shah**, Physician, Allergy and Asthma in the Greater Philadelphia area visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Anura Weerasinghe**, Professor, Medicine and Immunology at Dr Neville Fernando Sri Lanka Russia Friendship Teaching Hospital of South Asian Institute of Medicine and Technology, Malabe, Sri Lanka visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Dushantha Madegedara**, Consultant Respiratory Physician, Teaching Hospital, Kandy, Sri Lanka visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Andreas Nandy**, Allergopharma, Merk, Reinbek, Germany visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Randolph Brehler**, Professor of Dermatology, and senior physician and Head of the Department of Allergology, University Hospital Muenster, Germany visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.
- **Dr Ronald van Ree**, Germany visited the Respiratory Allergy and Applied Immunology Department during 22-25, October 2017 for the participating in 50<sup>th</sup> ICAAICON Conference 2016.

## Awards/Honours

### Prof. S.N. Gaur

- Awarded ***Distinguished Service Award*** for his significant contribution on influenza knowledge dissemination and its control during the Influenza Update and Felicitation Programme held at VPCI on 13<sup>th</sup> April 2016.
- **Chief Guest** of the 'Neelambari-2016', a District Level Philately Exhibition organized by Sr. Superintendent of Post Offices, Delhi North Division, Delhi, held on 29<sup>th</sup>-30<sup>th</sup> September 2016.
- Awarded **Lupin Oration Award** of Tuberculosis Association of India at the 71<sup>st</sup> National Conference on Tuberculosis and Chest Diseases held at PGIMER, Chandigarh, December 2016.
- **Chief Guest**, National Allergy Center's Training Programme on Allergy and Immunotherapy, New Delhi, 17<sup>th</sup> December 2016.
- **Secretary**, National College of Chest Physicians (India).
- **President**, Geriatric Society of India for 2017.
- **Member**, various sub committees on Immunotherapy, Food Allergy, Anaphylaxis, Diagnostics, etc., of American Academy of Allergy Asthma and Immunology (AAAAI), USA from the year 2009.
- **Member**, Academic Council, University of Delhi.
- **Board Executive Member**, Influenza Foundation of India, Delhi.
- **Expert**, Drug Safety Monitoring Committee, Ministry of Health and Family Welfare, Govt. of India.
- **Member**, Expert Committee on Food Allergy, Department of Biotechnology (DBT), Ministry of Science and Technology, New Delhi.
- **Chairman**, National Expert Committee for formulation/finalizing criteria for lot release of diagnostic and therapeutic allergen extracts in India, CDSCO, Drug Controller General of India (DCGI), Ministry of Health and Family Welfare, Government of India, 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).
- **Advisor**, Editorial Board, *Indian Journal of Geriatric Care*, Delhi.
- **Editorial Advisory Board Member**, *Open Medicine Journal*.
- **Member**, Programme Advisory Committee for Environment Research Programme (EnvRP), Ministry of Environment and Forest, Govt. of India, New Delhi.
- **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).

### Prof. Ashok Shah

- **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** (Infectious Diseases), *Lung India*, an official publication of the Indian Chest Society.
- **Member**, Editorial Board, *Asian Pacific Allergy Journal* of the Asia Pacific Association of Allergy, Asthma and Clinical Immunology (APAAACI).
- **Indian Editorial Advisor**, *European Respiratory Journal*, of the European Respiratory Society.
- **Member**, Editorial Board, *European Respiratory Journal*.
- **Indian Editorial Advisor**, *Breathe*, the clinical educational quarterly publication of European Respiratory Society.
- **Member**, National Committee on “*Bibliographic Biomedical Database from Indian Literature*”, Indian Council of Medical Research - National Informatics Centre, New Delhi.

### 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.

### Prof. S.K. Bansal

- **Vice-President**, Association of Clinical Biochemists of India.

### Prof. Raj Kumar

- **Member**, University of Delhi, Delhi, Selection Committee for the Personal Promotion Case under CAS-2010.
- **Member**, University Grants Commission, New Delhi, Expert Committee Meeting for Major Research Projects (MRP).
- **Selected as Director**, **AIIMS, Patna**, Ministry of Health and Family Welfare, Govt. of India on 15.12.2016.
- **Expert**, PGI Chandigarh, DM Thesis evaluation for DM Pulmonary Medicine.
- **Expert**, University Grants Commission, New Delhi, Interview Candidates for Commonwealth Medical Fellowships.
- **External Expert**, National Institute of Tuberculosis and Respiratory Diseases, New Delhi.
- **Member**, University of Delhi, Delhi, Selection Committee for Hindu College – Principal.
- **Member**, Ministry of Health and Family Welfare, Govt. of India, Delegation led by Honorable Health Minister Sh. JP Nadda for WHO Framework Convention on Tobacco Control (WHO FCTC) at Greater Noida, Gautam Buddha Nagar, Uttar Pradesh.

- **University Representative**, University of Delhi, Delhi, Governing Body of RajKumari Amrit Kaur College of Nursing – Appointments.
- **Member**, University of Delhi, Delhi, Parliamentary Committee for Welfare of SC and ST.
- **Chairman**, The Executive Council, University of Delhi, Delhi, W.U.S. Health Centres of University of Delhi.
- **Head**, Department of Pulmonary Medicine under Faculty of Medical Sciences, University of Delhi, Delhi, for term of 3 years.
- **Member**, Examination Disciplinary Committee, University of Delhi, Delhi, for the Year 2016-17.
- **Expert**, Technical Working Group Department of Pulmonary Medicine, AIIMS, New Delhi, to help in formulation COPD and Asthma Guidelines.
- **Guest of Honour**, on the occasion of Celebration of World Environment Day, Panel Discussion being attended by key environmentalists of the country, organised by India Eye International Human Rights Observer in collaboration with United Nation Centre for India & Bhutan, at India Islamic Center, Lodi Estate, New Delhi on 5<sup>th</sup> June 2016.
- **Associate 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).
- **Chief Guest**, in 2<sup>nd</sup> National Conference on 'Environmental Concerns of 21<sup>st</sup> Century: Indian and Global Context' at Zakir Husain Delhi College (Evening), University of Delhi on 29 March 2017.

#### 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

- **Bill & Melinda Gates Foundation's 'Global Health Award'** to attend Keystone Symposia on Molecular and Cellular Biology "Hemorrhagic Fever viruses (S3)" held from 4<sup>th</sup> - 8<sup>th</sup> December 2016 at New Mexico, USA.

#### Dr Mandira Varma-Basil

- **Member**, Ethics Committee, Rajan Babu Institute of Pulmonary Medicine and Tuberculosis, Delhi.
- **Secretary**, Indian Association of Mycoplasmologists.

#### Dr Anuradha Chowdhary

- **Fellow** (Elected), European Confederation of Medical Mycology, 2017.
- **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 Anita Kotwani

- One year assignment as **Technical Officer** at World Health Organization Regional Office for South-East Asia, New Delhi, on Essential Drugs and Other Medicines. From July 8, 2015 to July 7, 2016.
- **Member**, Core Working Group and Technical Advisory Group constituted by Ministry of Health & Family Welfare, Government of India on Antimicrobial Resistance to oversee and coordinate policy decisions and activities relating to AMR and for development of National Action Plan on AMR September 2016.

- **Member**, Advisory Group on WHO Fair Pricing Forum.
- Nominated as an **Expert**, by Director General, ICMR and Secretary, DHR to participate for the Indo-Norway bilateral meeting on 'Understanding Challenges and Identifying Potential Solution for Antimicrobial Resistance, 10<sup>th</sup>-11<sup>th</sup> November 2016.
- Invited by the World Health Organization, HQ, Geneva to participate in **Advisory Group Meeting on Fair Pricing Forum**, Geneva, Switzerland, 22<sup>nd</sup>-24<sup>th</sup> November 2016.

#### Dr Kavita Gulati

- Awarded "**Distinguished Services Award**" in Cardiovascular Sciences, Medicine and Surgery by International Academy of Cardiovascular Sciences, Winnipeg, Canada, 2017.
- **Treasurer**, Society for Nitric Oxide and Allied Radicals (SNOAR).
- **Member**, Editorial Board, *EC Pharmacology and Toxicology Journal*.

#### 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.

#### Dr Vishwajeet Rohil

- **External Expert**, Project Monitoring and Review Committee Meeting to review the progress of XIIIFYP Projects Defence Institute of Physiology & Allied Sciences (DRDO), Ministry of Defence, Govt. of India on 29.9.2016, 14.12.2016, 16.3.2017 & 17.3.2017.
- Awarded **Scientist of the Year Award 2016** for his outstanding contribution and recognition in the field of Medical Biochemistry and during 2<sup>nd</sup> Annual Scholar's Science Meet of BIOMEDCON 2016, organized by "The Society of Biomedical Laboratory Scientists" (SBMLS), India held on 16, December 2016 at Gandhi Peace Foundation, New Delhi.

