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Editor's Note

Dear Readers,

Welcome to the Twelfth Edition, Vol. 2 of our Newsletter, 'Science and Technology' Pulse.

This edition highlights a series of major government initiatives accelerating India's transition toward a science-driven, innovation-led economy. From Gujarat's new Science, Technology and Innovation (STI) Policy and the national launch of BharatGen to the expansion of MedTech, biotechnology, and AI ecosystems, India is building strong foundations for self-reliance and globally competitive research. Initiatives such as the Science, Technology and Innovation (EIR) Programme, SIDDHI 2.0, and targeted partnerships in pharmacovigilance and CRISPR gene therapy signal a decisive shift towards converting scientific advances into scalable, market-ready solutions.

At the same time, India's global engagement in science and technology continues to deepen. The International S&T Clusters Conference, space-economy reforms, and international collaborations in AI, biotechnology, climate technologies and advanced engineering reflect India's growing influence on global innovation agendas. Strategic programmes such as the national CCUS R&D Roadmap and food-testing infrastructure under PMKSY are also strengthening sector readiness, encouraging private investment and enhancing India's competitiveness in clean energy, sustainability, agri-tech and food-processing industries.

Together, these developments illustrate how policy direction, industrial collaboration and scientific excellence are converging to shape the country's journey toward Viksit Bharat 2047. As India continues to unlock new opportunities across AI, biotech, space, pharmaceuticals, materials and digital technologies, businesses and research institutions stand to benefit from deeper partnerships, stronger R&D ecosystems and a rapidly expanding market for high-value technologies. This edition invites you to explore how these shifts will influence industry strategy, investment priorities and India's emerging leadership in the global science and technology landscape.

I invite readers to delve into the detailed updates across government initiatives, emerging technologies, health sciences, environmental innovation, and space exploration and to reflect on how these shifts can shape strategic choices, business growth, and India's evolving leadership in the global science and technology landscape.

Warm regards,
Abhilasha Nayal

Gujarat Drafts New Science & Technology Policy with Strong Swadeshi Push

Business Impact:
This policy is poised to accelerate technology commercialisation and start-up growth, offering structured funding and infrastructure support to companies in deep tech, biotech, ICT, semiconductors and clean energy. By mandating increased R&D expenditure and promoting science clusters, it encourages industry–academia partnerships, enhances local tech production, and reduces import dependency.

The Gujarat government has prepared a draft Science, Technology and Innovation (STI) Policy 2025–30 designed to make the state a hub for advanced technologies while strengthening indigenous capabilities and self-reliance, in line with the 'Swadeshi' vision. The draft, prepared by the Department of Science and Technology, will replace the 2018 policy and proposes a INR 500 crore innovation fund for researchers, start-ups, academia and industry-led R&D, alongside a INR 1,500 crore corpus under the Viksit Gujarat@2047 initiative to support long-term development goals. The policy prioritises frontier fields such as AI, machine learning, blockchain, 5G-6G connectivity, quantum technologies, biotechnology, clean energy and cybersecurity, while also promoting technology adoption in traditional sectors like chemicals, textiles, engineering and food processing. Plans include the creation of science and technology clusters across cities such as Ahmedabad-Gandhinagar, Vadodara, Surat and Rajkot, and ambitious targets like developing a 100,000-strong skilled scientific workforce by 2030, achieving 1,000 annual IP filings, and raising STI spending to at least 1% of GSDP with all state departments allocating 1% of their budgets to R&D. A single-window digital portal is also planned to ease innovators' access to infrastructure and collaborative opportunities.

In this newsletter you can expect updates from:

- Government Initiatives
- Emerging Technologies
- Health and Medicine
- Environmental Science
- Food and Agriculture
- Space Exploration

Entrepreneur-in-Residence Programme (EIR) Fuels India's Biotech Innovation Ecosystem and Startup Growth

Business Impact: *It provides a structured pathway for biotech startups and research-driven enterprises to commercialise innovations in areas such as therapeutics, diagnostics, industrial biotechnology and sustainable bio-products, attracting both private investment and global partnerships.*

At the third Annual General Meeting of the Biotechnology Research and Innovation Council (BRIC), Union Minister Dr Jitendra Singh highlighted the Entrepreneur-in-Residence (EIR) Programme as a major driver of India's biotech innovation by enabling scientists to turn research into market-ready products. The initiative is boosting startup creation within public R&D institutions, attracting participation from the private sector and venture capital, and strengthening links between academia, hospitals, and industry. Dr Singh also emphasised India's growing strengths in AI-enabled biosciences, biofoundry capabilities and biomanufacturing, while noting the success of BRIC's i3c PhD programme, which has trained over 120 researchers across healthcare, agriculture and green energy.

