



# Country Report



PROF. MUHAMMAD IQBAL CHOUDHARY

**National Coordinator**  
**ASEA-UNINET, Pakistan**



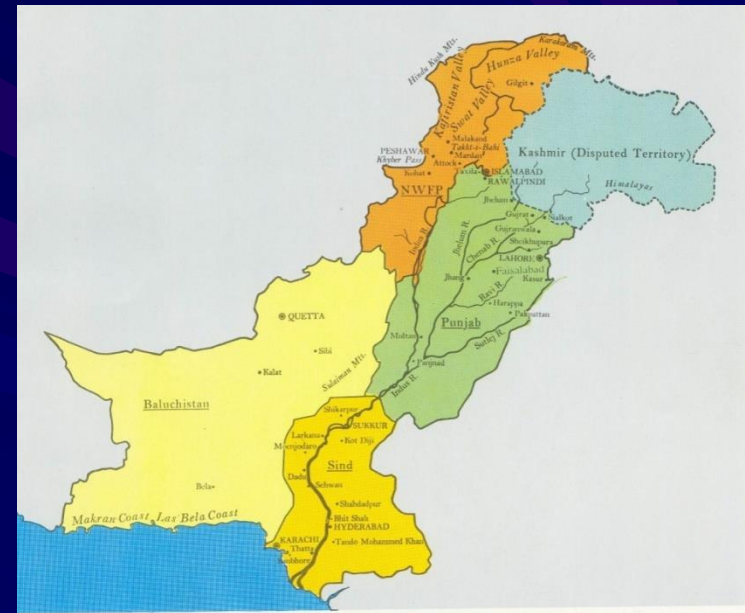
**International Center for Chemical and Biological Sciences  
(ICCBS)**

**(H. E. J. Research Institute of Chemistry and  
Dr. Panjwani Center for Molecular Medicine and Drug Research)  
University of Karachi, Karachi-75270**

# Pakistan



- Since the establishment of HEC in 2002, research output has grown nine-folds (from 815 in 2002 to more than 8,000 in 2012).
- As a result of this phenomenal increase in research publications, the world share of Pakistan's research has gone up by 300 percent in the last five years.
- Around 90 per cent of these research publications from Pakistan are coming from higher education institutions.
- Seven Pakistani universities have won place in the list of top 250 Asian universities and three Pakistani universities are now among the top 200 world universities in agriculture and forestry (QS World Universities Rankings 2013,)





# University of Karachi

- Largest University with over 24000 on-campus students and over 100,000 off-campus students



- Ranked 224 in natural sciences  
(*QS World Universities Rankings 2013*)

# ICCBS INTRODUCTION

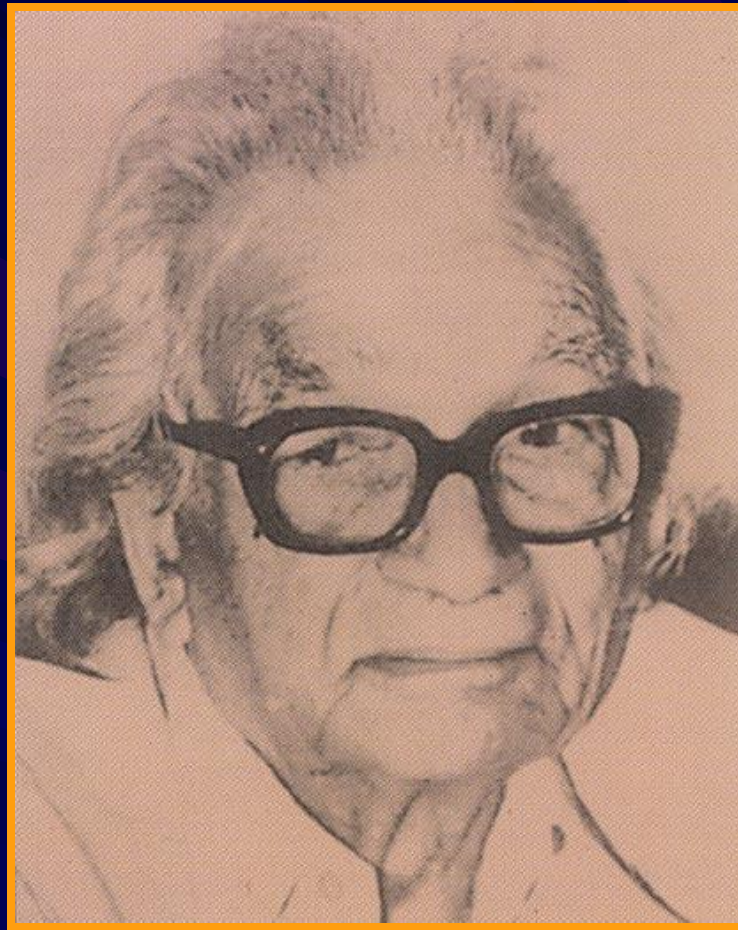




# **ICCBS- AN INTERNATIONAL CENTER OF EXCELLENCE**

- ★ **Fulfillment of the dreams of Late Prof. Abdus Salam, Nobel Laureate and Prof. Salim uz Zaman Siddiqui (FRS)**
- ★ **Affiliated with The Academy of Sciences for The Developing World (TWAS)**
- ★ **At par to:**
  - ★ **ICTP (International Center for Theoretical Physics), Trieste, Italy**
  - ★ **ICGB (International Center for Genetic and Biotechnology), Delhi (India), Trieste (Italy) and Durban (South Africa)**
  - ★ **ICMS (International Center in Mathematical Sciences), Sao Palo, Brazil**
  - ★ **ICES (International Center for Environmental Sciences), Beijing, China**