#### 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 Rajinder Bajaj

- **Supervisor**, All India Pre-Veterinary Test (AIPVT) 2016, Veterinary Council of India.

#### Dr Bhagwan Singh Patidar (MD Student - Biochemistry)

- Appreciation prize for **Young Scientists** Oral Presentation entitled "Alteration in the activity of adenosine deaminase and its isoenzymes in serum, lymphocytes and erythrocytes of COPD patients" at 6<sup>th</sup> Annual CME of Clinical Biochemistry-2017 "Trace Elements - The Forgotten Essentials" organized by Department of Biochemistry, Sir Ganga Ram Hospital, New Delhi and Association of Clinical Biochemists of India (Delhi Chapter & North Zone) held on 17<sup>th</sup> March 2017 at Sir Ganga Ram Hospital, New Delhi.

#### Mr Manoj Kumar (PhD Student - Biochemistry)

- Second Prize for **Young Scientists** Oral Presentation entitled "Changes in erythrocyte membrane protein profile in asthma" at 6<sup>th</sup> Annual CME of Clinical Biochemistry-2017 "Trace Elements - The Forgotten Essentials" organized by Department of Biochemistry, Sir Ganga Ram Hospital, New Delhi and Association of Clinical Biochemists of India (Delhi Chapter & North Zone) held on 17<sup>th</sup> March 2017 at Sir Ganga Ram Hospital, New Delhi.

#### Ms Astha Giri (PhD Student - Microbiology)

- Awarded **First Prize** for a poster paper presentation on “Polymorphism upstream to embbit lead to high-level ethambutol resistance in clinical isolates of *Mycobacterium tuberculosis* from North India” (Authors: Astha Giri, Shraddha Gupta, Anshika Narang, Naresh Sharma, Mrigula Bose and Mandira Barma-Basil), First Delhi Chapter Meeting, IAMM, All India Institute of Medical Sciences, New Delhi on 25<sup>th</sup> March 2017.
- Awarded **Travel Grant** from Indian Council of Medical Research for participating 38<sup>th</sup> Annual Congress of European Society of Mycobacteriology at Sibenik, Croatia, 25<sup>th</sup> -28<sup>th</sup> June 2017.

#### Ms Gaurav Tyagi (PhD Student - Microbiology)

- Awarded **Travel Grant** from Indian Council of Medical Research for participating the Conference of Federation of European Microbiological Society, 2017 at Valencia, Spain, 9<sup>th</sup> -13<sup>th</sup> July 2017.

#### Mr Tapan Behl (PhD Student - Pharmacology)

- Awarded with **Excellence Award** in Biomedical Research at National Conference on Recent Advances in Biomedical Science: Diagnosis & Research and 2<sup>nd</sup> Annual Scholar’s Science Meet of SBMLS held at New Delhi, 16<sup>th</sup> December 2016.
- Awarded with **Rashtriya Shiksha Rattan Award** during All India Achievers Association Excellence Awards 2016 (AIAC) held at New Delhi, 3<sup>rd</sup> December 2016.
- Elected as **Member** for Young Pharmacologist Forum of Indian Pharmacological Society, 2016.

## Sponsored Research Projects

Sl. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Grants Received (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) [extended upto 30.11.2016]	29.58 Lakhs
2.	Dr Malini Shariff (Microbiology)	Microbiome of human lung in COPD patients attending VPCI, Delhi	D.B.T. March 19, 2015 (Two years) [extended upto 18.09.2017]	25.00 Lakhs
3.	Dr Malini Shariff (Microbiology)	Isolation and characterization of anaerobic bacteria causing lower respiratory tract infections in patients attending VPCI, Delhi	D.S.T. March 01, 2017 (Three years)	16.73 Lakhs
4.	Dr Mandira Varma-Basil (Microbiology)	A point of care diagnostic tool for tuberculosis	D.S.T. September 3, 2014 (Three Years)	20.09 Lakhs
5.	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)	39.21 Lakhs
6.	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) [extended upto 30.06.2016]	17.65 Lakhs
7.	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)	20.30 Lakhs
8.	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)	21.73 Lakhs

Sl. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Grants Received (in Rs.)
9.	Dr Madhu Khanna (Respiratory Virology)	Aptamer-mRNA Chimera – the next generation RNA vaccine	D.S.T. August 19, 2016 (Three years)	13.31 Lakhs
10.	Dr Ritu Kulshrestha (Pathology)	Study of the transcriptional mechanisms underlying pulmonary fibrosis and their modulation by therapeutic agents	D.S.T. May 21, 2015 (Three years)	38.00 Lakhs
11.	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) [extended upto 16.04.2017]	33.80 Lakhs
12.	Prof. A. Ray (Pharmacology)	Pharmacological studies to validate the effects of traditional herbal preparations in experimental models of bronchial asthma in experimental animals	N.I.F. July 28, 2016 (One year)	7.36 Lakhs
13.	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 + one year extension)	19.37 Lakhs
14.	Dr Kavita Gulati (Pharmacology)	Studies on the anti-inflammatory and immunomodulatory effects of <i>Albizzia lebbek</i> and <i>Solanum xanthocarpum</i> in experimental models of bronchial asthma	D.B.T. March 10, 2014 (Three years) [extended upto 09.09.2017]	35.63 Lakhs
15.	Dr Kavita Gulati (Pharmacology)	A clinical study to evaluate the effects of yoga on pulmonary functions, cellular and molecular markers and quality of life in patients of bronchial asthma	AYUSH October 01, 2015 (Three years)	19.84 Lakhs

Sl. No.	Faculty Member (Department)	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Grants Received (in Rs.)
16.	Dr Vishal Bansal (Physiology)	Development of exercise protocol to improve hypoxic tolerance	D.I.P.A.S. April 10, 2015 (Three years)	45.00 Lakhs
17.	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 (Two years)	6.30 Lakhs
18.	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)	138.20 Lakhs
19.	Prof. Raj Kumar (Respiratory Allergy and Applied Immunology)	Bharat Tobacco Quit Line (A pilot service for Delhi)	Ministry of Health & Family Welfare (Govt. of India) – QL March 12, 2015 (Three years)	163.37 Lakhs
20.	Dr Raj Kumar (Respiratory Allergy and Applied Immunology)	Effect of outdoor air pollution on acute respiratory symtoms	I.C.M.R. March 15, 2017 (One Year and three months)	22.48 Lakhs
21.	Dr S.K. Bansal Nodal Officer Multi-Disciplinary Research Unit		Ministry of Health and Family Welfare	3.48 Crores
22.	Dr Ashima Anand (Principal Investigator) DST Project	To investigate the role of J receptors as a primary causative factor leading to dyspnea on exertion in patients with pulmonary hypertension 1 (i) with and (ii) without atrial septal defect and (2) with connective tissue disease	D.S.T. November 2, 2016 (Three years)	14.13 Lakhs
23.	Prof. H.S. Randhawa (INSA Honorary Scientist)	<i>Cryptococcus neoformans</i> : a study of its natural habits, serotypes and reappraisal of selective isolation techniques	I.N.S.A. January 1, 2001 (Seventeen years)	7.95 Lakhs

## Fellowships

Sl. No.	Name of Student (Department) and Faculty Member	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Budget Received (in Rs.)
1.	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)	19.01 Lakhs
2.	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)	16.99 Lakhs
3.	Ms. Cheshta Sharma (Senior Research Fellow) (Supervisor: Dr Anuradha Chowdhary)	Molecular mechanism of triazole antifungal resistance in <i>A. fumigatus</i> and <i>A. flavus</i> originating from clinical and environmental sources	U.G.C. February 27, 2012 (Five years)	13.41 Lakhs
4.	Mr. Gaurav Tyagi (Senior Research Fellow) (Supervisor: Dr Mandira Varma-Basil)	To study biotin metabolism in the biology of <i>Mycobacterium tuberculosis</i>	I.C.M.R. September 14, 2012 (Five years)	14.66 Lakhs
5.	Ms. Pooja Singh (Senior Research Fellow) (Supervisor: Dr Mandira Varma-Basil)	Cholesterol utilisation by MCE4A overexpressed <i>M. tuberculosis</i> H37RV and effect of verapamil	I.C.M.R. January 1, 2014 (Three years)	16.02 Lakhs
6.	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)	8.96 Lakhs
7.	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 to February 28, 2017	7.97 Lakhs
8.	Mr. Naresh Kumar (Senior Research Fellow) (Supervisor: Dr Mandira Varma-Basil)	Expression analysis of genes of liquid metabolism in clinical isolates of <i>Mycobacterium tuberculosis</i> from patients of pulmonary and lymph node tuberculosis	I.C.M.R. January 05, 2015 (Three years)	12.07 Lakhs

