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PUNE ▪ Volume 23 ▪ Issue 9 ▪ September 2025

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BioStartUps Founders & Investors Forum 2025

## Are BioStartUps in a Funding/Innovation Rut?

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**References**


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## Acknowledgement/ Feedback

Great article on 'Accelerated Reliance on Digital Animal Replacement Tech'. Hopefully this global movement towards New Approach Methodologies (NAMs) adoption is a harbinger of better biomedical science.

**Tejaswini D,** Hyderabad

---

Thank you BioSpectrum India for featuring my article, where I discuss how quantum technologies are poised to redefine the future of healthcare in India.

**Ravi Puvvala,** US

---

The story on 'India's Negligent Pharma Manufacturing Units' is insightful and timely. The article powerfully exposes critical safety lapses in pharma manufacturing and urges much-needed systemic accountability.

**Vinay Kumar,** Panchkula

---

The article 'Accelerated Reliance on Digital Animal Replacement Tech' is very well captured. We have our next summit on Advances in 3D cell culture coming up on January 22-23, 2026 at Goa.

**Dr Prajakta Dandekar,** Mumbai

---

Humbled and genuinely excited to be featured by the incredible team at BioSpectrum India, in the August edition. We had a fantastic discussion about AI and its impact and the growing usage matrix day by day in India. A huge thank you to the team for the insightful questions and for creating a space for such a great conversation with Unispace.

**Swatasiddha Majumdar,** Bengaluru

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# Letter from Publisher

**Ravindra Boratkar**
Publisher &
Managing Editor,
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***Dear Readers,***

India's bioeconomy is expected to grow to $300 billion by 2030, making the biotechnology startup community—which is aided by bioincubators—especially important. Although public sector organisations such as the Department of Biotechnology (DBT) and the Biotechnology Industry Research Assistance Council (BIRAC) have fostered the development of biotech startups, it is imperative to tackle obstacles that may impede their advancement. For example, a significant obstacle in India is the dearth of growth-stage financing, even if early-stage investors are eager to finance and support biotech businesses. Without bigger financial sources, we run the danger of losing potential businesses to acquisitions or relocations to foreign markets.

However, we observe that most investor-based activity occurs exclusively in Tier-I cities, whereas companies originating from Tier-II or Tier-III locations are losing out on possibilities. With the theme "Founders & Investors Forum 2025," our team, under the flagship brand BioStartUps, organised and covered the second edition of its annual event on August 1, 2025, held at the CIDCO Exhibition Centre in Vashi, Navi Mumbai. This event brought together over 100 participants from across the country, including investors, startups, incubators, and policy makers. The nation's innovation and startup environment were discussed by experts during this day-long summit.

Cell and gene therapy (CGT), often regarded as one of the most groundbreaking areas in modern medicine, has brought new hope for transformative treatments for patients suffering from rare and severe illnesses. By June 2024, a total of 100 therapies had been approved worldwide, with 2,848 more in development across stages from preclinical research to preregistration, according to Citeline. However, the recent deaths of three patients have drawn increased scrutiny to CGT, resulting in trial suspensions and sparking concerns about the safety of commonly used delivery platforms. Our team has captured the latest expert perspectives on how this development is influencing research progress, investor sentiment, and regulatory trust in the sector.

Indian pharmaceutical firms are embracing safer and more eco-friendly packaging procedures keeping mind patient well-being and the environment. The country's pharmaceutical packaging business is changing dramatically thanks to several state attempts to reduce carbon emissions. Companies are focusing on bioplastics, paper or paperboard, and biobased PET originating from timber, mitigating their reliance on petroleum-based plastics and decreasing their carbon footprint. Our contributor analyses how the business is reengineering itself to meet growing expectations of sustainability, pollution reduction, operational dynamics, and cost.

Increasing demand for gastrointestinal (GI) diagnosis in recent years demonstrates a rising disease burden and increased awareness of early intervention. Endoscopy is important for GI disease diagnosis, identifying cancer, ulcers, and infections early. Major city hospitals have well- equipped endoscopic facilities, but semi-urban/ rural areas struggle to access them. An expert piece addressing this gap represents a significant opportunity to spread early detection advantages across India's wider healthcare network.

We are delighted to announce that the BioSpectrum India Excellence Awards Ceremony will be held on December 5, 2025, in Delhi. The event will bring together luminaries, industry achievers, and startups, who will be honoured across multiple categories for their outstanding contributions. We also invite nominations for the Special Awards category to ensure that deserving contributors receive well-earned recognition. We look forward to your participation in this prestigious ceremony as we come together to honour the stalwarts of the industry and make the event truly memorable.

***I am sure you will find this edition a great read.***

***Thanks & Regards,***

***Ravindra Boratkar,***
***Publisher & Managing Editor***

COVER 17

# Are BioStartUps in a Funding/Innovation Rut?

At the BioStartUps Founders & Investors Forum 2025, held on August 1, 2025 at the CIDCO Exhibition Centre in Vashi, Navi Mumbai, biotech industry stalwarts deliberated on the country's innovation and startup ecosystem. While exceptional support to biotech startups is already being provided by bioincubators across various states in the country, there is a need to establish incubators in places where the surrounding ecosystem can further support the startup growth. Mechanisms are also required to be developed for industry-academia collaboration to purely focus on commercialisation, along with establishment of strategic funds for biotech ventures to succeed. Experts at the forum also highlighted the disparities between research institutions and industrial zones in terms of infrastructure and talent access, and how these elements can be co-located to create a win-win situation for the Indian biotech sector. Moreover, a few industry experts observed that startups need not just increased, steady inflow of investments but also idea validation that actually addresses real problems.


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## Packaging



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## Speaking With





## GI Diagnostics



## GI Diagnostics



## Top Video

Subhasis Banerjee, Ph.D., Principal Technical Application Expert, Bioprocessing APAC, Merck Life Sciences, talks about the evolving role of chromatography from lab-scale to commercial manufacturing.

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Gamification in physiotherapy - The impact of inculcating game-based approaches in rehabilitation. Habib Ali, Founder & CEO, BeAble Health shares his perspective.

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## Digital Twins



## Regulars

# Safeguarding Indian Pharma Exports

When dark clouds gather over a $11 billion export sector, the alarm bells must ring. This time, the looming threat for India comes from the United States in the form of proposed steep tariffs. Though not at present, but at stake could be India's pharmaceutical export industry.

The concern is understandable. Today, pharmaceutical exports to the US account for over 11 per cent of India's total merchandise exports to that country.

The numbers underline the stakes: the US is India's largest pharma export destination, buying nearly 35 per cent of India's total pharma shipments. Over 47 per cent of all generic drugs consumed in the US come from India, and more than 40 per cent of prescriptions written by US medical practitioners are for Indian-made medicines. According to analytics firm IQVIA, Indian generics saved the US healthcare system $219 billion in 2022 alone, and $1.3 trillion between 2013 and 2022.

Against this backdrop, President Donald Trump's announcement of heavy tariffs — 25 per cent plus an additional 25 per cent, bringing the total to 50 per cent — has sent shockwaves. These measures, coupled with punitive levies in response to India's continued crude oil purchases from Russia despite Western sanctions, came unexpectedly while trade agreement talks between the two nations were still in progress. Talks have since been halted by the US.

There is one silver lining: existing concessions of no tariff for pharmaceutical imports remain intact, insulating the sector from immediate harm. Many believe the US simply cannot afford to disrupt Indian generic supplies without hurting its own healthcare system. Heavy tariffs could raise medicine prices, burdening American patients and straining hospitals. Moreover, finding alternative suppliers at the same scale and price would be a formidable challenge. Local US production could take three to five years to scale up, and manufacturing certain drugs domestically can cost up to six times more than in India.

Adding to the irony, President Trump has urged top US pharma companies to cut prices in line with global benchmarks — a move seemingly at odds with imposing steep tariffs that would increase costs for American consumers.

Yet, Trump's unpredictable decision-making style offers no guarantee that pharma will remain exempt for long. He has openly stated that tariffs on pharmaceuticals could be considered separately. Meanwhile, the ongoing Section 232 investigation into imports could potentially bring the sector into the tariff net. Therefore, it becomes essential to closely examine the newly announced tariffs and assess their potential impact—even if currently limited—on India's pharma exports.

Experts suggest that a 10 per cent tariff on medicines may have little effect, as US consumers could absorb the cost. However, anything above 15 per cent would have a significant impact, and a full 50 per cent tariff could cut Indian pharma companies' earnings by 5–10 per cent. Proactive strategies and contingency planning will therefore be essential to cushion any potential blow.

One potential safety valve is the recently concluded India–UK Free Trade Deal (FTD). While the UK cannot match the scale of the US market, the agreement offers a chance for Indian exporters to diversify. The agreement is set to boost exports by providing easier access to the UK market. It is expected to help Indian companies — particularly those in generics and biosimilars — expand their market presence, accelerate product approvals, and foster cross-border R&D and innovation. It is expected to reduce regulatory burden on Indian exports to the UK. But compared to the US, the UK market is small.

But following the UK example, India will need to actively pursue other such partnerships to reduce its dependence on the US, without losing the export volumes that the US currently consumes. For now, the industry breathes easy. But in the shifting winds of global trade, those dark clouds remain on the horizon — and India's pharma sector must be ready. Fifty per cent tariff on other goods is a warning. BS

**Dr Milind Kokje**
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# Ministry of Ayush signs 2 MoUs to strengthen conservation of medicinal plants

Two significant Memoranda of Understanding (MoUs) have been signed by the National Medicinal Plants Board (NMPB), Ministry of Ayush, Government of India. The first MoU has been signed between NMPB and IshVed-Bioplants Venture, Pune, and the second tripartite MoU has been signed among NMPB, All India Institute of Ayurveda (AIIA) and All India Institute of Medical Sciences (AIIMS), New Delhi. The MoU between NMPB and IshVed-Bioplants Venture will bring better value

to the stakeholders through development of tissue culture methods and their extensive cultivation and maintenance protocols to facilitate the supply of medicinal plants in the rare, endangered, and threatened (RET) category used in Ayush industry, to preserve and maintain the germplasm of these medicinal plants. On the other hand, the MoU among NMPB, AIIA, and AIIMS will develop public awareness about the medicinal plants among patients and students who come from distant areas and will also benefit the visitors in the hospital premises.

# ICMR expands collaborative partnership with CEPI for vaccine research

Norway-based Coalition for Epidemic Preparedness Innovations (CEPI) and the Indian Council of Medical Research (ICMR) have expanded their collaborative partnership through a newly signed Memorandum of Understanding (MoU). The MoU will enable the two organisations to coordinate more effectively on projects that enhance the effectiveness of their respective efforts to protect people from the emerging and re-emerging infectious diseases. This agreement lays the foundation for closer coordination on vaccine R&D, supporting the shared goal of developing accessible, affordable and effective vaccines, and builds on CEPI's growing partnership with the Indian life-science sector. The key objectives include planning, developing and implementing clinical trial protocols for vaccines against priority pathogens (ii) Capacity strengthening of health personnel and researchers (iii) Develop and conduct epidemiological studies (iv) Development of standards, assays and diagnostics (v) Development of an epidemiology data-driven prioritisation process (vi) Co-sponsorship and co-convening of scientific meetings and conferences.

# Punjab launches Cancer Care Pathways

The Government of Punjab has launched the Punjab Cancer Care Pathways, a comprehensive initiative introducing Standard Treatment Guidelines (STGs) and streamlined care models for breast, cervical, oral, lung, and liver cancers. The pathways were developed and authored by the expert team from AIIMS Delhi, in collaboration with the Department of Health & Family Welfare, Punjab. The official launch was held in the presence of the Health Minister of Punjab, key contributors, and representatives from the World Health Organization (WHO), ICMR, PGIMER, and other national institutions. This is more than a document, it is a mission to ensure timely detection, evidence-based treatment, and survivor-focused care for the people of Punjab.

# MedGenome raises $47.5M to expand access to genomics offerings in India

Bengaluru-based genomic diagnostics and research services company MedGenome has raised $47.5 million in its Series E funding round, co-led by Maj Invest, a private equity firm, joining as a new investor, along with existing investor Novo Holdings. The round also saw participation from Sofina, an existing shareholder in the company. This funding will enable the company to broaden access to its genomics and integrated diagnostics solutions across India and other emerging markets. The announcement also reiterates MedGenome's mission to help reduce India's disease burden through early detection and targeted disease management using genetic and integrated diagnostics tools with high affordability. MedGenome combines cutting-edge science with real-world application, bringing advanced omics solutions that bridge the unmet need in disease diagnosis and management. Early genomics-led intervention not only helps the patient but also helps families manage the economic and emotional burden of a disease.

# ICT and ITRI sign agreement to catalyse Rs 30 Cr support for Mumbai Biocluster Building

The Institute of Chemical Technology (ICT), Mumbai and the India's Translational Research Initiative (ITRI) have signed a formal Expression of Interest (EoI) to jointly catalyse the construction of the Mumbai Biocluster - a cutting-edge, eight-storey facility dedicated to advancing translational biopharmaceutical research, training, and manufacturing in India, with an investment of Rs 30 crore. The Mumbai Biocluster is a response to one of the most critical challenges in Indian innovation - bridging the "valley of death" between early-stage discovery and scalable clinical and commercial translation. This initiative, along with the catalytic support of ITRI, seeks to deliver a multiplier effect on national R&D output by accelerating innovations to the clinic and market through a GMP-ready biologics pilot plant; Dedicated centres for rare diseases, process development, synthetic biology, and AI-powered drug development; Shared platforms for analytical sciences, formulation, and quality systems; and advanced training and upskilling zones for India's biopharma workforce.

# Medistep Healthcare eyes Rs 16.09 Cr fundraise to acquire new plant & machinery

Medistep Healthcare is set to raise approximately Rs 16.09 crore through its upcoming fixed-price Initial Public Offering (IPO), with the primary objective of strengthening its manufacturing infrastructure through the acquisition of advanced plant and machinery. A significant portion of the IPO proceeds will be allocated toward the acquisition and installation of state-of-the-art equipment at the company's existing manufacturing facility in Kheda, Gujarat. At the core of this investment is a fully automated, high-speed sanitary pad production line, capable of producing up to 500 pads per minute. This integrated line features raw material feeding, embossing, adhesive application, and inline quality inspection within a single, streamlined workflow. Additionally, the company will commission a twin-shaft ribbon blender with vacuum-sealed hoppers and an integrated volumetric filler from DEF Tech Industries. Medistep Healthcare has established a pan-India distribution network for a diversified portfolio of pharmaceutical, nutraceutical, surgical, and intimate-care products. The company reported revenue of Rs 49.65 crore in FY25, up from Rs 39.07 crore in FY24.

