National Centre for Cell Science

Annual Report 2023-24

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Part A: Overview

The National Centre for Cell Science (BRIC-NCCS), located in Pune, is a premium research organization in India that has been contributing to the nation's excellence in biomedical science via cutting-edge multidisciplinary research in cell biology. The objective of our research is to contribute towards improving diagnostic methods, treatment regimens and disease management strategies by understanding the nuances of the cellular and molecular underpinnings of various human diseases and disorders. Our research is aligned with global sustainable development goals, and is especially focused on addressing national needs related to human health.

BRIC-NCCS offers many services that facilitate high quality research at organizations across India. We serve as a national cell repository for animal cell cultures, which are provided to researchers from academia and industry. Therefore, a significant proportion of cell biology research in India relies on our repository, and is also supported by the training on cell culture technology that is routinely provided by us. Several other services are also offered by our central facilities with cutting-edge research tools. The National Centre for Microbial Resource (NCMR) project of BRIC-NCCS serves as a national depository for microorganisms, and provides microbial cultures and related services.

BRIC- NCCS contributes to capacity building of the nation through several teaching, training & outreach activities that benefit students, researchers & academicians, as well as the public at large. These include the Ph.D. program, project and summer research training, internships, workshops, support provided to postdoctoral researchers, and public engagement initiatives.

Part B:

1. Mandate:

BRIC-NCCS was established with a mandate of three main objectives as listed below:

i. To serve as a national cell repository.
ii. Research in cell biology.
iii. Human resource development.

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2. Research focus:

The research at BRIC-NCCS is aimed at addressing challenging questions about human health, especially those related to cancer, metabolic disorders like diabetes, infectious diseases, functioning of the immune system, stem cell biology and tissue regeneration, neurobiology, and the human microbiome in health and disease. This research encompasses diverse interdisciplinary areas, as illustrated below, through the use of cutting-edge approaches in cell biology, including structural biology, bioinformatics, systems biology, proteomics, metabolomics, and metagenomics.

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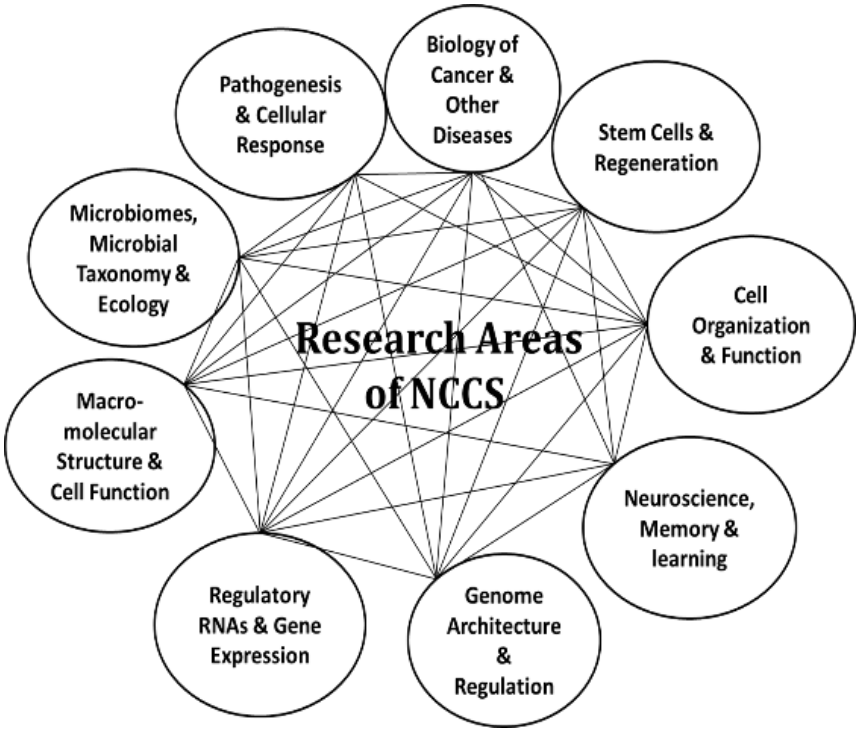
3. **Research Areas of BRIC-NCCS:**

Twenty-one research groups at BRIC-NCCS work in one or more of the following areas:



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4. **Key research highlights**

A] PUBLICATIONS

Some major research outcomes are summarized below

3D CP/Col-I composite scaffolds that mimic bone tissue and promote stem cell growth were successfully created in the laboratory by Dr. Nibedita Lenka and her team, using calcium phosphate (CP) and collagen type I (Col-I). These scaffolds were characterized, and their potential in osteoinduction and bone tissue engineering was demonstrated. These scaffolds could be developed further for application in bone grafts for patients with bone defects or injuries. These findings were published in the journal, 'RSC Advances'.

