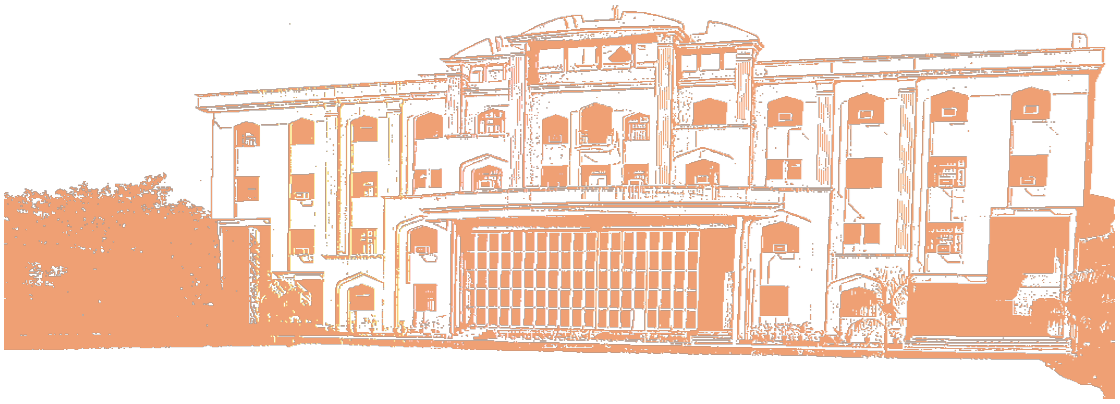
INTEGRAL UNIVERSITY
LUCKNOW - INDIA

A+ ACCREDITED BY NAAC

Research Centre:Integral Centre of Excellence for Interdisciplinary Research (ICEIR)

RESEARCH REPORT (2022-23)



Message

from the Desk of

Hon'ble Founder & Chancellor

The triumphant landing on moon by the Chandrayan 3's lander on-August 23, 2023 is a testament to the unwavering dedication, unparalleled commitment, and indomitable spirit displayed by the entire team at the Indian Space Research Organization (ISRO) and its invaluable collaborators. Their hard work, innovative thinking, and relentless pursuit of excellence have not only propelled India into the prestigious League of Nations capable of lunar landings but have also set an extraordinary example for the world to follow.

As we bask in the glory of this remarkable achievement, it is essential that we acknowledge the invaluable lessons that the Chandrayan-3 mission imparts to all of us, especially the teachers and students here at Integral University. These historic endeavors encapsulate numerous learning that will undoubtedly shape our collective future. To be in pace with the scientific developments in country, the Integral University is progressively heading towards transitioning from "Teaching University" to a "Research Intensive University".

With its A+ Ranking by NAAC, the University is committed to advancing scientific research and fostering interdisciplinary collaboration. In line with this vision, the University is in the process of establishment of an Integral Centre of Excellence for Interdisciplinary Research. This would facilitate interdisciplinary research, promote high-quality publications, develop collaborations, organize conferences, seminars and symposia and extend State-of-the-art research facilities. Exploring the unknown, and pursuing knowledge are fundamental tenets of any successful mission and we at Integral University have been following the same path.

This Research Annual Report 2022-23 records and showcases the activities and achievements of University in Research Innovations.

I am pleased to reiterate my confidence in University's Management consisting of excellent and dedicated colleagues drawn from various departments, who always rose to the occasion with the relentless spirit which bears testimony to the power of teamwork and collaboration.

-Prof. S.W. Akhtar

Founder & Chancellor

ABOUT INTEGRAL UNIVERSITY

Integral University is a premier, NAAC grade A+ accredited University located in the Northeastern part (N 26° 57' 30.4344", E 80° 59' 53.1924") of the UP-State capital city Lucknow. Initially established as a modest school, it swiftly evolved into the Integral Institute of Technology (IIT) in 1998. It later achieved the remarkable distinction of becoming the first UP State-Private Minority University incorporated under Integral University Act No. 9, approved by the UP State legislative assembly in 2004, and is governed through the UP State Private Universities Act no. 12 of 2019. The University is spread over a 125-acre lush green campus and is duly approved by the University Grants Commission (UGC) under sections 2(f) and 12B of the UGC Act, 1956, and is recognized by the Scientific & Industrial Research Organization (SIRO), Department of Scientific & Industrial Research, Ministry of Science & Technology, Government of India. It has further recognition from various councils including the Medical Council of India, Pharmacy Council of India, Indian Nursing Council, Council of Architecture, Bar Council of India, Indian Association of Physiotherapists, National Council for Teacher Education, UP State Medical Faculty and Distance Education Bureau and is a member of Association of Indian Universities. With more than 30,000 accomplished alumni placed in various governmental positions and esteemed organizations, the University boasts a track record of producing successful professionals who are contributing to the growth and development of India and abroad.

Integral University's mission extends beyond mere education; it is dedicated to providing access to higher education for students from semi-urban and underprivileged backgrounds. The University offers a diverse range of programs, including diploma, undergraduate, postgraduate, and doctoral programs in the fields of Engineering, Sciences, Biosciences, Bioengineering Health and Medical Sciences, Paramedical Sciences, Nursing, Commerce and Management, Pharmacy, Computer Application, Agriculture, Law, Architecture, Education and Social Sciences & Humanities, and has implemented NEP-2020 in letters and spirit in UG programs. With 11 Faculties of Study, 01 Polytechnic, and 48 Departments/Institutes offering over 125 UG/PG/Ph.D. programs, the University provides a comprehensive educational experience. The University is dedicated to fostering a vibrant campus life for its 13,000 students from across the country. It also has over 200 international

students from 17 countries, creating a melting pot of cultures and perspectives that enrich the campus environment with diversity. The Department of Biosciences has received the prestigious DST-FIST award from the Department of Science and Technology (DST), Ministry of Science and Technology, New Delhi, emphasizing its commitment to research and innovation.

Integral University is known for its exceptional infrastructure, offering cutting-edge facilities that cater to both academic and extracurricular pursuits. The academic blocks are meticulously designed to provide a conducive environment for higher education, research, and innovation. They are equipped with state-of-the-art amenities, including modern classrooms, seminar halls, research laboratories, and the remarkable ***Centre of Excellence in Interdisciplinary Research (ICEIR), with a vast array of advanced analytical and biological sciences research equipment, such as LC-MS/MS, ICP-MS, X-ray diffraction, HPLCs, FTIR, Spectrophotometers, Nano-drop, Spectrofluorometer, Gel Documentation Systems, Real-time PCR machines, Confocal Microscope, Molecular grade RNase/DNase/pyrogen free Milli Q Water system, Lyophilizer, Plant tissue culture, Animal tissue Culture, and stem cell research facilities.*** In addition to these facilities, the university possesses a Centre for Incubation and Entrepreneurship (CIED) with more than 13 incubates/Startups, a Centre for Human Resource and Development, an AIU-Academic and Administrative Development Center, an Advanced Computer Centre, and a Robotics Laboratory to foster talent and skill development, enhancing academic and administrative excellence, and to provide students with advanced tools and technological landscape to explore and excel in the realm of technology and innovation.

The University recognizes the importance of a comprehensive learning environment. This is reflected in the extensive library, which houses an impressive collection of over 1.3 lakh books and e-journals. Moreover, there is a mini-convention center that includes a central auditorium and annex seminar halls with a collective capacity of 800, fostering an atmosphere conducive to conferences and seminars. The commitment to holistic development extends to sports and fitness, with well-maintained facilities and expert coaches. The campus features a stadium that offers the convenience of day-night club-level games. A fully-equipped gymnasium complements the sports amenities. The campus provides safe and comfortable hostel accommodation for girls and boys, an 810-bed tertiary care hospital as part of the Integral Institute of Medical Sciences and Research (IMS&R) with the best medical facilities available 24/7 within the campus. Medical College of the University has also been rewarded with the Certificate of Excellence as an “Icon of Health” by the Government of Uttar Pradesh for its exceptional services during the COVID-19 pandemic and has been bestowed with an 800 LMP oxygen generation plant by Path-Google.org, further reinforcing its commitment to healthcare excellence.

