



# International Center for Chemical and Biological Sciences (ICCBS)

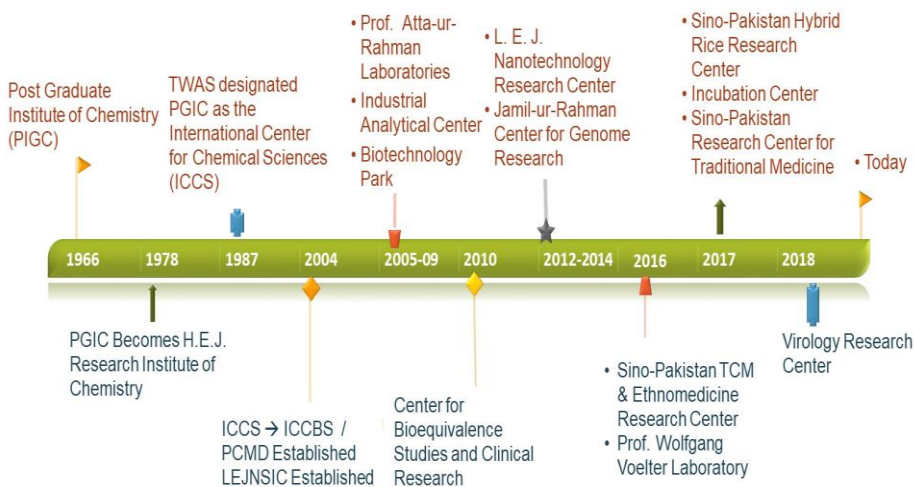
**Established in 1966**

**Leadership In Research and Higher Education**

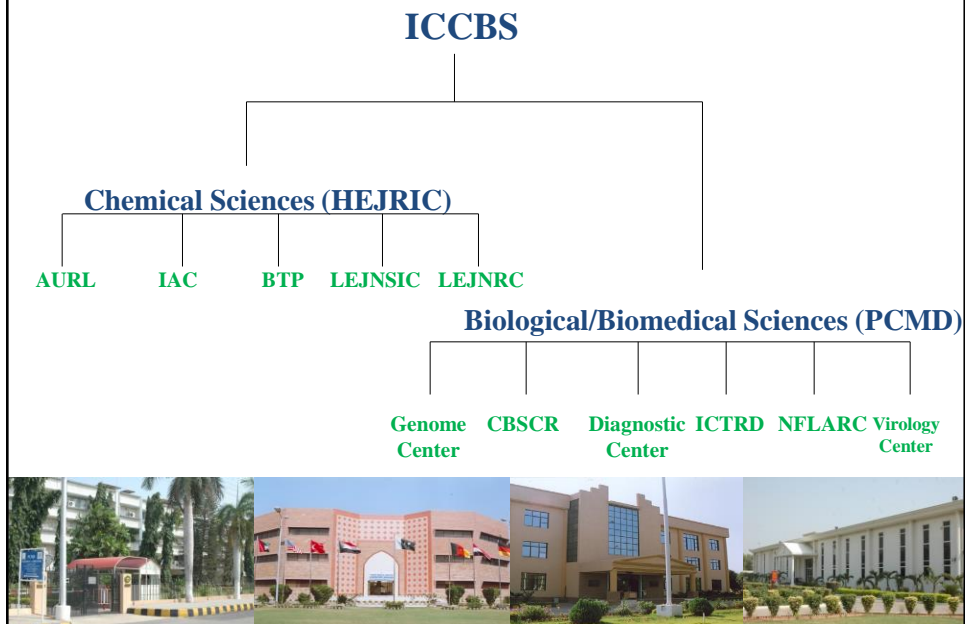
**H. E. J. Research Institute of Chemistry,  
Dr. Panjwani Center for Molecular Medicine and Drug Research  
(International Center for Chemical and Biological Sciences )  
University of Karachi, Karachi-75270  
[www.iccs.edu](http://www.iccs.edu)**



## ICCBS<sup>®</sup> - Genesis



## ICCBS- *ORGANOGRAM*



## UNIQUE DISTINCTIONS

- ❖ *Only OIC Center of Excellence* in Chemical Sciences
- ❖ UNESCO Category II Center
- ❖ WHO Center for Pesticide Analysis
- ❖ COMSATS Center of Excellence (Founding member)
- ❖ Received the **Islamic Development Bank Prize for Best Science Institution** twice (2004 and 2010).
- ❖ TWAS Center of Excellence for training of scholars from Africa