Sl. No.	Name of Student (Department) and Faculty Member	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Budget Received (in Rs.)
9.	Ms Tanushri Nandi (Senior Research Fellow) (Supervisor: Dr Madhu Khanna)	Synergistic effect of host defensive immune peptides in regulation of influenza A virus replication	I.C.M.R. August 12, 2015 (Three years)	9.14 Lakhs
10.	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)	21.21 Lakhs
11.	Ms. Sulekha Chaudhary (Senior Research Fellow) (Supervisor: Dr Kavita Gulati)	Studies on the anti-inflammatory and immunomodulatory effects of <i>albizia labbeck</i> and <i>solonam xanthocarpum</i> on the experimental model of brochial asthma	U.G.C. July 31, 2012 (Five years)	9.23 Lakhs
12.	Mr Anil Meena (Junior Research Fellow) (Supervisor: Prof. S.K. Bansal)	A study on CRHR1 and GR gene polymorphism and their correlation with the expression of various inflammatory cytokines in asthma in North Indian population	I.C.M.R. January 28, 2014 (Five years)	12.62 Lakhs
13.	Mr Ashutosh Singh (Junior Research Fellow) (Supervisor: Dr Anuradha Chowdhary)	Molecular epidemiology and ecology of human pathogenic fungi	C.S.I.R. October 28, 2014 (Two years)	7.41 Lakhs
14.	Mr Pradeep Kr. Singh (Junior Research Fellow) (Supervisor: Dr Anuradha Chowdhary)	Molecular characterization and antifungal susceptiblity profile of non-sprulating clinically significant moulds with special reference to the filamentation basidiomycetes occurring in patient with respiratory disorders	I.C.M.R. October 07, 2015 (Three years)	2.28 Lakhs
15.	Mr Maaz Naqvi , (Junior Research Fellow) (Supervisor: Prof. A. Ray)	Experimental pharmacological studies for optimization of constituents of UNIM-352, a polyherbal preparation for efficacious and safe treatment of brochial asthma	I.C.M.R. March 18, 2016 (Three years)	4.47 Lakhs

Sl. No.	Name of Student (Department) and Faculty Member	Title of Project	Funding Agency, Date of Sanction/ Implementation and Duration	Budget Received (in Rs.)
16.	Mr Vikas Kumar Solanki (Post-doctoral Fellow) (Supervisor : <i>Dr Mandira Varma-Basil</i> )	A novel and improved heterologous prime-boost vaccine regimen against tuberculosis	D.S.T. July 8, 2016 (Two years)	9.60 Lakhs
17.	Dr Malachy Chigozie Ugwu (Post-doctoral Fellow) (Supervisor : <i>Dr Malini Shariff</i> )	Molecular characterization of multidrug resistant bacterial uropathogens in south-eastern Nigeria	NAM S&T Centre January 30, 2017 (Six months)	2.70 Lakhs