## Maxivision Super Speciality Eye Hospitals invests Rs 100 Cr to expand network across Chennai

Maxivision Super Speciality Eye Hospitals, one of India's fastest-growing eye care providers, has announced its strategic expansion in Chennai with the launch of 10 eye hospitals/vision centres across Chennai. With an investment of Rs 100 crore, Maxivision aims to expand its network across Chennai, starting with this launch. Maxivision already operates eye hospitals in Trichy, Madurai, Salem, Tanjore, Kumbakonam, Perambalur, and plans to expand into all districts/towns across Tamil Nadu to fulfil its mission to deliver advanced, affordable, and community-centric eye care across Chennai & Tamil Nadu. With state-of-the-art technology and a strong focus on early diagnosis and preventive care, Maxivision aims to reduce the region's long-term disease burden and establish Tamil Nadu as a hub for clinical excellence and ophthalmic skill development. The centres will serve as the first point of contact for early diagnosis of conditions like diabetic retinopathy, cataract, and glaucoma, helping reduce the long-term disease burden through timely intervention and education.

## Aster DM Healthcare to inject Rs 580 Cr to build 5th hospital in Bengaluru

Aster DM Healthcare, one of India's leading integrated healthcare providers, in a move to strengthen its footprint in one of India's fastest-growing healthcare hubs, Bengaluru, has announced Rs 580 crore investment to develop a state-of-the-art, 500-bed multi-specialty hospital in Yeshwanthpur. This new facility will be Aster's fifth hospital in Bengaluru, bringing its total bed capacity in the city to 2,580 beds thus cementing its position as one of the top three healthcare players in the city. With a planned built-up area of approximately 5 lakh sq. ft, the facility will be on a Built-to-Suit (BTS) model, reinforcing Aster's asset-light expansion approach in the city. Consistent with Aster's asset-light approach, the facility will be fully operated and managed by the group, following the model applied to its recently announced facility on Sarjapur road. The new hospital is expected to be operational in the second half of FY 2028-2029.

## Iberia Pharma set to open manufacturing unit in India with investment of Rs 70 Cr

Gurugram-based Iberia Pharmaceuticals has announced its new hi-tech manufacturing and research facility spread across 60,000 sq. ft. in Jhajjar, Haryana. The next-generation unit is expected to be operational by mid of 2026. The facility is designed to serve customers with science-baked, derma-driven, wellness products. The company has made a massive investment of Rs 70 crore and is proud to be a part of the government backed 'Make-in-India' movement. This unit is equipped with best-in-class control systems and equipment. The facility will be supported by an experienced team that will be committed to ensuring large-scale commercial manufacturing is carried on smoothly. The scale of manufacturing will not compromise on international standards of quality control.


The plant will focus on delivering economically viable solutions, in a robust, compliant, and environmentally sustainable manner. The idea is to support customers who are seeking highly effective, and personalised skin-care products. Overall, with a focus on research and development, the high-tech research laboratories will support continuous tracking of market, consumer demand, product development, and judicious formulation improvement, all of which will be grounded in real-world science.

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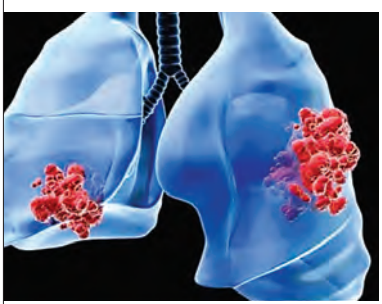
# Alveolus Bio secures strategic investment from Shilpa Medicare

Alveolus Bio, a US-based respiratory drug development biotech company founded by Dr Vivek Lal from University of Alabama at Birmingham, has announced a strategic financing round led by Raichur-based Shilpa Medicare, a prominent global pharmaceutical company with extensive expertise in respiratory therapeutics manufacturing and biotechnology innovation. Through this collaboration, Shilpa Biologics, the biologics arm of Shilpa Medicare, will become Alveolus Bio's exclusive global development and manufacturing partner. This partnership propels Alveolus Bio's live biotherapeutics and small molecule platform towards Phase 2 and first-in-human clinical trials, with a lead asset for chronic obstructive pulmonary disease (COPD) progressing rapidly. Shilpa Medicare brings deep experience in drug discovery, development, and manufacturing, along with strong regulatory capabilities. Their investment and strategic involvement will accelerate the clinical advancement of Alveolus Bio's resMIT (respiratory microbiota-based inhaled therapeutics) platform.

# Intas Pharma unveils India's first novel immunotherapy for advanced small cell lung cancer

Ahmedabad-based Intas Pharmaceuticals has launched Hetronifly (Serplulimab), the first PD-1 inhibitor globally approved for the treatment of Extensive-Stage Small Cell Lung Cancer (ES-SCLC), in the Indian market. This marks another major milestone, following the successful launch in Europe. This launch follows a strategic licensing agreement between Intas Pharmaceuticals and Shanghai Henlius Biotech, Inc., further strengthening Intas' oncology portfolio and reinforcing its commitment to delivering cutting-edge therapies to patients in India. Serplulimab is the first PD-1 inhibitor worldwide to receive approval for ES-SCLC, and is currently present in over 40 countries, including key European markets. Its efficacy is supported by the landmark ASTRUM-005 trial, which demonstrated a 40 per cent reduction in the risk of death and remarkably higher overall survival rate versus the current standard of Care Chemotherapy regimen. Despite the promise of immuno-oncology, cost remains a significant barrier in India.



# Lilly expands India presence with new Hyderabad site to accelerate global digital innovation

Eli Lilly and Company (India) has announced the opening of its new technology and innovation site in Hyderabad; a new strategic hub for advanced digital and technology capabilities that will improve efficiency across Lilly's global operations. By focusing on areas such as artificial intelligence (AI), automation, cloud computing, and software product engineering, the site will contribute to solving some of the world's most pressing health challenges while also creating growth opportunities for local talent. Located in Gachibowli, Lilly's Hyderabad site spans approximately 220,000 square feet across four floors within the Phoenix Equinox building. Lilly has already onboarded 100 professionals at the Hyderabad facility and plans to expand the headcount to 1,500 over the next few years. Lilly's Hyderabad site will integrate advanced technology capabilities across key functions, supporting accelerated innovation, enhanced efficiency, and improved health outcomes for patients globally.

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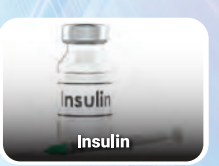


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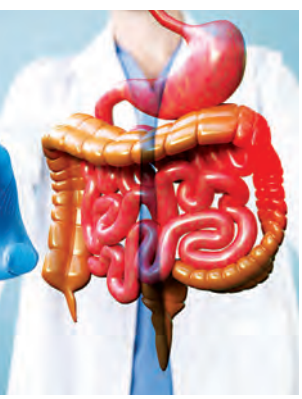
# Fujifilm India unveils ENDOVEDA to revolutionise clinical reporting in gastroenterology

Fujifilm India, a global leader in healthcare technology, recently unveiled its latest innovation in endoscopy reporting, ENDOVEDA, at the Endocon 2025 conference in Jaipur. Developed entirely in India, ENDOVEDA marks a significant leap forward in digital documentation for endoscopic procedures, designed to support clinicians with advanced reporting tools and intuitive workflow. ENDOVEDA offers a comprehensive suite of features for endoscopic reporting, including Full HD 4k and UHD 4K image capture, intelligent image enhancement, and a user-friendly interface. It ensures seamless integration with hospital systems (PACS/HIS), robust data security, and flexible reporting options.



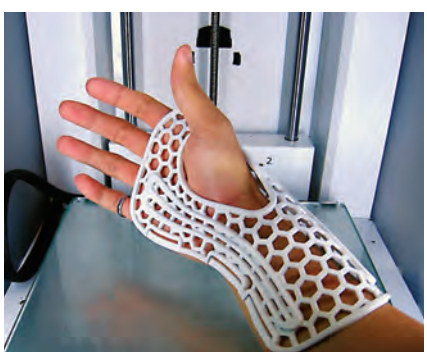
Backed by dedicated local and remote support, ENDOVEDA streamlines workflows and enhances diagnostic precision for healthcare professionals. ENDOVEDA is expected to become an essential component in the endoscopy workflow and help set new standards for digital documentation in India.

# SCHOTT announces launch of syringe and cartridge glass tubing in India

SCHOTT, a global pioneer in specialty glass, has announced the addition of syringe and cartridge glass tubing to its existing state-of-the-art manufacturing capabilities in Jambusar, Gujarat. This marks a significant milestone in India's glass primary pharmaceutical packaging landscape and reinforces SCHOTT's commitment to the 'Make in India' initiative. This strategic action positions the company as Asia's largest producer of syringe and cartridge glass tubing. The cutting-edge production is a direct technology transfer from SCHOTT's renowned German expertise. It is set to meet the surging demand for biologics like semaglutide (belonging to the GLP-1 receptor agonist class) used for weight management and control of blood sugar levels in patients with type 2 diabetes. The precise inner diameter tolerance of syringe glass tubing can ensure plunger tightness and consistent gliding forces on the inner surface of the entire length during administration of the drug. SCHOTT's Type I borosilicate glass tubing, FIOLAX, has consistent wall thickness and very tight geometric precision and tolerance especially for the inner diameter which makes it the perfect fit for prefillable syringes and cartridges.

# AMTZ to open India's first advanced 3D printing hub for orthopaedic implants

In a landmark collaboration that spans three continents, OIC International (USA), Medi Mold, part of the Andhra Pradesh Medtech Zone (AMTZ) (India), and AddUp, a subsidiary of Fives Group (France) have announced a strategic partnership to establish India's most advanced orthopaedic implant manufacturing facility powered by 3D printing and precision engineering. The facility will be housed within AMTZ, India's flagship medical device manufacturing park. OIC is launching a first-of-its-kind line of implants manufactured in India using advanced additive 3D technology, designed for both domestic and global markets. Developed with proprietary technology, these implants aim to significantly reduce post-surgery recovery time while delivering cutting-edge solutions at a fraction of the cost and can be produced on a mass scale, close to the delivery points. The first metal 3D printer from AddUp's FormUp range will be installed at AMTZ, enabling rapid prototyping and market entry.



BioStartUps Founders & Investors Forum 2025

# Are BioStartUps in a Funding/Innovation Rut?

At the BioStartUps Founders & Investors Forum 2025, held on August 1, 2025 at the CIDCO Exhibition Centre in Vashi, Navi Mumbai, biotech industry stalwarts deliberated on the country's innovation and startup ecosystem. While exceptional support to biotech startups is already being provided by bioincubators across various states in the country, there is a need to establish incubators in places where the surrounding ecosystem can further support the startup growth. Mechanisms are also required to be developed for industry-academia collaboration to purely focus on commercialisation, along with establishment of strategic funds for biotech ventures to succeed. Experts at the forum also highlighted the disparities between research institutions and industrial zones in terms of infrastructure and talent access, and how these elements can be co-located to create a win-win situation for the Indian biotech sector. Moreover, a few industry experts observed that startups need not just increased, steady inflow of investments but also idea validation that actually addresses real problems.

With India's bioeconomy projected to reach $300 billion by 2030, the role of the biotechnology startup community, supported by the bioincubators, is particularly instrumental. While Institutions like the Department of Biotechnology (DBT) and the Biotechnology Industry Research Assistance Council (BIRAC) have nurtured the evolution of biotech startups, it is absolutely essential to address challenges that could hinder the progress of these startups.

For instance, while early-stage investors are willing to fund and nurture the biotech startups, the lack of growth-stage capital in India is a major hurdle. Without larger funding pools, we risk losing promising companies to overseas markets through acquisitions or relocations. On the other hand, we see a lot of investors-based activity taking place only in Tier-I cities, while innovations emerging from startups based out of Tier-II or III cities are missing out on opportunities.

Keeping in view such disparities and challenges, BioStartUps organised the second edition of its annual event, with the theme- Founders & Investors Forum 2025, on August 1, 2025, at the CIDCO Exhibition Centre in Vashi, Navi Mumbai.

Emphasising the growth of India's innovation ecosystem and acknowledging the country's improving economy and growing recognition in manufacturing, Dr Manish Diwan, Head - Biofoundry, NCR Biotech Cluster & Indian Vaccine Corporation Ltd (IVCOL), Biotechnology Industry Research Assistance Council (BIRAC) pointed out the current hurdles and developments shaping up the biotech innovation ecosystem in India.

"While disruptive innovations are rare, incremental innovations led by large industries help sustain momentum. India's current bioeconomy contribution is ~4.25 per cent to the GDP. The target for 2047 will be to raise it to 10 per cent of the GDP. This growth can be envisioned through India's emergence as a global bio-innovation and bio-manufacturing hub", said Dr Diwan during the inaugural session of the Founders & Investors Forum 2025.

He also spoke on the need for incubation centres that support innovators from ideation to commercialisation. He mentioned the NCR Biotech Cluster, a 200-acre facility, as a model that houses major research institutions, India's largest experimental animal facility, a biological data centre and a bio repository. He cited examples of how clusters are designed for R&D where innovation can thrive, and encouraged stronger industry-academia collaboration and knowledge exchange across regions.

"Disparity exists between research institutions and industrial zones in terms of infrastructure and talent access. Research institutions have access to fresh talent but lack advanced infrastructure and market access. Whereas industrial zones have advanced infrastructure and market access but lack fresh talent and innovation. The need for co-location of these disparate elements will help to create a thriving innovation ecosystem", he highlighted.

## Inaugural Session


Dignitaries L-R- Ritu Baliya, Associate Director-Strategy, Healthark; Dr Mohamed Adil A.A, Managing Director, Bangalore Bioinnovation Centre; Dr Premnath Venugopalan, Director, Venture Center; Dr Manish Diwan, Head - Biofoundry, NCR Biotech Cluster & IVCOL, BIRAC; Ravindra Boratkar, Publisher and Managing Editor, BioSpectrum & Managing Director, MM Activ Sci-Tech Communications; Dr Mrutyunjay Suar, CEO, KIIT-TBI; Dr Praveen K.S, CEO, Bio 360 Life Sciences Park; Keshen Mathura, COO, Biotech Booster, Netherlands; and Manasee Kurlekar, CEO- Media, MM Activ Sci-Tech Communications releasing the August edition of BioSpectrum India.

