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Acknowledgement/ Feedback

Appreciation to BioSpectrum for carrying the article 'Medical Device Classification and FDA Approval: What Startups Need to Know' in the current issue. Happy to have Venture Center's team contribute in future as well.

Dr V Premnath, Pune

Thanks for including Shilpa Biological's comments in your cover story on Biosimilars in the May 2025 edition. Great write up.

Nidhi, London

The feature on 'Specialised Skill Development for Global Capability Centres (GCCs) in India' by Healthark Insights looks great. Thanks a lot.

Miral Mehta, Ahmedabad

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Letter from Publisher

Ravindra Boratkar
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Managing Editor,
MD, MM Activ Sci-Tech
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Dear Readers,

Digital healthcare, a multidisciplinary concept, incorporates a diverse array of technologies, such as telemedicine, ERP, CRM, EHRs and HIS, all of which enhance the transparency of patient data. The emerging technologies in the field of digital health include m-health, digital pathology, telemedicine, health wearables, digital and social connectivity, big data analytics, virtual reality, ambupods, blockchain and electronic medical records. Increased awareness and adoption of the Internet of Things (IoT) and telehealth have made health-monitoring technology more accessible and cost-effective. The healthcare sector of India has undergone significant transformations as a result of the Digital India initiative. Initiatives like the Ayushman Bharat Digital Mission, CoWIN App, Aarogya Setu, e-Sanjeevani and e-Hospital have extended healthcare facilities and services to every corner of India.

According to a customer market insights survey, it is expected that the Indian digital health market will reach $8.7944 billion in 2024 and expand at a CAGR of 17.67 per cent between 2024 and 2033, reaching $47.8069 billion, according to an International Comparative Legal Guides (ICLG) report. The lead story talks about the key innovations shaping digital health in India, including genomics enabling precision medicine, AI-driven drug discovery, and the digitisation of diagnostics—all contributing to more personalised and efficient healthcare delivery.

Artificial Intelligence (AI) is driving a revolutionary change in India's medical diagnostics industry. Early diagnosis of diseases like cancer, respiratory conditions, diabetes, and cardiovascular conditions, among others, is the main goal of the quick adoption of AI technology in diagnostics. AI is now being used by the industry to identify uncharted fields, such in vitro fertilisation, trichology, dermatology, and ophthalmology, to mention a few. Our correspondent discusses the possibilities of AI in medical diagnostics.

Although COVID-19 has ended, the threat of new and re-emerging zoonotic viruses remains, the most recent cases being the Nipah virus (NiV) and Guillain-Barré syndrome (GBS) outbreaks; there is also the risk of accidental or intentional biological threats. Experts working in this space, in an opinion piece, suggest that India needs a legal foundation such as the Public Health Emergency Management Act (PHEMA), which should define the scope of emergency powers, designate responsibilities across agencies, enable rapid resource mobilisation, and decentralise implementation to state and district levels.

With over €100 billion in pharmaceutical exports, Ireland ranks third globally. Ireland's dynamic ecology has allowed it to subtly but firmly establish itself as a global hub for innovation in the bio sciences. The Irish terrain offers a sophisticated combination of modern API and biologics production facilities, world-class clinical trial capabilities, and advanced research infrastructure. Ireland's well-established credibility with regulatory bodies such as the FDA and EMA is presented in a country focus article. This credibility guarantees that Indian companies seeking to expand their global reach beyond traditional markets can navigate the intricate regulatory environment of the European market more effectively.

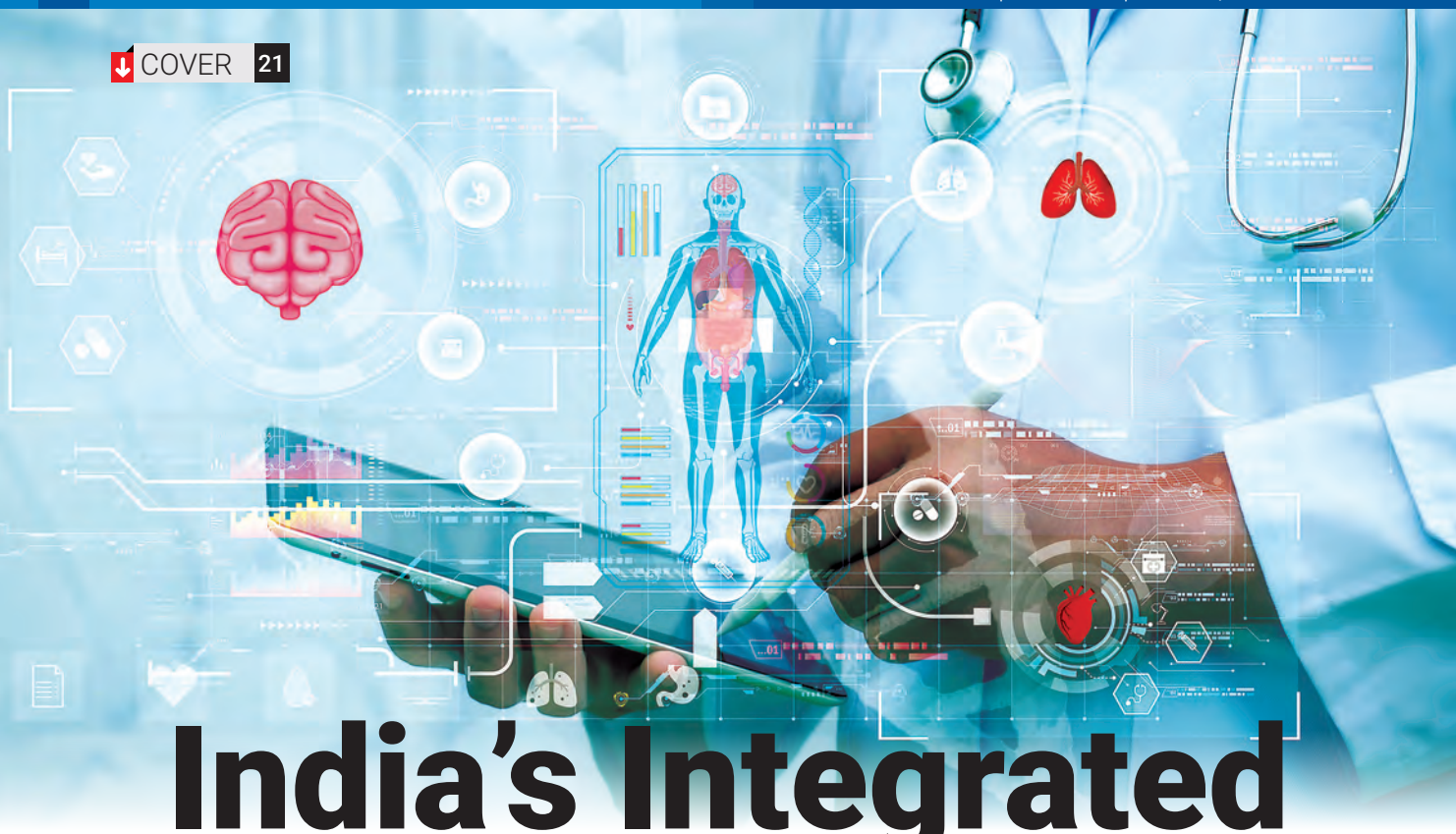
While modern hospitals deploy high-end technology and come with plush interiors, there is an invisible trail of carbon emissions that shadows this pursuit of healing. This is a contradiction at the heart of healthcare design: buildings meant to restore health are, paradoxically, exacting a toll on the health of the planet. An expert feels that sustainability is often dismissed as expensive or idealistic. Hence, there is a need to transform hospitals into a beacon of medical excellence, economically sustainable, and patient-centred institutions.

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

Thanks & Regards,

Ravindra Boratkar,
Publisher & Managing Editor

COVER 21



India's Integrated targets Affordable Healthcare Access

Technology is reshaping healthcare, offering new ways to tackle long-standing gaps and expand access. With its vast population and diverse healthcare needs, India is making significant strides to build a robust digital health ecosystem. Flagship initiatives like the Ayushman Bharat Digital Mission (ABDM) are laying the digital backbone for a unified healthcare system, with over 568 million Ayushman Bharat Health Account (ABHA) IDs and 350 million health records already integrated. Managing the administration of over 2 billion doses of COVID vaccines, CoWIN platform set a global benchmark for precision, scale, and transparency in vaccine delivery, and is now being repurposed for broader immunisation tracking and health logistics. India's digital health sector is poised for exponential growth, with a recent BCG report, in collaboration with B Capital, projecting a surge from $2.7 billion in 2022 to nearly $37 billion by 2030. Let's explore the cutting-edge technologies, key players, and policy shifts propelling the country's digital health journey.

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Hitesh Ganjoo, CEO of Iksha Labs, shares his thoughts on the rise of AI in the operating room redefining surgery.

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Country Focus

Regulars

Synergistic INDO-UK FTA

The trade tariff tussle between the US and India seems to have a good outcome. The recently concluded bilateral Free Trade Agreement (FTA) between India and the UK is probably an example of opening another door when one was shut. But of course, in this case, the first door–trade with the US-is not completely closed yet. But it is also not opened fully as in the past, and how much it will open is yet to be known. President Donald Trump's tussle with various countries over the trade tariffs issue has probably compelled different countries to have bilateral trade agreements.

The Indo-UK FTA, which was signed last month, is one such fallout of the trade tussle with the US. The talks were on for quite a long time – over three years - but both countries expedited them, probably following Trump's threats of imposing reciprocal rates for trade, threatening trade with the US. With the successful completion of the trade agreement with the UK, the European Union (EU) is also now keen to finalise the bilateral trade agreement with India.

Pharmaceutical products and drugs are an essential part of any trade agreement, as India is considered to be "the Pharmacy of the World" and thus has ample scope to export medicines. In the previous financial year (2024-25), India's pharma exports reached $30 billion, a rise of 9 per cent over the previous year (2023-24). Though the major export is to the US, the UK is also a destination for the export of medicines. India's export to the UK in the financial year 2024 was $784 million.

The FTA offers greater access to the UK market to Indian exporters from different sectors that include pharmaceuticals. As per the FTA, in the next few years, tariffs will be cut on 90 per cent of items imported from the UK, and 99 per cent of items exported from India to the UK will have tariff cuts. The FTA also aims to double the bilateral trade from $60 billion to $120 billion by 2030. When that happens naturally, the pharma industry will benefit since its share too in the whole trade will increase. The FTA also eliminates tariffs on various products, including pharmaceuticals. That will be one more advantage.

Still, the FTA can pose challenges in market access. Availability of cheaper drugs, medical devices, etc., can affect the domestic manufacturers. For example, imports of medical devices from Japan increased from over $8 billion in 2010-11 to nearly $16 billion in 2023-24. But India's exports grew from $5.09 billion to a mere $5.46 billion in the same period.

Probably, rejection of data exclusivity clauses by India may take care of the local drug manufacturers. This will prevent big pharma companies from the UK from stopping local drug producers from producing affordable versions of their medicines. Such relief was needed for local manufacturers in India since they are more into generic drug manufacturing.

However, industries on both sides have concerns. Indian manufacturers, particularly from the medical devices sector, are concerned about safeguarding themselves from rerouted products from other countries like China through the UK, as purportedly made in the UK.

On the flipside, the Association of the British Pharmaceutical Industry (ABPI) is unhappy with the FTA since they feel that it does not address key areas such as intellectual property protections for innovators within the Indian market and also does not provide sufficient support to the UK pharma industry. The trade body feels that robust intellectual property protections are fundamental for the innovation that UK companies deliver, and that opportunity has been missed to show a commitment to high IP standards.

While proceeding with the implementation of the FTA, both governments will have to address such concerns when they arise. The real success of the agreement will depend upon addressing such concerns, finding solutions to them and providing relief and justice to the industry on both sides. BS

Dr Milind Kokje
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Anusandhan National Research Foundation joins hands with Wadhwani Foundation

In a significant move to accelerate the transformation of India's research ecosystem, the Anusandhan National Research Foundation (ANRF) and the Wadhwani Foundation exchanged a landmark "Letter of Intent" in the presence of Prime Minister Narendra Modi, Union Science and Technology Minister, Dr Jitendra Singh and Union Education Minister, Dharmendra Pradhan. The partnership signals a first-of-its-kind collaboration between a government-backed apex research institution and a

philanthropic private foundation, aimed at co-funding and scaling up research that can drive tangible societal impact. The agreement is also the inaugural step in ANRF's strategy to foster expansive public-private partnerships across critical sectors of national relevance. The collaboration marks a turning point in how research will be funded and delivered in India in the times to come, emphasising inclusivity, interdisciplinary, and grassroots reach. In line with ANRF's broader vision, this partnership aims to promote equitable access to resources and opportunities across the country, including tier-2 and tier-3 institutions, thereby fostering a more distributed and resilient research culture.

Health Ministry unveils national zero Measles-Rubella elimination campaign

Union Minister of Health and Family Welfare, Jagat Prakash Nadda virtually launched the National Zero Measles-Rubella (MR) Elimination campaign 2025-26 on the first day of the World Immunisation Week (April 24-30), marking a significant step towards India's goal of eliminating MR by 2026. On the occasion, the Union Health Minister released multi-language M-R IEC materials (posters, radio jingles, MR elimination and official U-WIN launch film) for creating awareness in the communities. These IEC materials were also shared with all States/UTs for adaptation and rollout during the MR Elimination Campaign 2025-26. Measles and Rubella are highly infectious viral diseases that can lead to serious illnesses, lifelong complications, and even death. Due to their high infection rate, India has set a goal to eliminate these diseases by 2026.

India inks MoUs with Dubai to advance academic and research collaboration

Sheikh Hamdan bin Mohammed bin Rashid Al Maktoum, Crown Prince of Dubai, Deputy Prime Minister, and Minister of Defence of the UAE; and Piyush Goyal, India's Minister of Commerce and Industry, witnessed the signing of eight Memorandums of Understanding (MoUs) aimed at deepening collaboration across key sectors including infrastructure, healthcare, higher education, maritime services, logistics, and private sector engagement.

In a series of agreements that underscore the vital role of business communities in advancing collaboration and mutual growth, Dubai Chambers signed three MoUs with the Confederation of Indian Industry (CII), the Federation of Indian Chambers of Commerce and Industry (FICCI), and the IMC Chamber of Commerce and Industry. In another agreement that furthers a common commitment to delivering inclusive healthcare, Dubai Health signed an MoU to establish the UAE-India Friendship Hospital (UIFH), a new not-for-profit initiative aimed at providing inclusive and accessible healthcare, in Dubai. Another agreement was formalised between the Dubai Medical University (DMU) and the All India Institute of Medical Sciences (AIIMS), the country's top-ranked medical institute.

Shashvi Remedies secures Rs 10 lakh grant from Maharashtra State Innovation Society

Mumbai-based Shashvi Remedies, a pioneer in healthcare innovation, has received a grant of Rs 10 lakh for international patents from the Maharashtra State Innovation Society (MSINS) under the Government of Maharashtra's Skill Development and Entrepreneurship Department (SDED). With breast cancer affecting over 670,000 women worldwide each year and one woman diagnosed every four minutes in India, the need for breakthrough treatments has never been more urgent. Shashvi Remedies' patented innovation offers new hope by targeting and eliminating cancerous cells while preserving healthy tissue, representing a major step forward in patient-centered treatment options. As the global pharmaceutical industry braces for the upcoming patent cliff of 2030, which will see the expiration of several major drug patents, Shashvi's patented innovation is poised to capture attention. Industry analysts predict that pharmaceutical giants will be investing heavily in patented oncology solutions, with over $500 billion in reserves for acquisitions and pipeline growth. Shashvi's patented breast cancer treatment is a highly valuable asset, with both Indian and global pharmaceutical companies recognising its potential.

SRV Hospitals raises Rs 140 Cr from InvAscent to augment critical care-backed model

SRV Hospitals has raised Rs 140 crore from InvAscent, a life sciences private equity (PE) fund. This investment marks a pivotal moment for SRV, enabling the group to strengthen and amplify its multispecialty critical care-focused healthcare model. It is a bold step forward in The New Possible, SRV's mission to redefine how accessible tertiary care is imagined, delivered, and experienced. The funding positions SRV for its next chapter, setting new benchmarks in the healthcare sector, while deepening its commitment to advanced critical & surgical care, empowered clinicians, and elevated patient experience. Founded in 2015, SRV Hospitals has rapidly evolved into a benchmark in high-acuity neighbourhood healthcare, operating five advanced tertiary care hospitals across Mumbai, Nashik, and Bengaluru with a combined capacity of 500+ beds. The group has earned deep trust across patients, clinicians, and healthcare professionals alike, driven by a model built on consultant-led care, robust critical care systems & protocols, superior clinical outcomes, and a relentless focus on patient experience.