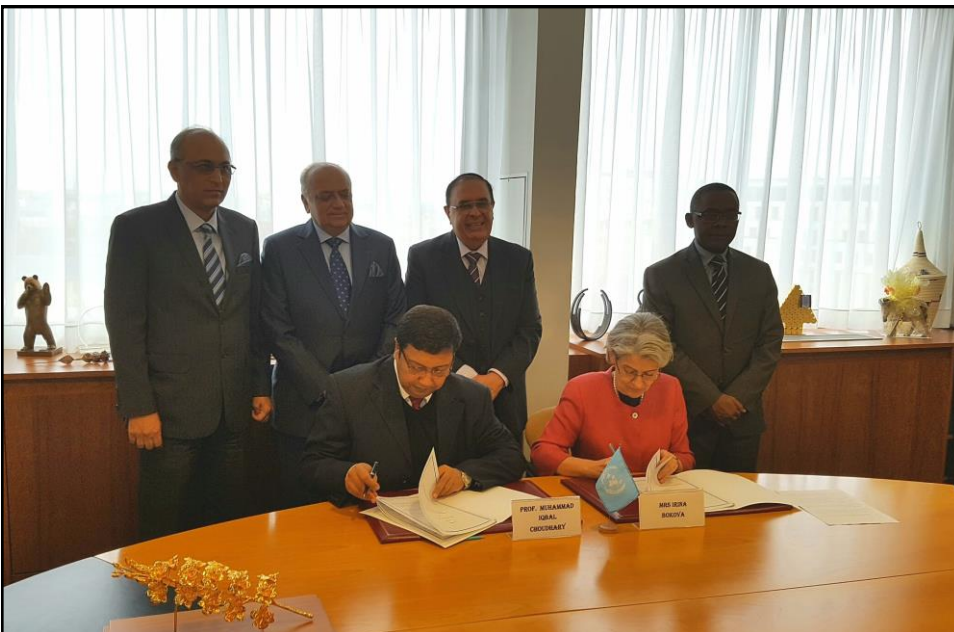


## HEJRIC - ISLAMIC DEVELOPMENT BANK PRIZE FOR BEST SCIENCE INSTITUTION



2004

2010



*UNESCO Category II Center-- Agreement Signing Ceremony in France*

## **ICCBS – *International and National Recognition***

❖	<b>Fellow of Royal Society (<i>FRS</i>)</b>	<b>2</b>
❖	<b>UNESCO Science Prize</b>	<b>1</b>
❖	<b>Fellow of the Chinese Academy of Sciences</b>	<b>1</b>
❖	<b>Nishan-e-Imtiaz</b>	<b>1</b>
❖	<b>Hilal-e-Imtiaz</b>	<b>5</b>
❖	<b>Sitara-e-Imtiaz</b>	<b>13</b>
❖	<b>Tamgha-e-Imtiaz/Pride of Performance</b>	<b>13</b>
❖	<b>D. Sc.</b>	<b>10</b>
❖	<b>Khwarizmi International Award</b>	<b>5</b>
❖	<b>ECO Award and Prize</b>	<b>3</b>
❖	<b>IDB Prize for Best Science Institution</b>	<b>2</b>
❖	<b>COMSTECH Award</b>	<b>1</b>



**Prof. Dr. Atta-ur-Rahman  
receiving the UNESCO  
Science Prize (2004)**



中华人民共和国国家外国专家局  
The State Administration of Foreign Experts Affairs, P.R.C.

**Friendship Award of the  
Peoples Republic of China**

## ***ICCBS – Research Output***

❖ Research articles in reputed science journals	Over 8,500
❖ Patents (National and international) (Including 50 US Patents)	320
❖ Books published internationally (Over 200 by Prof. Dr. Atta-ur-Rahman <i>FRS</i> )	350
❖ Total Scientific Impact Factor	Over 18,000
❖ Total Ph. D. / M. Phil. produced	Over 1,200
❖ Total Citations	Over 150,000



## ***ICCBS –International Research and Development Grants***

1. International grants worth over \$ 50 million were won:
 

(a) Germany	DM 5.7 million
(b) USA	\$ 8.0 million
(c) UK	£ 1.0 million
(d) Japan	\$ 23.0 million
(e) Others	\$ 3.0 million
  
2. Research projects worth > \$ 12.5 million from the WHO, OPCW, USAID, ONR, NSF (USA), IFS, PERIDOT, TUBITAK, and British Council have been completed or under progress.