Integral University has been ranked in the rank-band of 251 to 300 in ‘Engineering Category’ in 2022 and overall ranked in the rank-band of 151 to 200 in 2022. It has been awarded an International Green University Award 2023 in recognition of its outstanding contribution towards fostering a culture of environmental responsibility within the academic community and accepting accountability to the pupil and responsibility to the planet at the 7th New York School Conference, Cornell University, New York. The University is committed to promoting a sustainable and eco-friendly environment with a focus on developing a green curriculum, green teachers, and green students. The University has installed a 1 MWp Rooftop Grid Interactive Solar Power Plant for producing clean and green electricity, as a stainable

approach to reducing carbon mission, and is promoting net-zero and energy-efficient buildings on the campus. The University has inked 75 national and International MoUs for promoting academic and research collaborations. The University has a digital campus with Wi-Fi facilities all across the campus and an indigenously developed ERP called Integral Learning Initiative (ILI), an online learning platform under the Learning Management System (LMS), that ensures access to high-quality education.

The university is not just an academic institution; it is a force dedicated to inspiring excellence and empowering the youth through education. Its collaborations with top MNCs and academic institutions reflect a commitment to holistic development, including skill enhancement, attitude and personality development, and the cultivation of social, cultural, and moral values. Integral University is nurturing the next generation of global citizens, setting new standards in the world of education.

About Integral Centre of Excellence for Interdisciplinary Research (ICEIR)

The Integral Centre of Excellence for Interdisciplinary Research (ICEIR) is the brainchild of our Hon'ble Vice Chancellor, Professor Javed Musarrat. His unwavering commitment to research excellence has been a driving force to elevate Integral University into a renowned Research-Intensive institution. His proposal for the establishment of ICEIR at Integral University received unanimous approval during the 40th Meeting of the Executive Council, held on 22 July 2023. The development of this state-of-the-art facility is a testament to his resolute efforts, and it stands as a pivotal cornerstone within his overarching vision for advancing research initiatives at Integral University. This dedicated facility encompasses approximately 15,000 square feet, exclusively reserved for ICEIR. It has been meticulously designed by Eng. Mohd. Sufiyan Abbasi, to foster and support high-caliber interdisciplinary research in cutting-edge domains of science and technology. Deepest appreciation and recognition for the exceptional dedication and unwavering commitment of Prof. Syed Misbahul Hasan, Director of ICEIR, Prof. Abdur Rahman Khan, Dean of the Faculty of Sciences, Prof. Snober Mir, Dy. Director ICEIR, Integral University, and their esteemed team of faculty members. The pivotal role of Mr. Ahmad Raza, Treasurer, and the Finance & Accounts Department in expeditiously clearing the proposal and allocating the essential funds for the project is sincerely acknowledged in the success of this endeavor. Lastly, but by no means the least, heartfelt gratitude for the generous and unwavering support of the Hon'ble Chancellor, Syed Waseem Akhtar, and the Hon'ble Pro-Chancellor, Syed Nadeem Akhtar, at every stage of the facility's development has been a driving force behind its realization and success.

ICEIR serves as a pivotal hub for the promotion of interdisciplinary research, encompassing the domains of Science, Technology, Engineering, and Mathematics (STEM), as well as Medical, Health, and Allied Sciences. The scientific laboratories at the erstwhile Integral Centre of Information and Research (ICIR), now subsumed with ICEIR, have excelled in securing financial support from several prominent national funding agencies, including DST-SERB, DRDO, CSIR, DBT, and the Ministry of Ayush. The total amount of funding acquired thus far exceeds 300 lakhs, a testament to the center's strong research potential and capabilities and has successfully organized and conducted over 50 workshops, up until the year 2023. These workshops have been instrumental in disseminating knowledge, fostering collaboration, and driving forward the frontiers of research in a wide range of interdisciplinary fields.


INTEGRAL UNIVERSITY
इंटीग्रल विश्वविद्यालय
लखनऊ-भारत
LUCKNOW-INDIA
VISION
To lead the teeming millions of the world through the wilderness of ignorance and illiteracy, as "Kindly Light"*
with the resounding divine proclamation.
"Read: Thy Lord is the most bounteous."*
and to educate them in the most constructive and innovative ways.
To integrate the ebullience, intellect and dynamism of youth with decency, decorum, discipline and dedication through value-based quality education.
*Exodus (13:21) *Quran (96:3)
MISSION
To make every student a role model of intellectuals and torch bearers for others all over the world through his / her inspiring existence.
To inculcate a spirit of confidence, self-respect and firm commitment in students alongwith farsighted wisdom and understanding.
To make India a self reliant and dominant G-1 country recognized for quality education, higher economic growth and valuable moral practices.
Prof. S.W. AKHTAR
FOUNDER & CHANCELLOR

INTEGRAL UNIVERSITY
LUCKNOW - INDIA

Integral Centre of Excellence for Interdisciplinary Research (ICEIR)

Research Centre of Integral University

Integral University, Lucknow
Integral Centre of Excellence for Interdisciplinary Research (ICEIR)

Name of Director:

Prof. Syed Misbahul Hasan

About ICEIR:

Integral Centre of Excellence for Interdisciplinary Research (ICEIR) formerly known as *IIRC* is a specialized and dedicated center for R&D activity created in order to provide support for sustainable research**.**

Mandate: ICEIR would focus on:

- Undertaking activities to encourage and support research towards excellence.
- Provide dedicated infrastructure for R&D activity to the faculty of the University and foster research culture.
- Provide an over-arching structure for research activities in Science, Engineering and Humanities;
- Initiate product oriented new research program of interdisciplinary nature.
- Undertaking efforts for extension of Scientific Services.

Objectives:

The ICEIR aims to achieve the following objectives:

(i) **Foster Interdisciplinary Research:** The center serves as a collaborative hub for researchers across a wide spectrum of academic disciplines, facilitating innovative interdisciplinary research in the realms of STEM, Medical, and Allied Sciences.

(ii) **Promote High-Impact Publications**: The ICEIR is committed to disseminating groundbreaking research findings by actively encouraging publication in esteemed Q1 and Q2 journals. We aim for a minimum of five impactful publications per scientist and academic department faculty/researcher annually.

(iii) **Secure External Grants**: The center vigorously pursues extramural funding opportunities to bolster research initiatives, acquire cutting-edge equipment, maintain the Center Instrumentation Facility (CIF), and spearhead the development of pioneering technologies.

(iv) **Cultivate Collaborations**: ICEIR actively nurtures partnerships with industry leaders, national research institutes, and international institutions. These collaborations harness resources, expertise, and expansive networking opportunities to advance our research endeavors.

(v) **Host Scientific Gatherings**: The center regularly organizes conferences, seminars, and symposia to disseminate research outcomes, foster knowledge exchange, and catalyze interdisciplinary dialogues.

Key Components:

The ICEIR comprises the following integral components:

(i) **Cutting-Edge Research Facilities**: The center houses state-of-the-art laboratories equipped with advanced instrumentation and technologies, providing the essential support required for interdisciplinary research spanning STEM and Medical, Health & Allied Sciences.

(ii) **Research Clusters**: ICEIR establishes thematic research clusters, unifying experts from diverse disciplines to facilitate the exchange of knowledge and catalyze interdisciplinary synergy.

(iii) **Interdisciplinary Workshops and Seminars**: Regular workshops and seminars organized by the ICEIR promote interdisciplinary thinking, offering researchers a platform to share their work. These events serve as catalysts for collaboration and innovation.

Infrastructure and Resources:

To facilitate ICEIR's mission, the following infrastructure and resources are at your disposal:

(i) **Research Facilities:** Our well-equipped laboratories, computational resources, and access to specialized equipment and technology support your interdisciplinary research endeavors.

(ii) **Administrative Support**: Dedicated administrative staff oversee daily operations,

manage grant applications, handle financial matters, and coordinate events.

(iii) **Library and Information Resources**: Access an extensive collection of scientific literature, online databases, and subscriptions to relevant journals, enhancing your research activities.