Zydus invests in Feldan Therapeutics to drive innovation in intracellular drug delivery

Zynext Ventures USA LLC, the venture capital arm of Ahmedabad-based Zydus Lifesciences, has announced its investment in Feldan Therapeutics, a Canada-based early clinical-stage pharmaceutical company pioneering the development of treatments based on intracellular delivery of therapeutics. Feldan's proprietary Shuttle peptide technology enables the efficient and targeted delivery of biomolecules into cells, unlocking new therapeutic possibilities. The company's lead candidate, FLD-103, is administered directly into basal cell carcinoma (BCC) lesions, where the Shuttle peptide facilitates the delivery of a Hedgehog inhibitor to its target within BCC cells. This innovative approach aims to provide BCC patients with a non-surgical treatment option that improves outcomes and significantly enhances their quality of life.

TPG acquires 35% stake in Schott Poonawalla from Serum Institute of India

Schott Pharma, a pioneer in drug containment and delivery solutions, has announced that TPG, a leading global alternative asset management firm, has entered into a binding agreement to acquire a 35 per cent stake in its joint venture Schott Poonawalla from Serum Institute of India (SII). Schott Poonawalla is a joint venture of Schott Pharma and SII, part of the Cyrus Poonawalla Group and a global leader in vaccine manufacturing, dedicated to providing affordable vaccines worldwide. TPG Growth, TPG's middle market and growth equity platform, is funding the investment, along with Novo Holdings as a co-investor. Following the transaction, SII will retain a minority stake in the company. With deep healthcare investing experience and local expertise in India, having TPG join the partnership alongside Schott Pharma and Serum Institute of India represents a significant milestone in Schott Poonawalla's growth, equipping the company with additional resources and strategic insight to support its long-term global ambitions.

Hearzap unveils Rs 8 Cr ESOP plan, aims to double growth by FY28

Hearzap, a Hyderabad-based provider of complete hearing care solutions in India, has announced its Employee Stock Ownership Plan (ESOP), representing a significant step in Hearzap's journey of collective growth and success. With this programme, eligible employees will have the opportunity to become shareholders of the company and share in Hearzap's long-term vision of making hearing care accessible and affordable throughout India. The company recently approved the ESOP programme, through which stock options worth approximately Rs 8 crore will be granted to eligible employees. With an overall revenue growth of 20 per cent in FY 24-25, this initiative offers team members a chance to build personal wealth and grow alongside the company, reinforcing a sense of ownership and belonging. The company plans to expand to 250 stores by FY26, and 500 stores thereafter targeting 2X growth in the next three years.

Sterling Accuris buys Gujarat Pathology Laboratory and Diagnostic Centre

Sterling Accuris Diagnostics, one of the fastest growing chains of NABL accredited pathology laboratories in India with a leading presence in Gujarat, Rajasthan, and Madhya Pradesh, has announced the acquisition of Gujarat Pathology Laboratories, a leading pathology service provider in Ahmedabad. This acquisition is poised to significantly increase the footprints of Sterling Accuris across the length and breadth of Ahmedabad and add value to service excellence across the diagnostics landscape. Sterling Accuris is a strong, customer-centric brand known for providing ethical and market-appropriate pathology diagnostic services. It offers reliable, accurate, and dependable solutions to individual patients, hospitals, and corporates. Gujarat Pathology Laboratory has been serving Ahmedabad since 1998 and offering a comprehensive range of diagnostic services from Hematology, Biochemistry, and Immunology to Molecular Biology. With a network of 8 laboratories and more than 20 collection centres across Ahmedabad, it has served nearly 20 lakh patients so far.

Intuitive and HSSC come together to strengthen India's healthcare workforce

Intuitive, a global technology leader in minimally invasive care and the pioneer of robotic-assisted surgery, is working with the Healthcare Sector Skill Council (HSSC), a recognised body under the Ministry of Skill Development & Entrepreneurship (MSDE), to support the government's efforts in skilling emergency healthcare professionals to meet the growing demand for qualified personnel. Through this initiative, HSSC and Intuitive contribute to training healthcare professionals in critical skills associated with emergency medical responses. More than 200 candidates in Delhi and Jharkhand are undergoing a structured training programme as Emergency Medical Technician (EMT). As crucial frontline responders, EMTs play a vital role in delivering timely medical care during emergency situations. The programme is designed to enhance their employability and provide career opportunities in the healthcare sector. This initiative aligns with the broader vision of empowering youth with industry-relevant skills and supporting the development of a skilled workforce.

Indian research institutions and Oxford Nanopore to collaborate on genomic CoE

UK-based Oxford Nanopore Technologies, the global company behind a new generation of nanopore-based molecular sensing technology, has signed Letters of Intent with the Biotechnology Research and Innovation Council-Centre for DNA Fingerprinting and Diagnostics (BRIC-CDFD), and the Biotechnology Research and Innovation Council-National Institute of Biomedical Genomics (BRIC-NIBMG), which commit to the establishment of two new Indian Centres of Excellence (CoE) in genomics. The first Letter of Intent, signed in collaboration with BRIC-CDFD, will see the two partners enter into a R&D collaboration in rare disease research, which will facilitate the deployment of Oxford Nanopore's sequencing technologies for research, education, and clinical applications. This will enable BRIC-CDFD to benefit from cutting-edge advancements in genomics and to validate Oxford Nanopore sequencing for rapid characterisation of rare genetic diseases in the Indian clinical context.

Dr. Reddy's & Sanofi Healthcare expand partnership to treat Respiratory Syncytial Virus in India

Dr. Reddy's Laboratories has expanded its strategic partnership with Sanofi Healthcare India Private Limited (SHIPL) to introduce a novel drug, Beyfortus (nirsevimab), in India. Beyfortus contains the monoclonal antibody, nirsevimab, in a prefilled injection used for the prevention of respiratory syncytial virus (RSV) lower respiratory tract disease (LRTD) in newborns and infants born during or entering their first RSV season. It is also administered in children up to 24 months of age, who remain vulnerable to severe RSV disease through their second RSV season. Under the arrangement, Dr. Reddy's will have exclusive rights from SHIPL to promote and distribute Beyfortus (nirsevimab) in India. This announcement follows Dr. Reddy's successful exclusive distribution partnership with Sanofi for their portfolio of vaccines in India last year. Dr. Reddy's is expected to launch Beyfortus in India in the second quarter of the current fiscal year.

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Lytus Technologies expands healthcare footprint with acquisition of Blod.in

Mumbai-based startup Lytus Technologies has announced the completion of its acquisition of Blod.in, India's first on-demand blood component management and logistics platform (powered by advanced artificial intelligence- AI and machine learning algorithms) - currently operational in Chennai and soon to be available nationally. The acquisition of Blod.in, through Lytus HealthTech, its fully owned HealthTech subsidiary, underscores Lytus' commitment to working alongside and together with hospitals and

blood banks (private and public) in efficiently serving critical healthcare needs, optimising logistics, and ultimately saving lives. Over the last twelve months, Blod.in scaled rapidly, growing from 30 to 140 hospitals with a 20 per cent month-on-month growth trajectory. Now operating in Chennai, it plans to expand to 100 more hospitals and 15+ blood banks, with further growth in Bengaluru, Mumbai, and Hyderabad and other cities in the next phase. Blod.in's AI-driven technology will soon expand to global markets like the US and UAE, optimising inventory, minimising wastage, and ensuring timely blood availability for patients, hospitals, and blood banks.

HexaHealth closes Series A fund raise of $12 M to redefine surgical care journey across India

Gurugram-based startup HexaHealth, a leading tech-enabled surgery care platform, has successfully closed its $12 million Series A funding round. The round was led by Orios Venture Partners and 3one4 Capital, with participation from new investors Enzia Ventures and ITI Growth Opportunities Fund, along with existing backers Chiratae Ventures and Omidyar Network India. This milestone funding will accelerate HexaHealth's mission to reshape how surgical care is delivered and experienced across India. The new funds will be strategically deployed to drive HexaHealth's next phase of growth. Key initiatives include expanding into new surgical specialities, entering additional geographies across India, building an artificial intelligence (AI)-powered platform to further personalise and enhance patient care, and strengthening the senior leadership team to accelerate innovation and impact. To date, HexaHealth has facilitated over 30,000 surgeries across India's key cities, offering patients not just procedures but peace of mind through compassionate, end-to-end care.

SS Innovations International makes historic NASDAQ debut

In a defining leap for Indian medical technology on the global stage, Gurugram-based startup SS Innovations International (SSII), the makers of the indigenous SSI Mantra surgical robotic system, has been listed on NASDAQ, in the US. SS Innovations International reported impressive financial growth for the year ending December 31, 2024, with revenues reaching $20.6 million - a 3.5-fold increase from the previous year's revenue of $5.9 million. Gross margins also showed significant improvement, rising to 40.9 from 12.3 per cent in 2023, highlighting the company's robust financial performance and expanding market presence. Furthermore, SS Innovations International has made remarkable progress with its clinically validated and patented SSI Mantra Surgical Robotic System, which has been installed in 80 hospitals across 75 locations in India, as well as expanding its footprint in countries including Nepal, Ecuador, Guatemala, the Philippines, Indonesia, Sri Lanka, and Ukraine.

DeepTek's Chest X-Ray AI solution receives CE MDR Class IIb certification

Pune-based startup DeepTek, a leading provider of artificial intelligence (AI)-powered radiology solutions, has announced that its Chest X-ray AI solution has received CE certification under the European Union Medical Device Regulation (EU MDR) as a Class IIb medical device. The Chest X-ray AI solution is designed to assist physicians in interpreting frontal chest X-rays (chest anterior and posterior). Powered by advanced machine learning, the solution detects a host of lung conditions such as nodules, lung masses, tuberculosis, pneumothorax, and over 20 other findings, including rib and clavicular fractures. In addition, the solution identifies multiple medical devices commonly encountered in inpatient and ICU settings, such as chest leads, pacemakers, and various tubes, providing critical support in complex clinical scenarios.

Brain health startup Ivory raises $1M in fresh funding

Mumbai-based Ivory, an early-stage brain health startup, has announced the successful close of its latest $1million funding round. The round was co-led by IIM-A Ventures, the entrepreneurship center at IIM Ahmedabad that incubates, accelerates and invests in early-stage technology startups, and Capital-A, a fund known for backing innovative early-stage startups, which had previously backed Ivory in the pre-seed stage. The funding round saw additional backing from 1Crowd, and Stanford Angels, along with eminent angel investors such as Dr Sanjay Arora, Adarsh Narahari and Juhi Bhatnagar. According to various researches, 90 per cent of cognitive impairment remain underdiagnosed. With no definitive cure for neurodegenerative conditions like dementia, prevention is the only real defense. Ivory is on a mission to shift the focus from late-stage diagnosis to proactive brain health solutions. Through neuroscience-based digital assessments, it enables early detection of cognitive decline—empowering individuals to take action long before symptoms escalate. With this new capital, Ivory plans to strengthen the technology for its clinical grade assessments and scale distribution to reach more individuals across India.

SunAct opens first facility in Mumbai offering CAR-T cell therapy for solid-state tumours

SunAct - Advanced Cancer Therapies, the oncology startup founded by Dr Vijay Patil and Dr Ashay Karpe, aimed at making the world's most advanced and innovative cancer care accessible and affordable in the country, has launched its third facility in India and the first in Mumbai city, at the Dr. Gupte Surgical Hospital in Khar (West). The new centre will offer India's first CAR-T cell therapy for solid-state tumours along with various therapies which will be introduced in India via SunAct. SunAct's Khar centre will not only offer CAR-T for haematological cancers like Lymphoma, Leukemia and Myeloma, but it is also India's first CAR T-cell therapy for solid tumours, a revolutionary approach previously unavailable in the country. In addition to this milestone, the centre will provide TCR (T-Cell Receptor) Therapies; TIL (Tumor-Infiltrating Lymphocyte) Therapies; Gamma Delta T-Cell Platforms; Gene Therapies; Bone Marrow Transplantation & Clinical Trials.

WHO calls for revitalised efforts to end malaria

The World Health Organization (WHO) is calling for revitalised efforts at all levels, from global policy to community action, to accelerate progress towards malaria elimination. In the late 1990s, world leaders laid the foundation for remarkable progress in global malaria control, including preventing more than 2 billion cases of malaria and nearly 13 million deaths since 2000. To date, WHO has certified 45 countries and 1 territory as malaria-free, and many countries with a low burden of malaria continue to move steadily towards the goal of elimination. Of the remaining 83 malaria-endemic countries, 25 reported fewer than 10 cases of the disease in 2023. WHO recently warned that the 2025 funding cuts could further derail progress in many endemic countries, putting millions of additional lives at risk. Of the 64 WHO Country Offices in malaria-endemic countries that took part in a recent WHO stock take assessment, more than half reported moderate or severe disruptions to malaria services.

WHO claims health inequities are shortening lives by decades

A global report published by the World Health Organization (WHO) highlights that the underlying causes of ill health often stem from factors beyond the health sector, such as lack of quality housing, education and job opportunities. The new World report on social determinants of health equity shows that such determinants can be responsible for a dramatic reduction of healthy life expectancy – sometimes by decades – in high- and low-income countries alike. For example, people in the country with the lowest life expectancy will, on average, live 33 years shorter than those born in the country with the highest life expectancy. The social determinants of health equity can influence people's health outcomes more than genetic influences or access to health care. The report underscores that inequities in health are closely linked to degrees of social disadvantage and levels of discrimination. Health follows a social gradient whereby the more deprived the area in which people live, the lower their incomes are and they have fewer years of education, poorer health, with less number of healthy years to live.

WHO lays focus on increase in vaccine-preventable disease outbreaks

Immunisation efforts are under growing threat as misinformation, population growth, humanitarian crises and funding cuts jeopardise progress and leave millions of children, adolescents and adults at risk, warn WHO, UNICEF, and Gavi. Outbreaks of vaccine-preventable diseases such as measles, meningitis and yellow fever are rising globally, and diseases like diphtheria, that have long been held at bay or virtually disappeared in many countries, are at risk of re-emerging. In response, the agencies are calling for urgent and sustained political attention and investment to strengthen immunisation programmes and protect significant progress achieved in reducing child mortality over the past 50 years. Continued investment in the 'Big Catch-Up initiative', launched in 2023 to reach children who missed vaccines during the COVID-19 pandemic, and other routine immunisation programmes will be critical.

US launches next-generation universal vaccine platform for pandemic-prone viruses

The US Department of Health and Human Services (HHS) and the National Institutes for Health (NIH) have announced the development of the next-generation, universal vaccine platform, Generation Gold Standard, using a beta-propiolactone (BPL)-inactivated, whole-virus platform. This initiative represents a decisive shift toward transparency, effectiveness, and comprehensive preparedness, funding the NIH's in-house development of universal influenza and coronavirus vaccines, including candidates BPL-1357 and BPL-24910. These vaccines aim to provide broad-spectrum protection against multiple strains of pandemic-prone viruses such as H5N1 avian influenza and coronaviruses including SARS-CoV-2, SARS-CoV-1, and MERS-CoV. Clinical trials for universal influenza vaccines are scheduled to begin in 2026, with Food and Drug Administration (FDA) approval targeted for 2029. The intranasal BPL-1357 flu vaccine, currently in advanced trials, is also on track for FDA review by 2029.

PAHO & UNOPS to strengthen health systems in Latin America & the Caribbean

The United Nations Office for Project Services (UNOPS) and the Pan American Health Organization/World Health Organization (PAHO/WHO) have signed a new MoU aimed at reinforcing the collaboration between the two organisations and optimising the execution of health sector projects in the region. The agreement was signed by Fabrizio Feliciani, UNOPS Regional Director for Latin America and the Caribbean, and Dr Jarbas Barbosa, Director of PAHO, consolidating a strategic alliance focused on strengthening resilient health infrastructure, expanding access to essential medicines, and promoting efficient management of health resources in the countries of the region, among other objectives. This agreement supports the comprehensive strengthening of health systems in Latin America and the Caribbean through sustainable infrastructure and procurement projects in the health sector, helping build systems that are more resilient, efficient, & better equipped to meet the needs of the population.