**Late Prof. Dr. Salim-uz-zaman Siddiqui, *H.I., F.R.S.***  
**Founding Director (1966-87)**





**PROF. DR. ATTA-UR-RAHMAN, *FRS***

**Patron-in-Chief**





**Ms. Nadira Panjwani, *H.I., S.I.***  
***Chairperson***  
**Dr. Panjwani Memorial Trust**



# AN INSTITUTIONAL MODEL

- ★
- ★ Nucleus was established in 1966 by Late Prof. Dr. Salim-uz-zaman Siddiqui in a small laboratory of Department of Chemistry, University of Karachi.
- ★ Prof. Atta-ur-Rahman *FRS, N.I., H.I., S.I., T.I* joined in 1969 on his return from Cambridge, UK.
- ★ First international grant in 1972 (2.3 million DM).
- ★ Received a donation from Late Mr. Latif Ebrahim Jamal (Husein Ebrahim Foundation) in 1976.
- ★ Selected as the *International Center for Chemical Sciences* in 1986 after a stiff international competition.







**Prof. Atta-ur-Rahman (UNESCO Laureate) with Prof.  
Dr. Abdus Salam (Nobel Laureate from Pakistan)**



**The largest doctoral program in the country producing about 50-60 world class Ph.D. every year in the following fields:**

Organic Chemistry, Molecular Medicine, Herbal Medicines, Plant Biotechnology, Pharmacology, Computational Medicinal Chemistry, Bio-organic Synthesis and Natural Product Chemistry, Electrochemical Studies, Petroleum and Polymers, Clinical Biochemistry , Neuropharmacology, Analytical Chemistry

# HIGHEST RESEARCH OUTPUT

- ★ Research publications in top international journals: Over 7,200
- Patents (national and international) 195
- ★ Books published internationally (over 90 by Prof. Atta-ur-Rahman): 205
- ★ Total scientific impact factor: Over 9,500
- ★ Total Ph.D.'s produced: Over 850
- ★ Total Citations Over 50,000



# **DISTINGUISHED FACULTY**

- ❖ Out of ten (10) most productive scientists of Pakistan, five (8) are from the H. E. J. Research Institute of Chemistry, International Center for Chemical Sciences. (PCST Document , Scientists of Pakistan, 2011)
- ❖ Internationally Recognized Faculty. All Senior Professors with the D.Sc. degrees from various universities.
- ❖ Only Pakistani Institution with Two *FRS*.
- ❖ Majority of the academic staff are the authors of internationally published science books or editors of science journals.



# **MOST DECORATED ACADEMIC SCIENCE INSTITUTION**

|   |                                       |           |
|---|---------------------------------------|-----------|
| ❖ | <b>Fellow of Royal Society (FRS)</b>  | <b>2</b>  |
| ❖ | <b>UNESCO Science Prize</b>           | <b>1</b>  |
| ❖ | <b>Nishan-e-Imtiaz</b>                | <b>1</b>  |
| ❖ | <b>Hilal-e-Imtiaz</b>                 | <b>4</b>  |
| ❖ | <b>Sitara-e-Imtiaz</b>                | <b>11</b> |
| ❖ | <b>Pride of Performance</b>           | <b>1</b>  |
| ❖ | <b>Tamgha-e-Imtiaz</b>                | <b>9</b>  |
| ❖ | <b>D. Sc.</b>                         | <b>8</b>  |
| ❖ | <b>Khawarizmi International Award</b> | <b>5</b>  |
| ❖ | <b>ECO Award and Prize</b>            | <b>2</b>  |





# INTERNATIONAL STATUS

- ★ **One of the best in the fields of chemical and Biomedical sciences**
- ★ **Designated as the:**
  - a. **OIC Center of Excellence**
  - b. **World Health Organization Center for Pesticide Analysis for Eastern Mediterranean Region.**
  - c. **COMSATS Center of Excellence.**
  - d. **ASEA-UNINET Center**
  - e. **COMSTECH Library Center.**
  - f. **Islamic Development Bank Prize for Best Science Institution in the Islamic World (twice).**
  - g. **TWAS Center of Excellence**