(iv) **Funding Support**: While ICEIR requires initial funding for infrastructure setup, equipment procurement, and operational expenses, we are equally committed to seeking sustainable funding through grants and strategic collaborations to ensure the longevity of our mission.

Laboratory Facilities:

State-of-the-art Laboratories: To enhance research capabilities and address emerging scientific challenges, the ICEIR has 14 state-of-the-art laboratories. The focus areas for these laboratories are as follows:

(i) ***Chemistry Laboratory***: Equipped with advanced analytical instruments, synthetic chemistry setups, and specialized equipment, this laboratory will enable research in areas such as organic & medicinal chemistry, inorganic chemistry, and chemical synthesis and drug designing, etc.

(ii) ***Material and Environmental Sciences Laboratory***: This laboratory will be equipped with advanced characterization tools, material synthesis setups, and testing facilities to facilitate research in areas such as nanomaterials, polymers, composites, functional materials, etc. Moreover, Environmental science research shall focus on a wide range of research areas viz. Air, Water, and soil Quality Monitoring and Management, Waste Management and Recycling, Climate Change and Mitigation, Biodiversity Conservation, Toxicology and Environmental Health, Renewable Energy and Sustainable Technologies, Environmental Risk Assessment, Urban and Regional Planning, Remote Sensing and GIS, Ecosystem Restoration Green Chemistry and

Sustainable Materials, aimed at understanding, monitoring, and addressing environmental issues.

(iii) ***Biosciences and Bioengineering Laboratory***: With dedicated equipment for molecular biology, cell culture, genetic engineering, bioprospecting and bioprocessing, this laboratory will support research in areas such as bioengineering, biotechnology, genomics, proteomics, metabolomics, and bioinformatics, etc.

(iv) ***Pharmacy Laboratory:*** Designed to support research in pharmaceutical sciences, drug discovery, formulation development, and pharmacology, this laboratory will house specialized equipment for drug synthesis, drug delivery systems, and pharmacological studies, etc.

(v) ***Stem Cell Research Laboratory***: This laboratory will provide a controlled environment for stem cell culture, differentiation studies, tissue engineering, and regenerative medicine research. It will include state-of-the-art equipment for cellular imaging, flow cytometry, stem cell manipulation, etc.

(vi) ***Central Instrumentation Facility***: To enhance research capabilities and promote interdisciplinary collaborations, the existing central instrumentation facility (CIF) has been remodeled and the instrumentation facilities have been augmented to develop a well-equipped, state-of-the-art CIF as part of the ICEIR. This facility houses advanced research instruments and analytical tools that can be shared across various laboratories and research projects. Key components of the central instrumentation facility include:

(a) **Advanced Analytical Instruments**: High-performance equipment for spectroscopy, microscopy, chromatography, mass spectrometry, and other analytical techniques. This will enable precise characterization and analysis of samples across different research domains.

(b) Research Equipment: Specialized research equipment, such as high-throughput screening systems, RT-PCR, Del Documentation system, Milli Q water purification system, centrifuges, Lyophilizer, Confocal microscopes, and much more equipment are available. Further, the Particle size analyzers, and surface analysis instruments, DNA sequencers, Electron microscope, etc. will also be procured to cater to diverse research needs within the center.

(c) Data Processing and Analysis: The central instrumentation facility includes computational resources and software tools for data processing, analysis, and modeling. These enable researchers to derive meaningful insights from their experimental results.

(d) Technical Support: The facility has dedicated technical staff to assist researchers in operating and maintaining the instruments, provide training on specialized techniques, and ensure optimal utilization of the resources.

Thrust Areas and Importance:
The laboratories within the ICEIR focus their research efforts on addressing thrust areas of local, national, and international importance. These thrust areas are identified based on societal needs, emerging scientific challenges, and the potential for significant impact. Research projects conducted within the ICEIR are aligned with these thrust areas, ensuring that the center's efforts contribute to solving real-world problems and advancing knowledge in critical domains.

Research Thrust Areas:

- The research thrust areas at Integral University are focused on interdisciplinary research. The faculty of Sciences, Pharmacy Engineering, Medical Sciences and Agriculture, are at the forefront of research. Our research highlights showcase the work carried out by faculty members in frontier areas of research to benefit society and the nation at large. The major thrust areas of research from different departments are listed below:

- Medicinal and Computational Chemistry, Nanomaterials and Environmental Science, Phytopharmacological research, Pharmaceutical drug development, Agronomy and Soil

Sciences, Drug development for metabolic disorders, Cancer Biology, Neuroinformatics and Computational Biology, Computer Aided Drug Design, Air, Water, and soil Quality Monitoring and Management, Waste Management and Recycling, Climate Change and Mitigation, Biodiversity Conservation, Toxicology and Environmental Health, Renewable Energy and Sustainable Technologies, Environmental Risk Assessment, Urban and Regional Planning, Remote Sensing and GIS, Ecosystem Restoration Green Chemistry and Sustainable Materials, Medical Elementology, Metals, toxicity of Pesticides and xenobiotics.

- Earthquake Resistant Reinforced Concrete Buildings, Retrofitting & Strengthening of Concrete, Thermal Engineering, Material Science and Tribology, Digital Image Processing, Power Systems and Renewable Energy.

- Cloud Computing and Security, Wireless Sensor Networks, Data Science and Machine Learning, Web Engineering, Differential Geometry and Numerical Analysis and Robotics.

Outcome Measures:

The success of the proposed ICEIR is evaluated based on the following outcome measures:

(a) **High-Quality Publications**: Achievement of the target of at least five publications per scientist per year in reputed Q1 and Q2 journals.
(b) **Extramural Grants**: Acquisition of extramural funding for research projects and infrastructure development.
(c) **Collaborations and Partnerships**: Development of collaborations with industry partners, national and international institutions, leading to joint projects, knowledge exchange, and technology transfer.
(d) **Conferences and Events**: Successful organization of conferences, seminars, symposia, and workshops, attracting renowned researchers and fostering interdisciplinary dialogue.
(e) **Research Impact:** Measurable impact of research outcomes in terms of patents, citations, industry adoption, and contributions to scientific advancements.

Expected Outcomes:

The ICEIR is expected to yield the following outcomes:

(i) **Enhanced research productivity:** The ICEIR promotes interdisciplinary research, leading to a higher number of publications in reputable journals and conferences.
(ii) **Increased external funding**: By actively pursuing extramural grants, the ICEIR secure additional resources to support research activities and foster innovation.
(iii) **Industry collaborations and technology transfer**: Partnerships with industry facilitates the translation of research outcomes into practical applications, benefiting society and the economy.
(iv) **National and international recognition/rankings**: The ICEIR's interdisciplinary research endeavours elevate the university's profile, rankings and attract talented researchers, and foster collaborations with renowned institutions worldwide.

The establishment of an Integral Centre of Excellence for Interdisciplinary Research (ICEIR) will significantly contribute to the advancement of interdisciplinary research in the STEM field. By promoting collaboration, generating high-quality publications, securing extramural grants, and fostering partnerships, the ICEIR will serve as a catalyst for innovative research and

knowledge dissemination. The proposed staffing structure, objectives, and outcome measures outlined in this proposal provide a solid foundation for the successful establishment and operation of the ICEIR. By incorporating existing laboratories and introducing new state-of-the-art facilities, including the central instrumentation facility, the ICEIR will establish a strong foundation for conducting world-class research. These infrastructure expansions will enable scientists and researchers to pursue cutting-edge investigations in chemistry, material sciences, biosciences, bioengineering, pharmacy, and stem cell research. The interdisciplinary nature of the ICEIR, coupled with its focus on addressing thrust areas of local, national, and international importance, will ensure the center's research activities are impactful and contribute to advancements in various scientific fields.

About CIF:

The Central Instrument Facility (CIF) has undergone a profound transformation, thanks to the tireless dedication of Professor Javed Musarrat, the esteemed Vice-Chancellor of Integral University. This redevelopment occurred in May 2023 and stands as a pivotal component of his far-reaching research initiatives at Integral University. The primary objective behind the establishment of this cutting-edge facility is to cater to the needs of the scientific community within Integral University and external researchers, both from academia and industry. It provides an array of state-of-the-art equipment and resources for analytical, microscopy, and molecular biology experiments. Notable offerings within this facility include Flow Cytometry, Spectrometry, and Chromatographic techniques, enabling researchers to conduct imaging, cell analysis, separation, identification, and quantification of various biomolecules such as proteins, organic compounds, food and drug components, metals, and pesticide residues, among others.