Talking about what is happening in the innovation space in The Netherlands, Keshen Mathura, COO, Biotech Booster, Netherlands said, “The Netherlands has a tremendous biotechnology infrastructure and the country has become a source of biotech innovation. As the innovations are not able to reach the market at times, Biotech Boosters are set up to bridge the gap between innovation and the market. We would like our projects, our teams, to come to India and learn from investors, corporates, experts, about what it takes to start a business, to expand the business and succeed.”

Sharing her views Ritu Baliya, Associate Director-Strategy, Healthark, said “Academia, venture capitalists, government, and corporates need to reach the unreached areas and prove that innovation can happen from anywhere, provided the right kind of support and infrastructure are provided. Looking at inclusive innovation, the next big leap in Indian biotech will not come from expanding what's already working but from empowering where it's not yet visible.”

In his welcome address, Ravindra Boratkar, Publisher and Managing Editor, BioSpectrum; Managing Director, MM Activ Sci-Tech Communications said “The bioeconomy has grown at a phenomenal pace and the government's aim to see it reach the $300 billion mark by 2030 is not just a target, but it is also a testament to the immense potential that lies across the nation. No matter how brilliant an innovation, it needs a nurturing environment to transform from a hypothesis to a viable, market-ready solution.”

According to him, BioStartUps Founders & Investors Forum 2025 will explore the symbiotic relationship between the startup and the incubator, and of course, find some solutions. He opined, “The event will help to garner interest in how to generate funding, to streamline regulations without compromising on safety and ethics and to build a robust pipeline of industry-ready talent, etc.”

While thanking all the participants, he mentioned, “We are incredibly fortunate today, as with us, we have a spectacular lineup of speakers and panellists, individuals who are not mere commentators, but they are architects of this ecosystem. Their insights are born from their experiences and the revision.”

Earlier Manasee Kurlekar, CEO- Media, MM Activ Sci-Tech Communications in her introduction speech said “Founders & Investors Forum 2025 has set the stage to reflect upon the past growth of the biotech startup ecosystem in India, and to address the current challenges facing this sector, and also to develop new ideas on how to ensure the success of the Indian biotech startup ecosystem in the future.”

### Incremental role of State Bioincubators

As per the India Bioeconomy report 2025, the majority geographical concentration is led by states namely Maharashtra, Karnataka, and Telangana which are supporting the growth of biotech startups via their bioincubators, robust infrastructure, access to funding and availability of skilled talent.

Focusing on this observation, a major perspective on the current opportunities and investment related challenges facing the biotech startups, across various

states, was shared by experts from the country's leading bioincubators at the inaugural session of the Founders & Investors Forum 2025.

Dr Premnath Venugopalan, Director, Venture Center, Pune highlighted the opportunities and evolving support for biotech entrepreneurs in Maharashtra. Advocating for a larger ecosystem for startups to succeed in the long run, he talked about the importance of peer network. "Maharashtra is strongly positioned in the startup space, and the scenario is poised to go to newer heights where the ecosystem in Maharashtra is led by entrepreneurs themselves", said Dr Premnath.

Representing Karnataka, Dr Mohamed Adil A A, Managing Director, Bangalore Bioinnovation Centre, shared his extensive experience in biotech innovation and ecosystem building to highlight the critical need for stronger public-private synergy to drive India's bioeconomy forward focused on Karnataka's emergence as a leading biotech investment hub; the strategic role of bioincubators in de-risking innovation; and bridging the gap between deep science and venture capital.

"The path from innovation to approval is complex. There are plenty of bottlenecks for the startups, either coming from compliers or regulators. While the investors are looking for immediate money, these bottlenecks stand as constraints for the startups," said Dr Mohamed Adil.

Apart from these leading geographies, Odisha is another state that is setting sights on becoming India's next bioeconomy hub with its new biotechnology policy. By fostering innovation, attracting investments, and strengthening R&D, the state aims to emerge as a leading destination for biotechnology in India.

Hailing Bhubaneshwar to be the next destination for biotech startups, Dr Mrutyunjay Suar, CEO, KIIT-Technology Business Incubator (TBI) pointed out that the whole ecosystem is not only concentrated in cities like Bengaluru, Hyderabad, Pune and New Delhi but also in Bhubaneshwar.

"Investors will come to you if it's a really good startup. All entrepreneurs have to build good business plans. The bigger fund exists in India with the corporates and also with the international agencies. The startups should make use of it and grow further", Dr Suar said during his speech.

Kerala is another state where the startup landscape is on a meteoric rise. According to the Startup Genome report, Kerala's startup landscape is growing at an impressive 20 per cent rate annually and powering over 3,500 ventures. Shedding light on the growth of biotechnology in the state, Dr Praveen K S, CEO, Bio 360 Life Sciences Park mentioned about how Kerala Lifescience Industries Park, formed by the Government of Kerala, is looking after the development of the life sciences sector across the state and how it has become an important part of the bio-economic growth of the country.

"The bioeconomy has grown at a phenomenal pace and the government's aim to see it reach the $300 billion mark by 2030 is not just a target, but it is also a testament to the immense potential that lies across the nation. No matter how brilliant an innovation, it needs a nurturing environment to transform from a hypothesis to a viable, market-ready solution. This forum will help to garner interest in how to generate funding, to streamline regulations without compromising on safety and ethics and to build a robust pipeline of industry-ready talent, etc.And it will also explore the symbiotic relationship between the startup and the incubator, and of course, find some solutions."

**RAVINDRA BORATKAR**
Publisher and Managing Editor, BioSpectrum; Managing Director, MM Activ Sci-Tech Communications

Advocating for the right ecosystem to be in place, Dr Praveen said, "One needs scientific and technological support, technical evaluation, prototyping, testing, developing, and definite support from the R&D institutes. It takes five to seven years of continuous support to mature out from a startup to an MSME to a large-scale production company."

Exceptional support to biotech startups is already being provided by bioincubators across various states in the country, but there is a need to establish incubators in locations where the surrounding

## Biopioneer India Wins Best Startup Pitch Award


L-R- Sandeep Daga- Founder, Nine Rivers Capital; Suraj Nair- Deep Science Investor, Ankur Capital; Dr Amandeep Singh- Founder, Biostrateon; Mayuresh Deosthale- Founder, NEXG2EN CFO LLP; and Bijayananda Panigrahi, Founder, Biopioneer India.

The second edition of the BioStartUps event- Founders & Investors Forum 2025, held on August 1, 2025 at the CIDCO Convention Centre, Navi Mumbai witnessed interesting pitches from startups namely Clinexel; Biopioneer India, and SpineX, with Dr Amandeep Singh- Founder, Biostrateon; Suraj Nair- Deep Science Investor, Ankur Capital; Sandeep Daga- Founder, Nine Rivers Capital; and Mayuresh Deosthale- Founder, NEXG2EN CFO LLP on the jury panel. After a thorough review and evaluation by the jury members, Biopioneer India emerged as the winner of the Best Startup Pitch award during the session.

Biopioneer India, incubated at KIIT TBI in Odisha, is India's first manufacturer of protease inhibitor. While most available protease inhibitors are imported, less effective, and require cold-chain logistics for transport and storage, Biopioneer addresses these limitations with its flagship product — NexGen HM Protease Inhibitor. On the other hand, SpineX Inc. is a global, clinical-stage bioelectric medicine company transforming the treatment landscape for neurological disorders through non-invasive spinal cord neuromodulation. The company's proprietary platform, xStep, is built to address a broad range of chronic neurological and metabolic conditions. Clinexel works with investors to advise them on the key decision of investment, hand holding the biotech across the clinical development, designing milestones for funding, assessing the impact of external as well as internal environment, and developing strategies for timely exit.

ecosystem can further support the startup growth. Additionally, mechanisms are required to be developed for industry-academia collaboration to purely focus on commercialisation, along with establishment of strategic funds for biotech ventures to succeed.

### Bridging the gap between science and business

A key need of the hour is to increase the availability of risk capital for biotech ventures, particularly for early-stage funding. However, the startups also need to strike a balance within their core foundation on how to do good business in order to sell their scientific innovations, and push their growth story. A long deliberation on this aspect was organised in the form of a panel discussion at the Founders & Investors Forum 2025 which included experts like Sachin Joshi, Founder & Managing Director, PharmNXT; Dr Vishal Warke, Director - R&D (Cell Biology & Hydroponics), HiMedia Laboratories; Chandrashekaran Siddamadappa, Chairman & Managing Director, Vipragen Biosciences; Dr Vishal Gandhi, CEO & Founder, BioRx Venture Advisors; Giridharan Periyasamy, Chief Scientific Officer, 4baseCare and Shrey Agarwal, CEO & Director, Abdos Life Science.

The moderator Ruplekha Choudhurie, Research Manager, Everest Group reflected on the fact that although India's biotech landscape is being driven by a strong foundation of cutting-edge scientific innovation and disruptive technologies, the uncomfortable truth

## Panel Discussion


L-R- Sachin Joshi, Founder & Managing Director, PharmNXT; Dr Vishal Warke, Director - R&D (Cell Biology & Hydroponics), HiMedia Laboratories; Chandrashekaran Siddamadappa, Chairman & Managing Director, Vipragen Biosciences; Dr Vishal Gandhi, CEO & Founder, BioRx Venture Advisors; Giridharan Periyasamy, Chief Scientific Officer, 4baseCare and Shrey Agarwal, CEO & Director, Abdos Life Science; and Ruplekha Choudhurie, Research Manager, Everest Group.

remains that many of the science-led startups do not survive beyond their early validation phase and fade out even before their products reaching the market.

"Startups often fail not because the science is not good enough, but due to the scientific prowess that is not enough without regulatory foresight, a clear IP strategy, biliterate capital and an agile business model", said Ruplekha.

Drawing insights from global innovation hubs such as Boston, Cambridge (UK), and Singapore, Dr Vishal Warke underscored the urgent need for cross-disciplinary fluency among founders, investors, and ecosystem enablers. He further emphasised the importance of building biotech-literate capital, cultivating translational expertise, and developing integrated, value-driven support systems, cross-trained leadership to accelerate scalable and sustainable biotech innovation.

Sharing his perspective on the current investment scenario of the biotech startups in the country, Dr Vishal Gandhi said, "While many of the startups are built in silos, and incubation plays an important role, the reality is that no one is there to buy the products once these startups approach the market. There are many startups that are doing well in the market despite not even raising any money. The startups need to look at the idea validation and assure whether the idea is large enough, and is solving the real problem."

Dr Gandhi further insisted on scaling up for startups to achieve success in the long run, and said, "De-risking has led to value creation, but collaboration is the need of the hour." On this note, Sachin Joshi opined, "I think product-market fit is most important when you are entering the market as a startup, apart from choosing the right products, and choosing the right collaborators. Product-market fit assures the degree to which a product satisfies a strong market demand, indicating that the startup has found a viable market for its product."

Addressing the investment ecosystem in India as not a mature one, Siddamadappa from Vipragen Biosciences regarded scaling up of startups as a very crucial aspect of ensuring success. Backing this thought, Periyasamy from 4baseCare urged the startups to become more open and talk with a lot of investors for the long-term mission of their ideas.

Shrey Agarwal, further added that the Indian startups should look at the global space, to get returns out of their investments. Towards the end of the discussion, the speakers agreed that startups need to stay relevant for years and have a long-sighted outlook rather than a short-term one, and the investors must shift from FOMO (Fear of Missing Out) -driven investments to conviction-led biotech bets, with strong support from the government.

Founders & Investors Forum 2025 that witnessed over 100 participants from across the nation was well supported by industry and ecosystem partners- Meril, Abdos Life Science, Clinexel, HiMedia Laboratories, Charles River, Healthark, BIRAC, Venture Center, Evonik, Vipragen Biosciences, Ankur Capital, BioRx Venture Advisors. BS

**Sanjiv Das**
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## PHOTO GALLERY

BioStartUps
Leading Platform for Emerging StartUps

FIF FOUNDERS INVE$TO₹S FORUM 2025

Exsure won the Innovator of the Year award; presented by Dr Manish Diwan and Dr Mrutyunjay Suar (L).


Soulsense Innovations won Breakthrough Diagnostic Technology of the Year Award; presented by Dr Manish Diwan (R) and Ankit Kankar (centre).

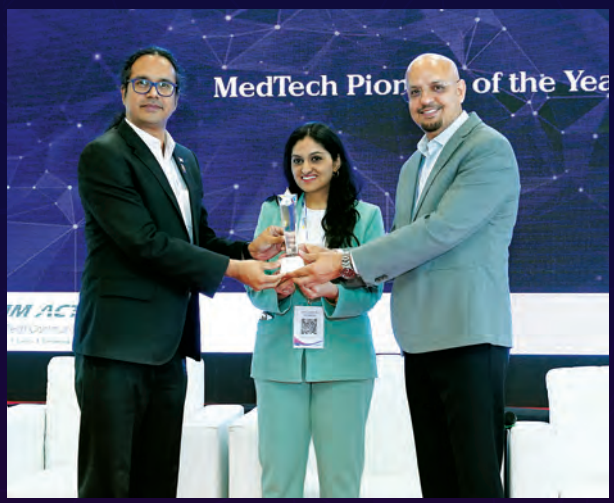

Avay Biosciences won the award for Startup to Watch Out : Life Sciences & AI Convergence; presented by Dr Manish Diwan (R) and Dr Mrutyunjay Suar (L).


Pragmatech Healthcare Solutions won the Trailblazing Women-led Startup of the Year Award; presented by Dr Manish Diwan (R) and Chandrashekaran Siddamadappa, Chairman & Managing Director, Vipragen Biosciences (centre).


Dr Vishal G Warke from HiMedia Laboratories (centre) won Mentor of the year- Life Sciences & Biotechnology Award; presented by Dr Manish Diwan (R) and Dr Premnath Venugopalan (L).

Peptris Technologies won Most Promising Startup of the Year Award; presented by Dr Manish Diwan (R) and Dr Premnath Venugopalan (L).

Genefiteletics won HealthTech Startup of the Year Award; presented by Dr Manish Diwan and Ritu Baliya (centre).



Startoon Labs won MedTech Pioneer of the Year Award; presented by Dr Manish Diwan (R) and Ritu Baliya (centre).

Abdos Life Science won Emerging Life Sciences Company Award; presented by Dr Manish Diwan (R) and Raghavendra Goud, Investor and Advisor (L).