New single-shot vaccine to offer controlled release of multiple doses over 6-months

Pioneering new research is set to investigate a promising vaccine technology designed to remove the need for cold-chain storage and condense multi-dose regimens into a single, controlled-release vaccination. The US-based company, VitriVax, has developed their proprietary vaccine design, Atomic Layering Thermostable Antigen and Adjuvant (ALTA), to replace multi-dose vaccines for protection against an infectious disease with a single-administration alternative. The company's innovative approach

in the pharma industry, known as 'atomic layering deposition', is used to control the release of the vaccine in the body over time. Norway-based Coalition for Epidemic Preparedness Innovations (CEPI) is providing up to $5 million in grant funding to VitriVax to further develop the ALTA technology as it could offer a simplified way to protect populations during an outbreak and help control the spread of a threatening pathogen. The funding will be used to test ALTA in preclinical trials using Rabies as a disease target. If successful, scientists will prepare the vaccine candidate for Phase I trials, the clinical research stage used to assess the safety of a vaccine in a small group of people.

Angola commits $5 M to Africa CDC for health financing strategy

In a strong act of continental solidarity, João Lourenço, President of the Republic of Angola and Chairperson of the African Union, announced a landmark voluntary contribution of $5 million to the Africa Centres for Disease Control and Prevention (Africa CDC), reaffirming Angola's leadership and enduring commitment to strengthening regional health security and sustainable health financing. The announcement came after a high-level meeting held recently in Luanda between President Lourenço and Dr Jean Kaseya, Director General of Africa CDC. During the meeting, the two leaders discussed regional health priorities and the urgent need to mitigate the impact of declining development assistance. In support of local manufacturing, Dr Kaseya announced that Africa CDC will support Angola's plan for production of mosquito bed nets, an initiative aimed at strengthening vector control and expanding regional production capacity.

UK's tech reform to transform cancer diagnosis

Millions of cancer patients will receive a faster diagnosis, helping cut treatment delays and boost survival rates as the UK government rolls out pioneering new technology across the National Health Service (NHS) through the Plan for Change. Currently, there are over two million people living with cancer, many of whom face a complex journey of tests, appointments or treatments. But a trailblazing new tool - dubbed Cancer 360 - brings all that data into one central system, so clinicians can prioritise those most in need and see patients quicker - with the technology set to benefit millions over the next 5 to 10 years. Cancer 360 represents the crucial reform that must accompany investment, shifting the NHS from analogue to digital, by creating a simple dashboard showing clinicians all the information they need about their patients in one place. Instead of having to gather vital information about each cancer patient from various systems, spreadsheets, emails, and records.

US FDA announces expanded use of unannounced inspections

The US Food and Drug Administration (FDA) has announced its intent to expand the use of unannounced inspections at foreign manufacturing facilities that produce foods, essential medicines, and other medical products intended for American consumers and patients. This change builds upon the agency's Office of Inspection and Investigations Foreign Unannounced Inspection Pilot programme in India and China and aims to ensure that foreign companies will receive the same level of regulatory oversight and scrutiny as domestic companies. In addition, the FDA will evaluate the agency's policies and practices for improvements to the foreign inspection programme to ensure that the FDA is the gold standard for regulatory oversight. The FDA conducts approximately 12,000 domestic inspections and 3,000 foreign inspections each year in more than 90 countries.

India's Integrated targets Affordable Healthcare Access

Technology is reshaping healthcare, offering new ways to tackle long-standing gaps and expand access. With its vast population and diverse healthcare needs, India is making significant strides to build a robust digital health ecosystem. Flagship initiatives like the Ayushman Bharat Digital Mission (ABDM) are laying the digital backbone for a unified healthcare system, with over 568 million Ayushman Bharat Health Account (ABHA) IDs and 350 million health records already integrated. Managing the administration of over 2 billion doses of COVID vaccines, CoWIN platform set a global benchmark for precision, scale, and transparency in vaccine delivery, and is now being repurposed for broader immunisation tracking and health logistics. India's digital health sector is poised for exponential growth, with a recent BCG report, in collaboration with B Capital, projecting a surge from $2.7 billion in 2022 to nearly $37 billion by 2030. Let's explore the cutting-edge technologies, key players, and policy shifts propelling the country's digital health journey.

From telemedicine to AI-driven diagnostics, India is leveraging digital innovation to transform its healthcare landscape. The telemedicine service eSanjeevani, is another noteworthy initiative by the government, launched by the Ministry of Health and Family Welfare. Originally designed for doctor-to-doctor consultations, it evolved into eSanjeevani OPD during the COVID-19 period to enable direct physician-to-patient care. As of August 2024, it has facilitated over 270 million consultations, connecting people in remote and underserved areas with quality healthcare. The upcoming eSanjeevani 2.0 aims to integrate point-of-care diagnostic data, enabling quicker diagnoses and personalised care.

These platforms are part of a larger digital vision under the ABDM, which aims to create a seamless, interoperable health ecosystem. With these platforms, India is laying the foundation for a unified digital healthcare infrastructure.

Acknowledging these efforts, a January 2025 article by the World Economic Forum praised India's strides, positioning it as a potential global leader in digital health. The report emphasised the critical role of public-private partnerships, strong data governance, and interoperability, underscoring how India's model could serve as a global benchmark for digital healthcare transformation.

Apart from government initiatives, several startups and researchers are working on developing digital health strategies. India's growing digital health landscape is also attracting global interest. A recent Dutch delegation in March 2025 expressed interest in C-CAMP's digital health innovations, particularly in labour-saving technologies for healthcare, pharmaceutical advancements using AI for drug discovery, and remote monitoring and telehealth solutions. These technologies are viewed as promising tools for medical triaging, improving accessibility, and optimising healthcare delivery in underserved regions.

India's AI push

The most talked-about technology, now deeply integrated into various industries and everyday life, holds significant implications for the healthcare sector. According to a Deloitte report, Artificial Intelligence (AI) in healthcare is expected to contribute $30 billion to India's GDP. Recognising this immense potential, India has launched a series of strategic initiatives and investments to revolutionise its healthcare ecosystem, making it more accessible and efficient.

The World Economic Forum has launched the India Digital Health Activator to drive AI adoption and ensure interoperability in healthcare systems. International collaboration is also gaining traction; India and France have identified digital health and antimicrobial resistance (AMR) as key areas for cooperation. Strengthening academic and institutional ties, Apollo Hospitals has partnered with the University of Leicester to establish a Centre for Digital Health & Precision Medicine in India, while Takeda's India Capability Centre (ICC) in Bengaluru is developing a specialised Global Capability Centre focused on digital health and R&D.

Industry leaders are equally engaged. Manipal Hospitals has joined hands with Google Cloud to advance AI-driven healthcare, and Zeiss India has launched an AI research lab for eyecare at the Indian Institute of Science in Bengaluru. Samsung R&D Institute, Noida and IIT Bombay have signed an MoU to pioneer research in digital health, AI, and other emerging technologies.

Key Innovations Shaping Digital Health in India

Some of the key innovations shaping digital health in India include genomics enabling precision medicine, AI-driven drug discovery, and the digitisation of diagnostics—all contributing to more personalised and efficient healthcare delivery.

Genomics driving precision care

In January 2025, India launched its Indian Genomic Data Set and the Indian Biological Data Centre (IBDC) portals. This initiative unlocks 10,000 whole genome sequencing (WGS) samples for researchers around the world, marking a significant milestone in the country's vision to build a self-reliant biotech ecosystem.

The IBDC is set to become a critical hub for genomic research, providing seamless access to valuable genetic information. The 10,000 WGS samples represent diverse Indian populations, offering researchers a rich catalogue of genetic variations. This initiative is poised to accelerate the development of genomic chips tailored to the Indian demographic, thereby enhancing the precision and accuracy of genetic studies.

Building on this momentum, global genomics leaders are turning their focus toward India. In April 2025, Oxford Nanopore Technologies, a UK-based company pioneering nanopore-based molecular sensing technology, announced strategic partnerships with two premier Indian institutions. The company signed Letters of Intent with the Biotechnology Research and Innovation Council-Centre for DNA Fingerprinting and Diagnostics (BRIC-CDFD) and the Biotechnology Research and

Stanford India Biodesign: 18-year Journey

In 2007, Stanford Biodesign forged a first-of-its-kind partnership with the Government of India to seed and nurture a new health technology innovation ecosystem in the country. So far, the Stanford Biodesign programme has driven innovation with 16 startups, 148 fellows, 48 medical devices, 147 IP filings, 7 commercialised products, and 13 summits that bring industry leaders together.

Stanford Biodesign's innovation ecosystem has given rise to impactful medical technologies transforming patient care. Among its commercialised technologies, Consure Medical leads with a comprehensive portfolio of active incontinence management products. At the same time, Sohum addresses newborn hearing loss with a unique screening solution for resource-poor settings. Windmill Health's Neobreathe empowers frontline health workers to resuscitate newborns effectively, and OrthoHeal's FlexiOh introduces a breathable, customisable cast for fracture immobilisation.

Emerging startups under the programme are pushing the boundaries of healthcare innovation. SparshMind Innovations is pioneering virtual reality-based neurological rehabilitation with ReMind-Home, while Prezitec Health enhances anaesthesia delivery with its iGuide system. Ripple Healthcare's HipPro+ is working to prevent fall-induced injuries, and Neuranics Lab's Muon reimagines diagnostics using AI-driven blood analysis. Innovations like Inochi Care's advanced wound dressing and Cureous Labs' Eturnal—an automated repositioning device for bedridden patients—aim to improve patient outcomes and quality of life. Other startups, including Crimson Healthcare's SphinX, RCupe Lifesciences' Ozyn-D and Chest Compression Device, Indio Labs' Bioscoop, Unino Healthcare's pleuraGoh, and Brun Health's fetal assessment tool, are addressing critical gaps in patient care and emergency response.

The programme's influence also extends through technology licensing to third-party manufacturers. InnAccel Technologies markets Noxeno, a device for safely removing nasal foreign bodies in children, while VFPL Medevice's Transfer Life Facilitates effortless patient transfers. HiCare LIMO provides innovative solutions for immobilising injured limbs in trauma cases, and Phoenix Medical Systems manufactures and markets devices designed by Windmill Health, amplifying their reach and impact.

It wouldn't be outlandish to say Stanford Biodesign has been instrumental in advancing health technology in India, fostering innovation and enabling the development of impactful medical solutions tailored to local needs.

Innovation Council-National Institute of Biomedical Genomics (BRIC-NIBMG). This agreement commits to the establishment of two new Centres of Excellence (CoE) in genomics, reinforcing India's positioning as a critical player in global genomic research.

The surge in genomics infrastructure is also evident in the private sector. 4baseCare, an emerging leader in precision oncology, recently inaugurated its genomics laboratory in Bengaluru. The company also unveiled the Global Cancer Diversity Atlas (GCDA)—an initiative aimed at bridging the genomics data gap in cancer care.

Experts are equally bullish on the transformative potential of genomics. "Genomics will significantly impact human health over the next 5-10 years by enabling precision medicine, early disease detection, and personalised treatments. For instance, genomics can identify genetic risks for conditions like heart disease and cancer, guiding preventive care. In India, the Genome India Project aims to map the genetic diversity of the population, creating a reference database for disease prediction and personalised healthcare," said Dr Vikram Venkateswaran, Partner, Healthcare & Life Sciences, Deloitte India.

Several firms are already driving breakthroughs in precision medicine through genomics. Strand Life Sciences has leveraged genomics to develop tests for hereditary cancers, enabling early detection and personalised treatment options tailored specifically for Indian patients.

Further amplifying India's genomic landscape, Noida-based Vgenomics, a leader in precision health, recently announced a strategic collaboration with Meril Genomics, a trusted provider in diagnostics and molecular biology. This partnership aims to deliver advanced genomic diagnostics to hospitals and research centres across India. By combining Vgenomics' expertise in bioinformatics, AI-driven research, and translational genomics with Meril Genomics' strengths in diagnostics and molecular biology, the collaboration is set to significantly expand the reach of precision medicine.

"Leading Indian corporate hospitals have already started integrating genome sequencing as

"While a lot of progress has been made, there are still opportunities to make more out of the data being held in hospitals. Certain regulatory guardrails would also help. I believe the DPDPA is a step in the right direction. It gives the much-needed incentive for hospitals to assess their data structures and make the necessary changes to ensure that the data can be used for more clinical research and innovation on the Indian genotype that would boost the care outcomes.

Dr Vikram Venkateswaran,
Partner, Healthcare & Life Sciences, Deloitte India

part of their treatment protocols. Most of them are already using this for expecting mothers, especially if there are risk indications like older expecting mothers, while testing for conditions like Down's Syndrome or Autism. Oncology is another area where molecular precision medicine, by analysing patients' genetic information, helps hospitals to identify specific mutations associated with cancer. This approach allows for the development of targeted therapies, improving treatment efficacy and patient outcomes. While this is just scratching the surface. The availability of high-power computers along with awareness within the medical and patient community has contributed to the adoption of genomics," said Dr Venkateswaran.

India's AI leap in drug discovery

AI is reshaping drug discovery, with leading pharma companies embedding it across their R&D pipelines. Globally, players like XtalPi in China and Standigm in South Korea are using machine learning and computational chemistry to fast-track drug design.

Now, India is stepping onto this stage with a surge of AI-driven startups focused on revolutionising drug discovery. These emerging companies are harnessing advanced algorithms and big data analytics to identify novel drug candidates faster and more efficiently. One such pioneer is Boltzmann Labs, with its vision to transform drug discovery through data-driven solutions. The company offers a comprehensive suite of products and services covering target and biomarker identification, small molecule design, antibody design, protein engineering, and custom synthesis planning—all powered by AI-driven technologies.

Another promising player is Peptris Technologies, an AI-powered preclinical drug discovery company. In March 2025, Peptris made headlines by out-licensing India's first AI-discovered drug candidate to US-based Revio Therapeutics.

Several other startups are also reimagining the AI-driven drug discovery process across India. Bengaluru-based Prescience Insilico is accelerating drug and materials discovery with its AI-driven platform, PRinS3. Sravathi AI focuses on designing and developing molecules and materials, collaborating across the R&D pipeline. Molecule AI, recognised at BioSpectrum Asia 2024, is gaining traction with its flagship platform, Molecule GEN.

Even established Indian pharmaceutical giants are embracing AI. Aurigene Pharmaceutical Services Ltd., the CDMO arm of Dr. Reddy's Laboratories, recently launched Aurigene.AI, an end-to-end AI and machine learning-assisted drug discovery platform.

Digitising Diagnostics

Digital pathology is emerging as a key area of innovation. In January 2025, IIIT-Hyderabad and Nizam's Institute of Medical Sciences (NIMS) launched India's first comprehensive pathology dataset. The India Pathology Dataset (IPD) project—a multi-stakeholder initiative involving academia, hospitals, industry, and the government-aims to digitise slide images of tissue biopsies. This project is expected to enhance clinical decision-making, reduce the risks associated with handling physical slides, and improve turnaround times for

diagnostics. By leveraging AI, the IPD project also aims to open new avenues for research in pathology.

Bengaluru-based startup SigTuple is also making strides in this space with its digital pathology platform capable of analysing blood samples remotely. This innovation is extending access to specialist diagnostics in areas lacking adequate medical facilities.

According to Dr Venkateswaran, “Digital pathology platforms can analyse specimens in record time, annotate them, and provide initial findings, allowing pathologists to focus on critical areas. This optimises analysis time and enhances the detection of key findings.”

AI is also driving change in medical imaging. In May 2025, Rajalakshmi Medical College Hospital and Research Institute in Chennai inaugurated the Rajalakshmi Advanced Diagnostics and Applied Radiomics (RADAR) Centre. This facility focuses on precision diagnostics through AI-enabled imaging, aiming to improve diagnostic accuracy and patient outcomes.

Qure.ai, a leader in AI-based medical imaging, is reshaping the radiology landscape with deep learning tools that automate the interpretation of X-rays, CT scans, and ultrasounds. Its technology accelerates diagnosis and improves healthcare accessibility. In April 2025, AstraZeneca partnered with Qure.ai to complete 5 million AI-enabled chest X-rays (CXRs) across more than 20 countries.

Tata Elxsi, through its innovation arm, is working on AI-powered medical imaging, while Google has partnered with Forus Health and AuroLab to scale up diabetic retinopathy screening across India.

Another area where AI is making significant strides is early diagnosis. Several Indian firms are launching innovative tools aimed at early detection and preventive care. Redcliffe Labs recently introduced a digital prediabetes risk checker, enabling early-stage identification and intervention.