- ★ **Over 200 visiting scientists annually from different countries.**
- ★ **An institution in which advanced countries are sending students for training- over 130 German, 9 French, 3 Australian students have already been trained.**
- ★ **Over 70 International Conferences, Symposia and workshops organized including the 19th IUPAC Symposium (1994), EURASIA Conference (2002), IBRO School (2006), ASOMPS (planned for Dec, 2013) and planned International Year of Crystallography (IYCr-2014).**
- ★ **Offer TWAS-ICCBS Fellowships (20 annually), NAM S&T Fellowships (5 annually), and COMSTECH Internships (10 annually)**



# INTERNATIONAL GRANTS

## I. International grants worth over \$ 15 million were won:

|                                       |                |
|---------------------------------------|----------------|
| (a) Germany                           | DM 5.7 million |
| (b) USA                               | \$ 2.0 million |
| (c) UK                                | £ 1.0 million  |
| (d) Japan                             | \$ 8.0 million |
| (e) Others (including IFS, TWAS, etc) | \$ 2.0 million |

## 2. Research projects worth another \$ 12.5 million from WHO, USAID, ONR, NSF (USA), OPCW and British Council have been completed.



# ICCBS ORGANOGRAM

ICCBS

HEJRIC

PCMD

Industrial  
Park



Prof. Dr. Atta-ur-Rahman  
Laboratories (TWC)

LEJNSIC

IAC

BTP

LEJNC



Genome Center

CBSBR

Diagnostic  
Center

IRCTRD

|                   |  |
|-------------------|--|
| HEJRIC            | Husein Ebrahim Jamal Research Institute of Chemistry                                 |
| PCMD              | Dr. Panjwani Center for Molecular Medicine and Drug Research                         |
| LEJNSIC           | Latif Ebrahim Jamal National Science Information Center                              |
| IAC               | Industrial Analytical Center   |
| BTP               | Biotechnology Park   |
| LEJNC             | Latif Ebrahim Jamal Nanochemistry Center   |
| Genome Center     | Jamil-ur-Rahman Center for Genome Research   |
| CBSBR             | Center for Bioequivalence Studies and Bioassay Research (clinical research facility) |
| Diagnostic Center | Diagnostic and Clinical Research Facility  |
| IRCTRD            | International Research Center for Tropical and Regional Diseases                     |



# **PLANNED NEW INSTITUTIONS (2006-2020)**

- ★ **Technology Incubator and Research Park ICCBS**
- ★ **Nuroscience Research Center PCMD**
- ★ **International Research Center of Tropical and Regional Diseases (IRCTRD) PCMD**
- ★ **Industrial Biotechnology Center**
- ★ **National Imaging Facility**





**Progress made under the Austrian-  
Pakistan Cooperation Project in  
Computational Chemistry,  
Proteomics, Analytical Chemistry,  
and Structural Biology**

**Supported by  
ASEA-UNINET Network**

Ms. Munazza, Dr. Sammer, and Dr. Tariq

# **Major Fields of Collaboration**

**Computational Chemistry**

**Computational Biology**

**Proteomics**

**Chromatography**

# ***First Computational Chemistry and Computational Biology Laboratories of Pakistan***

- *First Computational Chemistry and Computational Biology Laboratories of Pakistan*
- *Established at Dr. Panjwani Center for Molecular Medicine and Drug Research, University of Karachi*
- *In collaboration with Prof. Dr. Bernd Michael Rode, University of Innsbruck, Austria*
- *ASEA-UNINET played a key role in capacity building*

# ***Training in Fields of Computational Chemistry and Computational Biology***

- Postdoctoral (08)

- Split Ph.D. (05)

- Full Ph. D. (06)

- University of Innsbruck, Austria

# ***First Cluster Computer of Pakistan***

- Technical support for the establishment of first cluster computing facility of Pakistan at Dr. Panjwani Center for Molecular Medicine and Drug Research, university of Karachi
- University of Innsbruck, Austria



# ***Training in The Fields of Analytical Chemistry and Proteomics***

- Successful completion of 08 post doctoral and 05 split Ph. D. trainings in Mass spectrometry and cancer proteomics
- **Prof. Dr. Gunther Bonn, University of Innsbruck, Austria**
- **Assoc. Prof. Dr. Martin Tollinger, University of Innsbruck, Austria**

# ***Cancer Biomarkers/Mass Spectrometry Lab.***

- First Cancer Biomarker Mass Spectrometry lab. after training of the PCMD staff at the University of Innsbruck.
- *Established at Dr. Panjwani Center for Molecular Medicine and Drug Research, University of Karachi.*

# ***Research Publications in Top International Journals Resulted from the New Laboratories Established through the Help of ASEA-UNINET***

- Over 100 Research Publications (Computational Chemistry)
- 30 Research Publications (Cancer proteomics and mass spectrometry)

# ***International Academic/ Research Collaboration***

- Over 200 visitors from 28 countries including Turkey, Egypt, Cameron, Nigeria, Malaysia, Indonesia, Bangladesh, Nepal, Sri Lanka, Jordan, Lebanon, Kazakhstan, Azerbaijan, etc.
- 50 Scholarships were awarded to International scholars.
- 38 New linkages were established.
- Exchange of Researchers with UPM- An outcome of our interaction through ASEA-UNINET.