Atal Incubation Centre- Centre for Cellular and Molecular Biology won Bioincubator of the Year (Tier-1) Award; presented by Dr Manish Diwan and Raghavendra Goud, Investor and Advisor.

Manipal-GoK Bioincubator won Bioincubator of the Year (Tier-2) Award; presented by Dr Manish Diwan (R) and Raghavendra Goud, Investor and Advisor (L).

# Navigating the Complexities of Pharma Packaging Sustainability

**Pharma companies in India are increasingly adopting sustainable methods in packaging to ensure that medicines remain safe and the environment is protected. Various initiatives by the government, focusing on reducing carbon footprints, are revolutionising the pharma packaging industry. There has been a paradigm shift towards sustainability, digitalisation and patient-focused solutions. Companies are transitioning to bioplastics, paper-based, and wood-based bio-PET alternatives, reducing reliance on petroleum-based plastics and lowering carbon footprints.**

The pharma packaging industry is seeing a strong shift towards more patient-friendly packaging. Child-resistant designs are becoming a more commonly used feature in Over-The-Counter (OTC) products. The industry is also rapidly shifting towards opting for more sustainable manufacturing practices. Pharma manufacturers are not just working to reduce their carbon footprint, but are also choosing partners who can help them reduce their scope 3 emissions. The industry is seeing increased investments in packaging materials that are recyclable, reusable and bio-degradable. Medicines are travelling across continents facing diverse environmental conditions. This has amplified the need for robust, reliable packaging that can withstand varying temperatures, humidity, and handling challenges without compromising product integrity.

## Innovations and initiatives

Pharma packaging is seeing major innovations. Usage of QR codes, Data Matrix codes and RFID (Radio Frequency Identification) tags provide instant access to comprehensive drug information (dosage, side effects, refill options). These enable real-time tracking throughout the supply chain. These also help in verifying authenticity and combating the growing problem of counterfeit medications.

The sector is witnessing a shift from static to dynamic packaging which includes AR, QR codes, personalised dosing, refillable designs and eco-friendly materials. Secondary packaging enhancements include blister packs, senior-friendly PFS kits, RFID/NFC labelling, easy-open blister seals etc.

German-based company Gerresheimer, the systems and solutions provider for the pharmaceutical and biotech industry, having its production locations in Kosamba, Kundli and Mumbai in India has introduced a web-based product database designed to streamline the selection and registration of primary plastic packaging for medicinal products. The platform aims to simplify regulatory approvals and reduce time-to-market for pharmaceutical companies.

Pune-based Cilicant offers various innovations while packaging pharma products. These are silica gel, molecular sieve, DAVSORB (super-absorbent), Cilicant 270 (cargo desiccant) for moisture control and activated carbon sachets for odour control. Cilicant ensures that every desiccant product that the

company ships carries a unique serial number on its label. Canisters are laser-marked with a permanent serial number. This number is directly linked to the raw material batch used in manufacturing, giving a complete traceability for the desiccants down to their raw materials. The system ensures transparency and accountability throughout its supply chain.

Mylan has taken certain initiatives when it comes to sustainable packaging. Mylan (part of Viatris) employs bio-based materials, high-barrier multi-layer films, and modified-atmosphere tray sealing. The company invests in digital inkjet traceability. The company is optimising design, reducing components and using direct printing and biodegradable shrink films selectively.

ACG has introduced digital and laser printing innovations that support traceability and on-demand customisation. Digital printing allows for real-time printing of batch data and QR codes directly on packaging. Laser engraving creates durable, tamper-evident markings without ink. These technologies are designed to enhance traceability and patient safety while improving operational flexibility.

Packaging innovation efforts of Alkem combine practical elements for patient ease with strong security mechanisms in their approach. Several products are designed with child-resistant packaging, senior citizens-friendly features, and multilingual and braille labelling to improve accessibility. Alkem has also included calendar markers in the design which function as straightforward dosage reminder systems.

Says ***Dr Vikas Gupta, CEO, Alkem Laboratories,*** "Pharma packaging today goes much beyond protecting the product. It is becoming more patient centric with the design, safety features, and precise information enabling better compliance and preventing counterfeits. The industry is moving towards smart technologies such as barcodes, RFID tags, advanced serialisation, and even blockchain to combat counterfeiting and improve supply chain transparency. We are focussed on developing and integrating patient-friendly packaging solutions that not only comply with global benchmarks but also anticipate the evolving demands of healthcare."

Navi Mumbai-based Jay Wood Industry (JWI), the manufacturer of ISPM-15 certified wooden pallets and packaging, is helping pharma exporters move toward eco-conscious, regulation-compliant packaging solutions—a critical shift in light of evolving international standards and ESG goals. The natural, biodegradable wooden solutions help to reduce the carbon footprint and align with the growing demand for green packaging.

Says ***Jay Deepak Shah, CEO and MD, Jay Wood Industry,*** "We've witnessed increasing interest in reusable and treated wooden pallets that meet ISPM-15 standards and align with pharmaceutical hygiene and safety norms. Adoption of such sustainable solutions signals a broader commitment by pharma players to reduce their environmental footprint without compromising operational efficiency. While regulatory compliance continues to pose challenges, it is also pushing the industry toward smarter, greener practices. The future of pharmaceutical packaging lies in innovation that's not just tech-driven, but also deeply rooted in practical, scalable, and sustainable supply chain choices."

Sycure TE by Kaisha Packaging, the sister concern of Mumbai-based Dadachanji Group of Companies, offers clear visual proof of tampering, while Sycure AD locks the plunger post-use, preventing syringe reuse — both critical for safe, single-dose delivery. Another latest innovation is a flip-top seal with embedded

| Some key innovations in pharma packaging | |
|---|---|
| Blow-Fill-Seal (BFS) | Seen as FDA-endorsed for aseptic unit-dose filling, with pharma industry adopting these for biologics and liquid injectables due to reduced contamination risk |
| Smart/IoT packaging and sensors | Can monitor temperature, humidity, tampering, and integrate with patient-apps. |
| Advanced anti-counterfeit tech | Advanced anti-counterfeit tech: NFC, holograms, blockchain-backed unique traceability, fortified by DSCSA and EU FMD mandates |
| Serialisation/ digitisation | Mandatory in major markets; blockchain and AI enhance reliability and streamline verification, but require significant IT and compliance investment |

authentication — using a proprietary plastic mixture that can be read by a dedicated device.

***Rishad Dadachanji, Managing Director, Dadachanji Group*** mentions, "The pharmaceutical packaging industry is undergoing a decisive shift. We're seeing an accelerated adoption of intelligent automation — not just on manufacturing lines, but across the entire operational ecosystem.There is growing urgency around tamper evidence, reuse prevention and anti-counterfeiting. Packaging today must go beyond containment — it must protect, perform, and prove."

## Challenges

The pharma packaging sector faces some hurdles related to rising costs of raw materials, energy and logistics. Though the industry is constantly balancing innovations, complying with new regulations, and maintaining current operations in a cost-effective manner, issues like counterfeiting, tampering etc. pose risks to the packaging sector.

Regulatory and supply chain, cost and infrastructure, material trade-offs, waste and circularity are some of the causes plaguing the pharma packaging sector.

***Manish Jain, Managing Director and Founder, Cilicant*** says, "Counterfeiting remains one of the most serious challenges, which risks patient safety, in the pharmaceutical as well as packaging sectors. In a complex market like India, ensuring end-to-end traceability is difficult. This is why more and more pharmaceutical manufacturers are adopting anti-counterfeiting solutions like serialisation and track and trace systems. However, implementing these systems can be both technically complex and costly."

Also, it can be noted that developing sustainable materials – whether it is lighter glass, advanced recycled content, or new biodegradable polymers needs ultra-stringent safety and regulatory requirements for these can sometimes pose enormous technical and financial challenges.

***Rajesh Khosla, CEO, AGI Greenpac*** opines, "Developing truly sustainable materials – whether it is lighter glass, advanced recycled content, or new biodegradable polymers – that also meet this ultra-stringent safety and regulatory requirements can be an enormous technical and financial challenge. Every new material, every change, demands rigorous, time-consuming, and costly testing to ensure it won't interact with the drug or compromise its integrity over its entire shelf life. It takes time for packaging providers to win the trust of customers because of this."

## Cost-effectiveness

Any innovations come with a cost attached to them. In this case, most of the new packaging innovations are aimed at better customer convenience and quality and/or regulatory compliance. Currently, the most visible innovations are material/design innovation for user convenience and graphical/digital innovation for brand promotion/protection.

While the material/design innovations are relatively cheaper, graphical/digital innovations are costlier. Sometimes material/design innovations are also found costly when it calls for developing a new machine or process/system. A balance is often maintained through a cost-benefit analysis and an optimised solution is adopted as a short-term plan. Based on its evaluation over a period a long-term solution is adopted, unless it becomes obsolete.

Pharmaceutical manufacturers are adopting strategies like incremental innovation. They are simplifying the design and taking smaller steps to make their products more sustainable, thus keeping things cost-effective while moving towards a sustainable future.

***Dr Akbar Ali, General Manager & Head, Development and Technology, ACG Packaging Materials*** mentions, "Several developments, such as compact blister packs, directly reduce material use and cut packaging-related costs by up to 20 per cent. Smaller packaging also lowers logistics and warehousing expenses. Digital and laser printing reduce the need for inventory-heavy pre-printed stock, supporting more efficient, flexible production. However, cost challenges remain when sourcing sustainable raw materials, as prices are often prohibitive without broader government or industry support."

## The concern of microplastics in glass bottles

Recently research on glass bottles found the presence of micro plastics. This has raised concern over the fact that glass bottles were thought to be free from plastics. This has added a new dimension of scrutiny to pharmaceutical packaging. Although glass is considered inert, contamination during manufacturing, capping, or storage is a real concern.

A pharma expert with three decades of experience in packaging, ***Prabir Das, who was the Associate Director, PDL Packaging Development, Ranbaxy and Head, OSD Packaging Technical Services,*** Mylan mentions, "Even though glass bottles are slowly being replaced with alternate plastic-based packaging, it is still in use for products which are either not stable in alternate packs or not studied yet in alternate pack options. Glass bottles normally use a closure (often metal caps) which are coated/lacquered/printed. Those are opened and closed multiple times. This is one of the primary reasons for the migration of microplastics. The use of moulded plastic closures can minimise such migrations. Internal coating (if any) and washing/cleaning/drying also need to be validated to ensure the minimum presence of foreign matters, including the possibility of microplastic migration. The presence of microplastics is not wanted, but it requires extensive research to prove its ill impact on human health and find a long-term solution."

***Vinit Kapur, Secretary, The All India Glass Manufacturers' Federation (AIGMF),*** said, "Glass and plastics are fundamentally distinct materials. Glass bottles are manufactured from abundant natural ingredients such as silica sand and cullet (recycled glass), through a high-temperature process that does not involve the use or formation of plastics. The glass manufacturing units are entirely free of plastic production. When plastic particles are observed in beverages packaged in glass bottles, these particles are attributed to external components like caps and closures, specifically those involving painted metal surfaces, plastic liners, or sealing compounds."

## The future

The pharma packaging sector is heading for a huge change. Keeping sustainability, contamination risks, regulatory reforms, and affordability, packaging manufacturers can bring in a revolution in the sector.

Says ***Kumar Suman, Head Packaging Development Injectables & Medical Devices, Macleods Pharmaceuticals,*** "Pharma packaging is rapidly integrating advanced aseptic processes, serialisation, smart materials, and eco-design. Adoption is strong, especially in biologics and regulated markets but constrained by costs, regulatory inertia, and material supply. The glass bottle microplastic challenge underscores the need for stricter QA across containment types. As regulations tighten (e.g. EU Green Deal, DSCSA), packaging innovations with sustainability, traceability, and safety will become not just advantageous but essential."

As ***Alagu Subramaniam AR, Packaging Strategy & Commercialization Consultant – Pharmaceuticals,*** who has served for 20 years at West Pharmaceutical Services, points out, "The global pharma packaging market is projected to reach $180 billion by 2027, with smart and sustainable packaging expected to account for a growing share. The convergence of healthcare, technology, and sustainability is set to redefine the pharmaceutical packaging industry. With growing demand for personalised medicine, at-home care, and real-time monitoring, packaging will no longer be a passive container—but an active participant in the healthcare ecosystem."

As companies navigate this complex, fast-evolving landscape, collaboration between regulators, manufacturers, technology providers, and packaging innovators will be crucial to ensuring safety, scalability, and sustainability. BS

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# How Do Recent Deaths Impact Gene Therapy Development?

Cell and gene therapy (CGT) is among the most closely watched areas in pharma and biotech. As of June 2024, 100 products have been approved globally, with 2,848 candidates in the pipeline ranging from preclinical to preregistration phases, according to Citeline. But recent patient deaths have put the sector under scrutiny, leading to trial pauses and raising questions about the safety of some widely used delivery technologies. Would these shake development efforts or dampen investor and regulatory confidence in the field? Let's find out.

Cell and gene therapy, long hailed as one of the most promising frontiers in modern medicine, has offered hope of life-changing treatments for patients with rare and serious diseases.

The safety concerns began in March 2025, when Sarepta Therapeutics reported the first patient death linked to its approved Duchenne muscular dystrophy gene therapy, Elevidys. The non-ambulatory boy developed acute liver failure after receiving the treatment. In June 2025, a second non-ambulatory patient died following Elevidys treatment, prompting Sarepta to introduce a series of safety measures, including adding a black box warning to the product label. In May 2025, Rocket Pharmaceuticals disclosed the death of a participant in a small trial of its gene therapy for Danon disease, a rare genetic condition that weakens the heart muscle and typically kills male patients in early adulthood.

In July 2025, Sarepta reported a third patient death, this one occurring in a trial for an experimental gene therapy targeting limb-girdle muscular dystrophy. Following these three consecutive fatalities, the US Food and Drug Administration (FDA) asked Sarepta to halt all US distribution of Elevidys, including for ambulatory patients, and put several of the company's clinical trials on hold. These developments have sent ripples through the field of cell and gene therapy, a space more often celebrated for historic regulatory approvals.

## AAV on fire

It is worth noting that both these therapies used adeno-associated virus (AAV) vectors for gene delivery. Once considered the most reliable vehicle in the field, AAV technology has now come under scrutiny, with mounting concerns about immune-related side effects and liver toxicity. The FDA has also revoked Sarepta's AAV gene delivery technology's platform-therapy designation, which had previously sped up reviews of subsequent AAV-based therapies.