Breaking Barriers in Digital Health

A major challenge in scaling India's digital healthcare ecosystem is the uneven distribution of technology and infrastructure across the country. Urban areas generally benefit from better connectivity and digital literacy, while rural regions often face significant barriers, including limited internet access and inadequate IT infrastructure. Although rural India had over 400 million internet subscribers as of 2024, the connectivity quality is frequently insufficient to support reliable digital health services, according to a paper in the Nature publication.

Concerns around data privacy and security remain significant barriers to the adoption of ABDM. The digitisation of health records demands robust data protection measures to secure sensitive patient information, especially considering the vast scale of ABDM. The Digital Personal Data Protection Act (DPDPA) of 2023 marks a critical step in India's efforts to regulate personal data processing and uphold data privacy, the paper further noted.

“While a lot of progress has been made, there are still opportunities to make more out of the data being held in hospitals. Certain regulatory guardrails would also help. I believe the DPDPA is a step in the right direction. It gives the much-needed incentive for hospitals to assess their data structures and make the necessary changes to ensure that the data can be used for more clinical research and innovation on the Indian genotype that would boost the care outcomes. I also believe that we need a centralised regulatory authority like what RBI has for financial services. This will ensure that there is uniformity in the regulations and hospitals are not overburdened by complying with multiple regulations both at the state and central levels, ” added Dr Venkateswaran.

India’s digital health sector is poised for exponential growth, with a recent BCG report, in collaboration with B Capital, projecting a surge from $2.7 billion in 2022 to nearly $37 billion by 2030. Overcoming these challenges will be vital to unlocking the full potential of digital health, positioning India as a global leader in tech-enabled healthcare delivery. BS

Ayesha Siddiqui

How AI is enhancing medical diagnostics

India's medical diagnostics sector is undergoing a transformative shift, fuelled by the power of Artificial Intelligence (AI). According to a report by Research and Markets, the AI-based Medical Diagnostics Market in India was valued at $12.87 million in 2024 and is projected to soar to $44.87 million by 2030, growing at an impressive CAGR of 23.1 per cent. However, the rapid adoption of AI technologies in diagnostics is probably more focused on early detection of diseases such as cancer, respiratory diseases, diabetes, and cardiovascular diseases, among others. Sensing this bend, the industry has now started deploying AI to detect unexplored areas such as ophthalmology, dermatology, trichology, in vitro fertilisation, to name a few. Let's find out more about the potential that lies in the hands of AI in medical diagnostics.

AI is rapidly transforming healthcare, particularly in diagnostics and imaging across the globe. The industry is continuously developing solutions in the form of new apps and devices using AI to ease out the burden on the healthcare setting. As a result, these solutions are improving diagnostic accuracy and enabling faster treatment decisions for conditions such as cancer, tuberculosis, diabetes, cardiovascular diseases etc.

With India witnessing a rising burden of these diseases, coupled with a shortage of skilled healthcare professionals, AI-driven diagnostic solutions are emerging as a transformative force. By reducing diagnostic turnaround times, increasing accuracy, and enabling remote healthcare access, AI is playing a pivotal role in addressing the growing healthcare demand and disease burden, particularly in urban areas where non-communicable diseases (NCDs) are more prevalent.

However, challenges persist in terms of high implementation costs, the lack of standardised AI regulations, a limited skilled workforce and concerns over data privacy and patient confidentiality. Furthermore, limited adoption of AI in rural healthcare facilities remains a significant barrier to widespread deployment in India.

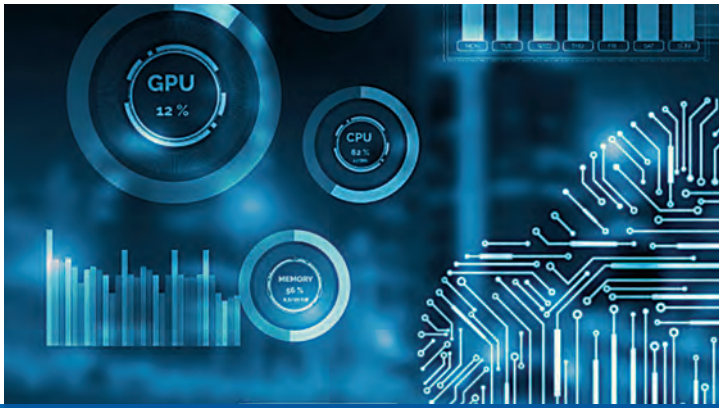
Despite these challenges, many new areas such as ophthalmology, dermatology, trichology, in vitro fertilisation, etc. are being touched upon by the industry where the use of AI can offer timely diagnosis and effective treatment plans.

"Diagnostics is undergoing a quiet revolution, one driven by artificial intelligence (AI). What was once a system dependent on reactive responses is now evolving into a proactive model that prioritises early detection, precision, and patient clarity. In a world where diagnostic errors contribute to 10 per cent of patient deaths, the stakes couldn't be higher. AI brings a much-needed shift, enhancing accuracy, speeding up outcomes, and making care more understandable and accessible", said ***Deepak Sahni, Founder & Chief Executive Officer, Healthians.***

Setting the right vision with AI

The growing number of cases of eye diseases such as diabetic retinopathy, glaucoma, cataract, and age-related macular degeneration (AMD), in the country has urged technology developers to increase the use of AI for their early detection. Studies have suggested that AI systems demonstrate strong diagnostic performance in detecting eye conditions such as diabetic retinopathy, with sensitivity and specificity comparable to or exceeding traditional clinicians.

One notable example is Remidio Innovative Solutions, a Bengaluru-based healthtech startup focused on preventing avoidable blindness with the use of AI. The company has recently received



regulatory approval from the State FDA, Karnataka (CDSCO), for its Medios HI (Humanising Intelligence) Glaucoma AI and Medios HI AMD AI tools. Following the success of the CDSCO-approved Medios DR HI, AI for diabetic retinopathy, which has impacted nearly 2,50,000 patients in the past year, the newly approved AI solutions are focused on early detection of glaucoma and AMD in diverse healthcare settings.

A recent significant initiative leveraging Remidio's AI technology is the announcement of Nayanamritham 2.0, India's first government-led AI-assisted eye disease screening programme, launched by the Kerala government in February 2025.

"India accounts for 12 million glaucoma patients, nearly one in eight globally. Yet over 90 per cent of these cases remain undiagnosed, often leading to irreversible vision loss. Early detection using portable, AI-enabled tools can drastically change this trajectory", said ***Dr Anand Sivaraman, CEO and Founding Director, Remidio.***

Another example of fostering cutting-edge research in eye care is Zeiss India partnering with the Indian Institute of Science (IISc), Bengaluru, to establish a state-of-the-art research facility. This facility is focused on developing high-fidelity AI solutions for eye care and upskilling students in AI-based technologies. Supported by the Spectrum Lab at IISc, the collaboration aims to harness AI's potential to improve early diagnosis and patient outcomes in ophthalmology.

Zeiss India is also sponsoring students through its 'MTech Fellowship Programme,' further strengthening the research ecosystem and promoting advancements in AI-driven eye care solutions.

Mumbai-based startup AND Healthcare Solutions is another player that is focused on delivering low-cost, AI-driven eye screening solutions to millions. The startup has partnered with Australian company TeleMedC to roll out advanced eye imaging and AI-powered diagnostics across India.

Mumbai-based institute Wadhwani AI is also emerging as another key player in this space. As a key partner, Wadhwani AI is supporting the development of multiple AI solutions for the screening of diabetic retinopathy, pulmonary and skin conditions at the All India Institutes of Medical Sciences (AIIMS). These solutions will now be scaled by the AIIMS Centre of Excellence (CoE), in collaboration with the Ministry of Health and Family Welfare, across primary and secondary healthcare settings to ensure timely care for all.

Key Players in India's AI in Medical Diagnostics Market

- Microsoft Corporation
- GE HealthCare Technologies Inc.
- Koninklijke Philips N.V.
- Intel Corporation
- Google LLC
- NVIDIA Corporation
- Digital Diagnostics Inc.

Source: ResearchAndMarkets.com

"Diabetic retinopathy is a leading cause of preventable blindness, especially in India, where access to specialised eye care is limited, particularly in rural regions. Many individuals are unaware of their condition until severe vision loss occurs. AI-based solutions can empower optometrists and field investigators to screen patients, enabling early diagnosis and referral to specialists. We strongly believe in India's ability to lead in AI innovation. With the right talent, ecosystem, and data, India can be at the forefront of AI applications", said ***Nakul Jain, Director of Products and Design at Wadhwani AI.***

Further, Bengaluru-based startup NeuraSim Health, in collaboration with QWR, has introduced BeeVee, India's first AI-powered VR therapy for amblyopia or lazy eye. This groundbreaking solution is transforming vision care with 3X faster recovery, making treatment more effective, engaging, and now available for at-home use.

The application of AI in ophthalmology encompasses a wide range of innovations, from advanced diagnostic tools that can detect conditions like diabetic retinopathy, AMD and glaucoma with remarkable precision to personalised treatment plans that optimise therapeutic outcomes and reduce costs. Additionally, AI-driven surgical tools and teleophthalmology services are making high-quality eye care more accessible, particularly in underserved and remote areas.

Exploring dermatology and trichology

AI is now also being used to detect numerous skin (eczema, acne, psoriasis, vitiligo) and hair (baldness, alopecia, scalp infection) conditions to offer better health solutions to millions across India.

For instance, in a revolutionary move set to transform the Rs 25,000 crore-worth Indian skincare market, Mumbai-based health-tech platform Skin Beyond Borders (SkinBB) has launched a pioneering Skincare Metaverse platform. This innovative digital ecosystem seamlessly integrates cutting-edge AI technology with clinical knowledge, creating a unique synergy between consumers, clinicians, and industry partners. Further, Kaya Clinic has launched a revolutionary AI app that offers an in-depth understanding of skin issues tailored to individual needs, making it the first app in India to leverage AI for personalised skin diagnosis. The app focuses on analysing acne, scars, pigmentation, fine lines, and anti-ageing concerns. Kaya holds the intellectual property, for the AI app, making it as the first AI-powered dermatology service in India. Also, Bengaluru-based startup Cureskin, a leader in AI-driven dermatology solutions, has developed the world's first AI-powered hair analyser. It is designed to accurately detect male pattern baldness and assess hairline health with advanced precision.

Arshan Ommid, Founder and Chief Executive Officer of Dermose, said, "AI has the unprecedented ability to analyse the complexities of hair loss, from genetic predispositions to lifestyle factors, creating a holistic diagnostic framework. This precision equips clinicians to design truly tailored treatments, giving patients confidence in both the process and the outcome. AI tools such as computer vision and big data analytics are transforming the treatment of chronic conditions by allowing physicians to automate the identification of biomarkers for hair loss and combine thorough lab results with trichoscopic data. These developments significantly shorten diagnostic times while increasing precision, enabling patients to start receiving efficient treatments earlier."

AI in IVF and birth management

Another area where a rapid surge of AI integration is taking place is in vitro fertilisation (IVF). A type of assisted reproductive technology (ART), IVF has been revolutionising the field of infertility treatment over the past few years in India. With a market size of Rs 12000 crore, the IVF procedures are now offering better treatment plans with AI integration. A most recent example of this utilisation is the world's first infant born (to an Indian couple in the US) using a fully automated and digitally controlled intracytoplasmic sperm injection (ICSI) process. After several failed IVF attempts, the couple was referred for ICSI treatment at a fertility clinic in Mexico, where four of the five eggs treated with AI-assisted ICSI were successfully fertilised, ultimately resulting in the first live birth.

According to ***Dr Ramnath Babu T J, Co-founder, CEO, SpOvum Technologies,*** "The potential that AI and automation bring to IVF is unimaginable. They hold the possibility of increased success rates, customised treatment protocols, and lower costs, making fertility treatment affordable. The intersection of AI, automation, and IVF is a revolution in reproductive medicine. These advancements are hope in a country like India, where infertility is increasing." Additionally, labour and delivery management is now also being handled using AI, by predicting birth times with precision and optimising hospital operations in real time. This groundbreaking AI-based obstetrics platform has been developed in a collaborative effort by US-based Birth Model with Pune-based Mindbowser.

"What makes AI particularly valuable is its ability to quickly process large volumes of data and identify patterns that might be missed during routine evaluations. As the technology evolves, AI is expected to become a standard part of maternal care, not just in well-equipped hospitals but also in remote and underserved areas via mobile health tools and wearable devices. With continued research and thoughtful regulation, AI has the potential to make maternal care more personalised, accessible, and timely, ultimately improving outcomes for mothers and babies and reshaping the future of prenatal health", said ***Ayush Jain, CEO & Founder, Mindbowser.***

Way forward

While new avenues are opening for AI-based healthcare implementation and delivery, a strong and supportive ecosystem will need to be built in the coming years. The government is already on track to strengthen the skills for AI with its ongoing IndiaAI Mission. With Stanford University ranking India among the top four countries along with the US, China, and the UK in the Global and National AI vibrancy, AI-based innovations in India will cement the landscape further. BS

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Countering Obesity with Drugs Vs Viable Alternatives

A sizable obese population in India is a free ground for multinational pharma companies to launch various anti-obesity drugs. Let aside the affordability issue, these drugs can be a game changer. However, severe side effects lurk in the background. Alternative treatment and fundamental lifestyle changes can be seen as an alternative mode to counter obesity. Let's examine the available and prospective obesity therapeutics.

The current state of obesity in India is alarming. As was evident from Prime Minister Narendra Modi's 119th Maan Ki Baat, where he cautioned against the rise in obesity cases that have doubled in the last few years. A major concern during his speech was how children are getting affected more. Union Minister Dr Jitendra Singh, a renowned Diabetologist, also raised alarms while underscoring the urgent need for a multifaceted and collective approach to combat the growing obesity crisis in India.

India's stint with obesity started in the last 20th century with people getting addicted to sugary drinks, junk foods etc. Rapid urbanisation, economic development, lifestyle changes and less physical activity all contributed to a rise in the obese population. Obesity is linked with stigma, and many encounter fat shaming. It leads to psychological stress. This apart, an obese person is vulnerable to various health issues like heart disease, type 2 diabetes, high blood pressure, cancer, sleep apnea, etc.

Launch of anti-obesity drugs

Seeing this as a strategy to market anti-obesity drugs, many multinational pharmaceutical companies are in a rat race to launch various products. With the launch of weight-loss drugs in the Indian market, the debate around pharmacological obesity treatment has intensified.

Seeking an opportunity, the US pharma major, Eli Lilly, recently launched Mounjaro. It is a single-dose vial presentation and has received marketing authorisation from the Central Drugs Standard Control Organisation (CDSCO). The company went ahead and also launched a campaign to combat the associated stigma with obesity.

Winselow Tucker, President and General Manager, Lilly India, claims, "Our mission to make life better for people living with obesity and diabetes in India is reflected in our efforts to accelerate the introduction of innovative medicines. The launch of Mounjaro demonstrates our ongoing support of this

In middle-income countries like India, these medications are not being rationally prescribed due to the absence of guidelines from regulatory bodies such as the ICMR and the lack of guidance from the National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD).

- Leena Menghaney,
Lawyer/Consultant, Public Health, Pharmaceuticals & Access

Given India's growing obesity epidemic and high prevalence of metabolic disorders, it is essential to balance the excitement around these therapies with caution.

- Dr Vanita Rahman,
an internal medicine physician and weight-loss expert, Physicians Committee for Responsible Medicine (PCRM)

Our mission to make life better for people living with obesity and diabetes in India is reflected in our efforts to accelerate the introduction of innovative medicines.

- Winselow Tucker,
President and General Manager, Lilly India

mission and our shared vision of a healthier nation."

Danish pharma major Novo Nordisk plans to launch its anti-diabetes and weight loss drug Wegovy in India. According to Martin Holst Lange, Executive VP for Development at Novo Nordisk, the company is dedicated to providing improved treatment options for people living with obesity, Type 2 diabetes, and other cardiometabolic diseases. The addition of a candidate targeting glucagon, as well as GLP-1 and GIP, will add important optionality to our clinical pipeline as we look to develop a broad portfolio of differentiated treatment options that cater to the diverse needs of people living with these highly prevalent diseases.

Many more companies may join the bandwagon to capture the obesity market in India. But at what cost?

With the increasing demand for quick-fix weight loss solutions, there is a risk that people without medical indications may start using the drug indiscriminately. This could lead to serious health repercussions, especially if taken without professional supervision.