## ***ICCBS – Impact on Industries and Commercial Sector***

- Over 600 industries are annually supported for analytical services, export certifications, raw material testing, and product improvement.
- **World class analytical and synthetic facility which is approached by the higher courts for critical analytical assignments.**
- **Contributed in making Pakistan's Pharmaceutical Industries *export-based*.**



## ***ICCBS – Public Services***

**Serving as the:**

- **Sindh Forensic DNA and Serology Laboratory.**
- **Food Testing Laboratory of Sindh.**
- **Drug Testing Laboratory of Sindh.**
- **Halal Products Research and Testing Facility**

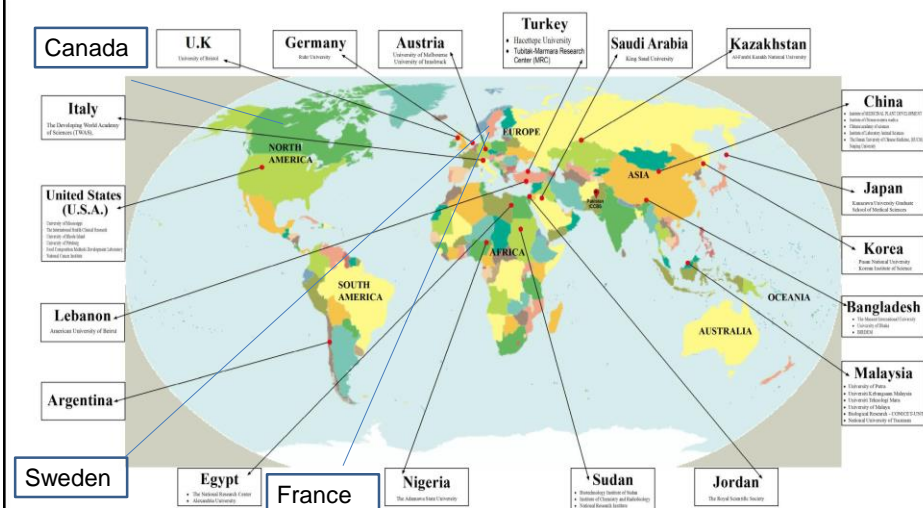


## ICCBS – Global Impact

- ❖ Over 200 visiting scientists annually from different countries.
- ❖ Only institution in the developing world in which advanced countries are sending students for training (*20 German students annually, over 130 German students have already been trained*).
- ❖ Over 120 major International Conferences, Symposia, and workshops organized, including 19<sup>th</sup> IUPAC Symposium (1994), EURASIA Conference (2002, 2016), IBRO School (2006), ASOMPS (December, 2013), FACS (2004), IUCr (2014), EURASIA (2016), and ANRAP (2018).
- ❖ Co-supervision of International M. S./Ph. D. scholars.
- ❖ Training of over 1,000 young scholars from countries of South.
- ❖ Scholarships for Sub-Saharan African Women Scientists (Over 30 annually).
- ❖ Capacity building workshops every year (~ 10).
- ❖ Foreign Universities have established Research Centers named after ICCBS faculty (*recognizing their contributions in global S&T capacity building*).



## ICCBS – GLOBAL LINKAGES



## ***ICCBS's ALUMNI- AMBASSADORS OF PAKISTAN'S EXCELLENCE IN SCIENCE***

- ❖ Over 1200, outstanding alumni of ICCBS are serving all over the globe.
- ❖ Chapters of ICCBS Alumni
  - ❖ USA and Canada
  - ❖ Sri Lanka
  - ❖ Iran
  - ❖ Sudan
  - ❖ Nigeria
  - ❖ Local Provincial Chapters
- ❖ Serving nationally and internationally in top institutions.



## ***ICCBS- SOME GLOBAL ACADEMIC PARTNERS***





## **ICCBS- MAJOR INDUSTRIAL AND DEVELOPMENT PARTNERS**



## **REGIONAL COOPERATION**

- ❖ Joint PAS (Pakistan Academy of Sciences) and INSA (Indian National Science Academy) programs.
- ❖ Pak-India-China cooperation in the field of chemical and biological crystallography.
- ❖ SAARC, and TWAS-based activities, including exchange of scientists, and young researchers.