## Conferences/Symposia/Seminars/Workshops/CMEs

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
1.	Prof. S.N. Gaur	Lecture on: Vaccination on pulmonology	Army Hospital, Delhi Cantt	CME on Current Trends in Pulmonary Medicines New Delhi April 10, 2016
2.	Prof. S.N. Gaur	Lecture on: Sleep hygiene and yoga	National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, in association with National College of Chest Physicians (India) and Society for Tobacco Control, Delhi	ACC-SLEEP Medicine (a Certificate Course in Sleep Medicine) Delhi May 21-22, 2016
3.	Prof. S.N. Gaur	Lecture on: Allergen specific immunotherapy (A to Z)- Practical tips from guidelines	ASISCIT (by Dr Nagendra Prasad, Bengaluru)	Case Discussion: ASISCIT Bangalore July 7-8, 2016
4.	Prof. S.N. Gaur	Lecture on: Management of difficult COPD	Metro Multi-speciality Hospital	WORCON PACS 2016 Noida July 17, 2016
5.	Prof. S.N. Gaur	Lecture on: Guidelines for spirometry in India	PGIMER	CME on Spirometry Chandigarh July 30-31, 2016
6.	Prof. S.N. Gaur	Lecture on: Vaccination - Pulmonology perspective	RESPICON (Annual National Conference of the Respiratory Chapter of Indian Academy of Paediatrics)	National Conference on International Pulmonology, Respiratory Medicine & Sleep New Delhi August 5-7, 2016
7.	Prof. S.N. Gaur	Lectures on: • Allergy Immunotherapy in respiratory medicine • Subcutaneous immunotherapy in clinical practice	Jaipur Chest Forum	CME on Allergy and Immunotherapy Jaipur September 1-18, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
		<ul style="list-style-type: none"> <li>• Immunotherapy methodology - SCIT</li> </ul> <p>Participated on Panel discussions on <i>In vitro</i> testing allergy, role of IgE in testing allergy and immunotherapy practical approach</p>		
8.	Prof. S.N. Gaur	<p>Organising Chairman</p> <p>Lectures on:</p> <ul style="list-style-type: none"> <li>• Immunotherapy SCIT and SLIT</li> <li>• Indian Guidelines: Allergy and immunology</li> </ul>	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	Golden Jubilee National Conference of Indian College of Allergy, Asthma & Applied Immunology (ICAAICON-2016) Delhi October 22-25, 2016
9.	Prof. S.N. Gaur	<p>Faculty</p> <p>Lectures on:</p> <ul style="list-style-type: none"> <li>• SCIT/SLIT</li> <li>• Revised Guidelines for practice in allergy immunotherapy in India</li> </ul>	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2016) [18th Joint National Conference of NCCP (I) & ICS] Mumbai November 24-27, 2016
10.	Prof. S.N. Gaur	Presidential Oration on Chronic cough in elderly	Geriatric Society of India in association with V.P.C.I., University of Delhi	GSICON 2016 13th International Conference on Geriatrics & Gerontology Delhi December 10- 11, 2016
11.	Prof. S.N. Gaur	<p>Patron</p> <p>Wecome Address</p> <p>Chaired the Plenary Lecture on CO<sub>2</sub> water bath therapy promotes blood flow and angiogenesis in diabetes with peripheral ischemia</p>	International Academy of Cardiovascular Sciences (India Section) and V.P.C.I., University of Delhi	International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Disease [9th Annual Conference of International Academy of Cardiovascular Sciences (India Section)] Delhi February 9-11, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
12.	Prof. S.N. Gaur	Lecture on: Allergy and immunotherapy	Indian Medical Association (Raebareli Chapter)	2nd RIMACON Raebareli March 3-4, 2017
13.	Prof. S.K. Chhabra	Lecture on: Epidemiology of asthma  Practical demonstrations on Pulmonary function tests	V.P.C.I., University of Delhi and Institute of Genomics and Integrative Biology	41st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 4-8, 2016
14.	Prof. S.K. Bansal	Organizing Secretary	V.P.C.I., University of Delhi	Training Programme on Structural Bioinformatics and Molecular Docking Delhi May 5, 2016
15.	Prof. S.K. Bansal	<ul style="list-style-type: none"> <li>• Joint Secretary (Member Executive Council, ICAAI)</li> <li>• Lecture on "Stem cell therapy in asthma"</li> <li>• One of the Judges for V. Raju Award (oral presentation)</li> <li>• One of the Judges for UCB ICAAI award (oral presentation)</li> <li>• One of the Judges for M. Sundaramma Young Scientist Award (oral presentation)</li> </ul>	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	Golden Jubilee National Conference of Indian College of Allergy, Asthma & Applied Immunology (ICAAICON-2016) Delhi October 22-25, 2016
16.	Prof. S.K. Bansal	Chaired "Prof. Suresh C Tyagi Award Session (Young Faculty)"	International Academy of Cardiovascular Sciences (India Section) and V.P.C.I., University of Delhi	International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Diseases [9th Annual Conference of International Academy of Cardiovascular Sciences (India Section)] Delhi February 9-11, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
17.	Prof. S.K. Bansal	Organizing Secretary	VPCI/DIPAS/INASS Delhi Chapter, ACBI	Lecture on the topic "Systemic Hypoxia and Organ Dysfunction" delivered by Prof. (Dr.) Gustavo Zubieta, Director, High Altitude Pulmonary and Pathology Institute, Bolivia Delhi July 18, 2016
18.	Prof. S.K. Bansal	Vice President (Delhi Chapter, ACBI)	SGRH and ACBI, Delhi Chapter & North Zone	Clinical Utility of <i>In-vitro</i> Allergy Diagnosis and Novel Approach in Diagnosis of Autoimmune Disorders New Delhi January 25, 2017
19.	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	41st Workshop on Respiratory Allergy: Diagnosis and Management Delhi April 4-8, 2016
20.	Prof. Raj Kumar	Lecture on: Smoking cessation-current status	Army Hospital (Research and Referral)	CME on Current Trends in Respiratory Medicine New Delhi April 10, 2016
21.	Prof. Raj Kumar	Organising Secretary  Lecture on: Scope on sleep medicine	National Centre of Respiratory Allergy, Asthma and Immunology (NCRAAI), VPCI, in association with National College of Chest Physicians (India) and Society for Tobacco Control, Delhi	ACC-SLEEP Medicine (a Certificate Course in Sleep Medicine) Delhi May 21-22, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
22.	Prof. Raj Kumar	Presentation on National Tobacco Quitline	WHO-India, Ministry of Health and Family Welfare, Govt. of India and the National Heritage City Development and Augmentation Yojana (HRIDAY)	World No Tobacco Day 2016 and Launching of National Tobacco Quit Line New Delhi May 30, 2016
23.	Prof. Raj Kumar	Organising Secretary  Lecture on: Smoking cessation	V.P.C.I., University of Delhi, National College of Chest Physicians (India) and Society for Tobacco Control, Delhi	Public Awareness Programme on "NoTobacco - Change your Lifestyle" Delhi June 3, 2016
24.	Prof. Raj Kumar	Lectures on: • Indication of immunotherapy • Prescribing AIT and dose schedules  Member Panel/Open Discussion, 'Personal Experience of AIT by participants' in ASI 2016	Indian College of Allergy, Asthma & Applied Immunology and Bengaluru Allergy Centre	ASI 2016, Consensus Meet on Allergen Specific Immunotherapy Bangalore July 7-8, 2016
25.	Prof. Raj Kumar	Chairperson - Panel Discussion	Glenmark Pharmaceuticals Ltd.	Precision in OAD Management - from Diagnosis to Delivery New Delhi July 24, 2016
26.	Prof. Raj Kumar	Guest Faculty	Post Graduate Institute of Medical Education and Research (PGIMER)	National Workshop to Formulate Guidelines for Spirometry in India Chandigarh July 30-31, 2016
27.	Prof. Raj Kumar	Lecture on: Smoking cessation	RESPICON (Annual National Conference of the Respiratory Chapter of Indian Academy of Pediatrics)	National Conference on Interventional Pulmonology, Respiratory Medicine & Sleep (RESPICON-INDIA) New Delhi August 5-7, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
28.	Prof. Raj Kumar	Lecture on: Indoor air pollution - lung health in children	Department of Physiology, Sree Balaji Medical College and Hospital, and Association of Physiologists of Tamilnadu	International Conference on Environment and Occupational Health (ENVOCCON 2016) and 10 <sup>th</sup> Annual Conference of Association of Physiologists of Tamilnadu Chennai September 10-11, 2016
29.	Prof. Raj Kumar	Organising Secretary  Lectures on: • Clinical immunological diagnosis of food allergy • Life style - diet & asthma	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	Golden Jubilee National Conference of Indian College of Allergy, Asthma & Applied Immunology (ICAAICON-2016) Delhi October 22-25, 2016
30.	Prof. Raj Kumar	Lecture on: Food allergy - status in India	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2016) [18th Joint National Conference of NCCP (I) & ICS] Mumbai November 24-27, 2016
31.	Prof. Raj Kumar	Chaired a session on Hyponatremia	Geriatric Society of India in association with V.P.C.I., University of Delhi	GSICON 2016 13th International Conference on Geriatrics & Gerontology Delhi December 10- 11, 2016
32.	Prof. Raj Kumar	Lecture on: Food allergy in India	American Association of Physicians of Indian Origin (AAPI) in collaboration with Ministry of Health and Family Welfare	AAPI Global Health Care Summit 2016 Udaipur December 28-30, 2016
33.	Prof. Raj Kumar	Lecture on: Respiratory allergy and applied immunology	Eco-club of Kirori Mal College, University of Delhi	Kirori Mal College Delhi February 25, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
34.	Prof. Raj Kumar	Lecture on: How can I get rid of my allergies? Book to bedside  Faculty, Workshop - Immunotherapy (Subcutaneous/Sublingual)	Sir Ganga Ram Hospital in association with Indian Academy of Paediatrics (IAP) Respiratory Chapter, New Delhi	Childhood Allergies Programme New Delhi March 4, 2017
35.	Dr Balakrishnan Menon	Lecture on: Anti IgE therapy for asthma: current indications	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	Golden Jubilee National Conference of Indian College of Allergy, Asthma & Applied Immunology (ICAAICON-2016) Delhi October 22-25, 2016
36.	Dr Balakrishnan Menon	Lecture on: Cellular senescence in normal and premature lung aging  Chaired in a Symposium on Pulmonary imaging	National College of Chest Physicians (India) and Indian Chest Society	National Conference on Pulmonary Diseases (NAPCON-2016) [18th Joint National Conference of NCCP (I) & ICS] Mumbai November 24-27, 2016
37.	Dr Balakrishnan Menon	Lecture on: Best chest radiology in diagnosis of tuberculosis	Babu Jagjivan Ram Memorial Hospital and Delhi State TB Control	CME on Tuberculosis New Delhi February 23, 2017
38.	Dr Balakrishnan Menon	Lecture on: Radiological diagnosis of ILD	API, Saharanpur	RESPICON 2017 Saharanpur February 23, 2017
39.	Dr Mandira Varma-Basil	Lecture on: Rv1458c: A new diagnostic marker for identification of <i>M. tuberculosis</i> complex in a novel duplex PCR assay	EuroSciCon	The 2016 TB Summit The O2 Peninsula Square London June 21-23, 2016
40.	Dr Mandira Varma-Basil	Lecture on: Molecular diagnosis of tuberculosis	Miranda House, University of Delhi	Add on Course on Biotechnology Delhi September 21, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
41.	Dr Mandira Varma-Basil	Lecture on: Role of efflux pumps in drug resistance in <i>M. tuberculosis</i>	Department of Biological Sciences, Birkbeck, University of London	Department of Biological Sciences, Birkbeck, University of London Bloomsbury, London October 25, 2016
42.	Dr Mandira Varma-Basil	Presented a poster on Lack of association of <i>ubiA</i> mutations with ethambutol resistance in clinical isolates of <i>M. tuberculosis</i> from North India	International Union Against Tuberculosis and Lung Diseases (The Union)	47th Union World Conference on Lung Health Liverpool, UK October 26-29, 2016
43.	Dr Mandira Varma-Basil	Lecture on: Mechanism of drug resistance in <i>M. tuberculosis</i> : role of efflux pumps in drug resistance	Indian Association of Medical Microbiologists and PGIMER	MICROCON 2016, 40 <sup>th</sup> National Conference of Indian Association of Medical Microbiologists Microbes, Man and Machine-The Way Forward Chandigarh November 23-27, 2016
44.	Dr Anuradha Chowdhary	Lecture on: Prevalence of azole resistance in clinical <i>Aspergillus flavus</i> isolates: presence of novel S196F, A324P, N423D and V465M substitutions in <i>cyp51C</i> gene  Presented a poster on Evaluation of matrix-assisted laser desorption/ionization time-of-flight mass spectrometry for identification of clinically significant filamentous basidiomycetes	European Society of Clinical Microbiology and Infectious Diseases	26 <sup>th</sup> European Congress of Clinical Microbiology and Infectious Diseases Amsterdam, Netherlands April 9-12, 2016
45.	Dr Anuradha Chowdhary	Lecture on: Emerging filamentous basidiomycetes	International Society for Human and Animal Mycology and Gilead Sciences, Inc	FORUM on Fungal Infections in the Middle East Dubai, UAE April 22-23, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
46.	Dr Anuradha Chowdhary	Lecture on: Molecular characterization and antifungal susceptibility profile of black fungi in diverse clinical entities in India	International Society for Human and Animal Mycology Working Group Black Yeasts and Relatives	6 <sup>th</sup> Meeting of the ISHAM Working Group Black Yeasts and Relatives Viterbo Italy September 15-17, 2016
47.	Dr Anuradha Chowdhary	Lectures on: <ul style="list-style-type: none"> <li>• Spectrum and antifungal susceptibility profiling of <i>Candida</i> species in vulvovaginal candidiasis by molecular methods and MALDI-TOF MS</li> <li>• Molecular characterization and genotyping of global <i>Candida africana</i> isolates</li> <li>• Characterization by matrix assisted laser desorption ionization-time of flight mass spectrometry (MALDI-TOF MS) of <i>Candida</i> species causing candidemia in tertiary care hospitals, India</li> </ul> <p>Presented posters on</p> <ul style="list-style-type: none"> <li>• Molecular characterization and antifungal susceptibility profile of clinical isolates of <i>Fusarium</i> species in Delhi, India</li> <li>• Trends in MIC distribution of <i>Candida</i> species isolated from patients with bloodstream candidiasis</li> </ul>	Indian Association of Medical Microbiologists and PGIMER	MICROCON 2016, 40 <sup>th</sup> National Conference of Indian Association of Medical Microbiologists Microbes, Man and Machine-The Way Forward Chandigarh November 23-27, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
48.	Dr Anuradha Chowdhary	Lectures on: <ul style="list-style-type: none"> <li>• Epidemiology of azole resistance in <i>Aspergillus</i></li> <li>• Emergence and spread of azole resistant <i>Aspergillus</i></li> </ul>	International Society for Human and Animal Mycology (ISHAM) and European Confederation of Medical Mycology (ECMM) ARS Working Group	2 <sup>nd</sup> Duden Conference/ 1 <sup>st</sup> ISHAM and ECMM ARS Working Group Meeting Nijmegen, the Netherlands January 20-21, 2017
49.	Dr Anita Kotwani	Lecture on: Surveillance of antibiotic use in humans	Indian Council of Medical Research	RCN-ICMR meeting during Indo-Norway Bilateral Meeting on 'Understanding Challenges and Identifying Potential Solution for Antimicrobial Resistance' New Delhi November 11, 2016
50.	Dr Anita Kotwani	Expert - Stakeholder Engagement Meeting	WHO Country Office for India, Ministry of Health and Family Welfare, and National Centre for Disease Control	National Workshop on National Action Plan on AMR New Delhi December 8-9, 2016
51.	Dr Anita Kotwani	Resource Person  Lecture on: Organizing a dissemination workshop: conveying research to media, press release and public engagement	Indian Institute of Health Management Research (IIHMR) University and the Wellcome Trust/ DBT India Alliance	Research Skills Communication Workshop New Delhi January 31, 2017
52.	Dr Anita Kotwani	Resource Person  Lectures on: <ul style="list-style-type: none"> <li>• Antimicrobial resistance: inappropriate use of antibiotics in the community</li> <li>• Global and national initiative to tackle antimicrobial resistance</li> </ul>	Kashmir University	Winter Refresher Course for Faculty Srinagar February 28, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
53.	Dr Kavita Gulati	Lecture on: Sexual dimorphism during stress gastric ulceration and its regulation by nitric oxide: an experimental study  Chaied a session on The brain-immune axis and stress ulcerogenesis	The International Union of Basic and Clinical Pharmacology (IUPHAR)	IUPHAR-GI Section Meeting Novigrad, Croatia June 2016
54.	Dr Kavita Gulati	Best poster award, titled; A clinical study to evaluate the effects of yogic intervention on pulmonary functions, inflammatory marker and quality of life in patients of bronchial asthma	Indian College of Allergy, Asthma & Applied Immunology and V.P.C.I., University of Delhi	Golden Jubilee National Conference of Indian College of Allergy, Asthma & Applied Immunology (ICAAICON-2016) Delhi October 22-25, 2016
55.	Dr Kavita Gulati	Lecture on: Pharmacovigilance: a tool for drug safety	The Delhi Institute of Pharmaceutical Sciences and Research (DIPSAR) and Delhi Pharmaceutical Science and Research University (DPSRU)	XXI - Quality Improvement Programme on 'Trends in Pharmaceutical Sciences Delhi January 30 - February 10, 2017
56.	Dr Kavita Gulati	Organising Secretary  Lecture on: Biomarkers of cardiovascular diseases: practical consideration during methylxanthine induced cardiotoxicity  (during Preconference cum Brainstorming Seminar on "Ayurveda and Prevention of Cardiovascular Disorders')	V.P.C.I., University of Delhi and International Academy of Cardiovascular Sciences (India Section)	Recent Advances in Cardiovascular Research: Impact on Health and Diseases [9 <sup>th</sup> Annual Conference of International Academy of Cardiovascular Sciences (India Section)] Delhi February 9-11, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
57.	Dr Kavita Gulati	Chairperson and Judge for best E-poster presentation	Delhi Pharmaceutical Science and Research University (DPSRU)	5 <sup>th</sup> National Conference of Pharmacoeconomics & Outcome Research Delhi March 3-4, 2017
58.	Dr Kavita Gulati	Lecture on: Clinical and experimental studies to evaluate the complementary role of traditional medicine in obstructive airway diseases	Indian Pharmacological Society and Indira Gandhi Institute of Medical Sciences (IGIMS)	50 <sup>th</sup> Annual Inaugural Golden Jubilee conference of Indian Pharmacological Society (AIGJCONIPS2017) Patna, Bihar March 13-15, 2017
59.	Dr Vishwajeet Rohil	Delivered Plenary Lecture on: Therapeutic potential of polyphenol acetates in lung cancer through a novel mechanism <i>via</i> epigenetic modulation  Chaired a Technical Session	The Society of Biomedical Laboratory Scientists" (SBMLS), India	2 <sup>nd</sup> Annual Scholar's Science Meet of BIOMEDCON 2016 New Delhi December 16, 2016
60.	Dr Ritu Kulshrestha	Faculty Member	National Institute for Cancer Prevention & Research (NICPR)	Regional Workshop on Capacity Building of the Faculty / Researchers in the Medical Colleges / Research Institutions Noida September 19-21, 2016
61.	Dr Ritu Kulshrestha	Presented a paper on Micro-RNAs (miR) and basal fibroblast growth factor (bFGF) influence bleomycin induced lung injury	Molecular Pathology Association of India and Kalinga Institute of Industrial Technology (KIIT)	6 <sup>th</sup> Annual Conference of Molecular Pathology Association of India and International Symposium on Frontiers in Molecular Diagnostics and Pathology of Human Diseases Bhubaneswar February 10-12, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
62.	Dr Ritu Kulshrestha	Presented a paper on Cigarette smoke and bleomycin induced caveolin-1 expression in lungs	Department of Zoology, University of Delhi, IndoUS Joint Center on Biological Timing, University of Delhi and The Indian Society for Chronobiology	Indo-U.S. Workshop and International Symposium on Biological Timing & Health Issues in the 21st Century Delhi February 21-24, 2017
63.	Dr Ritu Kulshrestha	Principal Investigator	Siksha O Anushandhan University	Monitoring Meeting on DST-SERB-EMR Health Science Scheme Funded Projects Bhubaneswar, Odisha March 7-8, 2017
64.	Dr Aditi (MD Student) <i>(Guide: Prof. Malini Shariff)</i>	Presented a poster on Resistance profile of commensal <i>Pseudomonas aeruginosa</i> isolates	American Society of Microbiology (Indian Chapter)	ASM CME on Antibiotic Resistance: Renewed Fears New Delhi September 10, 2016
65.	Dr Aditi (MD Student) <i>(Guide: Prof. Malini Shariff)</i>	Presented papers on <ul style="list-style-type: none"> <li>• Antimicrobial susceptibility of <i>Pseudomonas aeruginosa</i> isolates from the hospital environment</li> <li>• Clinically significant uncommon non-fermenters isolated from respiratory specimens</li> </ul>	Indian Association of Medical Microbiologists	MICRO-D-CON 2016 (Annual Conference of Indian Association of Medical Microbiologists - Delhi Chapter New Delhi November 17-19, 2016
66.	Mrs Uma Tyagi (Librarian)	Participated in a Panel discussion on Launch of 'Sugamya Pustakalaya': a step towards an accessible digital India	Department of Empowerment of Persons with Disabilities (Divyangjan), Ministry of Social Justice and Empowerment, Government of India and DAISY Forum of India (DFI)	Sugamya Pustakalaya Vigyan Bhavan New Delhi August 24, 2016