- Prof (Dr) Subhrojyoti Bhowmick,
VP (Projects and Academic Initiatives), Department of Pharmacology, KPC Medical College and Hospital, Jadavpur

Miracle drug or risky gamble?

Despite being claimed to give quick relief, weight-loss drugs are known to have side effects, according to experts and doctors working in this field.

Prof (Dr) Subhrojyoti Bhowmick, Vice President (Projects and Academic Initiatives), Department of Pharmacology, KPC Medical College and Hospital, Jadavpur, says, "Despite its effectiveness, Mounjaro is not without risks. Common side effects include nausea, vomiting, diarrhoea, and gastrointestinal discomfort. More severe complications, such as pancreatitis, gallbladder issues, and potential cardiovascular risks, have also been reported. A major concern is the potential for misuse. With the increasing demand for quick-fix weight loss solutions, there is a risk that people without medical indications may start using the drug indiscriminately. This could lead to serious health repercussions, especially if taken without professional supervision."

Research indicates that two-thirds of users discontinue these drugs within a year due to gastrointestinal issues such as nausea, vomiting, diarrhoea, and constipation, as well as more serious complications like pancreatitis or gallbladder problems. After discontinuation, most users rapidly regain the weight they initially lost because these drugs do not address the underlying metabolic causes of obesity, such as insulin resistance, inflammation, and dietary habits.

While explaining the limitations of GLP-1 drugs and why a dietary approach offers a more sustainable solution for weight management, Dr Vanita Rahman, an internal medicine physician and weight-loss expert, Physicians Committee for Responsible Medicine (PCRM) says, "Given India's growing obesity epidemic and high prevalence of metabolic disorders, it is essential to balance the excitement around these therapies with caution. As data on cardiovascular safety and long-term mortality risks continue to emerge, sustainable weight management

Recognising obesity as a disease is the first step toward effective management. India needs policy changes, such as stricter sugar regulations in beverages, tax cuts on healthy foods, and mandatory nutrition education in schools. Teaching people to read food labels can promote healthier choices.

- Dr Rajiv Kovil,
Head of Diabetology, Zandra Healthcare and Co-founder, Rang De Neela Initiative

Developed through cutting-edge gut microbiome research, the Advanced Metabolic System is a proprietary blend of clinically tested probiotics and prebiotics solving for obesity through Natural GLP-1 activation —without the adverse side effects commonly associated with weight-loss drugs.

- Keshav Biyani,
Co-founder, The Good Bug

must prioritise dietary and behavioural modifications over pharmacotherapy alone."

It is difficult to prescribe these medicines for a longer period. This is according to Dr Aparna Govil Bhasker, Consultant Bariatric and Laparoscopic Surgeon, MetaHeal - Laparoscopy and Bariatric Surgery Center, Mumbai; Saifee, Apollo, and Namaha Hospitals, Mumbai. Dr Aparna opines, "Mounjaro and the other drugs in the same category have shown good results in the trials that have been conducted and have shown about 15 to 20 per cent total body weight loss while the individual is on medications. The main concerns are the possibility of rebound weight gain after stopping medications. Studies have shown that a significant number of patients regain weight after the drugs are withdrawn. There is presently no long-term data available regarding the weight loss outcomes or the side effect profile."

Need for proper guidelines

Currently, no medications for obesity are included in the Essential Medicines List (EML). However, given their dual role in treating both type 2 diabetes and obesity, GLP-1 receptor agonists such as semaglutide and tirzepatide could be considered for inclusion.

Leena Menghaney, Lawyer/Consultant, Public Health, Pharmaceuticals & Access opines, "In middle-income countries like India, these medications are not being rationally prescribed due to the absence of guidelines from regulatory bodies such as the Indian Council of Medical Research (ICMR) and the lack of guidance from the National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD) on the use of GLP-1 receptor agonists in the management of type 2 diabetes and obesity."

Dr Rajiv Kovil, Head of Diabetology, Zandra Healthcare and Co-founder of Rang De Neela Initiative says, "Obesity is a complex disorder requiring medical intervention, including pharmacotherapy. Drugs like Mounjaro should be prescribed only by experts, not by

Desperate patients are willing to gamble despite knowing its adverse effects. Also, the affordability of the drugs needs to be looked into.

- S Srinivasan,
Founder, Low Cost Standard Therapeutics (LOCOST) and Co-convenor, All India Drug Action Network (AIDAN)

Long-term reliance on these drugs without lifestyle and nutritional interventions may not deliver sustainable outcomes.

- Amit Srivastava,
Founder and Chief Catalyst, Nutrify Today

gym trainers or nutritionists. Recognising obesity as a disease is the first step toward effective management. India needs policy changes, such as stricter sugar regulations in beverages, tax cuts on healthy foods, and mandatory nutrition education in schools. Teaching people to read food labels can promote healthier choices. A holistic approach combining medical treatment, policy reforms, and education can significantly combat obesity in India."

Question of affordability

The affordability of the recently launched Eli Lilly drug Mounjaro remains a big question. The drug is priced at Rs 3,500 for a 2.5 mg vial and Rs 4,375 for a 5 mg vial. This leads to a monthly cost between Rs

> It is difficult to prescribe these medicines for a longer period. Studies have shown that a significant number of patients regain weight after the drugs are withdrawn. There is presently no long-term data available regarding the weight loss outcomes or the side effect profile.
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> **- Dr Aparna Govil Bhasker,**
> Consultant Bariatric and Laparoscopic Surgeon, MetaHeal - Laparoscopy and Bariatric Surgery Center, Mumbai; Saifee, Apollo, and Namaha Hospitals, Mumbai

> There is a wide gap between lifestyle changes and invasive treatments like surgery. Scientific evidence increasingly highlights the gut microbiome as a cornerstone of metabolic health and sustainable weight management.
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> **- Dr MKN Manohar,**
> Senior Consultant, Manipal Hospitals

14,000 and Rs 17,500, depending on the prescribed dosage.

Mounjaro is an expensive drug requiring long-term use. Its accessibility in India—where healthcare expenses are largely out-of-pocket—raises questions about its feasibility as a mainstream treatment.

A Journal of the American Medical Association (JAMA) Network study suggests that these diabetes medicines (generic) could be produced at a fraction of the cost. If Indian manufacturers develop semaglutide and tirzepatide in pre-filled syringes with varying dose strengths, healthcare providers would be able to adjust dosages as needed—potentially increasing accessibility for those who need these treatments the most.

Alternative means

With the rising side effects and affordability of these drugs in question, alternative means to reduce obesity can be explored. Many experts are advocating for lifestyle modifications. Dietary changes, regular workouts, behavioural interventions, alternative medicines, etc., can do wonders if taken appropriately.

Unlike synthetic drugs, which often target a single mechanism, nutraceuticals offer a multidimensional approach. Says Amit Srivastava, Founder and Chief Catalyst, Nutrify Today, “These drugs often operate by suppressing hunger rather than correcting metabolism. So, while the kilos drop, the root cause—metabolic dysfunction—often remains unaddressed. Long-term reliance on these drugs without lifestyle and nutritional interventions may not deliver sustainable outcomes.”

Nutrify-Today, through NutrifyGenie AI, focuses on head comfort and improved quality of life, and another is dedicated to endurance for individuals with sugar concerns. Dealsphere is another AI-powered B2B nutraceutical deal discovery platform.

Clinically tested probiotics and prebiotics have solved obesity through Natural GLP-1 activation — without the adverse side effects commonly associated with weight-loss drugs. The Good Bug’s Advanced Metabolic System is the latest advancement in natural GLP-1 science, offering a sustainable and science-backed solution to weight loss. The company claims 12 per cent weight loss in 90 days.

Says, Keshav Biyani, Co-founder, The Good Bug, “Developed through cutting-edge gut microbiome research, the Advanced Metabolic System is a proprietary blend of clinically tested probiotics and prebiotics solving for obesity through Natural GLP-1 activation —without the adverse side effects commonly associated with weight-loss drugs. With the launch of this product, validated through scientific clinical trials, we are proud to offer a global first-of-its-kind innovative solution that delivers up to 12 per cent weight loss in 90 days.”

A well-balanced, plant-based diet has been scientifically proven to improve insulin sensitivity, reduce inflammation, and help with long-term weight loss. Various clinical trial studies found that participants following a low-fat, plant-based diet lost

an average of 12 kg over six months and kept it off at 12 months.

Dr M K N Manohar, Senior Consultant, Manipal Hospitals, mentions, "Obesity has become a silent pandemic, accelerated by COVID. There is a wide gap between lifestyle changes and invasive treatments like surgery. Scientific evidence increasingly highlights the gut microbiome as a cornerstone of metabolic health and sustainable weight management."

Educating consumers about natural GLP-1 boosters, raising awareness of gut microbiome science, and shifting the focus from symptomatic treatments to root-cause solutions are crucial for fostering trust and encouraging informed decisions.

As Dr Balaji Jaganmohan, Consultant Diabetologist, Apollo Sugar, Bengaluru, points out, "Rather than just addressing symptoms, weight management strategies should prioritise long-term health benefits. Natural GLP-1 boosters, when combined with lifestyle modifications and medical guidance, can be a crucial part of a comprehensive approach. However, their effectiveness requires rigorous scientific validation for widespread acceptance. Bridging the gap between conventional medicine and natural interventions through education, research, and awareness will empower individuals to make informed, sustainable health choices."

Long-term solution

All pharmaceutical drugs are known to have some side effects. Pharma companies sometimes try to push their products while engaging in unethical practices to lure doctors into prescribing drugs. Whether the drugs do good or harm seems to be no one's business.

The anti-obesity drugs market is huge, as the number of obese patients in India suggests. A quick way to shed the extra weight is the new norm.

> We are dedicated to providing improved treatment options for people living with obesity, Type 2 diabetes, and other cardiometabolic diseases. The addition of a candidate targeting glucagon, as well as GLP-1 and GIP, will add important optionality to our clinical pipeline, as we look to develop a broad portfolio of differentiated treatment options.

- Martin Holst Lange,
Executive VP for Development, Novo Nordisk

> Rather than just addressing symptoms, weight management strategies should prioritise long-term health benefits. Natural GLP-1 boosters, when combined with lifestyle modifications and medical guidance, can be a crucial part of a comprehensive approach.

- Dr Balaji Jaganmohan,
Consultant Diabetologist, Apollo Sugar, Bangalore

Various social media posts about losing weight are a dangerous precedent that plays with the emotions of obese people. On the other hand, popping pills is not at all a good option.

A holistic, research-based approach that integrates natural solutions, education and long-term health strategies is essential for managing obesity in India. Hence, lifestyle changes and long-term treatments by avoiding medicines that can create severe side effects will help many overcome the obesity challenges.

Activist S Srinivasan, Founder, Low Cost Standard Therapeutics (LOCOST) and Co-convenor, All India Drug Action Network (AIDAN), mentions that there seem to be many takers for tirzepatide. Desperate patients are willing to gamble despite knowing its adverse effects. Also, the affordability of the drugs needs to be looked into."

Eli Lilly, with its recently launched anti-obesity drug and Novo Nordisk's Wegovy might become a game changer in anti-obesity treatment, provided the companies come clean on the side effects and bring in more affordable drugs to India. BS

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"About 10-12 orphan drugs are available for patients in India"

Prasanna Kumar Shirol, Co-founder & Executive Director, The Organisation for Rare Diseases India (ORDI), in an interaction with BioSpectrum India, shared his views about the efforts of ORDI in reducing inequities and ensuring that persons with rare diseases have access to the same resources as the general community. ***Edited excerpts;***

There are 443 rare diseases which ORDI has listed. How many of these rare diseases are being treated in India?

These are the conditions reported by patients who have registered with ORDI through helpline, online and referrals. As per National Policy for Treatment of Rare Diseases (NPTRD), 2017, the Government of India mentions about 450 conditions have been identified in India, but the list of diseases being treated is not available. Lysosomal Storage Disorders (LSDs), a group of genetic metabolic disorders where enzymes responsible for breaking down complex molecules within lysosomes are deficient or absent such as Gaucher, Pompe, MPS and Neuro Muscular Diseases like DMD, SMA and IEMs like PKU, MSUD, Organic Acidemias, Cystic Fibrosis, Osteogenesis Imperfecta, Primary Immuno Deficiencies, are predominantly visible across India.

The National Policy for Rare Diseases (NPRD) has listed only 67 diseases under Group 3. How is ORDI pushing the government to include other rare diseases under NPRD?

Currently, the disease inclusion process is going at a very slow pace. We have requested the government to list all the rare disease / genetic conditions and treat which are treatable and provide supportive care for the non-treatable. We have been advocating for inclusion of all conditions regularly. Recently we have also met Prof. Vinod K Paul – Member NITI Aayog about the same and submitted a request letter for the same endorsed by all ORDI member Patient Advocacy Groups.

Around 500 approved orphan drugs exist; how many are available in India? Which companies offer them under charity?

About 10-12 drugs are available for patients in the country. Currently Sanofi, Takeda, Novartis etc. have been offering orphan drugs to Indian patients under charitable access initiative.

ORDI currently supports 8250 patients with only 372 receiving treatment. Apart from RaceFor7, what other outreach programmes does ORDI have?

The number of patients associated is dynamic. We get on average 2-3 calls on our helpline and registration. And several patients succumbed to death also. We also closely work with more than 25+ Registered Disease specific Patient Advocacy Groups (PAG). They have their own patients' members for a particular condition and their patients need not register with us. The 372 patients referred here are the patients supported by ORDI to receive treatment before the announcement of the NPRD through various sources such as ESI, Public Sector, CSR, Crowd Funding etc. Currently more than 1000 patients are taking treatment under NPRD across the country. But sustainability is a challenge specially after their treatment cost crosses Rs 50 lakh.

ORDI noted 3300 doctors support the organisation; how many treat rare disease patients in India?

We conduct various awareness programmes and initiatives among Medical Fraternity. These are the doctors who have participated, attended, referred, doctors etc. in the last 11+ years. These are Paediatrician, General Practitioner, Specialist etc. These may not be treating physicians, they are the ones who refer patients to the ORDI, Rare Disease Experts or to the Centre of Excellence (CoE) now. Regularly we conduct patient outreach programmes through medical camps.

How many companies are interested in rare disease clinical trials in India, and for which diseases?

We regularly get enquiries from many companies who are in different stages like Pre clinical, Approved Trials etc. BS

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"IPSO expects the govt to help set up infrastructure dedicated to the Indian CRDMO industry"

Due to a lack of a clear and unified industry definition and slow progress, India's Contract Research, Development, and Manufacturing Organisation (CRDMO) industry leaders have joined hands and formed the Innovative Pharmaceutical Services Organization (IPSO), to create a strategic blueprint- a roadmap to define the CRDMO sector. IPSO, a dedicated industry body uniting 11 leading CRDMO companies, is all set to accelerate India's dominance in biopharma innovation, ensuring a stronger, more structured future for the sector. As one of the key members of IPSO, Manni Kantipudi, CEO, Aragen Life Sciences shared the future plans of the industry body during an interaction with BioSpectrum. ***Edited excerpts-***

« **Manni Kantipudi,**
CEO,
Aragen Life Sciences

What are the key objectives of IPSO? Is there a timeline for achieving these objectives?

IPSO's key objective is to position India as a global hub for pharmaceutical innovation by advocating conducive policies, increasing sector awareness, and fostering a robust ecosystem through industry-government collaboration. To achieve this, IPSO will focus on creating a favourable regulatory landscape that recognises the unique needs of biopharmaceutical research; nurturing a talent pipeline through investments in Science, Technology, Engineering, and Mathematics (STEM) education and attracting global scientific expertise; securing incentives to fuel investment and innovation within the CRDMO sector; and strengthening the supply chain ecosystem to ensure the industry has the resources it needs to thrive. These are long term goals and objectives and require concerted efforts from multiple stakeholders.

What are the major challenges that are being addressed to strengthen the CRDMO sector in India?

In the last few years, the Central and State Governments have taken various measures to strengthen India's biopharmaceutical sector by introducing policies to promote research, development, and innovation. However, these policies do not focus on the specific requirements of the CRDMO sector. As service providers, we have a different operating and business model and cater to a more global customer segment compared to the overall biopharmaceutical sector. Despite this, the industry has shown strong growth prospects and plays a crucial role in exporting services to highly regulated markets such as the US, Europe, UK, Japan, and Australia. It is also increasingly contributing to foreign direct investments (FDIs) into the country. In the post COVID-era, India has emerged as a strong alternative to life sciences organisations looking at geo-diversifying operations beyond China. Building on this strong foundation, IPSO will work towards creating more awareness about the requirements of the sector, tackling regulatory and operational challenges, and streamlining the regulatory approval processes.