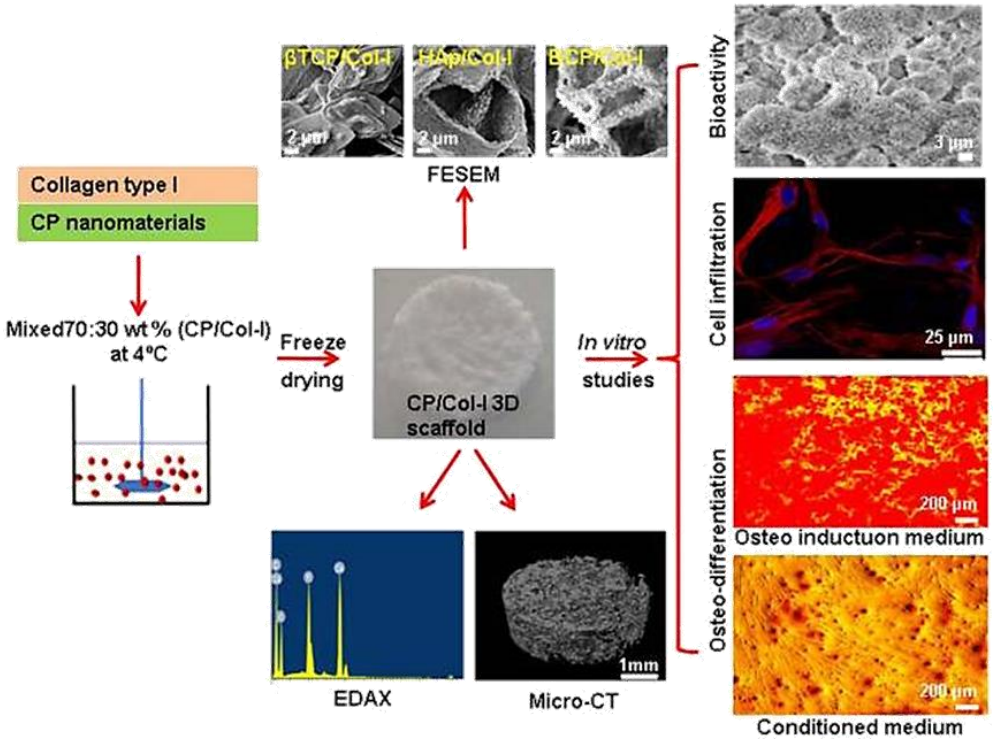

Figure 1: 3D scaffolds fabricated from ceramic-polymer composite that mimic bone tissue facilitates/promotes mesenchymal stem cell growth, infiltration and osteogenic differentiation. Source of the graphical abstract - DOI: 10.1039/d3ra04360f

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A different RNA species called chimeric transcripts (CTs) were investigated by Dr. Sharmila Bapat and her team in ovarian cancer samples, to understand how genes combine in unique ways to generate variability in biological systems. The diverse range of CTs that they discovered sheds light on the complexity of cancer cells. These insights into the potential impact of CTs on the survival and evolution of cancer cells could guide the diagnostic and therapeutic strategies for ovarian cancer in the future. These findings were published in 'Computational and Structural Biotechnology Journal'.

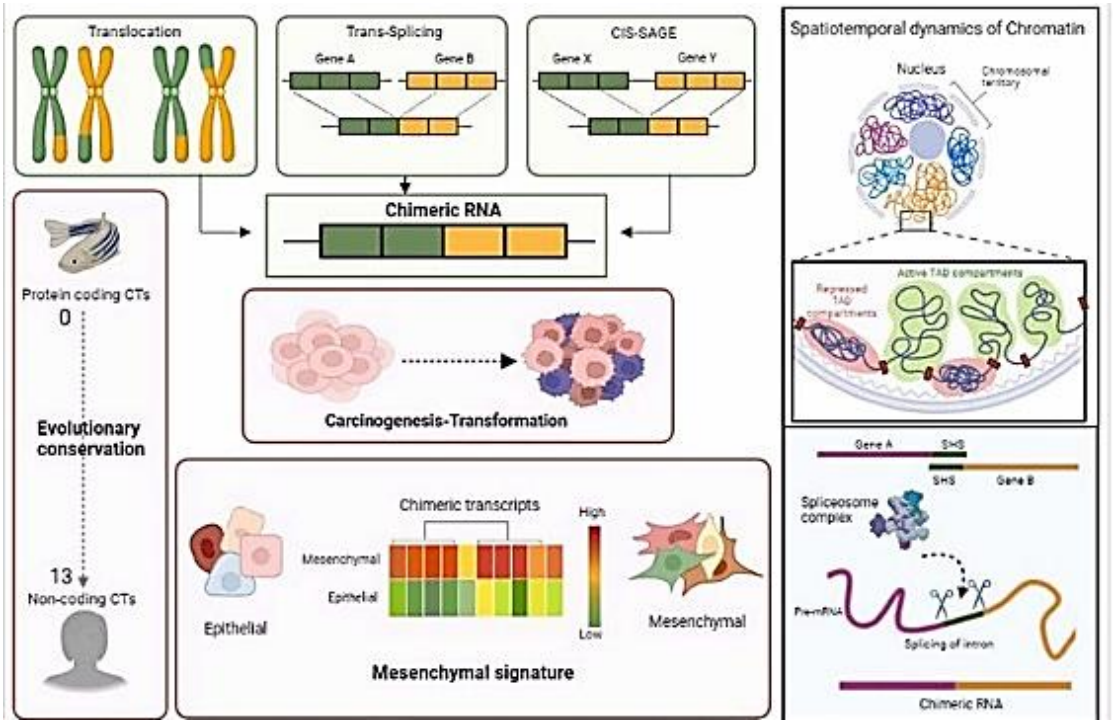

Figure 2: Identification of a diverse range of chimeric transcripts (CTs) reveals the complexity of ovarian cancer cells. Source of the graphical abstract - DOI: 10.1016/j.csbj.2023.10.028

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Dr. Shailza Singh and team explored the influence of two proteins, IL-6 and IL-17, and the intricate signaling pathways influenced by them, on lung cancer. These studies revealed that they play a role in promoting inflammation in the lungs, which can contribute to the development and progression of cancer. This research sheds light on potential druggable targets that could help develop new therapeutic approaches for non-small cell lung cancer. These findings were published in the 'International Journal of Molecular Sciences'.