## ***ICCBS - SCHOLARSHIPS***

Joint NAM S&T Centre-ICCBS Karachi (Pakistan)  
Fellowship

[www.namstet.org](http://www.namstet.org)

TWAS Fellowship Program

<http://www.iccs.edu/twas.php>

COMSTech Visiting Scientists Program

<http://www.comstech.org/Programs>

Others (UNESCO, IFS, ISESCO, COMSATS, IDB, etc)



## ***ICCBS - VISION 2025***

- ❖ Over 1,200 Ph. D. Students, including 200 foreign students
- ❖ 150 Post-doctoral Scholars, and 80 Research Officers
- ❖ Over 200 Ph. D. annually
- ❖ Over 1,000 research papers in top international journals, including top tier journals, and over 100 international patents
- ❖ Technology incubator with 500 companies and start-ups, and ten industrial support units.
- ❖ 30% of the budget by self generation (Royalties, and services)



## **ICCBS - *IN BRIEF***

- ❖ **Demonstrate the possibility to build world-class science institutions in Pakistan.**
- ❖ **Serving nation in various ways.**
- ❖ **Role model for others to follow.**
- ❖ **An institution with global vision.**



**HUSEIN EBRAHIM JAMAL RESEARCH INSTITUTE OF CHEMISTRY**



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



**PROF. DR. ATTA-UR-RAHMAN LABORATORIES  
(THIRD WORLD CENTER FOR CHEMICAL SCIENCES)**





**BIOTECHNOLOGY TECHNOLOGY PARK (BTP)**  
Sino-Pakistan Hybrid Rice Research Center

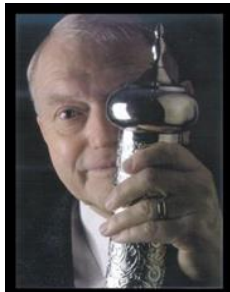


**L.E.J. NANOTECHNOLOGY CENTER (LEJNRC)**





**JAMIL-UR-RAHMAN CENTER FOR GENOME RESEARCH  
And  
SINDH DNA AND SEROLOGY TESTING FACILITY (PCMD)**



**PROF. DR. WOLFGANG VOELTER LABORATORY  
COMPLEX (2016)**





**MARINE CHEMISTRY CENTER,  
AND COLLECTION FACILITY**



**NEW MURREE MEDICINAL  
PLANT RESEARCH CENTER**

## ***VIROLOGY CENTER***



***VIROLOGY CENTER AND  
BSL-III (UNDER  
CONSTRUCTION)***

***MODEL OF VIROLOGY  
CENTER***





- ***ANIMAL HOUSE***
- ***NATIONAL FACILITY FOR  
LABORATORY  
ANIMAL RESEARCH (NFLAR)***



***ESTABLISHMENT OF NATIONAL FACILITY OF LABORATORY  
ANIMAL RESEARCH AND CARE AT PCMD  
(Computer Generated Model)***





**LATIF EBRAHIM JAMAL NATIONAL SCIENCE INFORMATION CENTER**

## **ICCBS INDUSTRIAL SUPPORT INFRASTRUCTURE**







**CENTER FOR BIOEQUIVALENCE STUDIES AND  
CLINICAL RESEARCH (PCMD)**  
120 Bed facility for clinical trials and bioequivalence studies