Would more members/companies be onboarding IPSO in the coming time? Please share details.

Absolutely. We are seeing keen interest from other Indian CRDMOs and have received additional membership requests. We expect the total membership count to cross 20 companies by the end of the calendar year.

What are the major expectations from the government to support IPSO and its goals?

One of the key expectations from the government, both State and Central, is to implement

policies and regulations that meet the specific requirements of the CRDMO industry. Currently, there is a lack of adequate understanding of the sector's operating model which reflects in the prevailing policies and guidelines. For instance, some of the approvals are relevant for companies intending to sell their products within the country and not for CRDMOs focused on exporting their services outside India. Yet, we need to apply for these approvals which negatively impacts our delivery timelines and cause unnecessary delays. Secondly, we expect the government to help set up infrastructure dedicated to the CRDMO industry with all relevant support facilities and amenities. This will reduce our cost of operations and help leverage collective resources. Thirdly, facilitate the setting up of incubation centres that promote investment in developing scientific research. Initiatives from Biotechnology Industry Research Assistance Council (BIRAC) are already in this direction and we expect continued support in this direction.

Would IPSO be organising events/meetings in 2025 to spread out its message? Please share details.

Yes, in the coming months, IPSO will organise various events aimed at increasing interaction and engagement with the government, regulatory authorities, industry bodies and academic institutions. For instance, we recently organised the first Supply Chain Meet that had the supply chain heads of various CRDMOs come together to discuss and deliberate shared challenges and drive collective solutions towards creating a robust supply chain ecosystem in the country.

What are current trends shaping the future of the CRDMO sector in India, and how would IPSO leverage those opportunities?

The Indian CRDMO sector is seeing rapid growth and has demonstrated immense potential in the face of global disruptions and a volatile market. As mentioned in the BCG-IPSO report, the sector is currently valued at around $3 billion growing at 15 per cent CAGR between 2019 and 2024, double the global growth rate of 7-8 per cent, and has the potential to scale to $25 billion by 2035. Besides cost arbitrage, it offers scalable, innovative and technology-driven solutions to the global life sciences sector. It is also investing heavily in expanding capacity and capabilities across R&D and manufacturing solutions. This includes investments in new modalities such as cell and gene therapies, ADCs, peptides and oligonucleotides.

Companies such as Aragen have committed significant capital investments in the coming years to expand their service offerings. We have also adopted AI/ML based digital tools, data analytics, and automation that is significantly improving operational efficiency, ensures superior quality control and speed to market, positioning Indian CRDMOs as reliable partners in the global supply chain. However, there are few key barriers that will need to be overcome for the sector to leverage its full potential. These relate to quantity and quality of talent pool, implementing policies and regulations specifically focused on the CRDMO sector, creating a world-class tier 1 supplier ecosystem, facilitating access to capital for driving growth and driving sustainability. This is where IPSO will step in and help overcome these barriers and strengthen the sector's overall position in the global marketplace. It will work closely with the industry and academia to develop relevant talent pool and with the government and regulatory authorities to frame conducive policies. It will also work towards strengthening the supply chain ecosystem to increase the competitive advantage of the sector.

How do you view the growth/inclusion of sustainability within the CRDMO sector in India? Are there any global lessons to be looked up to?

I think sustainability is becoming a core element of the overall life sciences industry, driving innovation and shaping business models. There is an increasing level of awareness, appreciation and a sense of urgency towards ensuring sustainable operations. This is a core topic of discussion during our conversations with all our customers. As the demand for environmentally friendly solutions grows, I believe that CRDMOs will increasingly focus on sustainable practices throughout their operations, from R&D to production. Driving sustainability initiatives at an industry level is also one of the focus areas of IPSO. Aragen is proactively investing in cutting-edge technologies and advanced processes that promote sustainability while delivering impactful solutions. We have made significant strides in utilising renewable energy sources within our operations, reducing our carbon footprint and energy consumption. Renewable energy accounts for more than 22 per cent of our total energy consumption. We've also focused on sustainable packaging and material sourcing, minimising environmental impact across our product lifecycle. BS

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"We are developing customised solutions aligned with India's regulatory and market needs"

US- headquartered Agilent Technologies International has opened its first-ever India Solution Center at its LEED Platinum-certified office in Manesar, Haryana. Designed to provide integrated solutions, this strategic investment marks a major milestone in Agilent's global journey, highlighting strong focus on India as a high-growth, innovation-driven market. BioSpectrum took the opportunity to interact with Jonah Kirkwood, Chief Commercial Officer at Agilent, during the launch ceremony on May 8, 2025, to find out more about the company's growth plans in the country. ***Edited excerpts-***

« **Jonah Kirkwood,** Chief Commercial Officer, Agilent

What are the key objectives of opening the India Solution Center?

The India Solution Center represents a strategic investment by Agilent to meet the growing demand for localised, end-to-end scientific solutions in India. Its primary objective is to deliver customised workflows across life sciences, diagnostics, and applied markets. By addressing critical challenges in areas such as pharmaceuticals, food safety, environmental monitoring, and clinical diagnostics, the center underscores Agilent's commitment to innovation, sustainability, and a customer-centric approach.

Are you deploying new technologies such as AI and automation at the new center?

Yes, the India Solution Center is equipped with cutting-edge technologies, including automation and advanced lab informatics. These innovations are designed to enhance laboratory efficiency and accelerate digital transformation. By integrating these tools, we aim to streamline workflows, reduce turnaround times, and support data-driven decision-making for our customers.

What makes the India center unique?

This is Agilent's first-ever Solution Center in India. While we operate similar centers globally, the India Solution Center stands out due to its strong focus on localised solutions tailored to India's unique scientific and regulatory environment; integration of training, research and development, and proof-of-concept demonstrations within a single facility; and a vision to become a collaborative hub for customers, fostering innovation and co-creation.

How do you plan to strengthen Agilent's presence in India through this facility?

The India Solution Center will play a pivotal role in deepening Agilent's engagement with key sectors such as pharmaceuticals, biopharma, food, and environmental sciences. By offering holistic, scalable, and real-world-ready solutions, the center will serve as a platform for collaboration among researchers, regulators, and industry leaders—driving innovation and knowledge exchange across the ecosystem.

What are Agilent's plans for India in 2025?

India is undergoing a significant transformation in its life sciences and healthcare sectors, with the pharmaceutical industry poised for substantial growth by 2030. In 2025, Agilent's focus will be on strengthening infrastructure through initiatives like the India Solution Center; developing customised solutions aligned with India's regulatory and market needs; supporting high-growth sectors such as Pharma and Biopharma, where India is emerging as a global leader; driving digital transformation and lab automation to enhance efficiency and meet international quality standards; and collaborating with academia and industry to nurture local talent and foster innovation in genomics, cell analysis, and next-generation therapeutics.

What are your views on the US pharma tariff and its impact on Agilent's business in India?

For Agilent, this situation reinforces the importance of supporting Indian pharma and biopharma customers through localized innovation at the India Solution Center; closely monitoring policy developments while ensuring supply chain resilience and sustained customer engagement; & leveraging the center to strengthen domestic capabilities in alignment with both Indian and global regulatory standards.

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Hospitals Without Carbon Footprints

« **Sameer Mehta,**
Director of Projects,
HOSMAC

While modern hospitals are made of high-end technology and sleek interiors, there is an invisible trail of carbon emissions that shadows this pursuit of healing. This is a contradiction at the heart of healthcare design: buildings meant to restore health are, paradoxically, exacting a toll on the health of the planet.

At the heart of the sustainability discourse is consumption of energy, materials, food, pharmaceuticals, and resources of all kinds. As an industry, healthcare is responsible for nearly 5 per cent of global greenhouse gas emissions. From energy-intensive diagnostic equipment to large volumes of biomedical waste, the sector is among the highest energy guzzlers on a per-square-foot basis. In our quest to save lives, it cannot be ignored that the industry is contributing to air pollution, climate change, and the very health challenges it seeks to treat.

Two forces often inhibit change in healthcare design. One is denial, the proverbial frog in the well, unaware or unwilling to acknowledge the problem. The other is apathy, a belief that individual or institutional efforts cannot move the needle. But evidence suggests otherwise. Sustainability in healthcare design offers tangible benefits in operational efficiency, cost reduction as well as patient and staff well-being.

Core Principles of Sustainable Healthcare Design

To build resilient, environmentally responsible healthcare infrastructure, we must begin with foundational design principles:

Energy Efficiency: Through passive design strategies like natural ventilation, daylighting, and high-performance insulation, energy demand can be significantly reduced. Energy-efficient HVAC systems, LED lighting, and smart building technologies can also be used to enhance efficiency.

Renewable Energy Integration: Solar panels, wind turbines, and geothermal systems reduce dependence on fossil fuels. For instance, a 260,000 sq. ft. ophthalmology centre is currently being designed in India to service 30 per cent of its electrical load through captive solar power.

Water Conservation: Facilities must adopt low-flow fixtures, rainwater harvesting systems, and greywater recycling to reduce water consumption and preserve precious resources.

Waste Management: Hospitals generate vast amounts of biomedical and general waste. By promoting waste segregation, recycling, composting, and reusable materials, the environmental impact can be minimised.

Sustainable and Non-Toxic Materials: The use of locally sourced, renewable, and low-VOC materials contributes to healthier indoor air quality and longer-lasting infrastructure.

Smart Technology: Advanced monitoring tools can track energy and water usage, enabling real-time optimization and predictive maintenance. Department-level power monitoring, for example, can help reduce electrical demand by an additional 15% over standard load calculations, without system failures or downtime.

Biophilic and Healing Design: The integration of nature, through gardens, green walls, and daylight, has psychological benefits and promotes sustainability through passive design techniques.

Site Orientation and Urban Planning: Green roofs, thoughtful placement of buildings, and access to public transportation reduce urban heat islands and carbon footprints.

Flexibility and Future-Proofing: Modular construction, scalable infrastructure, and adaptable spaces ensure that hospitals remain relevant as medical technologies and patient needs evolve.

Sustainability is often dismissed as expensive or idealistic. But small, practical measures can transform hospitals into climate-resilient, economically sustainable, and patient-centered institutions.

As designers, engineers, and healthcare professionals, we carry a dual responsibility: to heal people and to protect the planet. Let us aspire to make the healthcare industry not just a beacon of medical excellence, but a champion of carbon-neutral innovation. BS

Resolution to Strengthen India's Health Preparedness Framework

Although COVID-19 has ended, the threat of new and re-emerging zoonotic viruses remains, the most recent cases being the Nipah virus (NiV) and Guillain-Barré syndrome (GBS) outbreaks; there is also the risk of accidental or intentional biological threats. Addressing them requires effective surveillance systems and response mechanisms within a health emergency preparedness framework. Strengthening India's ability to identify and respond to pathogens depends on technological breakthroughs in a defined framework, an innovation-based ecosystem, and sustained international collaboration.

Global public health systems were put to the ultimate test during the COVID-19 pandemic, which revealed systemic flaws in existing frameworks that enable surveillance, readiness, and responsiveness. The crisis in India exposed significant gaps in the country's institutional and legal framework for handling serious biological threats. The Epidemic Diseases Act of 1897, a colonial-era law, and the National Disaster Management Act of 2005, which is disaster-centric, were used to manage the pandemic, but lack a thorough public health and clinical management framework. These legal tools were not created to address the complexity of a pandemic in the twenty-first century, nor were they in line with international standards for health emergency governance, despite the admirable efforts of health authorities.

India quickly saw a rise in domestic innovation, replacing its early reliance on imported diagnostics and materials. The pandemic sparked public-private partnerships (PPPs), as evidenced by the rapid development of diagnostic kits, personal protective equipment (PPE), and several domestic vaccines, including ZyCoV-D and COVAXIN. Scaling up domestic research and production was aided by government programmes like Mission COVID Suraksha and institutional leadership from organisations like the Department of Biotechnology (DBT) and the Indian Council of Medical Research (ICMR). However, there were still issues with standardising emergency regulatory approvals, accommodating global supply chain shocks, predicting public health demands, and establishing long-lasting connections between research institutions and industry partners.

Surveillance mechanisms were rapidly strengthened, with the expansion of testing infrastructure, genomic surveillance through INSACOG, and digital tools like Aarogya Setu and COWIN. Yet, surveillance systems operated in silos, often lacking interoperability and comprehensive data integration across genomic, serological, and epidemiological dimensions. This hampered timely response and predictive modelling. In addition, data portals were not linked to the private healthcare sector, which caters to 60 per cent of the population and remains a lacuna.

Furthermore, while India has embraced the "One Health" approach in principle, its implementation remains under-resourced and fragmented. The recurrent outbreaks of zoonotic diseases such as Nipah Virus (NiV) underscore the urgency of integrated ecosystem health monitoring and preventive interventions.

The pandemic disrupted routine healthcare delivery, especially for oncology, tuberculosis, and routine clinical services. It became evident that hospitals require a more robust and flexible plan to manage surge capacity and address non-emergency-related healthcare activities. The shift from reactive, emergency-based responses to anticipatory, sustainable health governance is imperative as India strives for Viksit Bharat 2047. To guarantee comprehensive readiness against new and re-emerging biological threats, a comprehensive legal framework encompassing an integrated surveillance system, a strong PPP ecosystem, and sustained international cooperation is needed. The report makes the following recommendations to help enhance India's health preparedness system.

Fostering Disease Preparedness through Sustained International Collaboration

India needs to institutionalise international collaborations to meet transboundary health threats. The Ministry of Health and Family Welfare (MoHFW) and the DBT need to make continued interaction through efforts such as the

Quad BioExplore, US-India TRUST initiative, and the Indo-Pacific Centre for Health Security a strategic priority. Joint exercises, common data repositories, and cross-border early warning systems will enhance India's pandemic response capacity, build mutual resilience, and strengthen global health security.

Developing a National Biosecurity and Biosafety Network

India needs to implement a National Biosecurity & Biosafety Network to address accidental & intentional biological threats. This programme, developed in partnership by the MoHFW and DBT, would ensure that all laboratories dealing with pathogens follow standardised safety procedures. The network would assist capacity-building activities, knowledge exchange, and biosafety laboratory monitoring (BSL-3 and BSL-4). A Centralised risk assessment committee can provide coordination among environmental, animal, & human health surveillance.

Creating a Dedicated PPP Framework for Medical Countermeasures

A national framework for PPPs should be formalised to bridge research institutions and the private sector, especially during health emergencies. This framework should enable rapid technology transfer, emergency regulatory approvals, and standardised production protocols for vaccines, diagnostics, and therapeutics. Additionally, a dedicated funding mechanism and incentive structure must be instituted to ensure scalability and equitable access to medical countermeasures.

Operationalising One Health with Integrated Approaches

The One Health approach must move from a conceptual framework to a practical governance tool. MoHFW should lead in integrating community-driven initiatives (bottom-up) with national policies (top-down), engaging veterinarians, environmental scientists, public health experts, and social scientists.

Developing Predictive Models under an Early Warning Response System (EWS)

The DBT should champion the development of artificial intelligence (AI)- and machine learning (ML)-powered predictive models that use integrated data, from climate trends to genomic surveillance, to forecast outbreaks. These models must inform real-time resource deployment, vaccination strategies, and public communication. An early warning system (EWS) supported by such predictive models can drastically reduce morbidity and mortality through proactive measures.

Establishing an Integrated Health Data Platform

A centralised, integrated database must be developed, integrating genomic, immunological, and serological information at local, state, and national levels. This platform, coordinated by MoHFW and DBT, would enable real-time surveillance, enhance clinical decision-making, and facilitate inter-sectoral coordination. It should provide interoperability with the existing portals such as IDSP (Integrated Disease Surveillance Programme; a database under the National Health Mission) and INSACOG (the Indian SARS-CoV-2 Genomics Consortium; a joint venture between the MoHFW, DBT, the Council for Scientific and Industrial Research, and ICMR that carried out genomic surveillance), as well as integrate private sector health data to enhance comprehensiveness.

Enacting a Public Health Emergency Management Act (PHEMA)

India needs a legal foundation for coordinated responses to biological crises. A dedicated PHEMA should define the scope of emergency powers, designate responsibilities across agencies, enable rapid resource mobilisation, and decentralise implementation to state and district levels. It should also mandate inter-agency drills, periodic risk assessments, and public transparency mechanisms. NITI Aayog made similar recommendations in its expert report last year.