The Central Instrument Facility (CIF) operates as a dynamic Analytical Research and Development Division, fully equipped to provide an array of invaluable services, including:

- **Comprehensive Qualitative and Quantitative Profiling**: Our technical staff excels in the thorough profiling of diverse biomolecular species, environmental samples, and inorganic and organic substances. High-throughput analyses are conducted utilizing cutting-edge technologies such as UV-visible and Fluorescence Spectrometry, Chromatographic techniques, Imaging, Flow-cytometry, Quantitative Real-time PCR, ChemiDoc analysis, and more.
- **Sample Processing and Quantitation**: We offer efficient sample processing, quantitation analysis, as well as data analysis and interpretation, empowering researchers with accurate insights into their work.
- **Skill Enhancement**: CIF is committed to skill enhancement by providing training to students and researchers. Workshops and hands-on training sessions, conducted at regular intervals, cover various techniques, including imaging, cell analysis, separation, identification, classification, and quantification. Collaboration with industry partners ensures the relevance and applicability of acquired skills.
- **Method Development and Validation**: We specialize in the development and validation of analytical methods. These methods cater to a wide range of in-house and commercial sample analyses, optimizing the utilization of CIF resources and opening new avenues in research and development.

Our commitment to advancing scientific knowledge and fostering collaboration extends to researchers, students, and industry partners, making CIF a cornerstone in the pursuit of excellence in research and innovation.

Major Instruments available at CIF:

The Central Instrument Facility (CIF) houses a comprehensive array of cutting-edge equipment and resources, including:

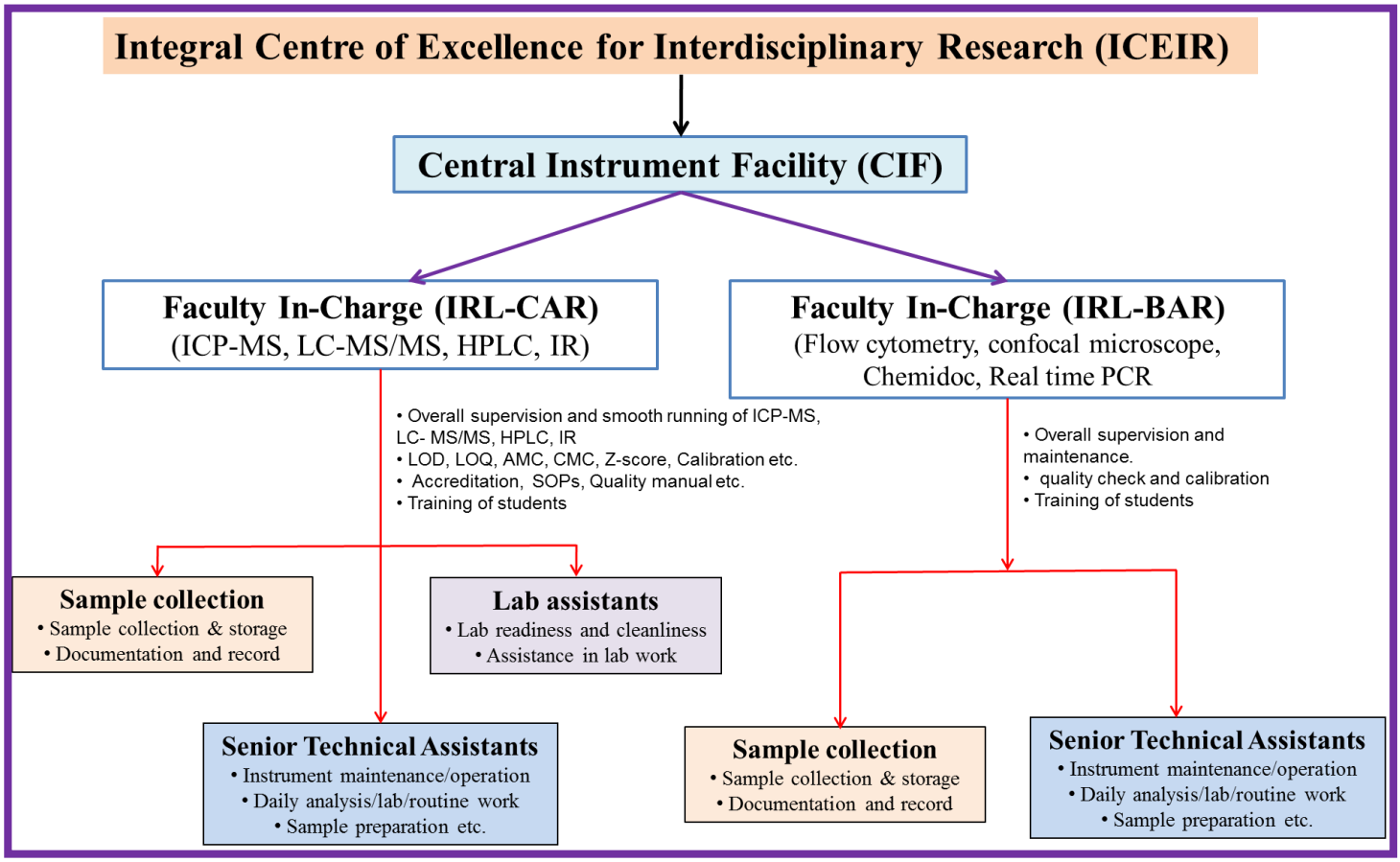
- **FACS Lyric Flow Cytometer**: A sophisticated tool for cell analysis and sorting.
- **Gel Documentation System**: Vital for capturing and analyzing gel images in molecular biology.
- **iBright 1500 ChemiDoc Imaging System**: Enabling precise documentation of chemiluminescent and fluorescent samples.
- **ABI 7500 FAST Real-Time PCR System**: A high-performance system for quantitative gene expression analysis.
- **Leica STELLARIS 5 Confocal Microscope**: Offering exceptional imaging capabilities with advanced microscopy.
- **Bruker Alpha II Spectrofluorometer**: Ideal for spectral analysis and fluorescence studies.
- **Systronics AU2702 Double-Beam Touchscreen UV-VIS Spectrophotometer**: Facilitating accurate UV-VIS spectrophotometry.
- **Agilent Cary Eclipse Fluorescence Spectrometer**: Specialized for precise fluorescence measurements.
- **X-ray Diffractometer**: Essential for the structural analysis of materials.
- **High-Performance Liquid Chromatography (HPLC)**: A powerful technique for separating and quantifying compounds in mixtures.
- **Gas Chromatography-Mass Spectrometry (GC-MS)**: Combining GC's separation power with MS's identification capabilities.
- **Liquid Chromatography-Mass Spectrometry (LC-MS/MS)**: Ideal for identifying and quantifying compounds in complex mixtures.
- **Inductively Coupled Plasma Mass Spectrometry (ICP-MS)**: Valuable for trace element analysis.
- **Millipore Ultra-Pure (DNAse/RNase)/Pyrogen-Free Water System**: Ensuring a consistent supply of high-quality water for experiments.

- **Bioinformatics Software and Tools**: Empowering researchers with data analysis and computational resources.

CIF's extensive capabilities span across various interdisciplinary research and analytical domains, facilitated through:

A) **Integral Referral Laboratory for Chemical Analysis and Research (IRL-CAR)**: Supporting chemical analysis and research needs across a wide spectrum of projects.
B) **Integral Referral Laboratory for Biological Analysis and Research (IRL-BAR)**: Catering to biological analysis and research demands, from molecular biology to microbiology and beyond.