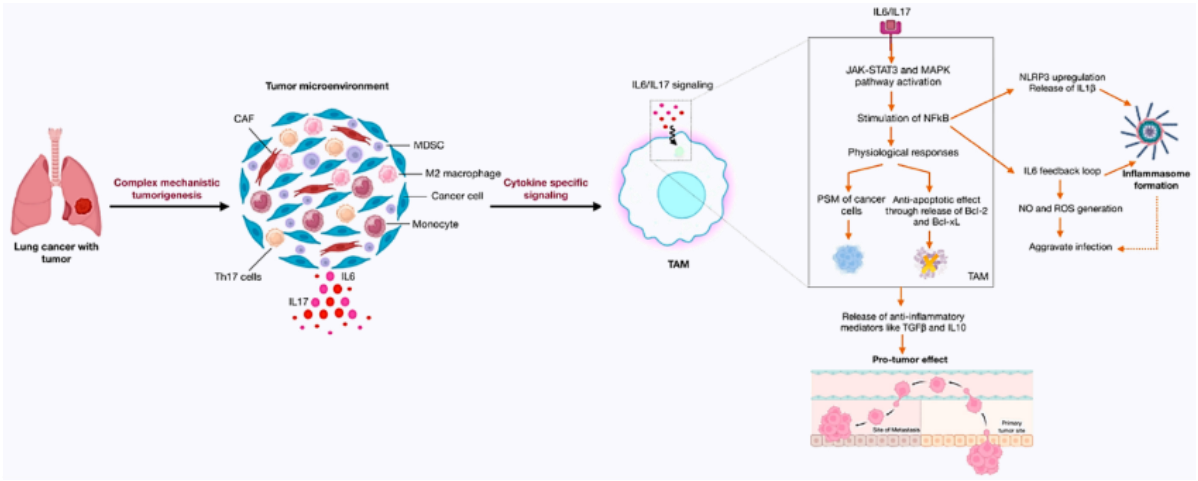

Figure 3: The effects of proteins IL-6 and IL-17, and the intricate signaling pathways influenced by them, on lung cancer. Source of the graphical abstract - DOI: 10.3390/ijms25021216

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Dr. Girdhari Lal and team investigated how neurons in the central nervous system (brain and spinal cord) die in neuronal autoimmune diseases. The studies revealed how pathogenic immune cells, called Th17 cells, damage the blood-brain barrier in the central nervous system (CNS) and promote the death of nerve cells. These findings help us understand cellular and molecular details of CNS autoimmunity and offer valuable clues for developing novel therapies to combat the disease and safeguard nerve cells. They were published in the journal, ‘Clinical Immunology’.