India Hosts International Science & Technology Clusters Conference to Accelerate Innovation Translation

Business Impact: *It will help agri-tech, clean tech, health-tech and industrial automation sectors accelerate the commercialisation of research innovations and attract investment through public–private collaborations.*

The Office of the Principal Scientific Adviser organised the first International Science & Technology Clusters Conference (ISTCC) on 4–5 December 2025 in New Delhi under the theme "Making Lives Easier Through S&T", bringing together academia, industry, start-ups, government bodies and global partners from over 30 countries. The event showcased cluster-developed solutions across smart agriculture, healthcare, environment, automation, plastic and e-waste management, and livelihood technologies, alongside the release of four compendiums on water tech, agri-tech and waste solutions. CEOs of all eight national S&T Clusters joined international experts for panels and roundtables on scaling innovation, and the valedictory session saw 12 MoUs signed with domestic and global stakeholders for clean energy, circular economy technologies, advanced systems, agriculture and bio-innovation. The conference marked the shift of S&T Clusters from concept to implementation, setting a roadmap for their evolution into national technology accelerators for climate resilience and sustainable development.

India Unveils “BharatGen” -First Sovereign Multilingual and Multimodal AI Stack

Business Impact: *BharatGen will provide a platform for the AI, software, cloud services and data analytics sectors to build India-centric applications and products, enabling local firms to compete globally with sovereign technology stacks. It will accelerate development of multilingual AI tools, expand opportunities in agri-tech, fintech, healthcare and GovTech, and reduce dependence on foreign AI infrastructure. make the introduction part short.*

Union Minister Dr Jitendra Singh announced the launch of BharatGen, India’s first sovereign multilingual and multimodal AI Large Language Model (LLM), developed at IIT Bombay with INR 1,293 crore support under the National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) of the Department of Science and Technology. Designed to handle text, speech, and document-vision in 22+ Indian languages, the initiative is being built by a consortium that includes IIT Bombay, IIT Madras, IIT Kanpur, IIIT Hyderabad, and others. Its core models-Param-1 (text), Shrutam (speech recognition), Sooktam (text-to-speech) and Patram (document understanding)—power applications like Krishi Sathi, e-VikrAI, and Docbodh for agriculture, e-commerce and public services. With an additional INR 1,058 crore from MeitY under the India AI Mission, BharatGen aims to strengthen India’s digital sovereignty and global AI leadership.

Australia’s Social Media Ban Creates Natural Experiment for Scientific Study

Business Impact: *The insight from this policy can help tech companies and digital platforms design safer, age-appropriate features and compliance tools, expanding markets for child-safety technology and age-verification services.*

Researchers are capitalising on Australia’s new law banning children under 16 from most social-media platforms as a “natural experiment” to study how restricted digital use affects young people’s mental health, social behaviour and political engagement. The policy, the first of its kind globally, has drawn strong reactions from teens but offers scientists a rare opportunity to observe real-world outcomes without artificial controls. By comparing data before and after the ban, researchers hope to understand causal links between social-media exposure and psychological and social development, with implications for education, health policy and family dynamics in digital environments. This regulatory move also invites broader international discussion on balancing technology adoption and youth wellbeing.

Indian Pharmacopoeia Commission Signs MoU with Jharkhand State Pharmacy Council to Strengthen Medicine Safety

Business Impact: *This initiative supports the pharmaceutical, healthcare and clinical service industries by improving medicine safety standards, which can reduce drug-related risks and build trust in healthcare products and services. Enhanced pharmacovigilance also drives demand for safety monitoring tools, reporting software and training services for pharmacists and healthcare providers.*