**INDUSTRIAL ANALYTICAL CENTER (HEJRIC)**  
An ISO 9001, I7025, Halal Testing, and WHO  
Recognized Facility



## **TECHNOLOGY INCUBATION CENTERS**



## **ICCBS RESEARCH FACILITIES**

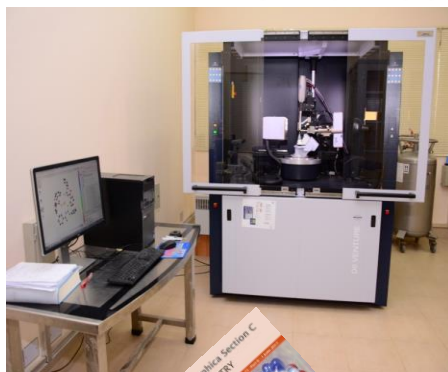


## ***NMR PARK AT THE ICCBS***



*13 Superconducting NMR instruments  
State-of-the-art Facility*

## ***X-RAY SPECTROSCOPY FACILITY***



## ***MASS SPECTROMETRY FACILITIES AT ICCBS***



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



**MASS SPECTROMETER (ELECTRON BOMBARDMENT SYSTEM)**



***Mexis II (HPLC QTOF)***

***Bruker Amazon  
(HPLC Ion Trap)***



## ***CELL CULTURE FACILITY***



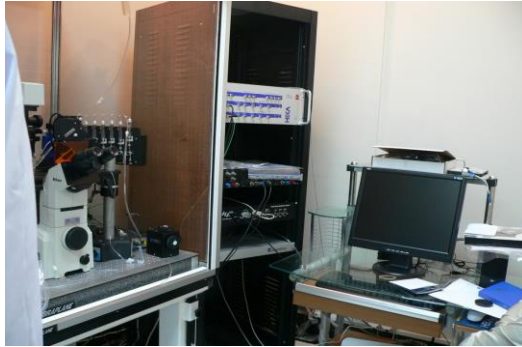
## ***IMAGING FACILITY***



## **FLORESCENCE MICROSCOPES**



## ***CELL PHYSIOLOGY LABORATORY***



**PATCH CLAMP**



## ***MOLECULAR AND GENOME BIOLOGY LAB***



**MiSeq Sequencer**



**Solid State Genome Sequencer**



**NextSeq Sequencer**



**ABI – 7500 Real time PCR**



**ABI – Verity Thermal Cycler**



**Hitachi – 3500 Genome Analyzer**



## ***COMPUTATIONAL RESEARCH FACILITY***



## ***ICCBS - LIBRARY***



## ***ICCBS – TISSUE CULTURE PLANT FACILITY***



## **PILOT PLANT**



## ***NITROGEN LIQUIFICATION PLANT***



**ICCBS  
INSTITUTIONAL ACCOMMODATION,  
AND OTHER FACILITIES**



## ***INTERNATIONAL GUEST HOUSES***



## ***EFFICIENCY APARTMENTS***



## ***FAMILY FLATS***



## ***NATIONAL GUEST HOUSE***





***STONE LAYING CEREMONY  
OF GIRLS HOSTEL***

***COMPUTER GENERATED  
MODEL OF GIRLS HOSTEL***



***Golden Jubilee Hall***



## ***ICCBS – STUDENTS***



## **ICCBS –FOREIGN FACULTY AND STUDENTS**



## ICCBS –FOREIGN FACULTY AND STUDENTS



### INTERNATIONAL CENTER FOR CHEMICAL AND BIOLOGICAL SCIENCES

#### COLLABORATIONS WITH COMSATS MEMBER COUNTRIES (2018-2019)

##### **Providing Capacity Building For COMSATS Member countries.**

Technician level and research trainings to personnel from Egypt, Sri Lanka, Kazakhstan, Nigeria, Iran, and Turkey.

##### **Collaborating with COMSATS Centers of Excellence.**

Trainings of TUBITAK Scholars in mass spectrometry. Post-doctoral trainings of four young scholars of ICCBS at TUBITAK. Joint research activities, including joint research laboratory with KAZNU

ICCBS signed MoUs with TIB, China; Al-Quds University, Palestine; and KAZNU, Kazakhstan

COMSATS travel support to scientists from COMSATS Centers of Excellence in STEP-5, ISNPS, and other international conferences organized by the ICCBS.

Establishment of first “Joint Laboratory for Innovation in Natural Products Research and Development” by Kazakhstan and Pakistan at ICCBS.

## Collaboration between ICCBS and Tianjin Institute of Industrial Biotechnology, China

The Director ICCBs visited TIB, China on January 8, 2019. During his visit to Tianjin Institute of Industrial Biotechnology, many collaborative projects between ICCBS and TIB have been planned. During meetings, ICCBS and TIB signed the MoU on Cooperation of Science and Technology.



## Collaboration between ICCBS and Tianjin Institute of Industrial Biotechnology, China

Prof. Huifeng Jiang from TIB delivered a lecture in the “2nd International Symposium on Natural Products for the Future (ISNPF-2)” and “14th International Symposium on Natural Product Chemistry (ISNPC-14)” organized by the ICCBS during 2018.