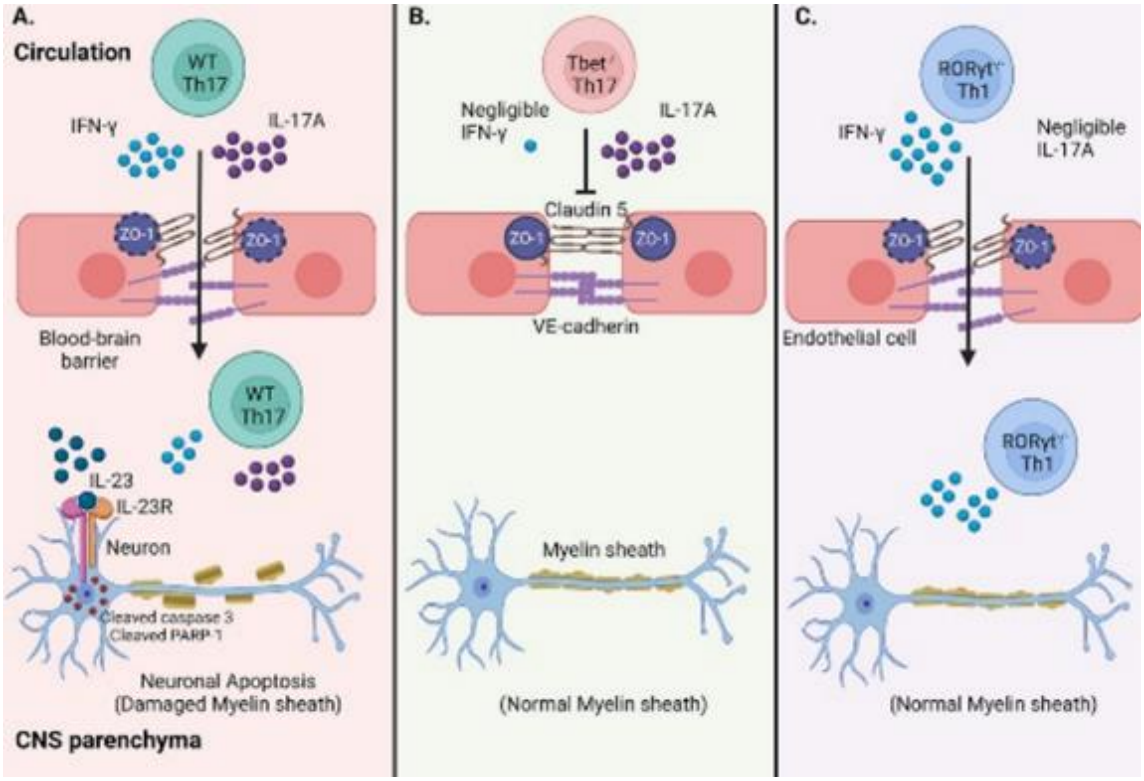

Figure 4: Th17 cells promote programmed cell death of IL-23R+ neurons in experimental autoimmune encephalomyelitis. Source of the graphical abstract - DOI: 10.1016/j.clim.2024.109898

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Dr. Manas Kumar Santra and his team investigated the role of a protein called FBXW2 in breast cancer. The study found that FBXW2 can regulate the activity of other proteins involved in cancer progression, such as Moesin. The identification of these molecular players and how they function inside the cell provide valuable insights into

how breast cancer develops and spreads, thus providing potential targets for new and more effective treatments for breast cancer. This research brings us closer to developing better therapies that could improve the outcomes for people with breast cancer. These findings were published in the journal, Cell Death and Disease (DOI: 10.1038/s41419-023-06127-x).

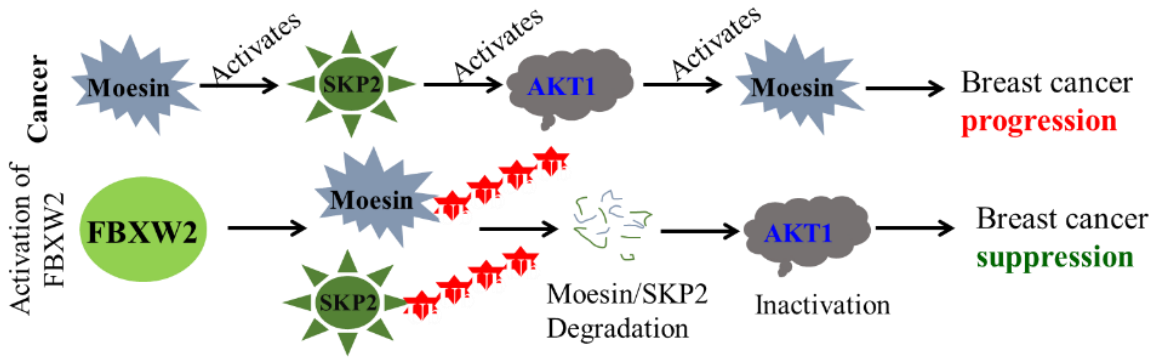

Figure 5: Protein FBXW2 suppresses breast cancer progression by regulating the AKT-Moesin-SKP2 pathway. (The infographic was provided by Dr. Manas Kumar Santra)

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Through a collaborative endeavour by a multidisciplinary group of researchers that included Dr. Nibedita Lenka of BRIC-NCCS, nanofibrous scaffolds were created using keratin from human hair, which showed a unique structure suitable for engineering skin tissue. The biocompatibility of these scaffolds, and their potential for promoting cell growth were confirmed by testing them with different cell types. Moreover, the arrangement of keratinocytes and dermal fibroblasts grown together on a 3D scaffold mimicked their native alignment seen in skin. This research opens up new possibilities for developing keratin-based materials that could be used for skin injuries and tissue regeneration. These findings were published in the journal. 'Drug Delivery and Translational Research'.

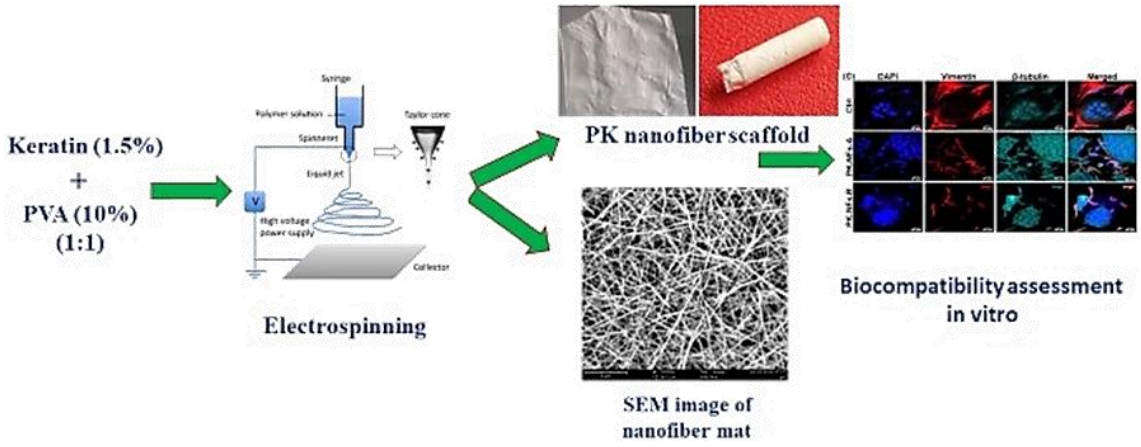

Figure 6: Human hair keratin-based nanofibrous scaffold for application in skin tissue engineering. Source of the graphical abstract - DOI: 10.1007/s13346-023-01396-7