AAV vectors form a key part of gene therapy development. Two well-known therapies that use AAVs are Luxturna and Zolgensma. Luxturna, originally developed by Spark Therapeutics and later acquired by Roche, was approved by the FDA in 2017 to treat a rare inherited vision disorder, delivering a functional gene to affected cells. Zolgensma, developed by AveXis and now marketed by Novartis Gene Therapies, treats spinal muscular atrophy by providing a working copy of a defective gene and became the first FDA-approved gene therapy for SMA in 2019.

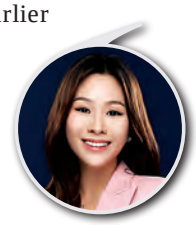
The technology is widely used because it typically induces little to no immune response. However, recent trial data have raised red flags. Some studies have reported excessive immune reactions in liver cells, leading to serious complications. A series of high-profile deaths has been linked to AAV based therapies, thirteen between 2021 and 2024 according to the Norn Group. The technology is now under fire, prompting several firms to rethink or discontinue

their approaches.

In April 2025, Vertex Pharmaceuticals announced it would discontinue all internal research related to AAV gene therapies, marking a pivotal moment in the evolution of the gene therapy landscape. Pfizer paused trials of its AAV-based Duchenne therapy in 2024 over liver toxicity concerns and scaled back research in this area. In 2023, Takeda announced it was moving away from early-stage R&D work in AAV-based gene therapies.

## What Experts' Say

Cell and gene therapies are already grappling with several hurdles, from manufacturing challenges and high costs to potential financial implications. Recent reports of patient deaths in clinical trials have raised questions about whether these concerns could further dampen investor sentiment. While earlier incidents shook confidence, experts stress that the field's fundamentals remain strong and that safety-focused innovation will be key to its progress.



"Certainly not," said ***Dr Joyce Cheong, Doctor Wellness Pte Ltd (Singapore),*** when asked if these incidents could derail the field. She added, "Cell and gene therapies are often used for late-stage, no-option patients who are already physically very weak. Dosage is crucial to avoid cytotoxicity. Generally, the less artificially made the therapy, with fewer genetic modifications — the better tolerated it will be. Scientists today have introduced many cellular modifications the human body has never encountered, such as antibodies and gene edits. This is why I prefer a more holistic approach, using what the human body already has, such as gamma delta T effector cells, which are effective natural immune cells with minimal genetic modification. You are born with these immune cells."

***Dr Ivan Horak, Founder and CEO of Tikva Allocell, Singapore,*** echoes similar sentiments by saying "We are confident that researchers, regulators, and investors understand the enormous promise of gene and cell therapies for a wide variety of patients. As the field is still relatively new, it is difficult to extrapolate from gene therapy setbacks to cell therapies. Cell therapies continue to face challenges that have slowed adoption, such as affordability and availability, and chief among these challenges is developing treatments with improved efficacy and safety."

Tikva is developing the next generation of 'off-the-shelf' T cell therapies using allogeneic Epstein–Barr Virus (EBV)-specific T cells (ALLO EBVST). The company believes these allogeneic virus-specific T cells (VSTs) can improve affordability, global availability, and cell persistence while reducing the risk of graft-versus-host disease (GvHD). Preclinical studies show that TAVST01 can safely target tumours, enabling multiple doses or combination therapies, with Tikva prioritising accessibility.

While AAV remains a gold standard for gene therapy delivery, researchers are now exploring safer alternative platforms. While these cases are unrelated to CAR T cell therapy, they have reinforced the broader need to anticipate and mitigate treatment-related risks early in development.

Current CAR T cell therapy trials primarily use modified alpha beta T cells derived from the patient and reinfused back into the same patient. "Because of their mechanism of action, various treatment-related complications including neurological issues, cytokine release syndrome, cytopenia, and infections may lead to mortality not related to cancer relapse," Dr Joyce explained. "In contrast, gamma delta T cells function differently and may significantly reduce these risks. Advancements in gamma delta T cells could enhance cancer cell therapy development and boost confidence among investors and regulators when introduced in clinical trials."

The global cell and gene therapy market is projected to grow from $ 8.94 billion in 2025 to $ 39.61 billion by 2034, according to Precedence Research. Seen as a key growth engine for the pharmaceutical and biotech sectors, the field holds promise for addressing rare and life-threatening diseases with limited treatment options. How it navigates recent safety concerns will play a critical role in shaping investment, regulatory confidence, and the pace of future approvals. BS

**Ayesha Siddiqui**

### The Sarepta saga

The FDA approved Elevidys in June 2023 for Duchenne muscular dystrophy patients aged 4–5 who could still walk, later expanding the label to include older and non-ambulatory patients. Elevidys' approval raised concerns, as trial data showed limited improvement in motor function. By mid-2025, three patient deaths, including one from liver failure, prompted the FDA to halt Elevidys distribution and pause several Sarepta gene therapy trials. In July 2025, The EMA also issued a negative opinion on Elevidys for DMD, citing unmet primary endpoints in its trials.

# “Awareness and consistent training are needed with the growing demand for effective skin treatments in India”

**Madhusudhan HK,**
Country Manager,
Aerolase, India

India’s dermatology and aesthetic market is reportedly among the fastest-growing globally, projected to grow at a CAGR of 10.11 per cent from 2025 to 2032. However, there remains a significant gap in access to advanced laser solutions that are truly effective, safer, and inclusive of all skin types. Addressing this concern, around the celebration of World Skin Day on July 8, US-based firm Aerolase announced the launch of Neo Elite in India, a US FDA-approved 650-microsecond laser technology that safely and effectively treats a wide range of skin conditions. This development marks a significant step towards Aerolase’s entry into the Indian market and how the brand is poised to reshape the country’s dermatology and aesthetic treatment landscape with its advanced, inclusive, and patient-friendly laser solutions. To find out more about the company’s future plans in India, BioSpectrum India interacted with Madhusudhan HK, Country Manager, Aerolase. ***Edited excerpts:***

## How does Aerolase see India as a strategic destination for expanding its advanced dermatology equipment?

India is a key part of our global expansion strategy. The dermatology and aesthetic segment here is growing rapidly, with increasing awareness and demand for non-invasive skincare solutions with no down time. With a strong network of dermatologists, evolving consumer expectations, and rising investments in clinical aesthetics, India offers a dynamic environment for us to introduce our technologies. We see this market as a long-term opportunity to build meaningful partnerships with practitioners and clinics across the country. We aim to offer highly personalised, zero-downtime treatments that are ideal for Indian skin concerns, from pigmentation to acne and rejuvenation. We are also laying the foundation to collaborate with reputed homegrown clinics and brands to scale our presence responsibly and sustainably.

## How do you envision the country’s growing demand for non-invasive skin treatments? What are the current challenges and opportunities in store?

There is a growing preference in India for skin treatments that are effective, safe, and have minimal downtime. This shift is being driven by younger consumers, greater access to global trends, and the influence of digital platforms. The opportunity lies in offering solutions that combine clinical depth with ease of use.

However, one of the challenges is the need for consistent training and awareness. The success of any advanced technology depends on how well it is understood and applied by practitioners. We are addressing this through focused training programmes and collaborations with experienced dermatologists.

We are also seeing strong interest from Tier 2 cities and smaller urban centres, which opens up a new wave of opportunity for quality-oriented solutions.

## What major plans and strategies are lined up to strengthen the company's presence in India this year, and beyond?

Our immediate priority is to strengthen the market presence of Neo Elite, our flagship laser device, across key cities through strategic partnerships that give us both scale and access to a high-quality network of skin experts and clinics.

We are also building a team of clinical specialists, training professionals, and service support to ensure seamless adoption and post-sale engagement. In the coming months, we plan to expand our footprint through collaborations with leading dermatology practices, participation in national conferences, and education-led outreach.

**Any new collaborations and partnerships in the Indian market?**

Our partnership with Kaya Clinic marks a significant step forward in India. It enables us to introduce Aerolase's global standard of laser technology to a wider consumer base in a clinical setting that is trusted and accessible.

Apart from Kaya, we are in active discussions with leading dermatologists and institutional clinics for potential collaborations. These partnerships are focused on driving both adoption and awareness through high-quality service and practitioner education.

**What are the unique features of your non-invasive skin treatment technologies? Are you planning to launch new devices in India in the coming months?**

Our patented 650-microsecond technology makes our devices uniquely effective while being gentle on the skin. Neo Elite is capable of treating more than 36 FDA-cleared indications, all without contact, cooling, or anesthetic. This is especially beneficial in the Indian market where patients often seek solutions that are fast, pain-free, and suited for different skin types.

We might introduce other devices from our global portfolio including solutions focused on skin resurfacing and other specialised indications.

**What is the cost of Neo Elite that has been recently launched in India? How much sales/profit are you expecting with this product being released in the Indian market?**

We fully appreciate India is a different market compared to the US, Europe and others. We have launched Neo Elite in India after customising the price to India market

As for our sales expectations, we are seeing encouraging interest from practitioners and also the business organisations. With the existing partnerships, we will soon be available in all the key markets of India and are optimistic about expanding our presence in both metros and upcoming markets in the near future

**Are you exploring entry into other markets within the Asian region, besides India, where there is high demand for skin care devices?**

We are actively assessing growth opportunities in other high-potential markets across Asia, particularly in Southeast Asia. We are already present in some of the countries and will soon be available in most of them. Countries like Singapore, Philippines, Thailand, Indonesia, are showing rising demand for advanced aesthetic solutions and have mature dermatology ecosystems.

*The dermatology and aesthetic segment in India is growing rapidly, with increasing awareness and demand for non-invasive skincare solutions with no down time. With a strong network of dermatologists, evolving consumer expectations, and rising investments in clinical aesthetics, India offers a dynamic environment for us to introduce our technologies. We see this market as a long-term opportunity to build meaningful partnerships with practitioners and clinics across the country. We aim to offer highly personalised, zero-downtime treatments that are ideal for Indian skin concerns, from pigmentation to acne and rejuvenation.*

**Any global launches of new technologies/ products planned this year or later?**

We are currently working on new technologies that will address more specialised needs in the aesthetic and dermatology space, including skin resurfacing and body contouring.

Some of these innovations are scheduled for launch at upcoming global medical conferences and will be rolled out in phases based on regional demand and regulatory clearances.

India being a priority market, we are committed to bringing these solutions here at the right time. BS

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# “Shortage of professionals with expertise in both AI and life sciences complicates adoption”

« **Mohit Sood,** Regional Managing Principal (India), ZS

With its ability to both generate insights and act on them autonomously, agentic AI is poised to revolutionise the process of developing new therapies and bringing them to the market. Across every stage of the value chain, from R&D to manufacturing to commercialisation, agentic AI is already having a significant impact. This evolution is particularly pertinent to India's dynamic life sciences landscape, where AI adoption is accelerating rapidly. While traditional AI systems have focused on analysing data and providing insights, agentic AI represents the next frontier. To understand more about the application of agentic AI in India, BioSpectrum spoke to Mohit Sood, Regional Managing Principal at ZS, a global management consulting and technology firm with over 40 years of legacy in transforming healthcare globally. ***Edited excerpts-***

## How is agentic AI fundamentally reimagining the life sciences ecosystem?

Agentic AI is revolutionising the life sciences industry by enabling autonomous systems that can plan, execute, and adapt complex tasks across R&D, clinical trials, manufacturing, and regulatory processes. These intelligent agents can rapidly analyse biological data, identify drug targets, design experiments, and even monitor trials in real time. Agentic AI's automation and redesign of commercial processes, such as launch control and omni-channel campaign deployment, significantly enhance efficiency and precision, reducing human error and operational costs. This transformation enables businesses to achieve faster, data-driven decision-making and improved customer engagement.

Globally, this shift is driving breakthroughs in areas like precision medicine and regulatory compliance. In India, while adoption is still maturing, there's strong momentum, especially with service provider companies integrating agentic AI into research, diagnostics, and automation workflows. As infrastructure and regulatory frameworks evolve, agentic AI is set to unlock significant gains in both speed and scale for the Indian life sciences ecosystem.

## Can you elaborate on how India's pharmaceuticals and life sciences global capability centres (GCCs) are adapting to agentic AI innovation? What role is ZS playing here?

GCCs are rapidly evolving into innovation hubs that solve complex problems with greater precision and insight. They play a critical role in accelerating R&D, driving emerging technology adoption, and enabling strategic business transformation. To power this shift, GCCs invest significantly to upskill their workforce through AI academies and certification programmes. A key focus is the development of AI translators, professionals who can bridge domain expertise in life sciences with technical AI capabilities. These individuals are instrumental in identifying and implementing high-value, agentic AI solutions across the enterprise.

We position ourselves as a capability and expertise centre because our mission has always been to consolidate knowledge and serve as both the heart and brain of our global operations. With nearly two decades of presence in India, we offer a unique vantage point to support GCCs in navigating the rapidly evolving life sciences landscape. Over the past two to three years, we’ve witnessed significant growth in this sector and have actively collaborated with several life sciences GCCs as they establish and expand their operations, helping them advance toward their strategic objectives.

ZS plays a pivotal role in supporting both new and existing GCCs. For new centres, we help build strong foundations by crafting business cases, operational blueprints, success metrics, and transition roadmaps that enable faster value realisation. Through our GCC-as-a-service model, we enable operating model

design, tech-driven transformation, and the creation of talent ecosystems and innovation labs. For established GCCs, ZS offers Build-Operate-Transfer or Enable models, enhanced by our proprietary platforms such as ZAIDYN and Max.AI.

### How does ZS differentiate its approach to agentic AI from other AI-powered solutions currently being deployed in the life sciences sector?

ZS's approach to agentic AI is deeply rooted in its life sciences expertise, making it uniquely differentiated in the market. At the core of this capability are two primary platforms. ZAIDYN: which is focused on life sciences and supports end-to-end commercial use cases. It helps take a drug from development to launch, covering all aspects of patient services and beyond. AI is embedded in the modules of the ZAIDYN platform to support these activities. Max.AI which is an industry agnostic platform allows our data scientists to create agents across industries with pre-trained models grounded in life sciences data, terminology, and regulatory requirements. Max. AI enables faster deployment within 2-4 weeks for our clients, allows for rapid building and monitoring, along with access to dedicated expertise in early engagement, engineering, AI, and customer success.