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
67.	Mrs Uma Tyagi (Librarian)	Presented a paper on Impact of state support systems in girl education: contextual relationship between libraries and schemes	Compact Society for Social Welfare, Library Professionals Association (LPA), New Delhi and Association of Media Libraries and Archives (AMLA)	National Conference on Role of Libraries in Social Empowerment New Delhi October 21-22, 2016
68.	Ms Karuna Sharma (PhD Student)  (Guide: Dr Vishwajeet Rohil)	Presented a poster on Preventing atherosclerosis nutrition and lifestyle	Indian Society for Atherosclerosis Research (Delhi Chapter and PGIMER-RML Hospital)	2 <sup>nd</sup> Symposium of the Delhi Chapter - ISAR (Indian Society for Atherosclerosis Research) New Delhi August 6, 2016
69.	Mr Naresh Kumar (PhD Student)  (Guide: Dr Mandira Varma-Basil)	Presented a paper on Differential expression of mycolic acid in <i>M. tuberculosis</i> from patients of pulmonary and lymph node tuberculosis under surface stress	PGIMER	MICROCON 2016 Chandigarh November 23-27, 2016
70.	Ms Pooja Singh (PhD Student)  (Guide: Dr Mandira Varma-Basil)	Presented a poster on Increased accumulation of lipids due to overexpression of cholesterol import gene in <i>M. tuberculosis</i> H37Rv	Indian Association of Medical Microbiologists (IAMM) (Delhi Chapter)	Delhi Chapter Meeting of Indian Association of Medical Microbiologists (IAMM) New Delhi March 25, 2017
71.	Ms Astha Giri (PhD Student)  (Guide: Dr Mandira Varma-Basil)	Presented a poster on Polymorphism upstream to embA lead to high-level ethambutol resistance in clinical isolates of <i>Mycobacterium tuberculosis</i> from North India	Indian Association of Medical Microbiologists (IAMM) (Delhi Chapter)	Delhi Chapter Meeting of Indian Association of Medical Microbiologists (IAMM) New Delhi March 25, 2017
72.	Mr Chanchal Kumar (Junior Research Fellow)  (Guide: Dr Mandira Varma-Basil)	Presented a poster on Comparison of an in-house duplex PCR assay with the MGIT TBcID assay for identification of <i>M. tuberculosis</i> complex	Indian Association of Medical Microbiologists (IAMM) (Delhi Chapter)	Delhi Chapter Meeting of Indian Association of Medical Microbiologists (IAMM) New Delhi March 25, 2017