The working structure of ICEIR



LIST OF MAJOR INSTRUMENTS & THEIR FACULTY IN-CHARGES (CIF)

S. No.	Name of Instruments	In-Charge
1	FACS (Flow Cytometer) with PC	Dr. Mohammad Rumman
2	Confocal Microscope With PC	Dr. Mohammad Rumman
3	RT-PCR	Dr. Mohammad Rumman
4	Chemi Documentation System with Laptop	Dr. Taiba Saeed
5	Water Purification System	Mohd. Shariq
6	XRD with Chiller and PC	Dr. Jamal Akhtar
7	ICP-MS	Dr. Jamal Akhtar
8	LC-MS/MS	Dr. Jamal Akhtar
9	High Performance Liquid Chromatography with PC	Mohd. Shariq
10	Lyophilizer	Mohd. Shariq
11	Fourier Transform Infrared Spectrometer with PC	Dr. Durdana Yasin Mohd. Shariq
12	Hydraulic Press	Mohd. Shariq
13	Gel Documentation System with PC	Dr. Durdana Yasin
14	UV-Spectrophotometer with PC	Dr. Durdana Yasin

Research Achievements by the research centre

ICEIR

Projects and Grants

The academic year 2022-23 witnessed significant research accomplishments, particularly in securing prestigious grants for innovative projects. Two faculty members from Integral University have been awarded substantial research grants from national funding agencies, underscoring the institution's commitment to cutting-edge research and scientific advancements.

1. **Dr. Snober S. Mir** (IIRC-4) has been awarded a prestigious research grant from the **Science and Engineering Research Board (SERB)** under the **Core Research Grant (CRG) scheme**. She has received a funding amount of **₹35,00,000** for her research project titled:

   "Elucidation of Hsp90 Inhibition in Combination with Repurposed Drug Metformin as a Therapeutic Strategy Against Lung Cancer" *(Project No: CRG/2022/005220).*

   This study aims to investigate the therapeutic potential of targeting **Hsp90** (a molecular chaperone protein) in combination with **Metformin**, a widely used anti-diabetic drug, to develop an effective treatment strategy against **lung cancer**. The research focuses on repurposing existing drugs to enhance their efficacy against cancer, offering promising advancements in oncology.

2. **Dr. Salman Khan** (IIRC-5) has been awarded a research grant of **₹28,80,000** from the **Department of Science and Technology (DST) - SERB** under the **State University Research Excellence (SURE) program**. His project, titled:

   "An Approach Towards Improving Care for Alzheimer's Disease and Type 2 Diabetes Mellitus Through the Design of Nano-Chaperones Targeting Amyloid-beta Peptide and Islet Amyloid Polypeptide Aggregation" *(Project No: SUR/2022/002111),*

   focuses on the intersection of **neurodegenerative diseases and metabolic disorders**. The research explores the development of **nano-chaperones**, which are designed to target and mitigate the aggregation of **amyloid-beta peptides** (linked to Alzheimer's disease) and **islet amyloid polypeptides** (associated with Type 2 Diabetes Mellitus). The project has the potential to revolutionize therapeutic approaches for these chronic diseases, bridging the gap between neurology and endocrinology.

These remarkable achievements highlight the **university's dedication to fostering high-impact research**, securing competitive funding, and contributing to the advancement of science and healthcare. The successful acquisition of these grants reflects the expertise of our faculty and their relentless pursuit of scientific excellence, further strengthening Integral University's position as a hub for **innovative and translational research**.

Major Activities Organised by the research centre ICEIR

Highlights of Major Activities and Achievements During the Academic Year 2022-23

Training Programs and Technical Workshops

The **Institute for Clinical and Experimental Investigative Research (ICEIR)** at **Integral University** organized a series of specialized training programs and technical workshops aimed at enhancing the technical expertise of faculty and researchers. These sessions focused on the handling, troubleshooting, and applications of advanced scientific instruments essential for modern research.

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1. Training on "Handling and Troubleshooting of RT-PCR and Chemi Documentation System"

Date: 19th June 2023

Trainers:

- **Dr. Arun Kumar**, Engineer, Thermo Fisher Scientific
- **Dr. Shiv Tripathi**, Engineer, Thermo Fisher Scientific

Faculty Participants:

- **Prof. S. Misbahul Hasan**, Director, ICEIR
- **Dr. Snober S. Mir**, Deputy Director, ICEIR
- **Dr. Mohd. Rumman**
- **Dr. Taiba Saeed**
- **Dr. Durdana Yasin**

Key Highlights:

This hands-on training focused on **real-time polymerase chain reaction (RT-PCR)** and **Chemi documentation systems**, which are crucial for molecular biology and biomedical research. Participants were trained on:

✅ The operational principles of **RT-PCR**, its application in gene expression analysis, and diagnostics.

Troubleshooting common errors in **thermal cycling** and **fluorescent detection systems**.

✅ The **Chemi documentation system**, an essential tool for imaging **Western blot** and other gel-based experiments.

Best practices in maintenance and calibration for accurate and reproducible results.

The session provided a deep understanding of RT-PCR applications, particularly in medical diagnostics and genetic research, helping researchers optimize their experimental workflows.

Glimpse of the Event:

2. Demonstration cum Training Program on "Handling and Troubleshooting of MilliQ Water Purification System"

Date: 20th June 2023

Trainer:

- **Mr. Chandresh**, Installation Engineer, Merck Millipore

Faculty Participants:

- **Prof. S. Misbahul Hasan**, Director, ICEIR
- **Dr. Snober S. Mir**, Deputy Director, ICEIR
- **Mr. Mohammad Shariq**

Key Highlights:

This session covered the importance of high-purity water in scientific experiments and the correct usage of **MilliQ Water Purification Systems**, which are widely used in pharmaceutical and molecular biology research. The training included:

✅ Understanding different **water purification technologies** (reverse osmosis, deionization, UV treatment).

Troubleshooting common issues related to **filter replacements and conductivity levels**.

Ensuring **contamination-free** water supply for critical experiments.

The session emphasized the role of ultra-pure water in achieving reliable and reproducible research outcomes, especially in fields such as **biotechnology, nanotechnology, and pharmaceutical sciences**.

ICEIR Research report 2022-23

Glimpse of the Event:

3. Training Program on "Handling and Troubleshooting of X-Ray Diffraction (XRD) Instrument"

Date: 23rd June 2023

Trainers:

- **Dr. R.K. Mishra**, Engineer
- **Mr. Rohit Kumar**, Engineer

Faculty Participants:

- **Prof. S. Misbahul Hasan**, Director, ICEIR
- **Dr. Snober S. Mir**, Deputy Director, ICEIR
- **Dr. Jamal Akhtar**
- **Mr. Mohammad Shariq**

Key Highlights:

The **X-ray Diffraction (XRD) Instrument** is an essential tool for material characterization and structural analysis. This training covered:

Basics of **crystal structure analysis** using XRD.

Hands-on experience with **sample preparation and instrument calibration**.

Troubleshooting data interpretation challenges.

Applications in **pharmaceuticals, nanomaterials, and solid-state physics**.

The session provided valuable insights into how XRD techniques contribute to **materials research, drug formulation, and forensic sciences**.

Glimpse of the Event

4. Training Program on "Handling and Applications of Confocal Microscope"

Date: 4th July 2022

Trainer:

- **Mr. Manoj Manna**, Application Engineer

Faculty Participants:

- **Prof. S. Misbahul Hasan**, Director, ICEIR
- **Dr. Snober S. Mir**, Deputy Director, ICEIR
- **Dr. Mohd. Rumman**
- **Dr. Taiba Saeed**
- **Dr. Durdana Yasin**

Key Highlights:

Confocal microscopy is an advanced imaging technique crucial for **biological and medical research**. This training program focused on:

Principles of **laser scanning confocal microscopy** for 3D imaging.

Hands-on training on **fluorescence imaging and live-cell imaging techniques**.

Applications in **cellular biology, neuroscience, and cancer research**.

Optimization of microscope settings for **high-resolution imaging**.

This session empowered researchers with the necessary skills to **visualize cellular processes** with higher accuracy, enabling breakthroughs in **biomedical sciences**.