Unlike traditional AI systems that rely on monolithic models, ZS employs a collaborative ecosystem of AI agents. Each agent is designed for specialised tasks such as policy analysis or formulary verification enabling high-efficiency workflow automation that delivers greater precision and speed.

ZS has also formed strategic partnerships with organisations like Cerebras, allowing for training of LLMs up to 70 times faster. This significantly accelerates time-to-value for clients and enables quicker deployment of AI solutions. Importantly, ZS supports full-spectrum integration of agentic AI across the life sciences value chain. This means organisations can embed advanced AI into existing workflows with minimal disruption, driving end-to-end efficiency and innovation.

### What are the challenges to adoption of agentic AI and how are ZS's products addressing it?

Generic AI often falls short in understanding the complex terminology, workflows, and strict regulations specific to healthcare, limiting its effectiveness in critical tasks. Moreover, AI must integrate with legacy systems and handle sensitive patient data, creating both technical and compliance hurdles. The shortage of professionals who possess expertise in both AI and life sciences further complicates adoption, making organisations heavily reliant on external support.

ZS addresses these challenges through innovative AI capabilities harnessing both GenAI and agentic AI. GenAI capabilities have been incorporated into our analytics for drug development and brand planning, resulting in a reduction of effort and time by over 30 per cent and quicker execution. Our latest innovation, Max.AI, harnesses GenAI capabilities to develop AI agents that accelerate enterprise use cases. Our LLM agents are notable for their easy setup, allowing deployment within 2-4 weeks, rapid building and monitoring, and support from dedicated teams specializing in early engagement, engineering, AI, and customer success. To ensure safe and responsible AI usage, Max.AI includes built-in security and compliance features that align with healthcare's rigorous privacy standards. ZS also empowers clients through validation tools, comprehensive training, and collaborative support, helping build internal capabilities and ensuring sustained, long-term adoption of AI within the enterprise. Another example is Atlas, a tool that accelerates market research by up to 40 per cent compared to traditional methods using pre-built ontologies and integrated customer insights.

### How do you envision the evolution of agentic AI in life sciences over the next 3-5 years in India?

India is at the forefront of the agentic AI revolution, with over 80 per cent of enterprises actively exploring the use of autonomous agents to drive efficiency and foster innovation, as per recent industry report. In life sciences, this shift is particularly transformative, accelerating drug discovery, enhancing diagnostic precision, and optimising operational workflows. Over the next 3–5 years, data will be the backbone of successful AI implementations. However, many organisations still grapple with fragmented, unstructured data. Agentic AI will function as 24/7 digital collaborators in clinical trials, autonomously recruiting eligible participants, monitoring adherence, flagging adverse events, and preparing trial documentation in real time. From drug discovery to patient care, these systems will operate as autonomous, intelligent agents trusted to make decisions, freeing up humans for oversight, innovation, and ethics.

Furthermore, as machine-to-machine interactions increase with automation, enterprises can take the lead in building scalable, end-to-end intelligent systems that minimise human intervention and maximise efficiency, paving the way for future-ready, AI-driven enterprises. BS

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# Why Is Endoscopy Crucial for GI Cancer Diagnosis?

« **Dheeraj Chaudhri,** Head, Endoscopy Systems Division, FUJIFILM India

*The increased demand for gastrointestinal (GI) diagnostics in India, driven by rising disease rates and awareness of early intervention, is not evenly distributed. While major urban hospitals have expanded their endoscopic capabilities, many semi-urban and rural areas face limited access. Addressing this disparity is crucial for extending the benefits of early disease detection across the country.*

India's healthcare system is entering a decisive phase, with diagnostics emerging as a frontline weapon in the battle against lifestyle diseases and late-stage diagnoses. With a growing focus on early detection and preventive care, diagnostics are playing an increasingly vital role in improving patient outcomes. As the burden of both communicable and non-communicable diseases (NCDs) rises, there is a clear need to strengthen access to accurate and timely testing, particularly for gastrointestinal (GI) cancers, colorectal conditions, and many GI disorders, which are lifestyle-related.

Endoscopy remains a key diagnostic modality for GI conditions, enabling clinicians to identify cancers, ulcers, and infections at an early stage. In recent years, there has been a notable increase in demand for GI diagnostics, reflecting both the rising disease burden and greater awareness around early intervention. However, while major urban hospitals have expanded endoscopic capabilities, many semi-urban and rural regions continue to face barriers to access. Addressing this gap offers a significant opportunity to extend the benefits of early detection across India's broader healthcare network.

## Key Technological Challenges Hindering Scale

While the endoscopy market in India is steadily gaining ground, a few challenges continue to limit its wider reach. Most advanced systems are still concentrated in metro hospitals, making access difficult in smaller cities and rural areas where infrastructure is still catching up. The prohibitive cost of equipment, along with the need for trained specialists and paramedic staff, is the need of the hour to operate and maintain advanced technological tools in remote government institutes as well as mid-sized private hospitals, often putting it out of reach for mid-sized and government-run facilities. There is a growing need to strengthen the skilled workforce, including gastroenterologists, nurses, and technicians, who are essential to running these services smoothly. At the same time, many healthcare setups are still working toward better integration between diagnostic tools and electronic health records, which is important for faster reporting and consistent follow-up care.

## Where the Future is Headed

India's endoscopy landscape is poised for a major leap forward, driven by artificial intelligence (AI), miniaturisation, and a growing national focus on early cancer detection.

**Expansion into Tier-2 and Tier-3 Regions:** Government programmes such as Ayushman Bharat and the National Health Mission enable diagnostic expansion at the district level. Mobile endoscopy units and modular setups are emerging as effective models for delivering services in primary health centres (PHCs), community camps, and remote areas.

**AI-Driven GI Diagnostics:** One of the most groundbreaking trends is the integration of AI in GI endoscopy, particularly for: Polyp and lesion detection during colonoscopy; Real-time image analysis for early cancer markers and Automated documentation and enhanced reporting accuracy.

AI technologies now assist gastroenterologists in identifying abnormalities that might be missed during routine screenings, especially in high-volume settings. This not only enhances diagnostic precision but also enables task-sharing in resource-constrained environments.

**Advancements in Gastric Technologies:** New endoscopic platforms feature enhanced imaging modalities such as Amber-Red Colour Imaging (ACI), Blue Light Imaging (BLI), and Linked Colour Imaging (LCI), which allow for improved visualisation of gastric mucosa and early-stage tumours. These innovations help clinicians detect gastric cancer, H. pylori infections, and chronic gastritis with higher accuracy and confidence.

**Portable & Ambulatory Endoscopy Units:** The demand for portable and modular systems is rising sharply, particularly in PHCs, district hospitals, and mobile medical vans. These innovations enable clinicians to perform diagnostic procedures in non-hospital settings, dramatically improving reach in underserved areas.

**Integration into Preventive & Screening Programmes:** Endoscopy is increasingly being embedded into community-based screening initiatives for colorectal cancer, gastric malignancies, and TB-related pulmonary conditions. Its non-invasive nature and cost-efficiency make it ideal for mass deployment in public health settings.

## Policy & Infrastructure Enablers Needed

To expand access to minimally invasive diagnostics, India will need to foster stronger public-private partnerships that focus on long-term system readiness. These collaborations can play a key role in enabling the deployment of endoscopic systems in underserved regions, supporting the development of endoscopy-specific training programmes, and ensuring that these services are integrated into primary care frameworks. It is very critical that government policy makers strategically align with Endoscopy Technology partners and healthcare professionals to work on capacity building and creating learning programmes for bridging the resource gap and adoption of technology for improved patient outcomes.

Aligning national skill-building efforts, such as Skill India and the objectives outlined under the National Health Policy, with specialised diagnostic training will be essential to address the workforce gap in semi-urban and rural areas.

Similarly, expanding reimbursement support under Ayushman Bharat and state insurance schemes can significantly improve affordability and uptake of endoscopic procedures. Regulatory alignment and the integration of diagnostic tools with digital health platforms will also be important to ensure seamless reporting, follow-up, and continuity of care. With the right policy support and coordinated execution, these efforts can accelerate the adoption of minimally invasive diagnostics and make early detection more accessible across the healthcare system.

## Segments & Growth Drivers

**Government Institutions:** Public sector hospitals, particularly in tier-2 and tier-3 cities, are expanding diagnostic infrastructure through schemes such as Ayushman Bharat and the National Health Mission. Investments are focused on strengthening endoscopic capabilities for routine and specialised screenings.

**Private Multi-Specialty Hospitals:** These facilities continue to lead in the adoption of advanced endoscopic systems, especially in gastroenterology, pulmonology, and oncology. High patient volumes and quality-driven care models support continuous upgrades in diagnostic equipment.

**Diagnostic Centres and Day-Care Clinics:** The shift toward outpatient-based diagnostics and early screening has accelerated demand for compact, high-throughput endoscopy systems. These facilities play a key role in expanding preventive health access across urban and semi-urban areas.

## Building India's Endoscopy-Ready Future

For India to meet its goals around timely, effective, and equitable healthcare, diagnostic services like endoscopy must evolve from being specialised offerings in large hospitals to becoming part of routine care across all levels of the health system. Expanding access beyond metros and equipping local clinicians with the right tools and training will be essential to support early detection and timely intervention, particularly for conditions where delays in diagnosis can lead to avoidable complications.

With sustained innovation, focused training, and cross-sector collaboration, minimally invasive diagnostics can play a defining role in strengthening India's preventive care framework. As the country continues to invest in expanding healthcare access, integrating endoscopy into mainstream diagnostic pathways will be critical.

The question is no longer whether India will scale minimally invasive diagnostics, it is how fast and how inclusively we can do it. With bold innovation, targeted investment, and stronger public-private synergy, endoscopy can move from specialised use to standard frontline care. BS

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Leading labs toward a greener future

# Driving Research Continuity in Indian R&D through Remote Lab Operations

« **Dr Mary Donlan,** Executive Director, Product Marketing, Revvity Signals

*India's research landscape is undergoing rapid transformation as institutions look toward hybrid and remote working models to enhance flexibility and collaboration. By turning to cloud-based lab systems and AI-powered analytics, R&D organisations can build agile, future-ready environments to help power India's academic and industrial sectors.*

The COVID-19 pandemic marked a turning point for research and development practices throughout the world. With restricted access to physical laboratories due to nationwide lockdowns, traditional on-site research models were disrupted overnight. In response, R&D organisations were compelled to adopt hybrid and remote research models, combining in-person lab work with digital off-site data analysis.

Ignited by the short-term necessity of COVID-19, digital R&D solutions have now evolved to redefine remote research frameworks and transform how research continuity is maintained. Moving from manual processes largely confined within the four walls of the lab to data-driven research that is independent of location, institutions have learned that the data itself represents the greatest store of value. As a result, reliable, flexible, secure access to lab-generated data is at a premium, and remote and cloud solutions have surged to fill a market gap. For example, in a survey conducted soon after the start of the pandemic, Deloitte showed that drug companies rated cloud computing as one of the highest priorities of the following 5 years.

In the work-from-anywhere hybrid environment, it is no longer practical for data to be encased within physical lab notebooks or local data systems. Researchers working from different locations require safe, real-time access, analysis and sharing of protocols and experimental results to maintain momentum in their projects and promote collaboration across departments and institutions.

In this new environment, cloud-based Electronic Lab Notebooks (ELNs) with AI-powered data analytic platforms play a key role. These solutions enable remote data accessibility, enhanced data integrity, and compliance with regulatory standards – crucial factors in both academic research and industrial R&D.

Specifically for India, digital platforms have the power to support the sector's desire to collaborate with globally dispersed partners, helping to position the country as a science and technology hub.

## Why On-Premises Lab Infrastructure Falls Short

On-premises-only laboratory systems, once central to managing research operations, are less suited to meet the demands of modern, collaborative R&D environments. Designed for a different era, on-premises systems typically offer limited data-sharing capabilities, and rarely will they include secured remote access. Research data held on internal systems will often only be accessible by researchers while in the lab, or through complex, IT-managed remote connections. For scientists working from different locations, on-premises data accessibility can become a significant challenge, adding to cost, complexity and delay.

In addition, each organisation may rely on several different research solutions, with data scattered in proprietary formats, residing on separate storage systems – and accompanied by unstructured data in the form of spreadsheets and miscellaneous documents. Fragmented data stores and the lack of synchronisation between file versions can result in inconsistencies in project documentation, duplicated effort, and misinformed decisions, all of which will impact timelines and increase costs.

## Labs from Anywhere: Secure, Synchronised and Collaborative

To resolve the issues around data fragmentation, labs are turning to modern ELN solutions that enable secure, flexible and real-time access to scientific data from multiple locations, based on

cloud technologies.

By switching away from on-premises to cloud-based solutions, users are no longer tethered to a specific device or internal network. Cloud operations provide the ability and the freedom to access data from anywhere, and to share data in standardised, controlled formats between research groups and between systems.

In addition, the access-from-anywhere capabilities of cloud solutions strike a balance between convenience and safeguarding, through comprehensive security and access management. Secure authentication protocols including single sign on (SSO), two-factor authentication (2FA) and role-based access controls ensure that data is protected and accessible only by authorised users, upholding stringent data protection standards without sacrificing usability.

Equally, cloud-based solutions solve the challenges around fragmented data and lack of synchronisation. Changes – whether amending or updating existing experimental protocols, uploading results or creating new documents – committed from any location are reflected across the platform for the entire team. Synchronised real-time updates eliminate the risks of version conflicts and encourage collaborative workflows, helping projects move forward without delays.

R&D thrives on teamwork and a strong sense of scientific community, and the elimination of data silos provides significant collaboration advantages. Researchers, analysts, regulatory reviewers and quality assurance personnel can work within a shared data environment that supports parallel workflows and real-time feedback – particularly beneficial in fast-paced R&D projects where swift decision-making is necessary.

## Digital-First Labs: Powering Resilience, Continuity and Global Collaboration

Organisational resilience and business continuity are no longer optional in today's R&D landscape – they are mission-critical objectives. The COVID-19 pandemic underscored how quickly disruptions can derail even the best-planned R&D programmes. To mitigate these risks, it is essential for research organisations to enhance infrastructure that can adapt to a range of possible scenarios. Central to this effort is a digital-led lab system offering the tools and flexibility to maintain programme progression regardless of physical limitations.

By moving data management to secure, cloud-based platforms, organisations gain the ability to operate across multiple locations, enabling teams to remain productive even when access to physical labs is limited. In addition, even if one site is impacted by disruption, research can continue without delay.