# **WHAT ICCBS CAN OFFER ASEA-UNINET COLLEAGUES ?**



# Research Trainings

- Over 50 scholarships annually
- Training visits of young scholars
- No bench fee
- On-campus accommodation
- State-of-the-art instrumental facilities
- Over 100 bioassays and access to animal house facility
- Excellent libraries (5 libraries)
- International, friendly and conducive working environment
- In some cases, financial support for living expenditures
- Cost of living is very affordable



# Access to Spectroscopic and Bioassay Facilities

- Access to excellent spectroscopic facilities
- Bioassay screenings
- *In vivo* assays (Animal houses)
- Library document delivery system
- Molecular Bank (Over 13,000 compounds now)
- Extract Bank (Over 5,000 plant extracts)
- Bio Banks (Over 300 cell lines and fungal cultures)

# Academic Collaboration

- On-lines courses through VEPP (Video conferencing Program Pakistan)
- Split Ph. D.
- Technician training
- Senior scientists visits
- Binational and multi-national workshops

# Joint Research Programs

- Collaborative Research Projects
- Field Surveys

# **Major Events:**

## **ASOMPS (Dec, 9-12, 2013)**

- **14th Asian Symposium on Medicinal Plants, Spices and Other Natural Products, to be held in Karachi, Pakistan, during December 9-12, 2013.**
- **The aim of the symposium is to bring together leading experts in the field of natural products sciences all around the world and forge global partnerships for sustainable utilization of natural resources for the common benefit of humanity and rapid development of the countries in the south.**
- **The symposium will be held at the beautiful campus of the International Center for Chemical and Biological Sciences at the University of Karachi.**

# **International Year of Crystallography (IYCr-2014)**

- **IYCr SOUTH ASIA REGIONAL SUMMIT MEETING on Vistas in structural chemistry was held during 28-30 April, 2014, Karachi, Pakistan**
- **Jointly Organized by:**
  - Ministry of Science and Technology (MoST), Govt. of Pakistan
  - Pakistan Academy of Sciences (PAS)
  - Chinese Academy of Sciences (CAS)
  - Indian National Science Academy (INSA)
  - Commission on Science and Technology for Sustainable Development in the South (COMSATS)
- **The IYCr 2014 South Asia meeting was held at the scenic and secure campus of the International Center for Chemical and Biological Science at the University of Karachi.**
- **Participation from 30 countries**

# On – Line Lectures

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# Coming Events

- **International Workshop on Human Genomics**  
**August 10-12, 2014**
- **International Symposium *cum* Training Course on Molecular Medicine and Drug Research (Jan 2015)**