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Kainate receptors are molecules that play key roles in the central nervous system. Different forms of this molecule have been identified in the brain, among which the 'GluK1-1' variant is abundant in the adult brain. It has fifteen extra amino acids inserted in a certain part of the molecule called the amino-terminal domain (ATD), which results from a specific step, the alternative splicing of exon 9. Dr. Janesh Kumar and his team discovered that this small change in a brain receptor, resulting from the exon 9 splice insert, can change the behaviour of the receptor, affecting how it responds to signals in the brain. The study emphasizes the need to investigate all possible variations of this receptor molecule, in order to gain a more comprehensive understanding of their distribution and functional diversity. This would prove valuable to design rational therapeutic approaches for disorders involving kainate receptors.

B] PATENTS

I] Patent Applications Filed: **3** (Europe, USA and India)

a) TITLE: Novel combination of serotonin receptor (5-HTR-2b) antagonist and an immunomodulator and chemotherapeutic drugs for inhibition of cancer
Date of filing: 29.03.2024
Application No. (Europe): 22 875 346.3 Application No. (USA): 18/696,916

b) TITLE: Method of screening compounds for assessing endocytic activity in the context of neurodegenerative disorders
Date of filing: 27.06.2023 Application No. (India): 202321043056

II] Patents Granted: **3** (1 in Japan + 2 in India)

a) TITLE: DAF-MCP chimeric protein, process to manufacture the same and use of the chimeric protein for treating pathological conditions involving the complement system
Date of grant: 27.02.2024 Japanese Patent No.: 7444968

b) TITLE: Stable nanoparticles and its pharmaceutical composition
Date of grant: 17.10.2023 Indian Patent No.: 459538

c) TITLE: Method for preparing drug loaded- fluorescent gqds embedded mesoporous silica nanostructure for tumor ablation

Date of grant: 09.08.2023 Indian Patent No: 444111

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C] HUMAN RESOURCE DEVELOPMENT AND CAPACITY BUILDING

Over 450 people received research-related training through various initiatives of DBT-NCCS, including the academic programmes, training workshops and participation in extramurally-funded research projects, as listed below:

Students pursuing a PhD at NCCS (as on 31 March 2024):	110
Students who were awarded a PhD degree:	18
Beneficiaries of the PhD coursework:	56
Indian Science Academies' Summer Trainees	35
Project trainees trained:	95
Postdoctoral researchers supported:	10
International student hosted under the DBT UNESCO – TWAS Sandwich Post Graduate Fellowship:	1
Students who received financial support from NCCS to participate in national and international conferences and workshops:	19
Project staff who received research training via extramurally-funded projects:	97
Participants of two workshops conducted by the cell repository	42

Additionally, the proteomics central facility was upgraded by installing a 6600 Triple TOF High Resolution LC-MS/MS System with a 6500 QTRAP LC-MS/MS system, under the Pune BioCluster project, which will augment proteomics research in India.

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5. List of publications

- Aadil et al., 2023. Drug Delivery and Translational Research. doi: 10.1007/s13346-023-01396-7
- Ahmed et al., 2024. Digestive & Liver Disease. doi: 10.1016/j.dld.2023.10.014
- Bandyopadhyay et al., 2023. Human Immunology. doi.org/10.1016/j.humimm.2023.08.142
- Banerjee et al., 2023. Cancer Biology & Medicine. doi: 10.20892/j.issn.2095-3941.2022.0714
- Bahir et al., 2023. RSC Advances. doi: 10.1039/d3ra04360f
- Barik et al., 2023. Cell Death & Diseases. doi: 10.1038/s41419-023-06127-x
- Bhadane et al., 2023. Cellular Signalling. doi: 10.1016/j.cellsig.2023.111008
- Bhatt et al., 2024. Archives of Microbiology. doi: 10.1007/s00203-024-03881-0
- Bhawna et al., 2023. Process Biochemistry. doi: 10.1016/j.procbio.2023.03.009
- Bodhale et al., 2023. European Journal of Immunolgy. doi: 10.1002/eji.202350430
- Butti et al., 2023. Oncology Report. doi: 10.3892/or.2023.8536
- Chandwani et al., 2023. Journal of Applied Microbiology. doi: 10.1093/jambio/lxad066
- Chopra et al., 2023. World Journal of Microbiology & Biotechnology. doi: 10.1007/s11274-023-03608-1
- Chauhan et al., 2023. Biodiversity. doi: 10.1080/14888386.2023.2257637
- Chauhan et al., Cold adapted Pseudomonas: ecology to biotechnology. Frontiers in Microbiology: Sec. Extreme Microbiology, July 2023, 14: 1218708. doi: 10.3389/fmicb.2023.1218708
- Chaudhari et al., 2023.International Microbiology.doi:10.1007/s10123-022-00297-y
- Choudhari et al., 2023. Journal of Ethnopharmacology. doi: 10.1016/j.jep.2023.116472
- Chowdhury et al., 2023. Cytokine. doi: 10.1016/j.cyto.2023.156373