Glimpse of the Event:

5. Training Program on "Handling and Applications of Flow Cytometer"

Date: 11th July 2022

Trainer:

- **Dr. Shashank Mishra**, Engineer, BD Biosciences

Faculty Participants:

- **Prof. S. Misbahul Hasan**, Director, ICEIR
- **Dr. Snober S. Mir**, Deputy Director, ICEIR
- **Dr. Mohd. Rumman**
- **Dr. Taiba Saeed**
- **Dr. Durdana Yasin**
- **Mr. Mohammad Shariq**

Key Highlights:

Flow cytometry is a powerful tool in **immunology, cancer research, and stem cell analysis**. This training included:

Principles of **flow cytometry** and its application in cell sorting.

Hands-on experience with **staining, gating, and data analysis**.

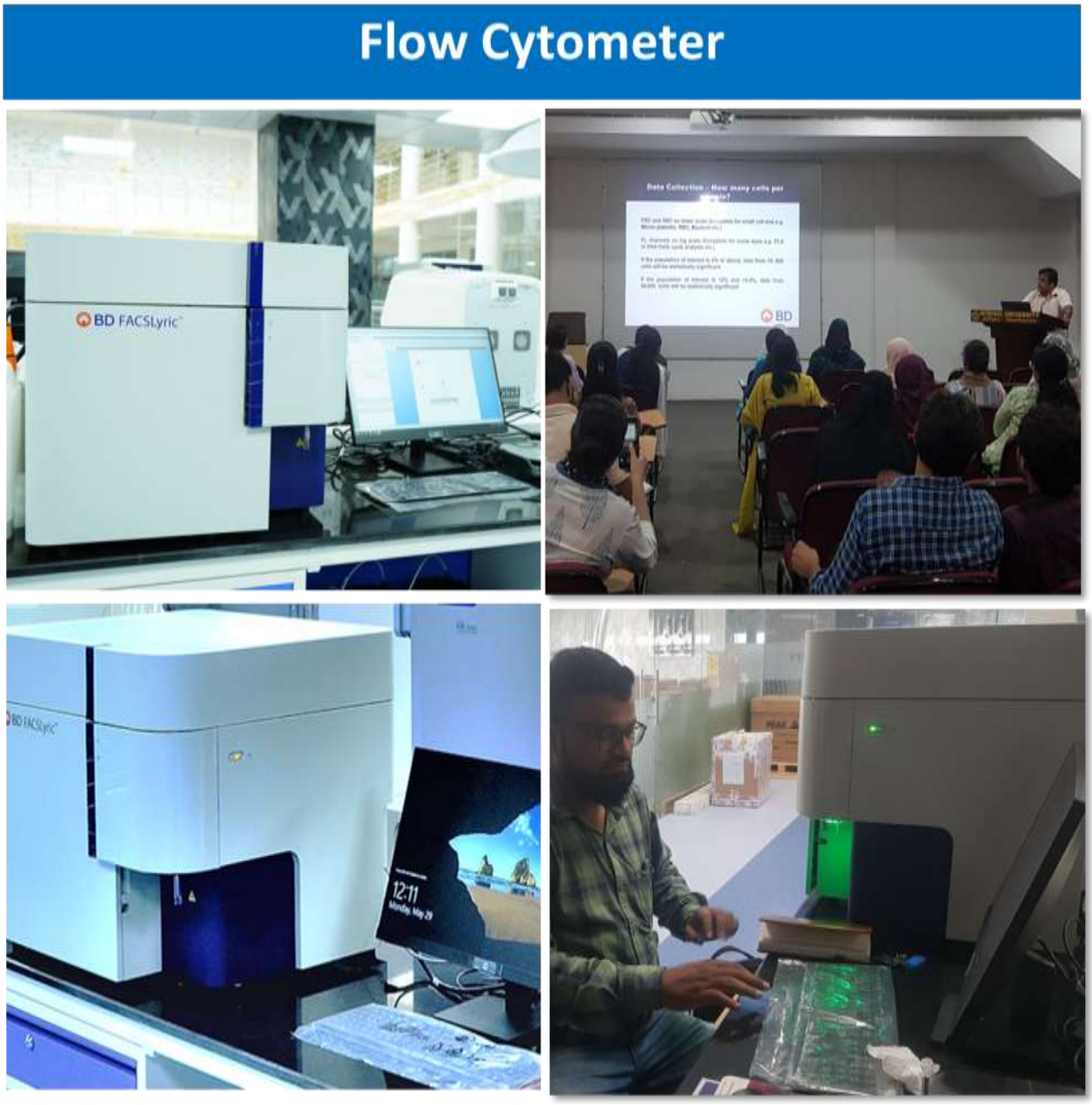
Troubleshooting issues with **fluorescent dye selection and compensation**.

Applications in **disease diagnostics, immunophenotyping, and biomarker discovery**.

This session enhanced participants' ability to perform **high-throughput cell analysis**, facilitating **advanced biomedical and clinical research**.

These training programs provided faculty and researchers with essential **technical skills** in handling advanced instruments, troubleshooting issues, and optimizing experimental workflows. Such initiatives reinforce **Integral University's commitment** to fostering **scientific excellence** and ensuring its researchers stay updated with the latest technological advancements.

Glimpse of the Event:



New Instruments Acquired by the research centre ICEIR

New Instruments Acquired at the Facility

S. No.	Name of Instrument	Make/ Model	Location
1.	**Flowcytometer**	BD Biosciences/ FACSlyric	Central Instrumentation Facilty
2.	**Confocal Microscope**	Leica/ Stellaris5	Central Instrumentation Facilty
3.	**ICPMS**	Agilent/7850ICP-MS	Central Instrumentation Facilty
4.	**LC-MS/MS**	Agilent/6475LC/TQ	Central Instrumentation Facilty
5.	**XRD**	Rigaku/Miniflex600	Central Instrumentation Facilty
6.	**RT-PCR**	Thermoscientific/ Fast7500	Central Instrumentation Facilty
7.	**Chemi Documentation System**	iBright/1500	Central Instrumentation Facilty
8.	**Water Purification System**	Merck Millipore/ MiliQ IQ7003	Central Instrumentation Facilty
9.	**UV Spectrophotometer**	Agilent/Cary UV-Vis Compact Peltier	Central Instrumentation Facilty
9.	**Biosafety Cabinet-1**	ESCO/Airstream	C413
10.	**Biosafety Cabinet-2**	ESCO/Airstream	C414
11.	**Biosafety Cabinet-3**	ESCO/Airstream	C415
12.	**Deep Freezer -80ºC (2)**	Thermo Scientific	C414
13.	**Deep Freezer -80ºC (3)**	Thermo Scientific	C415

Agilent UV Spectrophotometer

BIOSAFETY CABINET

INDUCTIVELY COUPLED PLASMA MASS SPECTROMETRY (ICP-MS)

Liquid Chromatography- Mass Spectroscopy (LC-MS)