# ICCBS IN PHOTOGRAPHS





# **H. E. J. RESEARCH INSTITUTE OF CHEMISTRY**

**(Constructed In 1978 With A Grant From Husein Ebrahim Foundation)**







## **DR. PANJWANI CENTER FOR MOLECULAR MEDICINE AND DRUG RESEARCH**





## PROF. DR. ATTA-UR-RAHMAN LABORATORIES







# **LATIF EBRAHIM JAMAL NATIONAL SCIENCE INFORMATION CENTER**

**One of the Largest Paperless Libraries with 31,000 On-line Journals**







## HEJRIC NEW RESEARCH LABORATORY





## INDUSTRIAL ANALYTICAL CENTER (IAC)







## INTERNATIONAL GUEST HOUSE





07.28.2011 10:47

**TISSUE CULTURE TECHNOLOGY PARK**





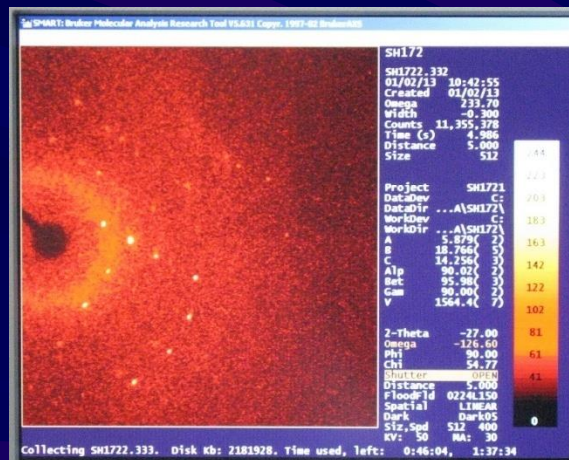
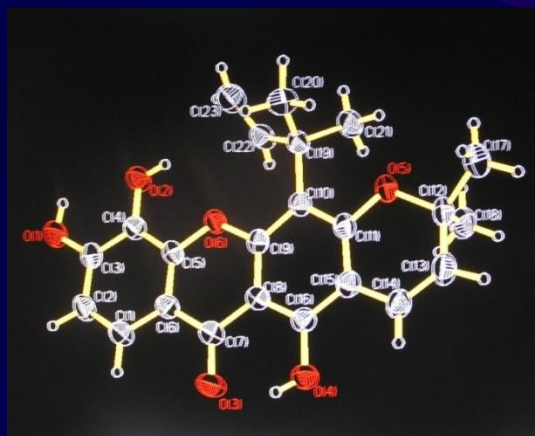
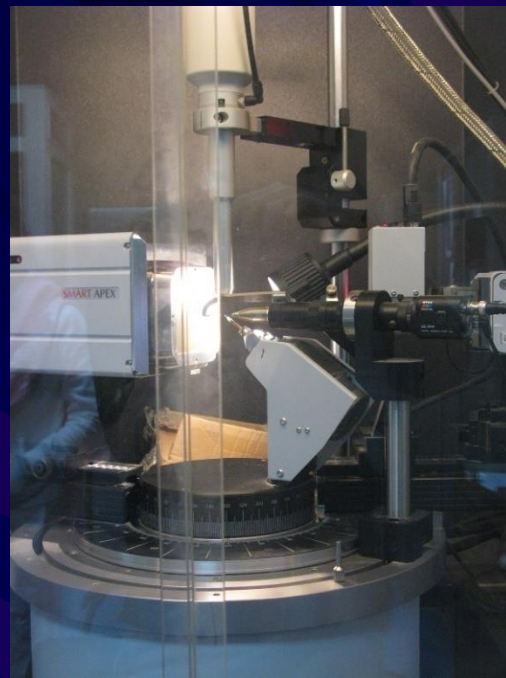
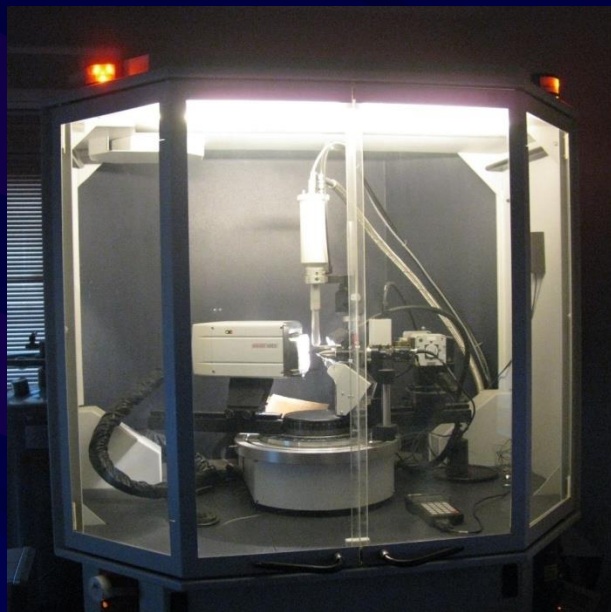
**CENTER FOR BIOEQUIVALENCE STUDIES AND BIOASS**



**MALDI-TOF (Ultra-flex-III)**







Join us  
As a member of the

*X-Ray Diffraction Techniques  
User Group of Pakistan  
(XRD-PAK)*

With the Objective  
*To build national capacity  
in the important field of  
X-ray diffraction*