- Dasila et al., 2024. Brazilian Journal of Microbiology. doi: 10.1007/s42770-024-01259-4
- Dewala et al., 2023. Journal of Bioscience. doi: 10.1007/s12038-023-00337-3
- Dey et al., 2023. Journal of Medicinal Chemistry. doi: 10.1021/acs.jmedchem.3c00368
- Dhat et al., 2023. Epigenetics & Chromatin. doi: 10.1186/s13072-023-00489-4
- Dhingra et al., 2023. eLife. doi: 10.7554/eLife.89755.3
- Fernández-García et al., 2023. Journal of Proteome Research. doi: 10.1021/acs.jproteome.2c00845
- Gaike et al., 2023. FEMS Microbiology Letters. doi: 10.1093/femsle/fnad116
- Ghosh et al., 2024. Immunology. doi: 10.1111/imm.13702
- Ghumnani et al., 2023. Phytomedicine Plus. doi: 10.1016/j.phyplu.2023.100429
- Giram et al., 2024. ACS Omega. doi: 10.1021/acsomega.3c07833
- Guhe et al., 2023. Frontiers in Molecular Biosciences. doi: 10.3389/fmolb.2023.1113249
- Guhe and Singh, 2024. ChemMedChem. doi: 10.1002/cmdc.202300679
- Gujjar et al., 2024. Advanced Biology. doi: 10.1002/adbi.202300349
- Gulhane and Singh. 2023. Translational Oncology. doi: 10.1016/j.tranon.2023.101673
- Gupta et al., 2023. Environmental Monitoring and Assessment. doi: 10.1007/s10661-023-11507-z
- Hussain et al., 2024. International Journal of Antimicrobial Agents. doi: 10.1016/j.ijantimicag.2024.107091
- Jafarzadeh et al., 2023. Cytokine. doi:10.1016/j.cyto.2023.156461
- Jha et al., 2024. International Immunopharmacology. doi:10.1016/j.intimp.2024.111589
- Jiya et al., 2023. Archives of Microbiology. doi:10.1007/s00203-023-03757-9
- Jiya et al., 2023. Polar Science. doi:10.1016/j.polar.2023.100973
- Jiya et al., 2024. Current Science. doi:10.18520/cs/v126/i5/562-568
- Joseph et al., 2023. Environmental Monitoring and Assessment. doi:10.1007/s10661-023-12023-w
- Kadam et al., 2024. Bioresource Technology. doi:10.1016/j.biortech.2023.130016
- Kadam et al., 2024. Bioremediation Journal. doi:10.1080/10889868.2023.2269193
- Karmakar et al., 2024. Journal of Leukocyte Biology. doi:10.1093/jleuko/qiad126
- Khandibharad and Singh, 2024. Frontiers in Microbiology Sec. Infectious Agents and Disease. doi:10.3389/fmicb.2024.1338749
- Khandibharad and Singh, 2024. Microbiolgy Specturm. doi: 10.1128/spectrum.03478-23
- Khandibharad and Singh, 2023. Bioinformatics Advances. doi:10.1093/bioadv/vbad125
- Khan et al., 2023. Frontiers in Veterinary Science. doi: 10.3389/fvets.2023.1149876
- Khilwani and Singh, 2023. Biomedicines. doi:10.3390/biomedicines11102706
- Khilwani and Singh, 2024. International Journal of Molecular Science. doi:10.3390/ijms25021216
- Kiran et al., 2023. Animal Biotechnology. doi:10.1080/10495398.2021.1976198
- Kumar et al., 2023. Citokine. doi:10.1016/j.cyto.2023.156475
- MV Vijayakumar, 2024. Journal of Scientific & Industrial Research. doi: 10.56042/jsir.v83i3.4610
- Maity et al., 2023. Bioessays. doi:10.1002/bies.202300035
- Mallu et al., 2023. Immunology. doi:10.1111/imm.13652
- Mann et al., 2024. Molecular Biology of the Cell. doi:10.1091/mbc.E23-08-0337
- Marta et al., 2023. Immunology. doi:10.1111/imm.13686
- Mayengbam et al., 2023. Cancer & Metabolism. doi:10.1186/s40170-023-00315-1
- Mehta et al., 2023. Wellcome Open Research. doi: 10.12688/wellcomeopenres.17853.2
- Mishra et al., 2023. Extremophiles. doi:10.1007/s00792-023-01323-1
- Mishra et al., 2023. Inorganic Chemistry. doi:10.1021/acs.inorgchem.3c00272
- Mitra et al., 2024. Archives of Biochemistry and Biophysics. doi:10.1016/j.abb.2024.109947
- Mukherjee et al., 2023. Microbiology Spectrum. doi: doi:10.1128/spectrum.05028-22
- Nair et al., 2023. Journal of Cell Communication and Signaling. doi:10.1007/s12079-023-00747-w
- Nair et al., 2023. Kinases and Phosphatases. doi:10.3390/kinasesphosphatases1020007
- Nimonkar et al., 2024. Indian Journal of Microbiology. doi:10.1007/s12088-023-01179-1
- Nimonkar et al., 2023. Microbiology Resource Announcements. doi: doi:10.1128/mra.00307-23