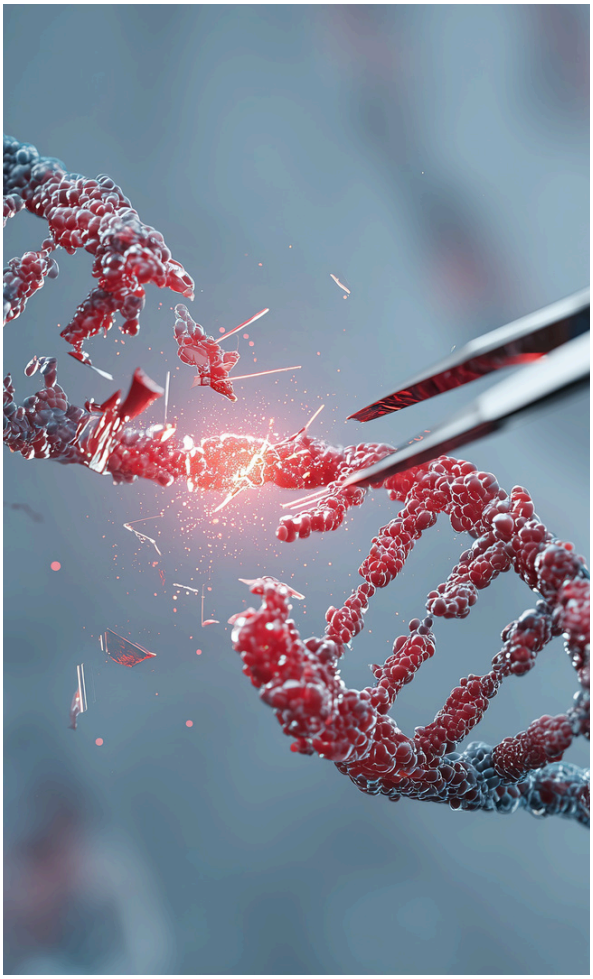
The Indian Pharmacopoeia Commission (IPC) has signed an MoU with the Jharkhand State Pharmacy Council (JSPC) to strengthen the safe and rational use of medicines, improve pharmacovigilance and materiovigilance, and enhance patient safety across Jharkhand. The partnership will train registered pharmacists in adverse drug reaction (ADR) reporting, safe dispensing practices, and the use of the National Formulary of India (NFI). It also includes awareness programmes for hospital and community pharmacists, mandatory institutional use of the NFI, and coordinated observance of National Pharmacovigilance Week. IPC will provide technical guidance, while JSPC will ensure implementation across public and private pharmacies.

CCRAS Launches SIDDHI 2.0 to Boost Evidence-Based Ayurvedic Innovation

Business Impact: *SIDDHI 2.0 will help herbal medicine manufacturers, nutraceutical firms and wellness brands develop clinically validated, export-ready products, boosting competitiveness in global markets. It supports growth in health-tech, biotech and lab services sectors by fostering demand for testing, validation and digital R&D infrastructure within the Ayurvedic value chain.*

The Central Council for Research in Ayurvedic Sciences (CCRAS) has launched SIDDHI 2.0, an industry–research interface platform designed to fast-track evidence-based Ayurvedic drug development and commercialisation. Introduced at a two-day conclave in Vijayawada with CII, the initiative brings together industry, academia and regulators to strengthen research-driven product pipelines, improve quality standards, and promote indigenous and tech-enabled innovation. The event also saw the release of a medico-historical book and a new Drug Inventory Management System, alongside commitments to industry-friendly research policies, IPR-sharing and AI-supported Ayurveda start-up growth. SIDDHI 2.0 aims to boost institutional collaboration, enhance global competitiveness and support the creation of scalable, scientifically validated Ayurvedic products.

India Launches First Indigenous CRISPR Gene Therapy "BIRSA 101" to Fight Sickle Cell Disease



Business Impact: *This indigenous gene therapy initiative offers biotechnology, biopharma and health-tech industries an opportunity to expand in gene therapy manufacturing, genomic R&D, clinical services and affordable biologics, leveraging scalable CRISPR platforms.*

India has introduced its first indigenous CRISPR-based gene therapy, BIRSA 101, targeting Sickle Cell Disease (SCD), a genetic blood disorder especially prevalent among tribal populations, marking a major milestone in genomic medicine and public health. The therapy, named in honour of tribal freedom fighter Bhagwan Birsa Munda, was launched by Union Minister Dr Jitendra Singh and developed by the CSIR–Institute of Genomics & Integrative Biology (IGIB), with a formal technology transfer agreement with Serum Institute of India Pvt Ltd to enable large-scale, affordable production and clinical deployment. This innovation aligns with the government's vision of an SCD-Free India by 2047 and reinforces the Atmanirbhar Bharat goal in advanced medical technologies by potentially replacing similar international therapies that cost INR 20–25 crore with a much more affordable, scalable solution. The launch event also highlighted strong public–private collaboration and India's growing capability to translate cutting-edge research into accessible health solutions.

AI Framework Deciphers Cancer's Molecular Behaviour for Personalised Therapy

Business Impact: *This AI-driven approach opens new avenues for healthcare analytics, biotech firms, and precision medicine developers to create treatment-decision platforms and companion diagnostics that are tailored to individual tumour profiles.*

Scientists have developed a novel artificial intelligence (AI) framework called OncoMark that can read the complex molecular behaviour of cancer cells and predict how tumours progress and respond to treatments, offering a deeper understanding beyond traditional staging systems. The study, led by researchers at the S N Bose National Centre for Basic Sciences (an autonomous institute under the Department of Science & Technology) in collaboration with Ashoka University, analysed over 3.1 million single cells from 14 cancer types to create synthetic "pseudo-biopsies" representing hallmark-driven tumour states. OncoMark demonstrated high accuracy above 99 % internally and 96 % across five independent cohorts—and was validated on 20,000 real-world patient samples, helping visualise how key cancer mechanisms such as metastasis and immune evasion evolve with disease stage. The results, published in Communications Biology (Nature Publishing Group), show the tool can identify active molecular hallmarks and guide clinicians on targeted therapies and early intervention strategies, potentially transforming personalised cancer care.