For Information

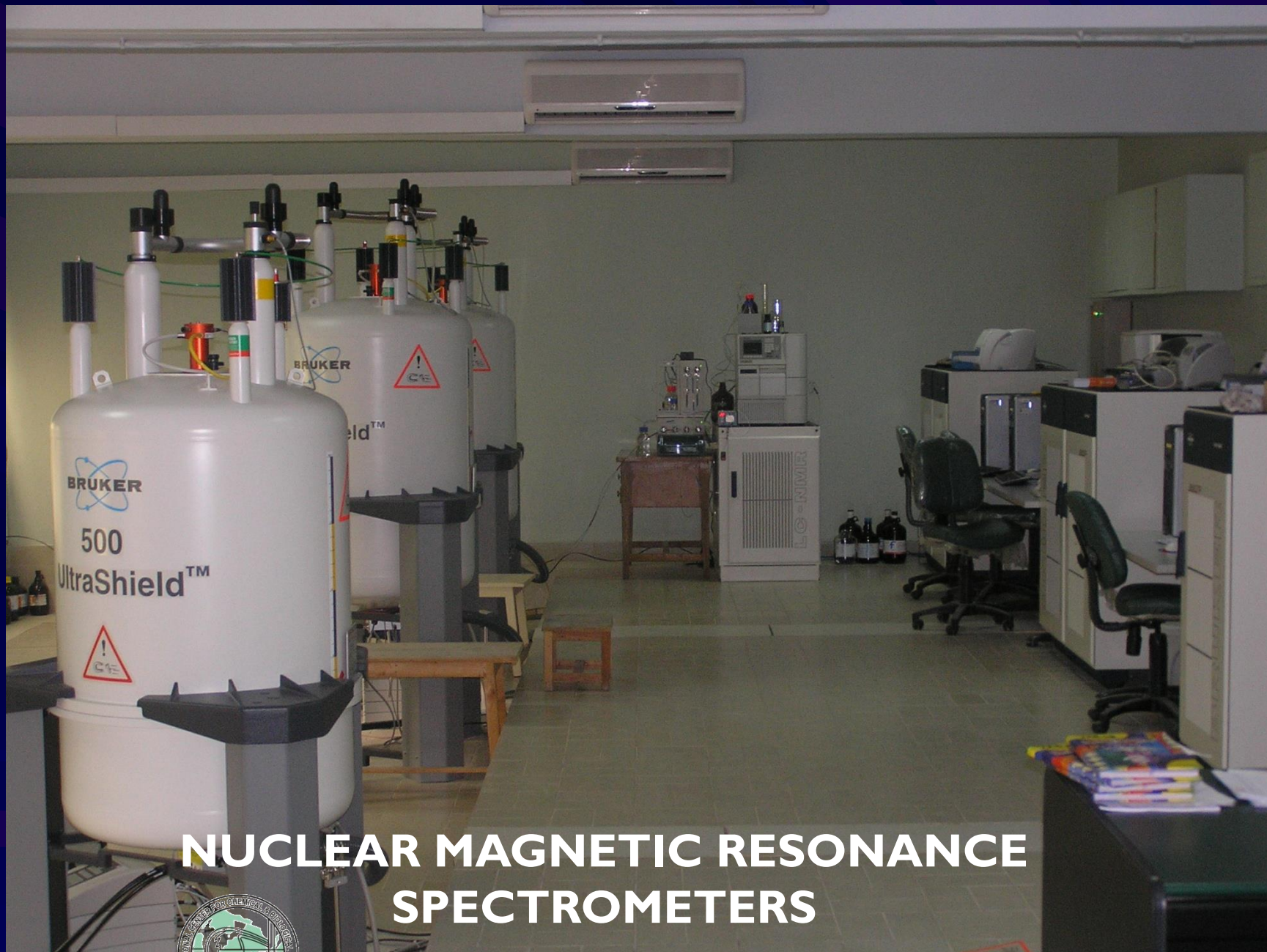
Kindly contact

**Dr. Sammer Yousuf**  
Coordinator XRD-PAK

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International Center for Chemical and Biological Sciences  
University of Karachi, Karachi-75270, Pakistan  
s.yousuf@gmail.com, xrd.user.group@iccs.edu

**E-CRYSTAL X-RAY DIFFRACTION LABORATORY**







## NUCLEAR MAGNETIC RESONANCE SPECTROMETERS







## MASS SPECTROMETER (ELECTRON BOMBARDMENT SYSTEM)





## MASS SPECTROMETER (ELECTROSPRAY IONIZATION)





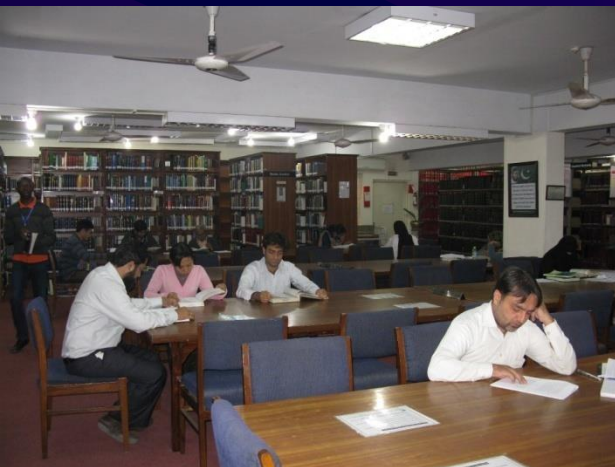


**PILOT PLANT**





**NATIONAL LIBRARY OF CHEMICAL SCIENCES  
H.E.J. RESEARCH INSTITUTE OF CHEMISTRY  
INTERNATIONAL CENTER FOR CHEMICAL SCIENCES**