Sl. No.	Faculty Member	Role/Topic	Organiser(s)	Conference, Place and Date
73.	Mr Kamal Shrivastava (Junior Research Fellow)  (Guide: Dr Mandira Varma-Basil)	Presented a poster on Clinical significance of nontuberculous mycobacteria isolated in a mycobacteriology laboratory in Delhi, India	International Union Against Tuberculosis and Lung Diseases (The Union)	47 <sup>th</sup> Union World Conference on Lung Health Liverpool, UK October 26-29, 2016
74.	Mr Kamal Shrivastava (Junior Research Fellow)  (Guide: Dr Mandira Varma-Basil)	Presented a poster on Isolation and antimicrobial susceptibility testing of clinically relevant rapidly growing mycobacteria in a mycobacteriology laboratory	Indian Association of Medical Microbiologists (IAMM) (Delhi Chapter)	Delhi Chapter Meeting of Indian Association of Medical Microbiologists (IAMM) New Delhi March 25, 2017
75.	Ms Kuldeep Patial (PhD Student)  (Guide: Prof. S.N. Gaur)	Presented a poster on Mallampati score as predictor of obstructive sleep apnea - hyponea syndrome	School of Life Sciences, Sambalpur University, Odisha	National Conference on Bioprospecting in Life Science Research for Human Welfare, 41 <sup>st</sup> Annual Conference of Odisha Botanical Society Sambalpur, Odisha December 24-26, 2016
76.	Mr Jamal Ali Moiz (PhD Student)  (Guide: Dr Vishal Bansal)	Test-retest reliability and responsiveness of lower limb muscle strength using hand held dynamometry in chronic obstructive pulmonary disease patients	V.P.C.I., University of Delhi and International Academy of Cardiovascular Sciences (India Section)	International Conference on Recent Advances in Cardiovascular Research: Impact on Health and Diseases [9 <sup>th</sup> Annual Conference of International Academy of Cardiovascular Sciences (India Section)] Delhi February 9-11, 2017

## Participation in Advanced and Specialised Training Programme by Faculty Members

Sl. No.	Participant (Department)	Course Title/ Topic	Training Duration	Host
1.	Dr Kavita Gulati (Pharmacology)	Workshop cum Brainstorming Seminar on "Ayurveda and Prevention of Cardiovascular Disorders"	February 9-11, 2017	V.P.C.I., University of Delhi and International Academy of Cardiovascular Sciences (India Section)
2.	Dr Rajinder Bajaj (Veterinarian)	Workshop on "Ease of Implementing the Bio-medical Waste Management Rules 2016"	November 9, 2016	Bio-Medical Waste Management Division of Delhi Pollution Control Committee

## Short Term Specialised Trainings Imparted by Faculty Members

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
1.	Ms Vidhi Khosla MSc (Biochemistry)  Kurukshetra University, Kurukshetra, Haryana	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 06 - July 05, 2016
2.	Mr Vishal Suppal, Mr Shubhranshu Vardhan, Mr Madhur Malhotra, Mr Vikas Sahni BTech +MTech (Dual) (Biotechnology)  Amity Institute of Biotechnology, Amity University, Noida, Uttar Pradesh	Techniques in biochemistry	Prof. S.K. Bansal (Biochemistry)	June 1- 30, 2016
3.	Ms Kiran, Ms Deepa, Ms Mamta, Ms Archi Tyagi, Ms Priyanka, Mr Mohit Rana MSc (Biotechnology)  Deenbandhu Chhotu Ram University of Science and Technology (DCRUST), Murthal, Sonapat, Haryana	Clinical biochemistry and biotechnology	Dr Vishwajeet Rohil (Clinical Biochemistry)	June 20 - July 29, 2016
4.	Ms Malvika Sharma and Ms Unnati Singh BSc (H) (Medical Biotechnology)  Amity Institute of Applied Sciences, Amity University, Noida, Uttar Pradesh	Clinical biochemistry and biotechnology	Dr Vishwajeet Rohil (Clinical Biochemistry)	February 22 - April 5, 2016

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
5.	Ms Priya Gulati (MSc Applied Microbiology)  Vellore Institue of Technology, Vellore	Development of a real time assay for quantification of non-tuberculous mycobacteria in clinical samples	Dr Mandira Varma-Basil (Microbiology)	December 1, 2015 - May 13, 2016
6.	Ms Sneha Mittal (MSc Biotechnology)  Amity University, Noida, Uttar Pradesh	Basic molecular biology techniques	Dr Mandira Varma-Basil (Microbiology)	June 1 -July 1, 2016
7.	Mr Danish Khan, Ms Tamanna Maheswari, Ms Deepanshi Sharma, Ms Diksha Kumari and Ms Anjali Somanathan B.Tech + M.Tech (Dual) (Biotechnology)  Amity Institute of Biotechnology, Amity University, Noida, Uttar Pradesh	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	May 23 - July 1, 2016
8.	Ms Bhamini Arora B.Tech (Biotechnology)  Ambala College of Engineering and Applied Research, Haryana	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	June 18 - July 31, 2016
9.	Mr Raju Kumar, Mr Nikhil Chahan, Mr Musabur Rahim Khan and Ms Shalini Sharma (BSc [Hons], Biotechnology) IMS Engineering College, Ghaziabad, Uttar Pradesh	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	August 1 - 31, 2016

Sl. No.	Name, Subject and University/Institute/College	Course Title/Topic	Faculty Member (Department)	Period
10.	Mr Chetan Negi Diploma in Medical Laboratory <i>Technology</i> (DMLT)  Integrated Institute of Technology, Dwarka, New Delhi	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	August 1 - December 15, 2016
11.	Ms Saakshi Saini (MSc Biomedical Sciences)  Dr B.R. Ambedkar Center for Biomedical Research, University of Delhi, Delhi	Training on pathology techniques	Dr Ritu Kulshrestha (Pathology)	December 20, 2016 - May 20, 2017
12.	Mrs Navjot Kaur* (Physiotherapist) and Mr A. Manivel** (Senior Physiotherapist)  *Medicaid Hospital, Circular Road, Amritsar, Punjab  ** PSG Hospitals, Avinashi Road, Peelamedu, Coimbatore, Tamil Nadu	Observership training in cardio-pulmonary rehabilitation	Dr Vishal Bansal (Physiology)	*September 5-9, 2016  **December 5-9, 2016

## Cultural and Sports Activities

The Institute conducted the VPCI Sports & Cultural Activity Programme from 1<sup>st</sup> to 6<sup>th</sup> January 2017. It was inaugurated by Prof. S.N. Gaur, Director (Acting), VPCI. The Sports events include: Musical Chair, Table Tennis, Badminton, Bench Press (Weight Lifting), 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 Tarun Thakur, PhD (Pharmacology) Student adjudged as the Best All-Round Sportsman and Ms Deepa, Stenographer (Joint Registrar Office) adjudged as the Best All-Round Sportswoman for the year 2016. Prof. A. Ray, Dept. of Pharmacology, VPCI, was the Convener of this Programme. VPCI Indoor Games Center was inaugurated by Prof. S.N. Gaur, Director (Acting), VPCI on 20<sup>th</sup> February 2017.

The staff members of the Institute had also participated in various events of the Annual Tournament of Delhi University Staff Club.



Independence Day and Republic Day were celebrated at Institute.



To encourage healthy life-style and stress free work atmosphere for the employees and students of the Institute, VPCI Games Centre was inaugurated at Institute. A gymnasium and badminton court is already functional at the Institute. Institute organizes annual sports and cultural programme. Staff members also participated in annual sports and other programmes of University of Delhi and won many prizes this year also.



Retirement function to bid farewell to Institute's employees (Sh Ram Dass, Sh R.C. Narang, Dr Ashok Shah, Dr S.K. Chhabra, (Voluntary Retirement), Ms Kusum Malhotra) and Ms Chanchal Rajpoot during the year under report.