Climate change, anthropogenic factors, conflict, and displacement are relevant factors that enhance the risk of emerging and re-emerging infectious diseases. While the risk of accidental or deliberate biological hazards poses another avenue for biological hazards. The need to adopt a unified framework to ensure surveillance and appropriate responsiveness to health crises is the need of the hour. A resilient modelling and forecasting system with a nationalised biosecurity framework can better prepare the country for health threats. BS

Shravishtha Ajaykumar,
Associate Fellow, Observer Research Foundation

Lakshmy Ramakrishnan,
Associate Fellow, Observer Research Foundation

Synergy Between Indian Biotech and Ireland's Research Ecosystem

India, as the "Pharmacy of the World," faces a transformative opportunity to elevate its position beyond manufacturing excellence toward breakthrough innovation. With projections indicating pharmaceutical exports reaching $350 billion by 2047, the necessity for a resilient, collaborative innovation ecosystem has never been more pronounced. India's pharmaceutical prowess, coupled with robust IT capabilities and growing expertise in digital technologies, offers a formidable foundation. The integration of artificial intelligence (AI) and machine learning (ML) into the research and development value chain promises to revolutionise drug discovery and clinical development processes. Yet, to truly orchestrate this evolution from manufacturing giant to innovation leader, and to accelerate the journey, Indian biotech and pharmaceutical firms require strategic international partnerships that complement their inherent strengths.

« **Tanaz Buhariwalla,** Director, South Asia, IDA Ireland, Mumbai

Ireland, with its dynamic ecosystem, has quietly but decisively positioned itself as a global nexus for life sciences innovation. The Irish landscape offers a sophisticated blend of advanced research infrastructure, world-class clinical trial capabilities, and complex API and biologics manufacturing facilities. It also hosts a strong presence of global leaders and young innovative companies, aligning perfectly with the aspirational trajectory of Indian pharmaceutical companies.

Life Sciences Ecosystem

Ireland is the world's third-largest pharmaceutical exporter, with over €100 billion in exports. Its rise as a biotech hub is driven by a strong innovation ecosystem and collaborative environment. Home to 100+ multinational biopharma facilities, Ireland boasts unmatched expertise in pharmaceutical and ATMP manufacturing. Companies like Zoetis are expanding R&D for monoclonal antibodies (mAbs), while MeiraGTx has established a scalable gene therapy manufacturing complex with plasmid DNA production, QC testing, and fill-finish suites, ensuring full control over advanced therapy development.

Cell therapy facilities require a specialised set of skills and a talent base, besides conditions like supplier partner, and agile supply chain, international air connectivity, and access to target markets. Little wonder then, that Takeda decided to expand its existing cell therapy facility in Dublin so that it can supply its products to patients in the EU, US and Canada within 72 hours.

Organisations like the National Institute for Bioprocessing Research and Technology (NIBRT), the Regenerative Medicine Institute (REMEDI), and Molecular Medicine Ireland have played a key role in nurturing Ireland's biotech ecosystem. NIBRT, a world-class institute supporting global pharmaceutical manufacturing, recently opened yet another cutting-edge facility, in collaboration with industry and academic partners. This one is dedicated to early-stage biotherapy research. This initiative focuses on biologics, Cell, Gene, and RNA therapies, bridging the research infrastructure gap for biopharma companies while accelerating innovation through access to advanced instrumentation and expertise. Forward-thinking policies like the Knowledge Development Box and R&D tax credits further support this thriving environment.

As we can see, for Indian firms looking to transcend traditional pharmaceutical boundaries, Ireland offers access to sophisticated technology and specialised expertise in emerging therapeutic frontiers, including biomanufacturing, biosimilars and cell and gene therapy. This advanced technological environment can significantly accelerate the innovation journey of Indian companies seeking to evolve beyond generic manufacturing toward more complex therapeutic domains.

Clinical Trials and Research Infrastructure

One of Ireland's most compelling advantages for Indian biotech firms lies in its rapidly expanding clinical trial infrastructure. With nearly 291 clinical trial sites distributed throughout the country. The creation of specialised research centres, such as the Institute of Clinical Trials at the University of Galway, further enhances Ireland's capabilities in this critical domain.

This robust infrastructure presents Indian biotech companies with unprecedented opportunities to participate in high-calibre clinical research that adheres to the most stringent international standards. By leveraging Ireland's clinical trial ecosystem, Indian firms can ensure their novel treatments meet global safety and efficacy requirements while simultaneously contributing to the advancement of medical knowledge on a global scale.

API Production and Innovation Opportunities

Ireland's thriving Contract Development and Manufacturing Organisation (CDMO) sector, particularly in API manufacturing, offers rich collaborative potential for Indian pharmaceutical companies. Industry leaders like AstraZeneca are making substantial investments in next-generation API facilities in Ireland, incorporating state-of-the-art technologies to accelerate the production of sophisticated small molecules for high-value medicines.

This environment creates a natural synergy with India's strengths in pharmaceutical manufacturing while offering pathways to more sophisticated production techniques. Indian firms can forge strategic alliances with Irish counterparts to adopt cutting-edge technologies in API manufacturing, enhancing their capabilities and global competitiveness. The sector's growth trajectory is further supported by government incentives such as R&D tax credits, creating a conducive environment for innovation-driven research and development.

Strategic Benefits for Indian Firms

For Indian biotech and pharmaceutical companies, Ireland represents more than a potential partnership – it serves as a strategic gateway to the global life sciences ecosystem, particularly the European market. The country offers several compelling advantages: A highly skilled workforce with specialised expertise in biopharmaceutical manufacturing and research; An exemplary regulatory environment that facilitates compliance with EU standards; Direct access to the European Union market, effectively bypassing complex regulatory barriers; and a young, educated population that embraces innovation and supports sustainable growth.

Additionally, Ireland's established credibility with regulatory agencies like the FDA and EMA ensures that Indian firms can navigate the complex regulatory landscape of the European market with greater efficiency. This regulatory expertise is particularly valuable for Indian companies looking to expand their global footprint beyond traditional markets.

The collaborative potential between Indian and Irish entities is already being demonstrated through strategic partnerships like Biocon's engagement with Trinity College Dublin to fund scholarships in genetics research. Such academic-industry collaborations foster innovation and knowledge exchange between the two countries, enhancing India's capabilities in next-generation therapeutics and advanced biotechnology research.

The Synergistic Advantage

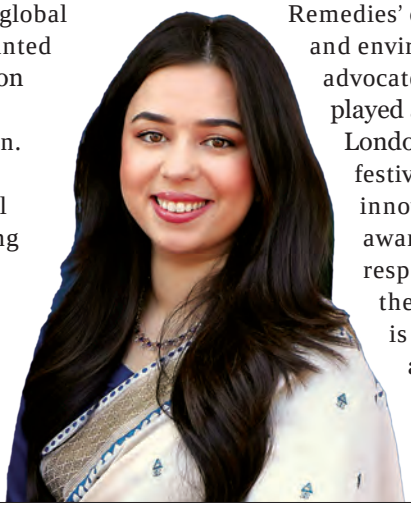
The true power of this potential partnership lies in its complementary nature. By combining India's cost-effective manufacturing capabilities with Ireland's advanced research ecosystem, Indian firms can create a powerful synergy that drives both innovation and market expansion. This strategic alignment allows Indian companies to maintain their competitive advantage in manufacturing while accessing Ireland's expertise in cutting-edge research and development, sophisticated clinical trials, and streamlined regulatory compliance.

As global demand for advanced diagnostics and therapies continues to rise, this Indo-Irish collaboration in the life sciences sector stands poised for significant growth. Major investments, such as Eli Lilly's €1.8 billion commitment to new facilities in Ireland, underscore the region's growing importance and highlight the tremendous potential for Indian firms to tap into this ecosystem for global drug discovery and API production.

The harmonised strengths of India's pharmaceutical industry and Ireland's research ecosystem present a compelling opportunity for strategic collaboration. By leveraging Ireland's infrastructure, highly skilled BioPharma workforce, expertise, and market access, Indian biotech and pharmaceutical firms can accelerate their innovation journey, enhance their global market presence, and ultimately contribute to advancing healthcare solutions on a global scale. BS

Ekta S. Chaudhary steps in as Chairperson of Venus Foundation to spearhead CSR initiatives

Venus Remedies Limited, a leading global pharmaceutical company, has appointed Ekta S. Chaudhary as the Chairperson of Venus Foundation, the dedicated social impact arm of the organisation. In this leadership role, Ekta will drive the company's corporate social responsibility (CSR) agenda, focusing on healthcare access, educational advancement, and inclusive community development. Her appointment marks a significant step in strengthening the Foundation's impact-driven initiatives aligned with Venus Remedies' core values of equity, empowerment and environmental stewardship. A passionate advocate for environmental action, she played a key role in launching Earthfest—London's first large-scale sustainability festival—bringing together change makers, innovators, and thought leaders to raise awareness about climate action and responsible living. With early experience in the biotech and AI space in London, she is now channeling her global exposure and scientific perspective into purpose-driven work, marking the beginning of her journey in corporate social responsibility and community impact.



Senores Pharm appoints Gautam Shah as President of US operations

The US subsidiary of Senores Pharmaceuticals Limited (SPL), Havix Group Inc. D/B/A Aavis Pharmaceuticals, has announced the appointment of Gautam Shah as President of US operations. This strategic move underscores the company's commitment to expanding its footprint in the regulated US market. Shah brings over three decades of experience in the pharmaceutical industry, including 10 years in India and 20 years in the United States. His illustrious career includes senior roles at renowned pharmaceutical companies such as Cipla and Sun Pharma in India and Sun Pharma, Zydus Lifesciences, Intas Pharmaceuticals, Dow Corning Corp., and Med-Pharmex in the US. His expertise spans quality assurance, compliance, operations management, manufacturing, and leadership. Shah holds a bachelor's degree in pharmacy, a postgraduate diploma in business administration, and is a certified Six Sigma Black Belt.

MediBuddy names Sidhartha Mehra as CFO

Bengaluru-based digital healthcare company MediBuddy has announced the appointment of Sidhartha Mehra as Chief Financial Officer (CFO). With over 20 years of global and Indian experience across multinational corporations and high-growth enterprises, Mehra has led Finance, Legal, Compliance, HR, Investments, and Procurement functions. He brings a rare blend of financial acumen and cross-functional leadership, with expertise in IPO, M&A, and strategic financial management. In his role at MediBuddy, Mehra will lead MediBuddy's financial strategy, capital management, and regulatory compliance. His proven expertise in managing large-scale M&A, corporate restructuring, finance transformation, and strategic capital allocation will be instrumental in driving long-term value creation for the company and its stakeholders. Mehra held senior leadership positions across global financial institutions and leading Indian companies. Most recently, he served as the CFO and CHRO at Zolo, where he played a pivotal role in leading enterprise-wide transformation, driving operational efficiency and governance frameworks. Prior to this, he held leadership roles at Jupiter Capital, GE Capital, and Barclays, managing financial planning, regulatory compliance, and business analytics across global markets including the UK, Ireland, Belgium, and India.

Integrated Bioprocess Solutions for India: Balancing Cost, Scale, and Compliance in Biopharma Manufacturing

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Samarjit Bhowmik
Managing Director - Duoning Biotechnology India

Samarjit Bhowmik is a seasoned bioprocess industry professional with over 27 years of experience spanning sales & marketing, service operations, and corporate leadership. He has played a pivotal role in establishing and expanding the presence of several leading European and U.S.-based multinational companies in the region. Known for driving sustainable growth strategies and building profitable organizations, Samarjit brings a relationship-driven approach that goes beyond delivering products—focusing instead on understanding customer needs, ensuring service excellence, and consistently creating long-term value.

India's fast-growing biopharma sector presents both immense opportunity and unique challenges. In this interview with BioSpectrum Editorial, Samarjit Bhowmik, Managing Director of Duoning Biotechnology India, discusses how the company has steadily built its presence over the past three years by offering integrated bioprocess solutions tailored to local needs. With several years of industry experience, Bhowmik shares insights on the rising demand in biosimilars, vaccines, and CDMO segments, and how Duoning balances universal technologies like single-use systems with project-specific solutions such as cell culture media and chromatography resins. He also highlights how customer feedback has shaped localized pricing and product strategies, and how India has evolved from a promising market to a strategic pillar in Duoning's Asia-Pacific growth plan.

How has your company performed in the Indian biopharma market since entering three years ago? Which segments of the Indian industry—biosimilars, vaccines, CDMOs, or research institutions—have shown the strongest demand for your solutions?

Over the past three years, our presence in the Indian biopharma market has grown steadily and meaningfully. We've been fortunate to establish strong connections with many of the country's leading biopharmaceutical companies, who have shown a remarkable openness to adopting new and innovative technologies. This progressive mindset has made India a dynamic and rewarding market for us. As a one-stop bioprocessing solution provider, we cater to the full spectrum of needs—from upstream cell culture to downstream purification—and our portfolio has found resonance across various industry segments.

We've seen particularly strong traction in the biosimilars and vaccine sectors, where scalability, efficiency, and regulatory compliance are critical. Additionally, CDMOs have emerged as key partners, seeking robust, ready-to-integrate platforms to support their growing pipeline demands. We're also actively engaged with research institutions and academic labs, offering support to scientists developing the next generation of life-saving biotherapeutics. Whether working with established manufacturers or early-stage innovators, our goal is the same: to empower every customer with the tools, support, and flexibility they need to bring better therapies to market—faster and more reliably.

We find some of your products are more "universal", like the single-use technologies, which might be adopted by multiple customers,

but for some products, like the cell culture medium and chromatography resin, seems more project-specific, or product-of-interest specific, how do you define this difference and how do you support these difference requirements?

That's a very insightful observation, we do acknowledge that some of our offerings are more "universal," while others are highly project- or molecule-specific. But even with so-called universal solutions like single-use technologies, it's not as straightforward as it may appear. It's not just about providing a standard bag or tube. There are often complex assemblies involved—customized configurations of bags, connectors, filters, sensors, and flow paths that need to be aligned with a customer's specific bioprocess and facility setup. In those cases, we work closely with the end-users through detailed discussions, technical reviews, and layout evaluations. Our engineering team plays a crucial role in proposing fit-for-purpose, reliable, and scalable designs that truly match the process needs.

On the other hand, when it comes to project-specific products like cell culture media or chromatography resins, you're absolutely right—these require a much more tailored approach. These products are directly linked to the nature of the molecule being produced and the performance goals of each process. It means a lot of experimentation, data generation, and fine-tuning. Sometimes, the first formulation or resin choice won't yield the best results—and that's part of the journey. Thanks to our dedicated cell culture and chromatography expert teams, who bring both patience and deep technical knowledge, we support our customers through multiple rounds of testing to find the optimal balance—be it in productivity, yield, or process efficiency.

At the end of the day, our philosophy is simple: no matter the level of customization required, we aim to become a true partner in our customers' development path—because every therapy being developed is potentially life-saving, and we want to be part of that mission.

What adaptations have you made to your product offerings or pricing models for the Indian market? What feedback have you received from Indian bioprocess engineers and production managers?

The Indian biopharma market is incredibly dynamic and, frankly, highly competitive. We fully recognize that we're operating in a space where there's not only strong competition from local players, but also from well-established global giants. That said, what truly sets us apart is our proximity to customers—both physically and strategically. It's not just about our team on the ground; it's also about our strong, responsive distribution network across India, which helps us stay close to end-users and respond quickly to their needs.

This closeness has allowed us to listen carefully to all feedback, from procurement teams to process engineers and production managers, and shape a more localized strategy—not only in terms of product design, but also in our pricing models. We've adjusted our offerings to ensure they're both technically relevant and commercially viable for Indian customers, while also delivering on the short lead times we've promised—and consistently met.

Over the past three years, the feedback we've received from Indian bioprocess engineers and production teams has been largely positive. They appreciate the flexibility, responsiveness, and the collaborative mindset we bring to the table. Of course, challenges still exist—it's part of any evolving market—but we see those challenges as opportunities to improve. And with every iteration, we get better at supporting our customers in their mission.

How is India in your company's overall Asia-Pacific strategy today compared to when you first entered?