**ONE OF THE ICCBS LIBRARIES**  
***One of the Finest in the Field of Chemical Sciences***



**UPLC**







**Advance Re-cycling HPLCs**

# ONE OF THE GREEN HOUSES FOR VIRUS-FREE BANANA VARIETIES



BIOTECHNOLOGY DIVISION







## PLANT BIOTECHNOLOGY DIVISION







**PLANT BIOTECHNOLOGY DIVISION**



# Atomic Force Microscope (AFM)



# LEJ Nanochemistry Center



# Triple Quadrupole GC/MS (H.E.J.)







# MOLECULAR BANK AT PCMD

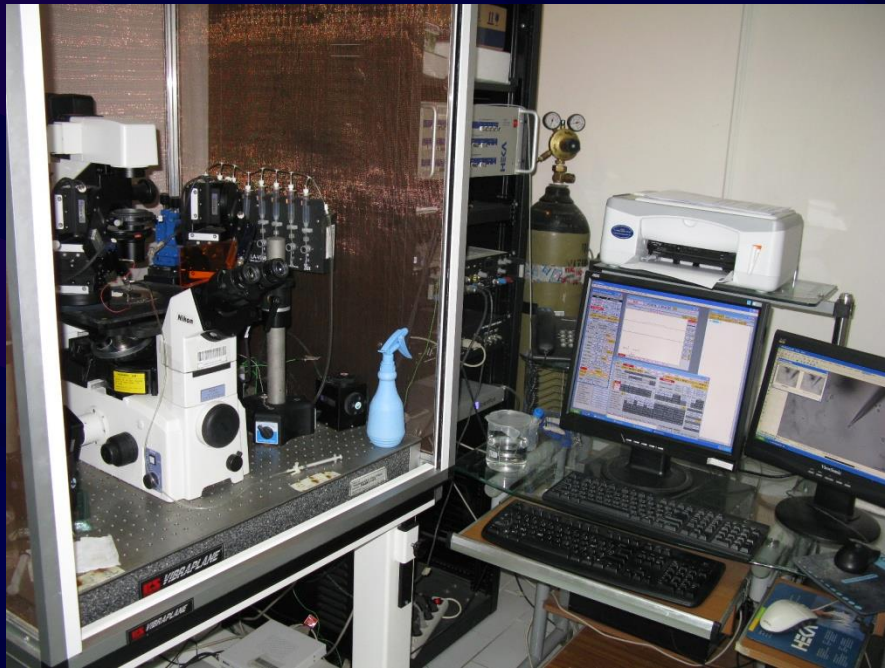




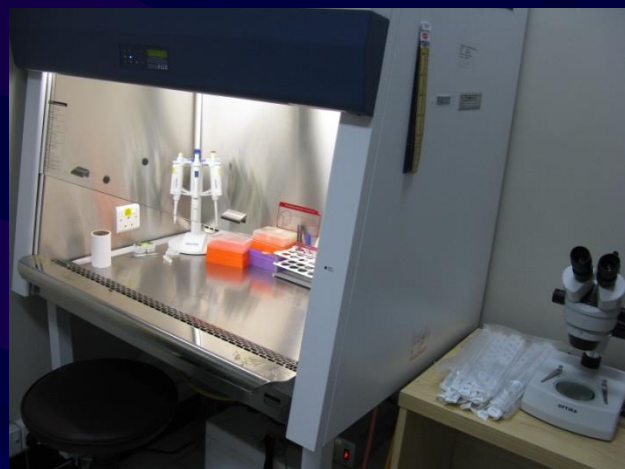
## DIAGNOSTIC LABORATORY AT THE PCMD







***PATCH CLAMP FACILITY AT PCMD***



***BioBank of PCMD***





## TISSUE CULTURE FACILITY AT PCMD









## **FLORESCENCE MICROSCOPIC LABORATORY AT PCMD**





# COMPUTATIONAL CHEMISTRY LABORATORY AT PCMD







## IMMUNOLOGY LABORATORY AT PCMD







## NEUROPHARMACOLOGY LABORATORY AT PCMD





## PHARMACOLOGY LABORATORY AT PCMD



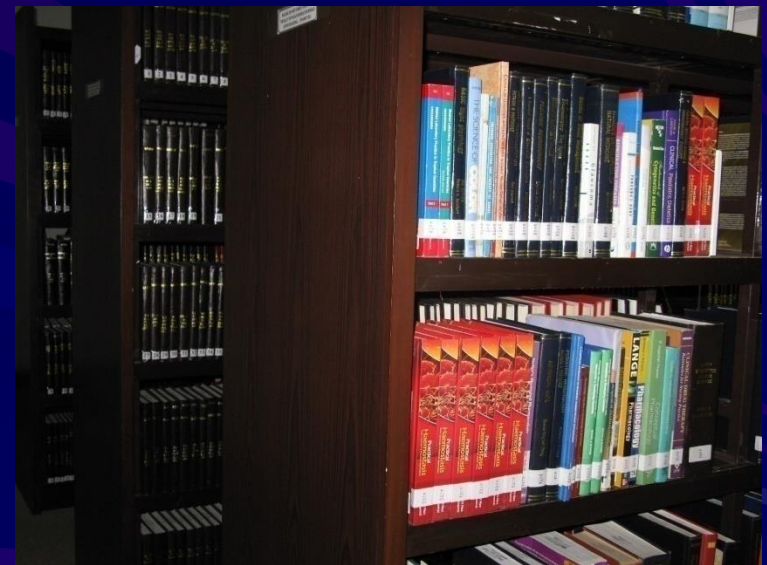




## STEM CELL RESEARCH LABORATORY AT PCMD







**PCMD LIBRARY**



## **DATABASE SEARCHING FACILITY OF THE LATIF EBRAHIM JAMAL NATIONAL SCIENCE CENTER**







## **VIDEO CONFERENCING OF THE LATIF EBRAHIM JAMAL NATIONAL SCIENCE CENTER**







## **VIDEO LECTURE FACILITY OF THE LATIF EBRAHIM JAMAL NATIONAL SCIENCE CENTER**





**Director ICCBS, with French Delegates**





**Director ICCBS, with French Delegates**







## **VISIT OF FACULTY FROM UNIVERSITY OF RHODE ISLAND, USA**





**IN HOUSE LIQUID NITROGEN SETUP**







## FLORESCENCE MICROSCOPIC LABORATORY AT PCMD







Pictures of some Germans students visited the institute



# **ISO 17025, and 9001 : 2000 Certified Industrial Analytical Center (IAC) is serving over 350 industries in Pakistan**

The Industrial Analytical Center (IAC) is a commercial entity, under the auspices of the H.E.J Research Institute of Chemistry. The IAC is offering a range of professional analytical and consultancy services to the industries and other private