## List of Publications

### Journals

1. Akhtar R, Jain S, Kumar A, Bhatia S, Joshi JC, Singh D, Shamsuzzaman M, Sharma M, Pal G, Vijayan VK, Gaur SN, Gulati K, Ray A. Evaluation of therapeutic efficacy of ascorbic acid in patients with bronchial asthma. *J Young Pharm* 2016;8:214-9.
2. Bansal P, Gaur SN, Arora N. Lysophosphatidylcholine plays critical role in allergic airway disease manifestation. *Sci Rep* 2016;6:27430. doi: 10.1038/srep27430 [www.nature.com/scientificreports].
3. Bansal V, Gaur SN. Challenges of developing a pulmonary rehabilitation programme: practical aspects with India as a model country (Editorial). *Indian J Chest Dis Allied Sci* 2016;58:89-91.
4. Behl T, Kaur I, Goel H, Kotwani A. Implications of endogenous PPAR-gamma ligand, 15-Deoxy-Delta-12, 14-prostaglandin J2, in diabetic retinopathy. *Life Sciences* 2016;153:93-9.
5. Behl T, Kaur I, Kotwani A. Role of leukotrienes in diabetic retinopathy. *Prostaglandins and Other Lipid Mediators* 2016;122:1-9.
6. Behl T, Kotwani A. Proposed mechanisms of *Terminalia catappa* in hyperglycaemia and associated diabetic complications. *J Pharmacy Pharmacology* 2017;69:123-34. doi: 10.1111/jphp.12676.
7. Behl T, Kotwani A. Downregulated brain-derived neurotrophic factor-induced oxidative stress in the pathophysiology of diabetic retinopathy. *Can J Diabetes* 2017;41:241-6. doi: 10.1016/j.jcjd.2016.08.228.
8. Behl T, Kotwani A. Chinese herbal drugs for the treatment of diabetic retinopathy. *J Pharm Pharmacol* 2017;69:223-35. doi: 10.1111/jphp.12683.
9. Chander J, Singla N, Kundu R, Handa U, Chowdhary A. Phaeohyphomycosis caused by *Rhizoglyphus mucedoni* and review of literature. *Mycopathologia* 2017;182:403-7.
10. Chang H, Ashu E, Sharma C, Kathuria S, Chowdhary A, Xu J. Diversity and origins of Indian multi-triazole resistant strains of *Aspergillus fumigatus*. *Mycoses* 2016;59:450-66.
11. Chaudhary S, Gulati K, Rai N, Ray A. Effects of aqueous extract of *Solanum xanthocarpum* in experimental model of bronchial asthma and its mechanisms. *EC Pharmacology and Toxicology* 2016;2:241-50.
12. Chowdhary A, Voss A, Meis JF. Multidrug-resistant *Candida auris*: 'new kid on the block' in hospital-associated infections? *J Hosp Infect* 2016;94: 209-12.
13. Dar M, Menon B, Vardhan H, Jamal S, Noufal M. Study of inflammatory markers in sputum positive patients of pulmonary tuberculosis and its response to anti-tubercular treatment. *Euro Respir J* 2016; 48:2702.
14. Gaur SN. Chronic cough in elderly. *Indian J Geriatric Care* 2016;5:71.
15. Gaur SN, Singh G. Vitamin D and asthma. (Editorial). *Indian J Allergy Asthma Immunol* 2016;30:55-6.
16. Gaur SN, Begum G, Bhati G, Rahman M. Response of influenza vaccine in chronic obstructive pulmonary disease patients. *Indian J Allergy Asthma Immunol* 2016;30:66-70.
17. Girard V, Mailler S, Chetry M, Vidal C, Durand G, van Belkum A, Colombo AL, Hagen F, Meis JF, Chowdhary A. Identification and typing of the emerging pathogen *Candida auris* by matrix-assisted laser desorption ionisation time of flight mass spectrometry. *Mycoses* 2016;59:535-8.

18. Govindaraj D, Sharma S, Gaur SN, Lavasa S, Prasad N, Arora N. Immunogenic peptides: B & T cell epitopes of Per a 10 allergen of *Periplaneta americana*. *Mol Immunol* 2016;80:24-32. doi: 10.1016/j.molimm.2016.10.007. Epub 2016 Oct 25.
19. Gulati K, Guhathakurta S, Joshi J, Rai N, Ray A. Cytokines: their role in health and disease. *MOJ Immunol* 2016;4:1-9.
20. Jamal S, Menon B, Yousoof M, Vardhan H. Reason for non-compliance to inhaled medications among adult patients of asthma and COPD attending outpatient department in a tertiary care hospital. *Euro Respir J* 2016 ; 48 : 852.
21. Joshi JC, Anuradha, Roy I, Gulati K, Ray A. Experimental studies on the systemic toxicity and biodistribution of synthesized calcium phosphate nanoparticles after oral administration in rats. *Pharmaceutical Nanotechnology* 2016;4:1-11.
22. Kale SL, Agrawal K, Gaur SN, Arora N. Cockroach protease allergen induces allergic airway inflammation *via* epithelial cell activation. *Sci Rep* 2017; 7:42341. doi: 10.1038/srep42341[www.nature.com/scientificreports].
23. Khanna M, Nandi T, Roy S, Saini S. Zika virus: A brief overview. *Austin Virol and Retrovirology* 2016;3:1021.
24. Khanna M, Agrawal N, Gupta S, Saini S, Kumar B, Kumar J, Kumar H, Shariff M, Saini S. Prevalence of respiratory viruses in exacerbation of chronic obstructive pulmonary disease. *Austin Virol and Retrovirology* 2016;3:1018.
25. Kotarkonda LK, Kulshrestha R, Ravi K. Role of insulin like growth factor axis in the bleomycin induced lung injury in rats. *Exper Molecular Pathol* 2017;102:86–96.
26. Kotwani A, Wattal C, Joshi PC, Holloway K. Knowledge and perceptions on antibiotic use and resistance among high school students and teachers in New Delhi, India – a qualitative study. *Indian J Pharmacol* 2016;48:365-71.
27. Kulshrestha R, Singh H, Pandey A. Hemorrhagic effusions in pleural tuberculosis: Need for correlation with pleural biopsy histopathological patterns. *MedPulse – International Medical Journal* 2016;3:758-61.
28. Kumar A, Prakash A, Singh A, Kumar H, Hagen F, Meis JF, Chowdhary A. *Candida haemulonii* species complex: an emerging species in India and its genetic diversity assessed with multilocus sequence and amplified fragment-length polymorphism analyses. *Emerg Microbes Infect* 2016; 25; 5:e49.
29. Kumar R, Goel N, Kumar S, Kushwan AS, Vijayan VK. Epidemiological profile of tobacco users at Tobacco Cessation Centre – an Indian experience. *Indian J Chest Dis Allied Sci* 2016;58:93-7.
30. Kumar R, Singh K, Gupta N. Effect of diet on the respiratory health of children in rural area of Delhi-NCR. *Indian J Allergy Asthma Immunol* 2016;30:71-5.
31. Lockhart SR, Etienne KA, Vallabhaneni S, Farooqi J, Chowdhary A, Govender NP, Colombo AL, Calvo B, Cuomo CA, Desjardins CA, Berkow EL, Castanheira M, Magobo RE, Jabeen K, Asghar RJ, Meis JF, Jackson B, Chiller T, Litvintseva AP. Simultaneous emergence of multidrug-resistant *Candida auris* on 3 continents confirmed by whole-genome sequencing and epidemiological analyses. *Clin Infect Dis* 2017;64:134-40.
32. Masih A, Singh PK, Kathuria S, Agarwal K, Meis JF, Chowdhary A. Identification by molecular methods and matrix-assisted laser desorption ionization-time of flight mass spectrometry and antifungal susceptibility profiles of clinically significant rare *Aspergillus* species in a referral chest hospital in Delhi, India. *J Clin Microbiol* 2016;54:2354-64.