International Conferences Organized by the research centre ICEIR

INTEGRAL UNIVERSITY
LUCKNOW - INDIA

INTERNATIONAL CONFERENCE

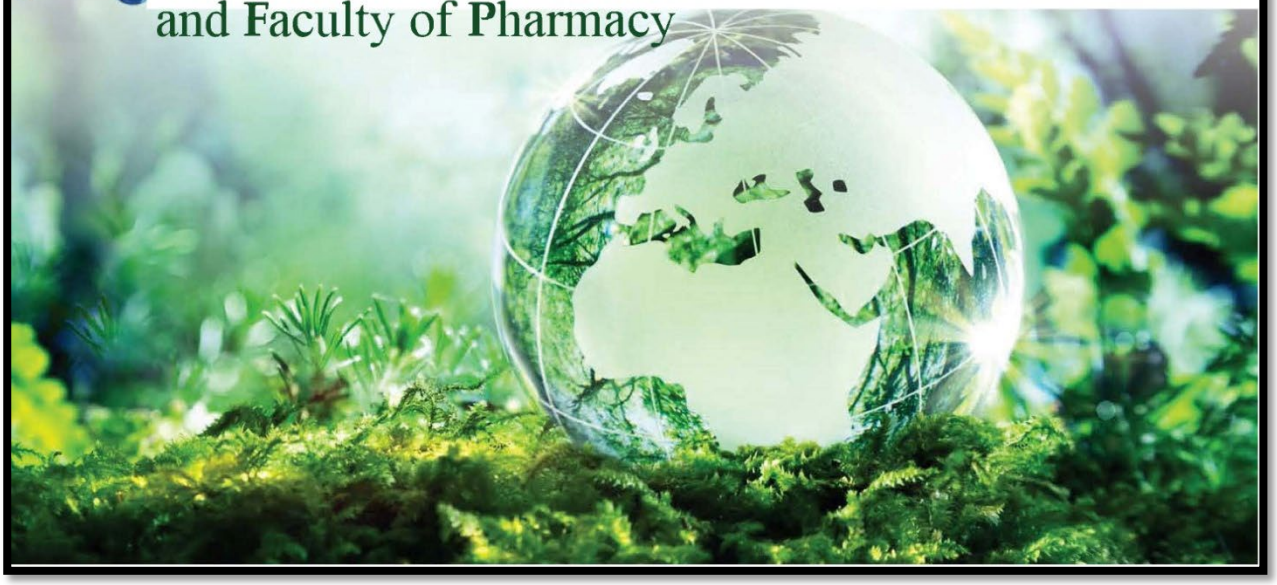
ON

PHARMACEUTICAL SCIENCES: NEW PARADIGMS

02-03 March 2023

Jointly Organized By

Integral Centre of Excellence for Interdisciplinary Research(ICEIR) and Faculty of Pharmacy



About the University :

Integral University is a premier university situated in Lucknow, the capital city of the largest state of India, Uttar Pradesh. It was established under Act Number 9 of 2004 by the State Government. The University is duly approved by the University Grants Commission (UGC) under sections 2(f) and 12B of the UGC Act, 1956 and all relevant statutory bodies. In the recent past, the University has been a recipient of several prestigious awards in the education sector. The university has been accredited A+ by the National Assessment and Accreditation Council (NAAC). The University offers diploma, undergraduate, postgraduate and doctoral programs in all prominent fields like Pharmacy, Engineering, Sciences, Health & Medical Sciences, Commerce & Management, Computer Applications, Agriculture, Law, Architecture & Planning, Education, Library & Information Science and Humanities & Social Sciences. The University offers more than 240 programs across 47 disciplines, and currently hosts around 11000 students at its 120-acre campus. In a lush green, safe, serene and ragging-free environment, the campus provides state-of-the-art hostel accommodation, with the capacity to host 2600 students in the hostels and houses a 550- bedded hospital, as part of the Medical College, with state-of-the-art medical facilities, and more than 200 doctors. The grand Central Library of the University holds more than 100,000 books and several hundreds of journals and magazines. The University currently hosts students from more than 20 countries. Integral University has hosted several diplomats and dignitaries from African and Asian countries and enjoys the trust and support of the embassies on account of its quality education and infrastructure. The guidance and support that the University provides to its students in general and international students in particular, have brought accolades from the diplomatic community and student associations around the world.

About the Department :

The Faculty of Pharmacy offers education for Diploma, Bachelors and Masters Program in Pharmacy apart from a six year degree program leading to Doctor of Pharmacy. Our experienced faculty also guides research scholars pursuing Ph.D. degree in different disciplines of Pharmaceutical Sciences. Novel approaches to treatment of diseases and new medications in the market over the past decade have contributed in a big way in the rapidly growing health care sector. The pharmaceutical industry in India is expected to be worth $130 billion by the year 2030 and a qualified pharmacist finds innumerable job opportunities that no other discipline may offer. As reflected in the University Mission, we are driven by the belief that every student deserves high quality education. The Faculty is part of a comprehensive health sciences campus dedicated to health education, research and patient care. The faculty members care deeply about teaching & mentoring our students employing both traditional and modern methods of teaching and are supported through excellent infrastructure. The highly qualified and experienced staff is committed to impart the knowledge and skills in diverse fields like drug design, drug development, natural product research and pharmacy practice to prepare future health care leaders

About the Conference :

Pharmaceutical sciences have been evolving rapidly in recent years. The focus has shifted from traditional drug discovery and development to more innovative approaches that are aimed at improving patient outcomes. The goal of the conference is to bring together academicians and researchers from all areas of pharmaceutical sciences and other related fields and to provide a potential platform for exchanging and updating knowledge in pharmaceutical and health sciences research and innovation. It will include exciting scientific programs that will cover all aspects of pharmaceutical sciences from basics to their applications. The conference will also give attendees a clear knowledge of the problems by advance pharmaceuticals, as well as potential solutions. It will be an excellent forum for students, postdoctoral fellows, established scientists, faculties, and industry delegates from India and abroad, to exchange ideas and expand their knowledge. It will be an excellent occasion to meet researchers from India and across the globe and will provide a platform to widen professional contact and create new opportunities, including establishing new collaborations. This strategic conference will provide in-depth presentations and interactive sessions, for the possibility to network with like-minded professionals and discuss how to overcome the current challenges in pharmaceutical sciences. The conference shall have oral and poster presentation sessions from the academic, industry delegates and researchers.

Sub-themes of the Conference:

- Nanocarrier mediated targeted drug delivery
- Newer screening tools and alternatives to animal models
- Drug safety and sustainable health
- Drug designing for newer targets

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Integral University, Lucknow	Integral University, Lucknow	Integral University, Lucknow	Integral University, Lucknow	Integral University, Lucknow

INVITED SPEAKERS/RESOURCE PERSONS

- **Dr. Gaurav Kaithwas,** Dean, Faculty of Pharmacy, BBAU, Lucknow, India
- **Mr. S. Uday Kumar,** Founder, VRise Therapeutics Inc., Cambridge, Massachusetts, USA
- **Dr. Shahid Karim,** Associate Professor, Department of Clinical Pharmacy, KAA University, KSA
- **Dr. Vivek Gupta,** Associate Dean for Graduate Education & Research, College of Pharmacy & Health Sciences, St. John's University, USA
- **Dr. Saurabh Arora,** Managing Director, Auriga Research, New Delhi, India

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- Prof. G.D. Gupta, Director, IFS Moga, Punjab
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- Prof. Kamla Pathak, Dean, UPUMS, Saifai
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- Prof. M. Shahar Yar, SPER Jamia Hamdard, New Delhi
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- Prof. Abul Kalam Najmi, SPER, Jamia Hamdard, New Delhi
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- Prof. Munira Momin, Principal SVKM's Dr. Bhanuber Nanavati, College of Pharmacy Mumbai
- Prof. Amit Bhatia, Head, Department of Pharmaceutical Sciences and Technology, MRSPTU, Bathinda, Punjab
- Prof. Mumtaz Alam, SPER, Jamia Hamdard, New Delhi
- Dr. Shaquiquzzaman, Asso. Professor, SPER, Jamia Hamdard, New Delhi
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- Prof. Mohd Mujeeb, SPER, Jamia Hamdard, New Delhi
- Prof. Md. Salahuddeen, Principal, Al-Ameen College of Pharmacy, Bangalore
- Prof. Deependra Singh, Chairman ERC, PCI
- Dr. Sheelendra Pratap Singh, Sr. Scientist, IITR, Lucknow
- Prof. Rohit Dutt, President, APTI, North Zone
- Prof. Pranay Wal, Dean, Faculty of Pharmacy , PSIT, Kanpur
- Prof. Akash Ved, Associate Dean, AKTU, Lucknow
- Dr. D.U Bawarkule, Principal Scientist, CIMAP, Lucknow
- Dr. Sharad Shrivastava, Sr. Principal Scientist, NBRI, Lucknow
- Prof. Sanju Nanda, Dean, Faculty of Pharmacy, MDU, Rohtak
- Dr. Shashyendra Singh Gautam, Principal Scientist, Biocon-Bristol-Myers Squibb Research Centre, Bangalore
- Prof. Anuradha Mishra, Director, Amity institute of Pharmacy, Amity University, Lucknow
- Prof. Sanjula Baboota, Founder Member The Health IQ Intelligent Healthcare Solutions, Seattle, USA
- Prof. Syed Shadab Raza, Era Medical University, Lucknow
- Dr. Anurag Mishra, Director, Shree Krishna College of Pharmacy, Sitapur

This conference is an inclusive platform designed to facilitate the exchange of knowledge, ideas, and innovations in the field of drug development and drug delivery. We welcome a diverse range of participants who play pivotal roles in shaping the future of pharmaceuticals. The conference is valuable for Researchers and Scientists, Pharmaceutical Industry Professionals, Academic Scholars and Educators, Students, Sponsors and Exhibitors and International Delegates. The registration link and fee details are as under.