**FOUNDATION STONE OF JAMIL-UR-RAHMAN CENTER FOR GENOMIC RESEARCH**



# The only institute which has received Islamic Development Bank (IDB) Prizes for Best Science Institution Twice (2004 and 2010)

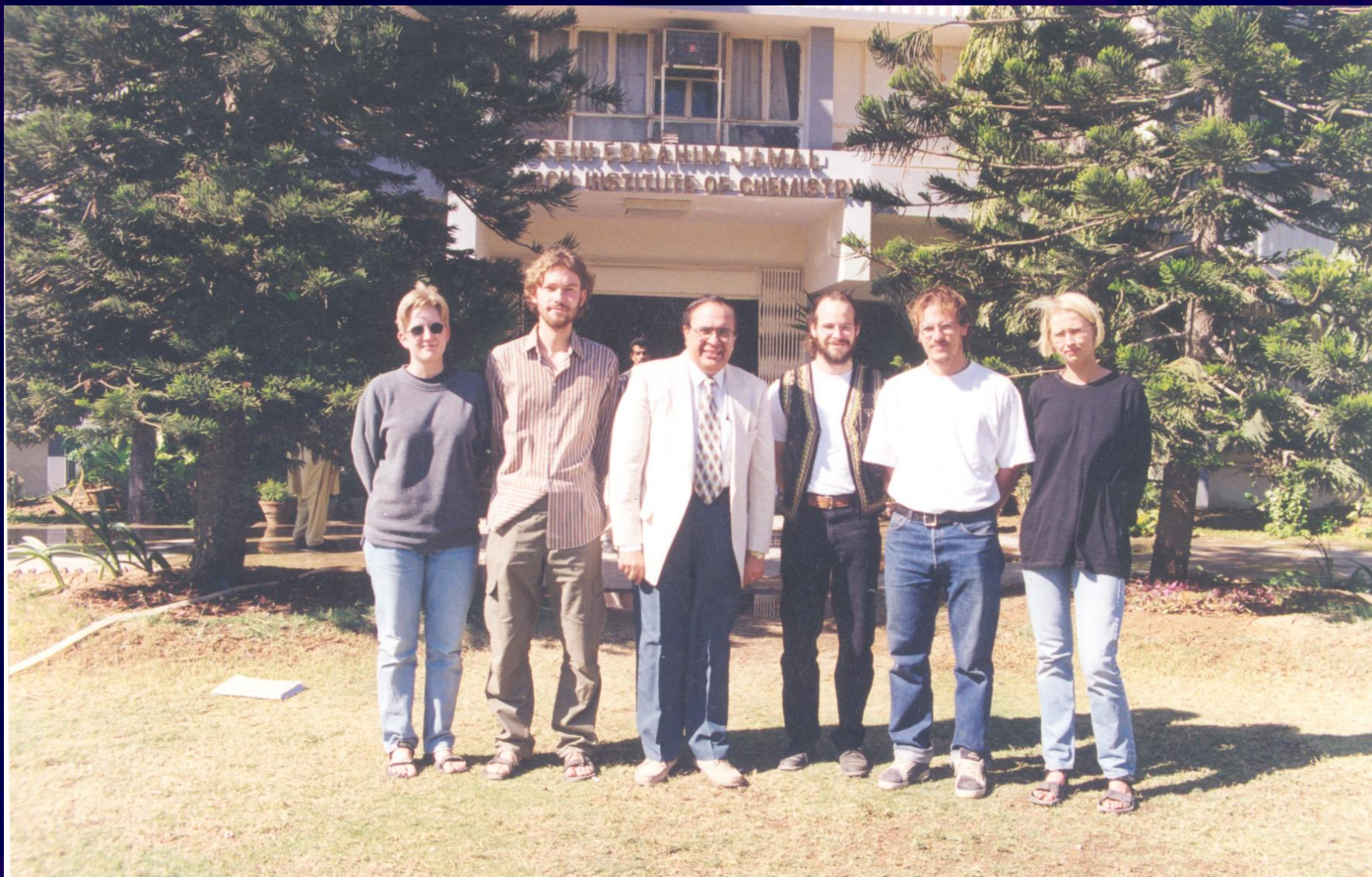




**A GROUP OF GERMAN STUDENTS**







**GERMAN STUDENTS ON TRAINING**







## FOREIGN STUDENTS AT H.E.J. RESEARCH INSTITUTE OF CHEMISTRY





**FOREIGN STUDENTS AT H.E.J. RESEARCH INSTITUTE OF CHEMISTRY**







**SOME MORE FOREIGN STUDENTS AT H.E.J. RESEARCH INSTITUTE  
OF CHEMISTRY**





**FORIEGN STUDENTS**







**ICCBS Group Photograph, 2012**



# THANK YOU VERY MUCH