## Collaboration between ICCBS and TUBITAK (The Scientific and Technological Research Council of Turkey)

1. Cooperation on Mass spectrometry based proteo-metabolomics project at the TUBITAK labs. Dr. Arslan Ali (Assistant Professor, ICCBS) visited the TUBITAK for training of TUBITAK scholars in mass spectrometry.
2. Four post-doctoral fellows from ICCBS are working at Molecular Oncology research group Genetic Engineering and Biotechnology Institute, MAM, TUBITAK

Dr. Bushra Taj, Project Title: “Identification of novel therapeutic cell penetrating peptides as potential non-catalytic regulators of Lyn tyrosine kinase in Lung cancer”

Dr. Rana Zeeshan Haider, Project Title: Development of 3D Lung Cancer Spheroid Model for Drug Screening”.

Dr. Hana’a Iqbal, Project Title: *A cellular therapy-based modified tissue engineering strategy for bone repair*”.

Dr. Beenish Mirza working on Biosimilar studies

## Collaboration between ICCBS and Al-Farabi Kazakh National University, Almaty, Kazakhstan

More than 50 young scholars from Kazakhstan had visited the international center to pursue their training programs during the last 20 years. ICCBS and Al-Farabi Kazakh National University have made remarkable collaborative work especially in the field of natural product chemistry.



## Collaboration between ICCBS and Al-Farabi Kazakh National University, Almaty, Kazakhstan

The first 'Joint Laboratory for Innovation in Natural Products Research and Development', was jointly established by Kazakhstan and Pakistan in the Prof. Dr. Wolfgang Voelter Laboratories Complex of the ICCBS on March 05, 2019.



## Collaboration between ICCBS and Al-Farabi Kazakh National University, Almaty, Kazakhstan

A delegation of Al-Farabi Kazakh National University, Kazakhstan including Prof. Dr. Tlekkabul Ramazanov, Vice-Rector of Science and Innovations, Prof. Dr. Zharylkassyn Abilov, visited the ICCBS.

- Joint project submission.
- Training of Kazakh research Scholars at the ICCBS
- Preclinical studies of hepatoprotective medicinal products
- developed by Kazakh scientists at the ICCBS.



## **Memorandum of Understanding (MoU) With COMSATS Member Institutions**

Memorandum of Understanding (MoU) were signed between ICCBS and Al-Farabi Kazakh National University, TIB, China, Al-Quds University for international collaborations in the field of natural product.



## **Bi-national Capacity Building Workshop on Phytochemical Research and Development**

**22-27<sup>th</sup> October, 2017.**

➤ Organized by the ICCBS, and AL-Farabi KazNU under the leadership of joint research center, Prof. M. Iqbal Chaudhary, Director, International Center for Chemical and Prof. Zharylkasyn Abilov (Department of Chemical Technology of Organic Substances, Natural Compounds and Polymers of Al-Farabi KazNU).

➤ Supported by IDB project entitled, “Developing the Capacities of Al-Farabi Kazakh National University, Kazakhstan in Phytochemical Development.

➤ Program included theme and invited lectures from many eminent scientists from Pakistan and Kazakhstan.

➤ Training of herbal product development starting from **preparation of plant extracts**, **separation and purification**, **spectroscopic analysis**, **structure elucidation** using modern spectroscopic techniques and **biological activity evaluation** of compounds.

## **MoU signed with NETDZLY, China and ICCBS**

**ICCBS signed MoU with National Economic and Technical Development Zone in Liuyang, Hunan Province, China (NETDZLY) on June 21, 2017. MoU aims to conduct Research and Development (R&D) in the field of drug, health food, including efficacy and safety evaluation, quality control, as well as registration in both of Pakistan and China.**



## **9<sup>th</sup> Asian Network of Research on Anti-Diabetic Plants (ANRAP) International Seminar January 25-27, 2019**

**ANRAP was established with the aim of coordinating research efforts in the field of antidiabetic plant materials with enormous floral resources of the Asian subcontinent.**





**9<sup>th</sup> Asian Network of Research on Anti-Diabetic Plants  
(ANRAP) International Seminar  
January 25-27, 2019**

**ANRAP-9 organized by ICCBS** provided an opportunity to bring world famous scientists in the multidisciplinary fields of metabolic disorders together and exchange ideas on developing a common strategy towards science-based development of plant-based medicine against diabetes, and other metabolic disorders.