- Pal et al., 2023. Immunobiology. doi:10.1016/j.imbio.2023.152663
- Parveen et al., 2024. International Immunopharmacology. doi:10.1016/j.intimp.2024.111644
- Prakash et al., 2023. IJSEM. doi:10.1099/ijsem.0.005500
- Prakash Om et al., 2024. Frontiers in Microbiology: Sec. Biology of Archaea doi:10.3389/fmicb.2023.1273037
- Rambia et al., 2023. International Microbiology. doi:10.1007/s10123-023-00430-5
- Rekadwad et al., 2023. Biotech. doi:10.1007/s13205-023-03733-6
- Sharma et al., 2023. Immunobiology. doi:10.1016/j.imbio.2023.152656
- Shrivas et al., 2023. International Microbiology. doi:10.1007/s10123-023-00396-4
- Singh et al., 2024. Star Protocol. doi: 10.1016/j.xpro.2024.102870
- Singh et al., 2023. Water, Air, & Soil Pollution. doi:10.1007/s11270-023-06479-2
- Sonar et al., 2024. Clinical Immunology. doi 10.1016/j.clim.2024.109898
- Sridhar et al., 2023. Computational and Structural Biotechnology Journal. doi: 10.1016/j.csbj.2023.10.028
- Sukanya et al., 2024. Frontiers in Immunology. doi: 10.3389/fimmu.2023.1303959
- Soy et al., 2023. Scientific Report. doi:10.1038/s41598-023-41515-5
- Swain et al., 2023. Journal of Biomolecular Structure and Dynamics. doi:10.1080/07391102.2023.2259487
- Syamprasad et al., 2023. Chemico-Biological Interactions. doi:10.1016/j.cbi.2023.110566
- Tamahane et al., 2023. Journal of Diabetes. doi:10.1111/1753-0407.13438
- Taunk et al., 2023. Methods. doi:10.1016/j.ymeth.2023.10.011
- Thite et al., 2023. Antonie Van Leeuwenhoek. doi:10.1007/s10482-023-01872-7
- Tripathi et al., 2023. FEBS Letters. doi: 10.1002/1873-3468.14772
- Upreti et al., 2023. Chemical Engineering Journal. doi:10.1016/j.cej.2023.142738
- Utage et al., 2023. Journal of Traditional and Complementary Medicine. doi:10.1016/j.jtcme.2023.06.003
- Venkatesan et al., 2024. Journal of the Mechanical Behavior of Biomedical Materials. doi:10.1016/j.jmbbm.2023.106210
- Wadhwa et al., 2024. Indian Journal of Medical Research. doi: 10.4103/ijmr.ijmr_1041_23
- Yadav et al., 2024. Archives of Microbiology. doi:10.1007/s00203-023-03794-4
- Yadav et al., 2023. iScience. doi: 10.1016/j.isci.2023.108304

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6. Awards and Honours

Faculty

- Dr. Shailza Singh: Elected as Fellow of the Royal Society of Chemistry (FRSC), London, UK, for her contributions in chemical sciences; February 2024.
- Dr. Janesh Kumar: S. Ramachandran National Bioscience Award for Career Development' awarded by DBT.
- Dr. Dhiraj Dhotre: Regional Young Investigators' Meeting Grant (RYIM Pune, 2023-2024) awarded by IndiaBioscience.
- Dr. Girdhari Lal: Travel Grant from the American Association of Immunologists (AAI), USA, to present a paper at the 18th International Congress of Immunology (IUIS2023), Cape Town, South Africa; 27 November - 02 December 2023.

Students

- Two students won awards at the 46th All India Cell Biology Conference of the Indian Society of Cell Biology, TMC-ACTREC, Navi Mumbai (10-12 January 2024):
  - Lizanne Oliveira: Springer Nature Award for Oral Presentation.
  - Akshay Lonare: Prof. S R V Rao Best Poster Award
- Two students won awards at the International Conference on 'Biology Beyond Boundaries: Mitochondrial Insights, Computational Breakthroughs, and Clinical Transformations', S. P. Pune University, Pune, India; 29-31 January 2024:
  - Amruta Jadhav: 1st prize for oral presentation
  - Aravindan Narayanan: 3rd prize for poster presentation.
- Fatima Munavar: 2nd Prize for Oral Presentation at the DBT, SERB and CSIR-sponsored 'International Conference on Advances in Biotechnology: Current Discoveries and Future Perspectives' (ICAB- 2023), Mumbai; 17–18 October 2023.
- Three students received honours at the International Conference on 'Integrated Proteomics: Applications in Food, Nutrition and Health' organized by the Proteomics Society, India, at NIPGR, New Delhi; 20-22 November 2023:
  - Sadanand Bhanuse: Proteomics Society of India (PSI) Springer Nature Best Poster Award.
  - Mahima Choudhari: Travel Award to present a poster.
  - Praneeta Bhavsar: Selection of abstract for an oral presentation.
- Souparni Ghosh: Second Best Poster Presentation Award awarded by the Society of Inflammation Research (SIR) at the SIRCON 2023 conference at Indian Institute of Science, Bangalore; 17 September 2023.
- Mahima Choudhari: 2nd Prize for E-poster at the Indian Myeloma Congress, 6th Annual meeting of IMAGe, Pune, India (12 - 14 January 2024).
- Himanshi Yaduvanshi: 3rd prize in the poster presentation at the I-OSICON-2024 conference organized by the Immune-Oncology Society of India at DBT-NCCS, Pune, India; 12-14 January 2024.
- Radhika Mohandasan: Selected to participate in the Cajal Advanced Neuroscience Training Programme (France; 18 Sep–06 Oct 2023) with full registration fee waiver.
- Namrita Halder: International Travel Award to attend the FOCIS European Advanced Course and Conference on Immunology at Rouen, France (27-31 August 2023).
- Rimpi Saikia: EUR Travel Award to attend the EMBO Workshop on Inter-organelle Contacts Biology at Fiuggi, Italy (01-06 October 2023).
- Praneeta Bhavsar: International Travel Award to attend the 22nd World Congress of the Human Proteome Organization (HUPO 2023) at Busan, South Korea; 17 to 21 September 2023.
- Two students received travel awards to participate in the 18th International Congress of Immunology in Cape Town, South Africa; 27 November – 02 December 2023:
  - Akshata Bammigatti: International Travel Award to present a poster.
  - Surojit Karmakar: International Union of Immunologists (IUIS) Travel Award to present a paper.