Government Invites Proposals to Set Up NABL-Accredited Food Testing Laboratories under PMKSY

Business Impact: *The scheme will boost demand for advanced testing technologies, creating opportunities for food-testing equipment makers, lab service providers, quality-assurance firms, and biotech instrumentation companies. It will also encourage public–private investment in food-safety infrastructure, helping firms scale operations and meet global compliance standards, especially for processed-food exports.*

The Ministry of Food Processing Industries (MoFPI) has invited proposals from eligible entrepreneurs to establish NABL-accredited Food Testing Laboratories under the Food Safety and Quality Assurance Infrastructure (FSQAI) component of the Pradhan Mantri Kisan SAMPADA Yojana (PMKSY). Interested applicants must submit their proposals online through the official SAMPADA portal by 20 January 2026, with a pre-bid meeting scheduled for 2 December 2025 in New Delhi. This initiative aims to strengthen India's food quality infrastructure by supporting accredited testing facilities that ensure compliance with safety standards and enhance product credibility in domestic and international markets.

India Launches First National CCUS R&D Roadmap to Support Net-Zero Ambition

Business Impact: *It opens commercial opportunities for clean-tech, green engineering and carbon services companies to develop, deploy and scale CCUS solutions across industrial clusters. It will attract private investment and partnerships in climate technologies, positioning India as a competitive player in the global low-carbon technology market while supporting sustainable industrial growth.*

India has released its first R&D Roadmap for Carbon Capture, Utilisation and Storage (CCUS) to support its Net-Zero 2070 goal, launched on 2 December 2025 by Principal Scientific Adviser Prof. Ajay Kumar Sood and developed by the Department of Science & Technology (DST). The roadmap outlines a national strategy for research, industry collaboration, infrastructure and investment to develop CCUS technologies for hard-to-abate sectors such as steel, cement and power. It highlights the need for regulatory standards, skilled manpower and funding mechanisms aligned with the INR 1 lakh crore RDI Scheme, positioning CCUS as a key tool for industrial decarbonisation. By enabling partnerships and supporting the shift from lab-scale innovation to commercial deployment, the roadmap strengthens India's ability to pursue low-carbon growth while sustaining industrial expansion.

India Eyes USD 45 Billion Space Economy with Private Sector at the Helm

Business Impact: *It will attract venture capital and private investment into India's space startups, boosting R&D and employment in high-tech manufacturing and engineering services. It also positions India to increase space exports and global partnerships, strengthening its aerospace supply chains and driving long-term economic growth.*

India's space economy, currently around USD 8 billion, is projected to grow to about USD 40–45 billion over the next decade by leveraging strong government reforms and a rapidly expanding private sector, according to officials, including Minister Dr Jitendra Singh. The growth will be driven by over 400 space start-ups and private firms engaged in areas such as satellite manufacturing, launch services and space-based data analytics, with India aiming to capture a larger share of the global commercial space market as it pursues ambitious goals like a national space station by 2035 and a human Moon landing by 2040. The shift from a predominantly government-led sector to a commercially vibrant ecosystem has been enabled by policy changes and increased investment, positioning India as a significant player in the global space value chain.

UPCOMING NATIONAL EVENTS 20 DEC 2025- 20 JAN 2026

9-11 January 2026

EVENT: National Conference on Emerging Trends in Structural Biophysics (CETSB26)

LOCATION: Warangal, Telangana, India

FOCUS/ THEME: The conference explores the latest developments in structural biophysics, including how structure, dynamics and function intersect in biological systems.

INDUSTRY RELEVANCE: The conference bridges research and industry by highlighting applications of AI/ML, structural biology and drug discovery tools, helping biotech and pharmaceutical companies adopt advanced computational and structural methods for product design and R&D.

21-23 January 2026

EVENT: ICAMSE 2026: International Conference on Advances in Multidisciplinary Sciences and Engineering

LOCATION: Manipur, India

FOCUS/ THEME: A multidisciplinary forum for researchers, engineers and scientists to present and discuss innovations across science and engineering fields, including nanomaterials, biotechnology, environmental remediation and mathematical sciences.

INDUSTRY RELEVANCE: The conference connects industry with academic research, helping firms in nanotech, biotech, environmental engineering and materials science access emerging technologies and form R&D partnerships.

VeK is a policy advisory and research firm, distinguished by data-driven approach to analyse policy and regulatory developments in India and globally.

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