33. Mehta PK, Singh N, Dharra R, Dahiya B, Sharma S, Sheoran A, Gupta KB, Chaudhary D, Mehta N, Varma-Basil M. Diagnosis of tuberculosis based on the detection of a cocktail of mycobacterial antigen 85B, ESAT-6 and cord factor by immuno-PCR. *J Microbiol Methods* 2016;127:24-7.
34. Meis JF, Chowdhary A, Rhodes JL, Fisher MC, Verweij PE. Clinical implications of globally emerging azole resistance in *Aspergillus fumigatus*. *Philos Trans R Soc Lond B Biol Sci* 2016;5:371(1709). pii: 20150460.
35. Menon B, C Kaur, H. Vardhan, Gopi A, Y. Dar. Evaluation of Vitamin D, IL6 and hs-CRP in different stages of chronic obstructive pulmonary disease and their correlation with severity of disease and frequency of exacerbation. *Intl J Allergy Medications* 2016;2:20-3.
36. Menon B, C Kaur, H. Vardhan, Y. Dar. Placebo controlled trial of Vitamin D supplementation in allergic rhinitis. *Research* 2016;3:1501-9.
37. Menon B, Y. Dar, H. Vardhan, Gopi A. All that wheezes is not asthma: laryngeal malignancy masquerading as bronchial asthma. *Intl J Basic Applied Med Sci* 2016;6:41-8.
38. Menon B, C. Kaur, H. Vardhan, M. Dar. Evaluation of indacaterol and glycopyrronium as inhalation powder on systemic inflammatory and oxidative stress parameters in severe COPD. *Eur Respir J* 2016;48:4098.
39. Moiz JA, Bansal V, Noohu MM, Gaur SN, Hussain ME, Anwer S, Alghadir A. Activities-specific balance confidence scale for predicting future falls in Indian older adults. *Clinical Interventions in Aging* (Dove Press) 2017;12:645-51.
40. Pal G, Rohil V, Akhthar R, Behl T, Bharati S, Swain TR, Imran M, Jena J. Pharmacological and biochemical modulation of stress markers by L-NAME and L-Ascorbic acid in chronic restraint model in Wistar rats. *Asian J Med Sci* 2017;8:15-20.
41. Poongadan MN, Gupta N, Kumar R. Dietary pattern and lifestyle factors in asthma control. *Indian J Allergy Asthma Immunol* 2016;30:80-90.
42. Poongadan MN, Gupta N, Kumar R. Dietary pattern and asthma in India. *Pneumonol Alergol Pol* 2016;84:160-7.
43. Rai N, Ray A, Rais-Ur-Rahman, Gulati K. Effects of a polyherbal agent on structural changes and biochemical markers during airway remodelling in experimental model of bronchial asthma. *EC Pharmacol Toxicol* 2016;2:99-107.
44. Rathor N, Garima K, Sharma NK, Narang A, Varma-Basil M, Bose M. Expression profile of *mce4* operon of *Mycobacterium tuberculosis* following environmental stress. *Intl J Mycobacteriol* 2016;5:328-32. <http://dx.doi.org/10.1016/j.ijmyco.2016.08.004>.
45. Ray A, Gulati K, Anand R. Stress, adaptogens and their evaluation: an overview. *J Pharma Reports* 2016;1:1-10.
46. Saini NK, Sinha R, Singh P, Sharma M, Pathak R, Rathor N, Varma-Basil M, Bose M. *Mce4A* protein of *Mycobacterium tuberculosis* induces pro inflammatory cytokine response leading to macrophage apoptosis in a TNF- $\alpha$  dependent manner. *Microb Pathog* 2016;100:43-50.
47. Schelenz S, Hagen F, Rhodes JL, Abdolrasouli A, Chowdhary A, Hall A, Ryan L, Shackleton J, Trimlett R, Meis JF, Armstrong-James D, Fisher MC. First hospital outbreak of the globally emerging *Candida auris* in a European hospital. *Antimicrob Resist Infect Control* 2016;5:35. eCollection 2016.
48. Shamsuzzaman Md, Gulati K, Ray A. Methylxanthine induced cardiotoxicity and its mechanisms, *Manipal J Med Sci* 2016;1:10-19.
49. Shariff M, Aditi. Antimicrobial resistance: challenges and the way forward. *Indian J Chest Dis Allied Sci* 2016;58:157-9.

50. Sharma A, Rohil V, Paul S, Kumar A, Joshi R, Prasad AK, Bhattacharjee J. Anticancer activity of ellagic acid peracetate in human lung cancer A549 cell line. *Intl J Current Med Pharmaceutical Res* 2017;3:1341-7.
51. Sharma C, Kumar N, Pandey R, Meis JF, Chowdhary A. Whole genome sequencing of emerging multidrug resistant *Candida auris* isolates in India demonstrates low genetic variation. *New Microbes and New Infect.* 2016;13:77-82.
52. Sharma M, Gulati K, Ravi K, Ray A. Experimental studies on the role of nitric oxide (NO) in high altitude stress induced physiological and behavioral changes in rats. *Indian J Physiol Pharmacol* 2016;60:371-9.
53. Singh A, Singh PK, Kumar A, Chander J, Khanna G, Roy P, Meis JF, Chowdhary A. Molecular and matrix-assisted laser desorption ionization-time of flight mass spectrometry characterization of clinically significant melanized fungi in India. *J Clin Microbiol* 2017;55:1090-1103.
54. Singh DK, Gulati K, Ray A, Effects of chelidonic acid, a secondary plant metabolite, on mast cell degranulation and adaptive immunity in rats. *Intl Immuno Pharmacol* 2016;40:229-34.
55. Singh M, Gupta N, Kumar R. Effect of obesity and metabolic syndrome on severity, quality of life, sleep quality and inflammatory markers in patients in India. *Pneumonol Alergol Pol* 2016;84: 258–64.
56. Shrivastava K, Garima K, Narang A, Bhattacharyya K, Vishnoi E, Singh RK, Choudhary A, Prasad R, Bose M, Varma-Basil M. Rv1458c: A new diagnostic marker for identification of *M. tuberculosis* complex in a novel duplex PCR assay. *J Med Microbiol* 2017;66:371-6. doi: 10.1099/jmm.0.000440.
57. Tyagi Uma, Yanthan Zuchamo. ICT Contents in Bachelor's Degree of LIS Curriculum in Select Universities in India: a study. *Library Herald* 2016;54:4:475-88.
58. Tyagi Uma, Yanthan Zuchamo. Contextual analysis of ICT contents in LIS Master's Degree curriculum: a study of select universities across India. *DESIDOC Journal of Library & Information Technology* (Special issue on LIS curriculum), 2017;37:1;14-23.
59. Varma-Basil M, Narang A, Chakravorty S, Garima K, Gupta S, Sharma N, Giri A, Zozio T, Couvin D, Hanif M, Bhatnagar AK, Menon BK, Niemann S, Rastogi N, Alland D, Bose M. (2016). A snapshot of the predominant single nucleotide polymorphism cluster groups of *Mycobacterium tuberculosis* clinical isolates in Delhi, India. *Tuberculosis* 2016;100:72-81.
60. Varma-Basil M, Shah A. GeneXpert: A momentous innovation that needs a touch of prudence. *Indian J Tuberc* 2017;64:69-71.

### **Books**

1. Gaur SN, Kumar R, Singh AB, Agarwal MK, Arora N. Guidelines for Practice of Allergic Immunotherapy in India-A 2017 update (Book). Published by Indian College of Allergy Asthma and Applied Immunology. *Indian J Allergy Asthma Immunol* 2017; 31(1): ahead of print.
2. Kumar R. *Respiratory Allergy Diagnosis and Management*, Editor-in-Chief: Kumar R; Published by Neelam Graphics, New Delhi.

### **Chapters in Books**

1. Gulati K, Rai N, Ray A. Nitric oxide and anxiety. In: *Vitamins and Hormones*, (G.Litwack), Elsevier Inc., 2016;pp.169-192.
2. Patial K, Behera RK, Gaur SN. Role of antioxidant in obstructive sleep apnea syndrome. In: *Frontiers in Life Science* Editors: Behera RK, Kariali E, Sahu SK. Excel India Publishers, New Delhi. 2016;pp.125-34.

3. Kumar R. Allergy Testing - Chapter in Text Book - Respiratory Allergy Diagnosis and Management, Editor-in-Chief: Dr. Raj Kumar; Published by Neelam Graphics, Delhi, 2016;pp.93-130.
4. Kumar R. Food Allergy in Bronchial Asthma : Diagnostic Modalities - Chapter in Text Book - Respiratory Allergy Diagnosis and Management, Editor-in-Chief: Dr. Raj Kumar; Published by Neelam Graphics, Delhi, 2016;pp.265-81.
5. Prasad R, Kumar R. Allergy situation in India. In: 41<sup>st</sup>Workshop on Respiratory Allergy, Diagnosis and Management( Training Manual), VP Chest Institute, 4-8, April, 2016;pp.1-4.
6. Ray A, Gulati K, Rai N. Stress, anxiety, and immunomodulation: A pharmacological analysis. In: *Vitamins and Hormones*, (G.Litwack), Elsevier Inc., 2016;pp. 1-25.



**"Vigilance Awareness Week-2016" from 31<sup>st</sup> October, 2016 to 5<sup>th</sup> November, 2016. A pledge was taken by the faculty, staff and students of the Institute.**



**"Constitute Day" was observed on 26<sup>th</sup> November 2016 at Institute.**



**A programme on "Swachhta Action Plan (SAP)" of Government of India, from 1<sup>st</sup> to 15<sup>th</sup> February 2017 was held in the Institute. Participants were taking a Swachhta Pledge.**