- Juhi Yadav: 3rd prize in the Debate Competition in Hindi organized by the Town Official Language Implementation Committee (TOLIC), Pune; 20 April 2023.

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7. Outreach

Over 2000 people benefitted from various outreach initiatives as listed below.

- **IISF 2023 Outreach Event:** Included a popular science talk on 'The History of Biomedical Science in India' by Dr. Shekhar Mande (Honorary Distinguished Scientist, NCCS, and National President, Vijnana Bharati). 03 January 2024.
- **National Science Day Open Day (28 February 2024):** Public talk by Dr. Anand Deshpande (Founder, Chairman and MD of Persistent Systems) on 'Why is a Career in Science in India So Rewarding?' and lab visits.

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<td colspan="2">Public talk by
Dr. Anand Deshpande</td>
<td colspan="2">Lab visits</td>
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- **Human Microbiome Awareness Program:** Microbiome Days for school and college students on three days. Included talks, a panel discussion and a career guidance session, poster competitions and lab visits. 20, 21, 22 February 2024.
- **'Ek Bharat Shrestha Bharat' campaign – Visit by youth from Northeast India** Visit by 50 youth from Assam and five coordinators from the S. P. Pune University, as part of the 'Yuva Sangam Phase III Cultural-Educational Visit' initiative. 23 January 2024.
- **Students' Visits:** Through the year, more than 500 students and educators visited NCCS and toured the central facilities and labs.
- **Science Communication Workshop** organized jointly with the DBT/Wellcome Trust-India Alliance for PhD students and postdoctoral researchers from research and academic institutions in Pune. 20, 21 April 2023.
- **Mini-symposium on 'The Omnipresent Microbes: Revealing their Mystical Life'.** Jointly organized with INYAS New Delhi, and AMI, Pune Unit. 25 May 2023.
- **Outreach at Extramural Science Exhibitions:**
  - **India International Science Festival** at RCB-THSTI, Faridabad. 17-20 January 2024.
  - **Vibrant Gujarat Bharatiya Vigyan Sammelan**, Science City, Ahmedabad. 21-24 December, 2023.
  - **National Technology Week**, New Delhi. 11-14 May 2023.
  - **Global BioIndia**, New Delhi. 4-6 December, 2023.

- **Shining Maharashtra Exhibition** at Phaltan. 19-21 February 2024.

Other extramural outreach included many talks delivered by our faculty members at academic and research institutions.

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8. Research Infrastructure:

The research at BRIC-NCCS is supported by the state-of-the-art central facilities listed below, which are led by faculty members:

• Bio-Imaging Facility	• Scanning Electron Microscope
• Proteomics Facility	• DNA Sequencing
• Flow Cytometry Facility	• In vivo imaging
• Bioinformatics Facility	• Experimental Animal Facility
• X ray Diffraction Facility	• National Cell Repository
• Surface Plasmon Resonance Facility	• National Centre for Microbial Resources

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9. Services offered:

A] National Cell Repository

NCCS facilitated cell biology research across India by providing 4,526 cell cultures to 2,496 users from 549 organizations nationwide. 42 participants (PhD scholars, faculty and technical staff) from 39 institutions across India benefited from two hands-on training workshops on ‘Basic Cell Culture Technology’ organized during this year.

B] Other Central Facilities

The central facilities are used extensively by researchers within and outside BRIC-NCCS. About 6000 internal and external users benefited from the services provided by these central facilities through the year.

C] Contract Research

NCCS offers partnerships with the industry, academia and the medical fraternity via consultancy and technical services, in addition to collaborative research projects. Under these services, BRIC-NCCS was contracted for research by AVES FoodTech Pvt Ltd for lipid analysis.

D] National Centre for Microbial Resources (NCMR)

Three hundred microbial cultures were supplied, microbial isolations were carried out from thirty-one samples, 446 microbial cultures were deposited under the general deposit services, and 12,648 samples were analyzed under the various identification services of NCMR.