WHO SHOULD ATTEND

REGISTRATION LINK : https://www.iul.ac.in/FrmAdvProgramReg.aspx

Send the abstract (about 250 words) for oral /poster presentation by 01 February to: icnpps23@iul.ac.in

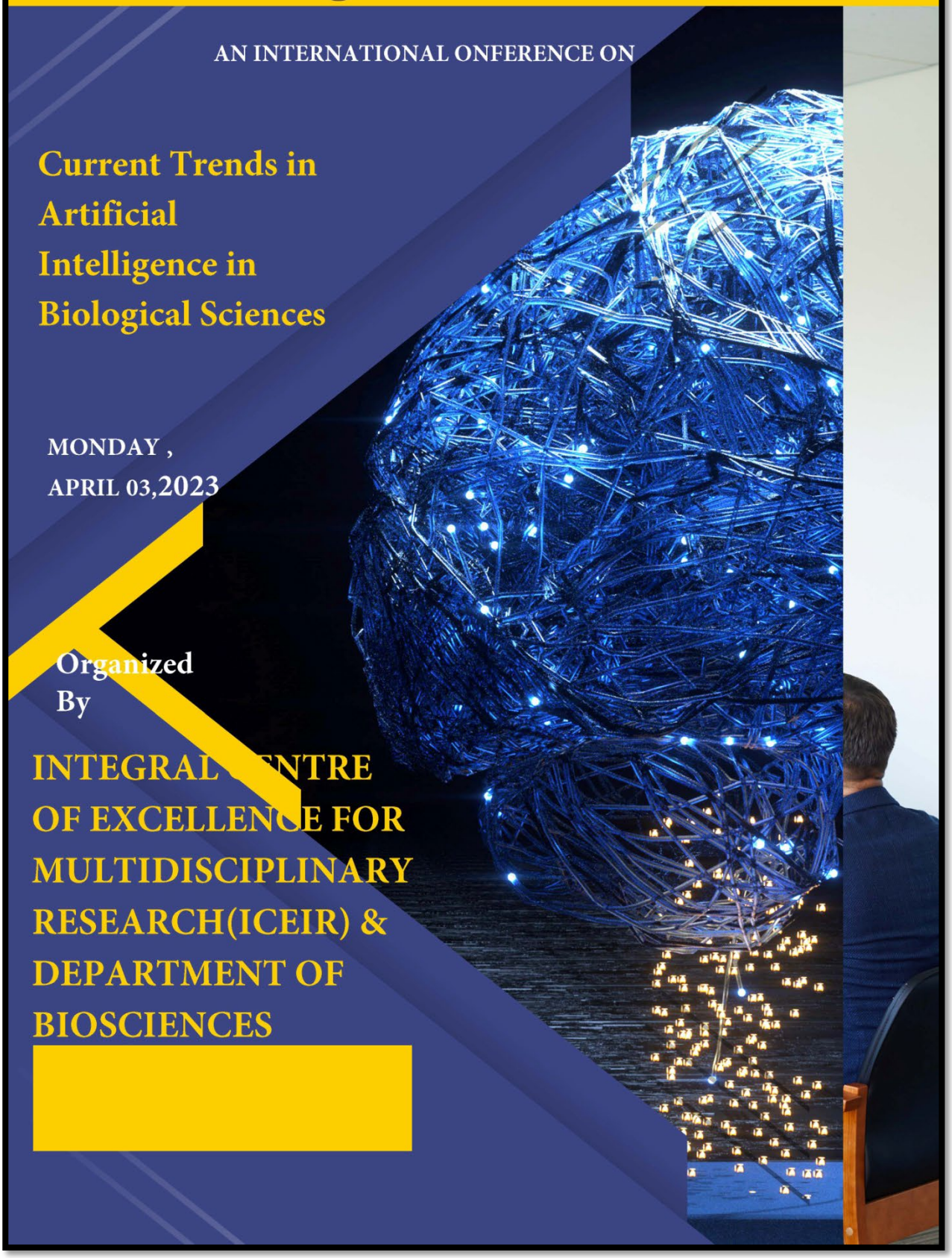
Category	Fee before 20th Feb, 2023		Fee after 20th Feb, 2023	
	National (INR)	International (USD)	National (INR)	International (USD)
Students/ Research Scholars	1,500/-	100/-	2,000/-	100/-
Faculty Members	2,000/-	100/-	2,500/-	100/-
Industry Delegates	3,000/-	150/-	3,500/-	150/-

SCAN QR CODE FOR REGISTRATION

INTEGRAL UNIVERSITY

AN INTERNATIONAL ONFERENCE ON

Current Trends in Artificial Intelligence in Biological Sciences



MONDAY ,
APRIL 03,2023

Organized
By

INTEGRAL CENTRE OF EXCELLENCE FOR MULTIDISCIPLINARY RESEARCH(ICEIR) & DEPARTMENT OF BIOSCIENCES

INTEGRAL UNIVERSITY

ABOUT THE UNIVERSITY

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ABOUT THE DEPARTMENT

The Department of Biosciences at Integral University serves as a hub for research and educational endeavors aimed at fostering a multidisciplinary understanding of modern biology. The Department has garnered recognition for its receipt of extramural grants from esteemed funding agencies such as DST, DBT, ICMR, and UP-CST, which have been instrumental in bolstering its research infrastructure. Supported by the DST-FIST grant, the department has successfully enhanced its instrumentation facility. Research within the Department spans various critical areas including Clinical Biochemistry, Cancer Biology, Nanomedicine, Neurobiology and Molecular Immunology. Notably, students have excelled in competitive examinations such as NET/GATE and have pursued training, including doctoral and post-doctoral studies, at prestigious institutions both nationally and internationally.

ABOUT THE CONFERENCE

The conference on "Current trends in Artificial Intelligence in Biosciences" serves as a platform to explore the profound impact of Artificial Intelligence (AI) on advancing research, innovation, and discovery in various domains of biological sciences. With the rapid evolution of AI technologies, researchers are harnessing its power to revolutionize traditional approaches in genomics, drug discovery, healthcare, agriculture, and environmental conservation. By integrating AI algorithms, machine learning, and big data analytics, scientists can unravel complex biological phenomena, accelerate data analysis, and make novel discoveries that were previously unattainable. This conference aims to delve into the synergistic relationship between AI and biological sciences, fostering interdisciplinary collaboration, and paving the way for transformative breakthroughs that address critical challenges in human health, agriculture sustainability, and environmental conservation.

APPLICATIONS OF AI IN THE LIFE SCIENCES

1. Machine Learning and Deep Neural Networks
2. Medical Imaging and Diagnostics
3. Protein Decoding and Drug Discovery
4. Environmental Monitoring and Conservation
5. Genomics and Personalized Medicine
6. Epidemiology and Public Health
7. Neuroscience and Brain Mapping
8. Agriculture and Crop Science
9. Microbiome Research
10. Evolutionary Biology and Phylogenetics

EVENT HIGHLIGHTS

- Keynote speeches by renowned experts.
- Presentations on recent breakthroughs in biological sciences.
- Opportunities for networking and collaboration.
- Exhibition showcasing cutting-edge research through Poster Presentation.

WHO SHOULD ATTEND THE CONFERENCE

- Researchers and scientists in the field of biological sciences.
- Academicians and students pursuing microbiology, biotechnology, biochemistry and related disciplines.
- Industry professionals interested in exploring the role of AI in biological sciences
- Anyone passionate about the intersection of artificial intelligence, biological sciences, and their recent advancements.


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