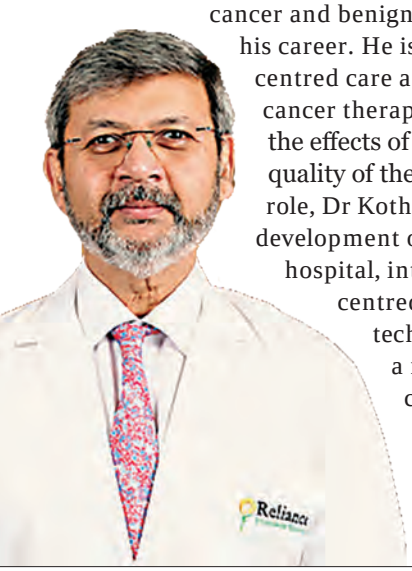
When we first entered the Indian market three years ago, India was seen as a promising and emerging opportunity within our broader Asia-Pacific strategy. Today, I can confidently say that India has evolved into a strategic pillar of our regional growth plan. The pace of development in India's biopharmaceutical sector—especially in biosimilars, vaccines, and CDMOs—has been impressive, and the demand for high-quality, flexible, and localized bioprocessing solutions continues to grow rapidly.

What's changed is not just the scale of opportunity, but also the depth of engagement we now have with Indian customers. We're no longer just introducing products—we're co-developing solutions, customizing workflows, and actively contributing to process innovations here. This deepening involvement has naturally led to increased investment in local resources, partnerships, technical support, and distribution capabilities.

So compared to when we started, India has moved from being a "high-potential" market to a core market in our Asia-Pacific strategy, and we expect that role to continue expanding in the years ahead.

Sir H.N. Reliance Foundation Hospital ropes in breast surgeon Dr Ashutosh Kothari

World renowned breast surgeon Dr Ashutosh Kothari has joined Sir H.N. Reliance Foundation Hospital as Director – Breast Cancer, Oncoplastic & Reconstructive Surgery. With more than 30 years of global experience in breast surgery, Dr Kothari brings his outstanding skills, vast knowledge, and international reputation to head the hospital's department of Breast Cancer. Dr Kothari has specialised in breast cancer surgery, oncoplastic and reconstructive surgery, hereditary breast cancer and benign breast diseases throughout his career. He is a strong advocate of patient centred care and de-escalation of breast cancer therapies with a focus on reducing the effects of surgery and enhancing the quality of the patient's life. In his new role, Dr Kothari will be emphasising the development of breast cancer services in the hospital, introducing innovative, patient centred care treatment and newer techniques in surgery. He has a reputation for performing complicated breast reconstructions, obtaining long-term aesthetic outcomes, and minimising complications post-surgery.

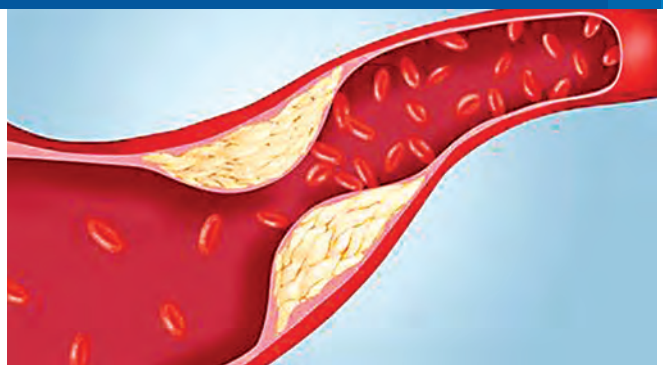


Nandakumar Kalathil steps in as Country General Manager for Agilent India

Agilent has announced the appointment of Nandakumar (Nanda) Kalathil as the Country General Manager (CGM) for Agilent India. With over 25 years of experience in the analytical industry, Nanda brings extensive expertise in leadership, team management, and customer relations. His focus on strategy and business development has been instrumental in shaping enterprise-wide planning initiatives, ensuring alignment with customer needs and market dynamics at Agilent. Nanda has earlier held multiple roles at Agilent, as Director- Strategy and Enterprise Business; Regional Sales Director (Instruments); Sales Director; and Area Sales Manager. Before joining Agilent India, Nanda had been working with Millipore.

Redcliffe Labs appoints Dr Prashant Nag as Chief Operating & Medical Officer

Redcliffe Labs, India's fastest-growing omnichannel diagnostics service provider, has announced the appointment of Dr Prashant Nag as its Chief Operating & Medical Officer (COMO). With two decades of experience in diagnostic operations, pathology, and clinical strategy, Dr Nag's vision aligns seamlessly with Redcliffe's purpose to give India its right to Quality Diagnostics. At Redcliffe Labs, he will spearhead clinical operations, supply chain, quality governance, regulatory compliance, and medical innovation, reinforcing the company's commitment to delivering high-quality diagnostic services. Dr Nag, an esteemed alumnus of AIIMS Delhi, where he completed his senior residency in Laboratory Medicine, holds an MD in Pathology from the Government Medical College, Surat. His illustrious career includes pivotal roles in India's top diagnostic networks across the country, leading nationwide operations, ensuring quality standards across NABL and CAP-accredited labs, optimising the supply chain, and managing a workforce of phlebotomists.



IASST designs optical sensing platform for detecting cholesterol

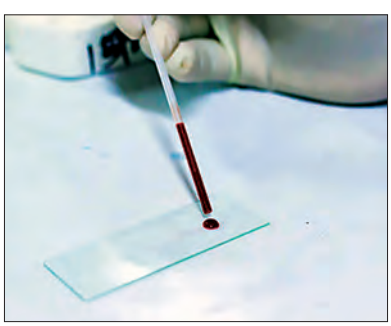
A team of interdisciplinary researchers at the Institute of Advanced Study in Science and Technology (IASST) in Guwahati, an autonomous institute under the Department of Science and Technology (DST), has developed an optical sensing platform for cholesterol detection based on silk fibre functionalised using phosphorene quantum dots. A point-of-care (POC) device has been developed on the laboratory scale for detecting cholesterol using this. It can sense cholesterol in trace amounts, even below the preferred range. It can be an efficient tool for routine monitoring of cholesterol levels in the human body. The synthesised sensors were highly sensitive as well as selective for cholesterol detection. Furthermore, the electrical sensing platform generates no e-waste, a key advantage of the fabricated device. Both sensing platforms respond similarly to real-world media such as human blood serum, experimental rat blood serum, and milk.

IIT-M leads development of new biosensor platform to test pregnant women for pre-eclampsia

An Indian Institute of Technology Madras (IIT-M)-led multi-institute research team has developed a new biosensor platform that can test pregnant women for pre-eclampsia. The researchers have come together to develop a Point-of-Care (PoC) testing using fiber optics sensor technology as a possible alternative to existing technologies. Pre-eclampsia (PE) is a life-threatening complication that occurs during pregnancy, affecting a large number of pregnant women and newborns worldwide. Placental growth factor (PlGF) is an angiogenic blood biomarker used for pre-eclampsia diagnosis. Herein, the researchers have established the Plasmonic Fiber Optic Absorbance Biosensor (P-FAB) technology for detecting PlGF at femtomolar level using polymethyl methacrylate (PMMA) based U-bent polymeric optical fiber (POF) sensor probes. The biosensor platform developed by the research team is simple and reliable, paving the way for affordable diagnosis.

Researchers in Nashik develop blood test to detect 30 types of cancer

In a landmark advancement for global oncology, a multi-institutional research team led by Prof Dr Raj Nagarkar, Managing Director and Chief of Surgical Oncology & Robotic Services at HCG Manavata Cancer Centre (HCGMCC), Nashik, has developed a revolutionary blood test that can detect 30 different types of cancers including pancreatic, lung, and ovarian cancers across both genders, with an average accuracy of 98.4 per cent. The pioneering study, recently published in Cancer



Reports, is the largest clinical trial of its kind in India. It utilised a novel serum metabolome-based diagnostic platform powered by machine learning to identify distinct metabolic signatures associated with cancer. The trial included 6,445 participants, with over 2,800 confirmed, treatment-naïve cancer patients across four stages of the disease. Remarkably, the platform showed consistent high sensitivity even in early-stage (Stage I/II) cancers, a feat rarely achieved by current diagnostic standards. The model's robustness was validated across multiple age groups, showing detection sensitivity consistently above 96 per cent across all demographics and cancer stages.

Cytiva develops 2 new protein A resins bringing cost efficiency to mAb capture

With the growth and transformation of the monoclonal antibody (mAb) market, particularly with the recent rapid rise of biosimilars, a one-size-fits-all approach to protein purification is no longer viable. To address this, Cytiva developed two new protein A resins: the MabSelect SuRe 70 and the MabSelect PrismA X.

With these new resins, Cytiva has expanded its comprehensive protein A resin portfolio with additional options to further help customers reduce manufacturing expenses and increase flexibility, while maintaining the same high-quality customers expect. MabSelect SuRe 70 has high dynamic binding capacity (DBC). It combines Cytiva's industry-leading quality with affordability, addressing the needs of clinical stages. While MabSelect PrismA X offers highest DBC of all MabSelect resins and excellent durability for robust mAb capture.

The need for affordability is especially relevant in the purification stage for preclinical or clinical production, where 20 batches are run at most. Whereas in commercial production, speed and performance becomes crucial.

Qiagen expands digital PCR portfolio with new lentivirus solutions

Qiagen has announced the expansion of its cell and gene therapy (CGT) portfolio with an enhanced digital PCR (dPCR) workflow that now includes solutions for lentivirus-based applications, commonly used in the production of advanced treatments such as chimeric antigen receptor T-cell (CAR-T), a personalised form of cancer immunotherapy. This expanded offering supports standardised, high-precision quality control (QC) workflows and strengthens the position of QIAGEN as a trusted partner for quality control, supporting biotech and biopharma companies, Contract Development and Manufacturing Organisations (CDMO) and therapy developers in CGT manufacturing. The QIAcuity RCL Quant Kit detects replication-competent lentivirus (RCL), a key safety concern in lentiviral vector production. The kit uses clear step-by-step protocols to find even small amounts of RCL, helping therapy developers meet regulations and keep treatments safe.

Thermo Fisher accelerates development of biologic therapeutics

Thermo Fisher Scientific is employing an enhanced platform technology and a new CHO K-1 cell line that can reduce timelines to Investigational New Drug (IND) filing from 13 to nine months, helping biotech and pharmaceutical companies overcome logistical complexities within pre-clinical biologic drug development. The new CHO K-1 cell line is able to deliver up to 8g/L, providing higher protein expression levels and increased stability, allowing customers to achieve greater productivity from pre-clinical phases through commercial development. Leveraging Accelerator Drug Development, Thermo Fisher's 360-degree Contract Development and Manufacturing Organisation (CDMO), Contract Research Organisation (CRO) and bioprocessing solutions, customers will have access to the full breadth of the company's integrated services of customisable manufacturing capabilities, clinical research and supply chain services and bioprocessing capacity. The CHO K-1 cell line offers greater efficiency and optimisation on the path to IND. This comprehensive approach ensures a reliable supply chain, offering consistent support from pre-clinical stages through to commercial development.

Revvity fuels future of cancer science with new research solutions

Revvity, Inc has unveiled the VivoJect Image-Guided Injection System as part of its distinguished cancer research and discovery portfolio. Paired with the Vega automated preclinical ultrasound system, the VivoJect system allows for real-time imaging and precise, nimble operation for researchers at a higher throughput compared to traditional techniques. It streamlines in vivo imaging workflows for applications such as tumour model creation, targeted

drug delivery, gene therapy, stem cell research, and cardiac studies. At the recently held AACR Annual Meeting 2025, Revvity has featured new solutions that include cell counters and image cytometers, cellular imaging reagents, microplates and analysis software, as well as high-content imaging instruments; an extensive range of immunoassay technologies including multimode microplate readers and microplates, as well as assay kits and reagents; and instruments, reagents, software and related accessories to help accelerate drug development by tracking disease progression, evaluate efficacy, and assess toxicity.

Agilent inaugurates India Solution Center to accelerate innovation

Agilent has announced the opening of its first-ever India Solution Center at its LEED Platinum-certified office in Manesar, Haryana. Designed to provide integrated solutions, this strategic investment marks a major milestone in Agilent's global journey, highlighting strong focus on India as a high-growth, innovation-driven market. As India sees a rapid rise in chronic health conditions such as obesity and Type 2 diabetes, and a growing emphasis on environmental and food safety regulations, the demand for advanced, localised solutions is accelerating. The India Solution Center brings together Agilent's expertise across different disciplines to deliver holistic end-to-end solutions in sectors such as GLP-1 analysis, emerging food and environmental contaminants analysis, and PFAS detection. Spanning 12,500 square feet, the facility offers development of analytical workflow methods and novel applications, as well as proof-of-concept demonstration, and collaborative R&D and training.

Waters integrates multi-angle light scattering detectors with Empower software

Waters Corporation has announced that its Empower software now supports biologics data collection and quality control (QC) analysis of multi-angle light scattering (MALS) and refractive index (RI) instruments in its Wyatt Technology portfolio. This integration expands the scope of critical quality attributes that a biopharmaceutical laboratory can manage with Empower Software. In addition, this advancement simplifies the process and digital footprint of collecting and submitting compliant data to regulatory authorities – from biologic drug development to quality control – and saves customers up to six months of software validation time. Empower Software is the industry's most established and compliant chromatography data system (CDS) deployed globally, submitting data for more than 80 per cent of novel medicines to regulatory authorities. The new integration enables the use of MALS techniques in quality control for biotherapeutics, improving efficiency and readiness to comply with Good Manufacturing Practices (GMP) while reducing the amount of training required for end-users in compliant environments.

Can AI Phase Out Animal Testing?

Earlier in April 2025, the US Food and Drug Administration (FDA) took a groundbreaking step to advance public health by replacing animal testing in the development of monoclonal antibody (mAb) therapies and other drugs with more effective, human-relevant methods.

As per this new development, FDA's animal testing requirement will be reduced, refined, or potentially replaced using a range of approaches, including artificial intelligence (AI)-based computational models of toxicity and cell lines and organoid toxicity testing in a laboratory setting (so-called New Approach Methodologies or NAMs data). Over time, the FDA aims to launch a pilot programme allowing select monoclonal antibody developers to use a primarily non-animal-based testing strategy, under close FDA consultation.

In parallel, National Institute of Health (NIH) Common Fund's Complement Animal Research In Experimentation (Complement-ARIE) Programme has partnered with the Foundation for the National Institutes of Health (FNIH) to enhance the adoption and regulatory use of New Approach Methodologies through the establishment of a Validation and Qualification Network (VQN).

Experts are confident that by leveraging AI-based computational modeling, human organ model-based lab testing, and real-world human data, we can get safer treatments to patients faster and more reliably, while also reducing R&D costs and drug prices. This could turn out to be a win-win situation for public health and ethics. Beyond the scientific merits, the ethical imperative to reduce animal suffering in research is a powerful driver for the adoption of AI alternatives.

Focusing on the industry initiatives in this regard, we see VivoSim Labs, a US-based biotechnology firm, recently announcing the launch of its NAM models designed to provide insights into liver and intestinal toxicology for drug discovery and development. VivoSim's models utilise AI-based computational modeling, human organ model-based lab testing, and real-world human data to predict liver toxicity, intestinal toxicity, and drug permeability.

Simultaneously, a group of scientists at the University of Iowa has shown in its recent study that with continued investment and collaboration across sectors, AI can promise to accelerate the development of safer and more effective therapies for neurological conditions while significantly reducing animal use. The scientists say that AI-based methods such as brain organoids, the computational models of neural circuits, and machine learning are enabling the research community to study neurological disorders, predict drug effects, and personalise treatments in ways that were not possible with animal models.

For example, AI-powered brain simulations are now being used to study disorders like Alzheimer's and Parkinson's disease, providing new insights into disease mechanisms and potential therapies.

Speaking particularly of mAb therapies, as mentioned in the latest directive by the US FDA, an ambitious project has recently been announced by Vanderbilt University Medical Center (VUMC) investigators that aims to use AI technologies to generate antibody therapies against any antigen target of interest. VUMC has been awarded up to $30 million from the Advanced Research Projects Agency for Health (ARPA-H) to build a massive antibody-antigen atlas, develop AI-based algorithms to engineer antigen-specific antibodies, and apply the AI technology to identify and develop potential therapeutic antibodies.

Currently, North America holds the major share of the global mAb therapeutics market, with the human mAb segment in the lead, with majority application being explored in the cancer segment. However, the high cost of creating and manufacturing monoclonal antibodies is the main obstacle facing the market, which might be eased out by the growing implementation of AI during the studies.

While the potential for AI to replace animal experiments for the development of mAb therapies and other drugs is immense, the transition will require concerted efforts and collaboration across the field. We need more success stories and validation studies to demonstrate the power of AI approaches to replace animal experiments, which will eventually gain broader acceptance and adoption in the scientific community. BS

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