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Beyond continuity, a digital-first cloud-based approach positions organisations to attract and retain global collaborators. In an increasingly connected research environment, the newest cloud solutions provide security, reliability and always-on availability that international partners expect.

## Future-Ready Research Starts with Cloud-powered Labs

In India, where the scientific community is becoming globally integrated, the desire to move to a scalable and digitally connected research environment is particularly urgent. Institutions hoping to engage in cross-border collaboration now depend on continuity and accessibility regardless of location.

Cloud-based solutions – especially cloud-based ELNs – with browser-based data access, real-time data synchronisation, remote experimental logging, and digital approvals, enable research teams to work seamlessly across geographies and support the speed and efficiency of competitive research domains.

Adopting a digital-first strategy anchored in cloud ELNs offers Indian research organisations a significant competitive advantage, shielding operations from disruption and enhancing high-integrity workflows that are essential for cutting-edge discovery. By building agile, future-ready research environments with cloud ELNs, India's R&D sector can accelerate both growth and global impact, leading the way in shaping the future of science and innovation. BS

# How Digital Twins Transform Drug Development Processes

« **Joydeep Ghosh,** Partner, Life Sciences and Healthcare Industry leader, Deloitte India

« **Sayantan Sengupta,** Manager, Deloitte India

*Digital twins enable a move from a slow, trial-and-error approach to a highly predictive, efficient, and data-driven drug discovery process—getting safer, more effective treatments to patients faster than ever before.*

India, long recognised as the "pharmacy of the world," has strengthened its position as the largest provider of generic medicines globally, accounting for over 20 per cent of the global supply by volume and contributing to 60 per cent of global vaccine demand. Over the past two decades, the country has evolved from a manufacturing powerhouse into a thriving pharmaceutical ecosystem, powered by cutting-edge research, biotech start-ups and a rising wave of digital and data science talent. This strong foundation has recently enabled a major transformation in the country's pharmaceutical landscape. India's pharmaceutical sector is entering a new chapter, driven by integrating traditional sciences with emerging technologies such as AI and data analytics.

## India's Global Capability Centres (GCCs): A launchpad for next-gen innovation

One of the key accelerators of this transformation has been the rapid growth of GCCs. India accounts for over 55 per cent of the world's GCCs, benefiting from a unique blend of talent availability, cost competitiveness and supportive policies. In the Life Sciences and Healthcare (LSHC) sector, GCCs employ over 15 per cent of the total Indian GCC workforce. While many of these centres started by handling support functions, they now take on more strategic roles across R&D, drug development, regulatory analytics, commercialisation and post-market surveillance. These pharma innovation hubs are emerging across major Indian cities such as Bengaluru, Hyderabad, Pune and Mumbai. They focus on machine learning, natural language processing, computer vision and other AI techniques to fast-track the traditionally long and expensive drug development processes, clinical trials and regulatory approvals.

## Digital twins: A new frontier in drug development

A key technological advancement emerging from these hubs is the application of digital twins in pharmaceutical research. Initially used in engineering and manufacturing sectors, digital twins in the pharmaceutical industry are virtual models of human systems that replicate biological processes. These replicas are built using vast volumes of biological, clinical and genomic data, enabling researchers to test how different patient profiles might respond to specific drugs without exposing individuals to experimental therapies. The implications of this approach are transformative.

Through digital twins, pharmaceutical scientists can simulate the progression of diseases, predict Adverse Drug Reactions (ADRs) and model patient diversity across age, gender, genetic traits and comorbidities. This ability to run in-silico trials, which are clinical trials conducted through virtual simulations, reduces the cost, duration and risk associated with traditional clinical testing. Moreover, it makes clinical research more inclusive by ensuring that underrepresented populations are factored into trial designs from the outset.

## India's role in the global digital twin ecosystem

Globally, leading pharmaceutical companies are also leaning into this shift. Digital twin

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technology is being explored to simulate complex biological systems, optimise drug development and enhance clinical trial design. These models accelerate drug development timelines by integrating real-world data, imaging, genomics and AI while improving safety, precision and scalability across the pharmaceutical value chain. For instance, studies presented at the Alzheimer's Association International Conference 2024 in the US showcased how digital twins can reduce control group sizes in Phase 3 trials by up to 33 per cent. In a typical 1,000-person trial, reducing the control group by even 25 per cent could accelerate recruitment by four to five months. About 50 per cent reduction might shorten overall trial timeline by nearly a year, saving costs while speeding access to life-saving therapies.

India can potentially align with global trends and play an active role in shaping them. The country generates a vast amount of patient data daily, supported by its vast network of public and private hospitals, diagnostic labs and insurance systems. Moreover, under the central government's Ayushman Bharat Digital Mission (ABDM), more than 74 crore Ayushman Bharat Health Accounts (ABHA) have been created with nearly 50 crore health records digitally linked as of mid-2025. This data-rich environment provides the fuel to train digital twin models to identify biomarkers, predict disease outbreaks and personalise treatment strategies.

AI-led pharma GCCs in India have already started integrating this health data into simulation platforms to optimise key decisions around dosage levels, patient recruitment strategies, trial endpoints and even post-market monitoring. They are working on virtual patient cohorts using real-world health data to assess drug efficacy across diverse demographic and genetic profiles, improving precision and inclusivity in clinical research. Additionally, these GCCs are exploring machine learning algorithms to optimise protocol design, reduce patient dropouts and identify ideal trial sites based on epidemiological trends and resource availability. By combining domain expertise with deep tech capabilities, India's pharma GCCs focus on redefining global best practices in intelligent, patient-centric drug development.

India's regulatory landscape is also evolving rapidly to match the pace of this pharmaceutical innovation. The Central Drugs Standard Control Organisation (CDSCO) has introduced pilot initiatives to explore the integration of AI into drug approval processes, while regulatory sandboxes provide a safe space for pharma companies to test digital health solutions under controlled conditions. At the policy level, the government's Rs 500 billion Production Linked Incentive (PLI) scheme includes dedicated support for digital innovation, advanced R&D and AI adoption within the pharma sector. Together, these measures signal a strong commitment to building a future-ready regulatory framework enabling safe, scalable and tech-driven growth across India's life sciences ecosystem.

Another key enabler of this progress is India's growing network of academic institutions, research hospitals and digital health start-ups. Collaborative ecosystems allow innovation hubs to co-develop tools, share data ethically and validate models in real-world settings. By combining clinical domain knowledge with AI and software engineering, this multidisciplinary approach is expected to lead to faster prototyping and deployment of digital twin technologies. It can also help to bridge the gap between computational simulations and clinical realities, ensuring that the virtual models are grounded in practical, physiological insights.

## The road ahead: Scaling AI and digital twin in pharma

AI is transforming every clinical development phase worldwide, from trial design to execution and outcome analysis. According to industry estimates, AI is expected to support 60–70 per cent of clinical trials by 2030, potentially saving $20–30 billion annually. While digital twins represent just one facet of this broader AI integration, their capacity to virtually assess drug safety and efficacy could significantly accelerate the journey from discovery to patient delivery.

India's pharmaceutical GCC hubs are expected to rely on a robust digital infrastructure to realise this potential. Cloud-based platforms that enable rapid data processing and model training at scale will be essential. The integration of high-performance computing with both structured and unstructured real-world data from sources such as electronic health records, wearable devices and genomics will enable the development of highly personalised and adaptive models. These platforms must be designed to comply with stringent global regulatory standards to ensure data privacy, model transparency and scientific rigour.

As digital twins evolve from experimental tools to everyday clinical applications, and AI continues to reshape how drugs are discovered, tested and delivered, India is well-positioned to contribute meaningfully to this global shift. BS

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# IIT Indore & Mehta Family Foundation to launch academic schools in Sustainability and Biomedical Engineering

The Indian Institute of Technology (IIT) Indore, with support of the Bhupat & Jyoti Mehta Family Foundation (MFF), has announced a landmark partnership to establish two new academic schools at the IIT Indore campus: Mehta Family School of Sustainability and Mehta Family School of Biosciences and Biomedical Engineering. The Mehta Family School of Sustainability, a one-of-a-kind institution dedicated to climate-conscious innovation, leadership,

and knowledge creation, is set to launch India's first BTech programme in Environmental Economics and Sustainable Engineering, creating a taskforce of more than 400 graduates and 1000+ professionals through Executive Master's and PhD programmes in the next decade. With a strong emphasis on developing data-driven solutions for endemics such as chikungunya and dengue, and addressing the escalating threat of antimicrobial resistance (AMR), the Mehta Family School of Biosciences and Biomedical Engineering is poised to make a significant impact through interdisciplinary, translational research.

# International medical programme for Indian students to practice in the US and Canada

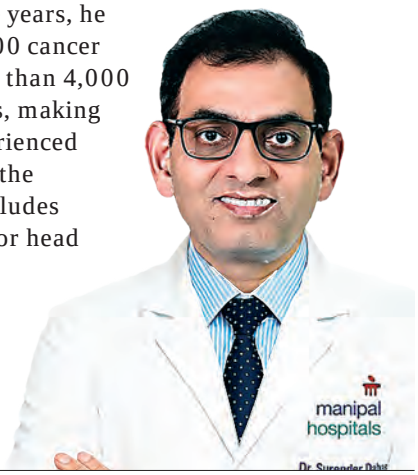
With a growing number of Indian students aspiring to pursue medical education and careers in the United States, Canada, and beyond, Xavier University School of Medicine, Aruba (XUSOM), in collaboration with KLE University, India, has launched a unique international medical pathway to support this ambition. This programme allows students to begin their medical journey in India at KLE University's Belgaum campus, continue with their preclinical sciences education at XUSOM, and then complete clinical rotations at Xavier's affiliated and accredited teaching hospitals across the United States. Students will spend the first year completing pre-health coursework at KLE's campus in Belgaum. They will then advance to Xavier's state-of-the-art campus in Aruba for basic science training before transitioning to hands-on clinical experiences in the United States.

# Dr. Moopen's Legacy Scholarship & Fellowships to aid 25 students from across India

In a path breaking initiative to make medical education accessible to meritorious students and students from economically challenged backgrounds, Padma Shri Dr Azad Moopen, Founder & Chairman of Aster DM Healthcare and a globally recognised philanthropist, has announced an annual scholarship programme Dr. Moopen's Legacy Scholarship & Fellowships Programme aimed at supporting meritorious students seeking admissions in Dr. Moopen's Medical College, Dr Moopen's Nursing College and Dr Moopen's College of Pharmacy in Wayanad, Kerala. This initiative marks the first time a private medical college in Kerala is offering a 100 per cent tuition fee waiver for eligible meritorious medical students, promising to transform access to quality healthcare education for talented, deserving individuals. The scholarships will be offered to 25 eligible students applying to MBBS, BSc Nursing, and BPharm courses. Each year, 5 MBBS, 10 BSc Nursing, and 10 BPharm students will receive these scholarships. For MBBS scholarships, selection will be based solely on merit, recognising and encouraging students with excellent academic track records and top NEET rankings. Meanwhile, BSc Nursing and B.Pharm candidates will be chosen based on academic merit and financial need. Over the next five years, 125 students will benefit, with the total financial commitment expected to exceed Rs 3 crore per annum.

# Dr Surender Kumar Dabas joins Manipal Hospitals

Manipal Hospital, a leading healthcare institution in Delhi NCR with hospitals across Delhi, Gurugram, and Ghaziabad, has announced the appointment of India's most renowned and celebrated robotic onco-surgeons, Dr Surender Kumar Dabas as Chairman – Manipal Comprehensive Cancer Centre and Onco Robotic Surgeries, North-West Cluster. With this addition, the hospital reinforces its commitment to providing advanced and comprehensive cancer care, with a strong focus on robot-assisted cancer surgeries. Dr Dabas brings with him more than 22 years of experience in surgical oncology and has been a pioneer in the field of robotic head and neck cancer surgery in India. Over the years, he has performed over 30,000 cancer surgeries, including more than 4,000 robot-assisted procedures, making him one of the most experienced robotic onco-surgeons in the country. His expertise includes robot-assisted surgeries for head and neck cancer, thoracic cancer, gynaecologic malignancies, urological cancer, gastrointestinal and colorectal cancer, and breast cancer.




# Healthium Medtech names Rajnish Damani as Group COO

Bengaluru-based Healthium Medtech, a global player in medical devices, focused on products in the surgical and post-surgical ecosystem including wound closure, advanced wound care, arthroscopy and infection prevention segments, has announced the appointment of Rajnish Damani as Group Chief Operating Officer (COO). In this newly created leadership role, Damani will oversee Manufacturing, R&D, and Supply Chain operations across the Group, reporting directly to the CEO & MD, Anish Bafna. Damani joins Healthium with over 32 years of diverse experience across manufacturing, procurement, supply chain, quality and EHS. He has worked across sectors including automotive, healthcare, renewables, aviation, transportation, power and tire industries. Most recently, he served as Executive Director – Manufacturing Operations at Bridgestone India, where he led strategic manufacturing initiatives, including long-term investment planning, quality improvements, talent development and new product introductions.

# HealthQuad appoints Namit Chugh as Director

Quadria Group, Asia's leading healthcare-focused private equity platform, has announced the appointment of Namit Chugh as Director at HealthQuad, India's leading healthcare-focused growth venture capital platform. With over 15 years of experience in healthtech investing and consulting, Chugh will play a pivotal role in strengthening HealthQuad's investment approach in deep-tech and tech-enabled healthcare models. Chugh joins HealthQuad from W Health Ventures, an early-stage healthtech fund, where he was a Principal and part of the founding team since its inception. At W Health, he was instrumental in shaping the fund's India and India–US corridor investment strategy and led key investments in Wysa (AI-driven mental health app), BeatO (digital diabetes care), and Mylo (parenting-focused content and commerce platform). Chugh also played a pivotal role in conceptualising 2070 Health - the venture studio arm of W Health Ventures where he backed tech-enabled companies at seed stage and in the process set up India's only seed to venture healthtech platform. Prior to this, Chugh was part of Lok Capital, a leading impact venture fund, where he executed and exited investments across healthcare, consumer-tech, and insurtech including Dr. Mohan's Diabetes Center, Renewbuy, amongst others.