**1<sup>ST</sup> SRI LANKAN ANRAP REGIONAL SEMINAR  
National Institute of Fundamental Studies - Sri Lanka  
January 17 – 19, 2018**

**Scientist from COMSATS countries including ICCBS participated 1<sup>ST</sup> SRI LANKAN ANRAP REGIONAL SEMINAR AT National Institute of Fundamental Studies - Sri Lanka.**



## **ICCBS signed MoU with Hunan University of Chinese Medicine, and Hunan Agricultural University**

ICCBS signed two agreements with the School of Pharmacy, Hunan University of Chinese Medicine, China (SPHUCM), and Hunan Provincial Key Laboratory of Phytohormones, Hunan Agricultural University, China (KLPHAU) during the three-day 9<sup>th</sup> ANRAP International Seminar held at the International Center during January 25 to 27, 2019.

The areas of cooperation include joint supervision of graduate students, including masters and PhD students and researchers in the areas of chemistry, biology, biotechnology, molecular medicine, pharmacology, and natural and life sciences.



## **Collaboration between ICCBS and Al-Qudus University, Palestine**

### **MoU Signed between the ICCBS and Palestinian Al-Quds University**

An Intent of Cooperation (IoC) was signed with Al-Quds University, Palestine and International Center for Chemical and Biological Sciences (ICCBS), University of Karachi (UoK), on to promote scientific and educational collaborative activities between the two institutions.

As per the agreement, both the organizations agree to promote exchange program which is based on their respective academic and educational needs, including joint educational and research activities, participation in conference and academic meetings, exchange of research scholars and staff, exchange of undergraduate and graduate students, exchange of academic information and materials and other academic exchange

## Collaboration between ICCBS (International Center for Chemical and Biological Sciences) and Al-Qudus University, Palestine

Assistant Professor and Director, Biotechnolgy Research Center, Palestine Polytechnic University, **Dr. Rami Mamdouh Arafeyh** was invited top deliver lecture on “Induction, Elicitation and Determination of Total Secondary Metabolites from *In-vitro* Growing Cultures of *Arbutus andrachne* L”



## Science and Technology Exchange Program 5 ICCBS and Mustafa (Pbuh) Foundation

Over 450 Scientists from OIC member countries attended the 5<sup>th</sup> Science and Technology Exchange Program (STEP-5), focusing on health care challenges in developing world.



## ICCBS-COMSATS POSTDOCTORAL FELLOWSHIPS

- Postdoctoral Fellowship for 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
- International, friendly and conducive working environment



## Role of ICCBS in the Achievement of SDGs set for Pakistan

Through strong academic, research programs, leadership and international research collaboration, the ICCBS has prominent contributions in achieving the SDGs.

### 1. Providing Equitable Quality Education and Promoting Lifelong Learning Opportunities for All (SGD 4)

Through massive online programs (through VEPP), Off line courses (iMOOCS, lej4learning.com.pk), and regular training workshops in advance fields of science and technology along with skill development programs, the Center is providing students of all level with the knowledge, and skills to address the SDG (Education for sustainable development).

### 2. Gender Equality, and Women Empowerment:

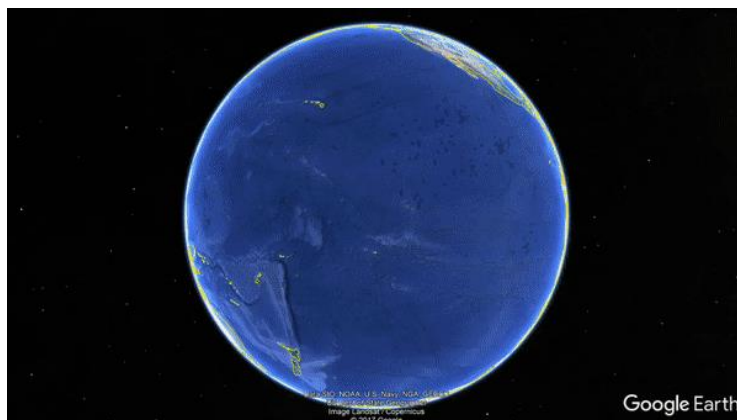
Enrollment of female scholars is highly encouraged in ICCBS system at all level, by providing a conducive working environment to help in their learning experiences, and help them to excel in career.



## **Role of ICCBS in the Achievement of SDGS set for Pakistan**

### **3. Health for All**

The ICCBS's massive traditional medicine validation, and natural drug discovery program providing necessary scientific basis for the rational use of natural products as drugs against prevailing and neglected tropical diseases.



***Thank You***