# Deepak Bagla assumes charge as Mission Director of Atal Innovation Mission

NITI Aayog has announced that Deepak Bagla has officially assumed charge as the Mission Director of the Atal Innovation Mission (AIM). Bagla joins AIM with an extensive background spanning banking, investment promotion, policy advisory, and institutional leadership. His experience extends across multilateral institutions, the private sector, and Government, bringing a unique blend of strategic insight and operational execution to the role. Prior to this, Bagla served as the Managing Director & CEO of Invest India, the Government of India's national investment promotion and facilitation agency. Under his leadership, Invest India received multiple global accolades and emerged as a key institution supporting entrepreneurship, innovation, and startup growth across the country. He has served on several high-level government committees and represented India in multiple international forums, including as President of the World Association of Investment Promotion Agencies (WAIPA).

# Chander Shekhar Sibal steps in as India CEO of SS Innovations International

Gurugram-based medtech startup SS Innovations International has announced the appointment of Chander Shekhar Sibal as the Chief Executive Officer of India business. Sibal has previously served as the Senior Vice President at Fujifilm India, responsible for the healthcare and medical division. He has also worked at Samsung Medison where he was handling sales of healthcare medical equipment. Prior to that, Sibal has worked at GE HealthCare for 14 years, handling various responsibilities such as National Product Manager and Regional Manager. An alumni of IIM Lucknow, Sibal comes with two and half decades of professional experience with proficiency in sales & marketing sphere, business analytics, project management along with excellent financial management acumen, risk and contingency management appetite, and knack for technology to drive business.

# Yann D'Herve joins Cohance Lifesciences as CEO of CDMO Business

Hyderabad-based Cohance Lifesciences (formerly Suven Pharmaceuticals Limited), a leading integrated Contract Development and Manufacturing Organisation (CDMO), has announced the appointment of Yann D'Herve as Chief Executive Officer (CEO) of the company's CDMO business. Effective August 1, 2025, D'Herve's appointment brings a strong track record of senior-level leadership to Cohance. He has a rich and diverse background spanning multiple business functions and geographies. His experience includes leadership roles in manufacturing, strategic management, and commercial operations across the pharmaceuticals, healthcare, and specialty chemicals sectors.

Most recently, D'Herve served as Senior Vice President and General Manager of Evonik's Healthcare division, where he was responsible for 2,600 employees across nine manufacturing sites, with full P&L responsibility, including for the company's CDMO business. Prior to that, he held several senior roles at Evonik including as Vice President of Sales and Services, and divisional leadership assignments. He began his career in manufacturing, gaining hands-on experience in production and operations.

# NIT Calicut develops nano-sensor to detect deadly infections in minutes

A team of scientists at the National Institute of Technology (NIT), Calicut has developed a new highly sensitive, low-cost, point-of-care device with an electrochemical biosensor that could help early diagnosis of sepsis at the bedside of the patient. Sepsis is a serious medical condition caused by an infection that can lead to multiple organ failure, shock and even death.

Endotoxin, a toxic component of the outer membrane of Gram-negative bacteria, acts as a key biomarker, signalling the presence of an infection that could lead to sepsis. The scientists have developed eight distinct sensor architectures and a sensitive device for detecting endotoxins rapidly. In a paper published in the journal Langmuir, the team has demonstrated a highly sensitive electrochemical sensor chip designed for the selective detection of Lipopolysaccharide (LPS), which is compatible with a portable analyser for on-site detection. The sensor is fabricated using functionalised CNT (fCNT) and copper(I) oxide nanoparticles (Cu2O). The specific binding of endotoxin to LPS-binding Aptamers or polymyxin B was used to improve selectivity.

# JNCASR explores potential cure for Alzheimer's Disease

Researchers from Bengaluru-based Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute of the Department of Science and Technology (DST) have explored altered miRNAs in the Alzheimer's Disease (AD) brain and also probed the potential of miRNAs to be biomarkers for early, specific and accurate clinical diagnosis of AD. Since miRNAs are small non-coding RNA, they are known to target multiple mRNAs to regulate pathways linked to health and diseases as well as multiple disease pathologies linked to AD. With clinical evaluation, the developed miRNA mimic and small molecule, if proven safe and effective, could potentially cure AD, benefiting both patients and caregivers. The study unveiled the panel of upregulated and down regulated miRNA in AD which might serve as potential biomarkers for early clinical diagnosis of AD. The results would significantly reduce the large socio-economic burden posed by this disease and would pave the path to treatment of neurodegenerative and neuroinflammatory disorders by targeting neuroinflammation and ferroptosis.

# Indo-US scientists decode hair loss at molecular level, paving way for regrowth without transplants

Scientists have mapped the complete molecular network that controls human hair growth, offering what may be the clearest path yet to restoring hair without surgery, drugs, or transplantation. Published in Stem Cell Research & Therapy, the review reframes androgenetic alopecia (AGA)—the most common form of hair loss—not as an irreversible condition, but as a breakdown in regenerative signalling that can potentially be reversed. This study is among the first to integrate stem cell biology, gene therapy, and molecular signalling into a unified strategy for treating AGA. Developed by a multidisciplinary team from India and the United States with lead contributions from Indian researchers at The Esthetic Clinics (TEC) and the QR678 Research teams in Mumbai, the paper synthesises decades of hair biology into one unified model of how follicular cycles function, and where regenerative treatment may begin. The paper centres on five key molecular pathways—Wnt/β-catenin, Sonic Hedgehog (Shh), Bone Morphogenetic Protein (BMP), Notch, and AKT/MAPK—that collectively manage the hair follicle lifecycle.


# Qiagen expands NGS portfolio with launch of QIAseq xHYB long read panels

Qiagen has announced the launch of its new QIAseq xHYB Long Read Panels, a suite of target enrichment solutions designed to unlock long-read sequencing of genomically complex regions. This new offering strengthens Qiagen's position as a provider of differentiated solutions for use on any next-generation sequencing (NGS) platforms spanning both short- and long-read technologies. The new Qiagen panels are optimised for use with native long-read platforms, including from PacBio, and designed to enable researchers to capture a broader spectrum of genomic variation. Applications include HLA typing, repeat expansion analysis, and the detection of structural variants – areas where short-read sequencing have been shown to have challenges. Qiagen's expanded portfolio now allows researchers to choose between short- and long-read sequencing, or combine them, depending on their sample type and research objectives. Qiagen's end-to-end NGS solutions empower genomic discovery across research and clinical settings. The portfolio integrates robust extraction kits and instruments for diverse and challenging sample types with dedicated target enrichment panels and streamlined library preparation and quality control automation.

# Agilent opens Experience Centre in Hyderabad to support India's global biopharma ambitions

Agilent Technologies, a global leader in life sciences, diagnostics, and applied chemical markets, has announced the inauguration of its new Biopharma Experience Centre in Hyderabad. The facility marks a significant investment in India's rapidly growing life sciences ecosystem and reflects Agilent's long-term commitment to advancing biopharmaceutical innovation both locally and globally. The new Agilent Biopharma Experience Centre in Hyderabad presents a major opportunity to accelerate the city's leadership in life sciences and healthcare innovation. Designed to support the full drug development journey, the centre brings together advanced lab technologies, expert training, and regulatory-ready workflows to help researchers, scientists, and companies develop high-quality, life-saving medicines faster and more efficiently. It offers end-to-end solutions across key modalities such as chromatography, mass spectrometry, cell analysis, and lab informatics, allowing companies to simulate real lab environments, test for quality and compliance, and co-create market-ready solutions tailored to both Indian and global needs.

# Thermo Fisher announces launch of Scios 3 & Talos 12 Electron Microscopes

Thermo Fisher Scientific has announced the launch of two new electron microscopes, each significantly contributing to the democratisation of research in the sciences. The Thermo Scientific Scios 3 is a focused ion beam (FIB) scanning electron microscope (SEM) with automation to dramatically improve site-specific quality control. The Scios 3 FIB-SEM offers increased productivity for both industry and academia with enhanced lamella preparation, due to advances in FIB column performance. Ease-of-use upgrades will benefit microscopists of all experience levels. On the other hand, Talos 12 adapts to researchers across disciplines and experience levels. Thermo Fisher has evolved the popular Talos transmission electron microscope (TEM) design, culminating in the Thermo Scientific Talos 12 TEM, making leading-edge sample analysis more accessible than ever for biological research, pathology and drug development.

# Eppendorf unveils next-generation pipettes in India for better accuracy and precision

Eppendorf has announced the worldwide sales start of its next generation of mechanical pipettes, the Eppendorf Research 3 neo. The new pipettes offer renowned Eppendorf accuracy and precision, faster or easier volume selection, optimised ergonomics with a shorter pipetting button, and adaptable settings and accessories to customise the pipetting experience for speed, comfort, or accuracy in different applications. The new pipettes are available for sale in India from August 5, 2025. The Research 3 neo pipette is highly adaptable,

allowing users to easily speed up or fine-tune volume changes by switching between two volume setting speeds. Users can also temporarily adjust the pipette to accommodate different liquid types, tip geometries, reverse pipetting, and altitudes, ensuring optimal accuracy across various applications without the need for recalibration. Additionally, the new ColorTag changeable pipette marking rings enable users to reversibly label the instrument. Further adding to its customisation options, the Research 3 neo boasts carefully designed ergonomics. Features include a new operating concept with a shorter pipetting button, an ergonomic finger hook, and a well- balanced, lightweight design.

## Revvity introduces innovative reagent technology to accelerate therapeutics development

US-based Revvity, Inc. has announced the launch of pHSense reagents, a powerful technology designed to advance internalisation studies in drug discovery. pHSense reagents are designed for high-throughput, plate-based workflows and intended for researchers studying G protein-coupled receptors (GPCRs) or antibody-drug conjugates (ADCs). They offer a scalable, accurate, and easy-to-implement solution for monitoring antibody, ADC, or receptor internalisation. Developed for use with standard plate readers, pHSense reagents combine a pH-sensitive dye and a time-resolved fluorescence (TRF) readout to allow for the delivery of robust kinetics of internalisation and high signal-to-background, even at low endogenous receptor expression levels. Fully compatible with Revvity's multimode detection platforms, pHSense reagents have the potential to significantly enhance detection capability while simplifying integration into existing drug discovery workflows. By enabling more efficient screening and characterisation of promising therapeutic candidates, pHSense reagents can help researchers accelerate preclinical development timelines, potentially reducing overall development costs and contributing to more efficient advancement of candidates toward clinical evaluation.

## New England Biolabs launches NEBNext low-bias small RNA library prep kit

US-based New England Biolabs (NEB) has announced the launch of the NEBNext Low-bias Small RNA Library Prep Kit, designed to minimise biased representation of small RNA species in sequencing data. This next generation small RNA preparation method is faster, less biased, and has a broader input range than other commercially available kits. Protocol enhancements include the addition of a novel splint adaptor that increases the diversity of interactions, facilitating ligation and increasing sensitivity, with a streamlined, simplified protocol. As a result, researchers can now confidently analyse all RNA species present in biologically relevant samples. Additional improvements include unprecedented speed (~3.5 hrs), shelf life (18 months), and input range.

# AI/IoT-Driven Real-time Cardiac Event Prediction & Treatment

It is anticipated that between 2025 and 2050, a significant 50.2 per cent increase in cardiovascular mortality rates will result in 35.6 million cardiovascular deaths by 2050, of which ischemic heart disease or coronary heart disease will remain the leading cause, accounting for 56.2 per cent of fatalities in 2050. This World Heart Day, celebrated every year on September 29, calls for enhancing diagnostic precision and rapid advancements in cardiac imaging technology for detecting conditions such as ischemic heart disease, arrhythmia, atherosclerosis, atrial fibrillation, cardiac arrest, congenital heart disease etc. As a result, the application of artificial intelligence (AI) and machine learning is rapidly increasing in cardiac healthcare.

The AI-based global cardiology market size estimated at $1.29 billion in 2024, is reportedly projected to grow at a CAGR of 22.81 per cent from 2025 to 2030, where North America leads with the largest revenue share. There are numerous players within the US market that have developed AI-based tools to enhance diagnosis of cardiovascular conditions, supported by the US Food and Drug Administration (FDA). As per available data, there are more than 1000 AI algorithms cleared by the US FDA, where cardiology is at the second number.

For instance, AISAP, a US-based medical technology company, received US FDA's 510(k) clearance in 2024, for its first-of-a-kind, AI-powered AISAP CARDIO point-of-care ultrasound (POCUS) software platform. This platform provides diagnostic assessment and measurements of several key cardiac structural functional parameters.

Likewise, recently the US FDA granted clearance for CardioTag, a device designed by Cardiosense, to play a foundational role in building a non-invasive cardiac AI platform. The US FDA has also recently granted clearance to HeartFocus, an AI-powered cardiac imaging software developed by French medtech company DESKi. Europe, not being far behind, has launched EuroHeartPath project, under the Horizon Europe Innovative Health Initiative Joint Undertaking (IHI-JU), with a significant €27 million budget spanning a five-year timeline, to deploy AI, robotics and other technologies, to transform cardiovascular care in the country.

While the US is ruling the global AI-based cardiology market, the Asia-Pacific region is anticipated to grow at the fastest rate in the next few years, particularly India. In August 2025, Bengaluru-based Narayana Health announced the launch of India's first AI model for real-time heart failure detection. Designed for seamless integration into clinical workflows, the model aims to support earlier identification of heart failure and improve diagnostic access in resource-limited settings. In July 2025, Jaslok Hospital, along with a startup AnginaX AI, announced the development of Maharashtra's first AI-powered heart disease prevention model. This tool apparently emerges as the country's first licensed AI Doctor Assistant in cardiology.

In February this year, Kauvery Hospitals unveiled its Advanced Heart Failure Centre – India's first AI-powered, multidisciplinary hub for heart failure care and rehabilitation in Bengaluru. This is India's first programme integrating AI and IoT for real-time monitoring, personalised recovery plans, and predictive risk alerts. Citing another development, Japanese firm Omron Healthcare has expanded its partnership with Tricog Health in Bengaluru to launch KeeboHealth, an AI-powered connected cardiac care platform in India. KeeboHealth integrates AI-driven, real-time analytics with Omron's connected devices like home ECG monitors, BP monitors, and weighing scales. While patient data is continuously analysed by Tricog's AI engine to detect early warning signs and instantly alert medical teams for timely intervention.

Multiple developments taking place across the globe in this space clearly indicate that the integration of AI in cardiology can facilitate personalised medicine, thereby assisting in tailoring treatment plans designed to address the unique needs and conditions of each patient. Moreover, integrating AI into cardiovascular medicine can allow healthcare professionals to identify vital signs, assess disease history, prescribe appropriate medication more effectively, and help reduce mortality in times to come. BS

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