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23rd ANNIVERSARY

10 Women 'Power Players' of Bio Research & Policy

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"Quality shouldn't be an afterthought but an integral part of manufacturing process"

– Dr Rajeev Raghuvanshi, Drugs Controller General of India – 29

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Acknowledgement/ Feedback

India's biotech industry is moving towards thriving growth as biotechnology has played a pivotal role in various sectors over the last few years. Thank you for publishing insights by Supriya Kashikar, from GeNext Genomics in your February edition.

- Saavie S, New Delhi

We appreciate the coverage on 4baseCare, a precision oncology company that is bridging the genomics data gap in cancer care, around the World Cancer Day on BioSpectrum India.

- Neethu Anand, Bengaluru

Thank you so much BioSpectrum for publishing the recent article by BDO India highlighting the latest trends of the diagnostics industry.

- Tushita Sahni, New Delhi

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Letter from Publisher

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

BioSpectrum is observing its 23rd anniversary this March. On this momentous occasion, I wish to extend my thanks and appreciation to all our readers, advertisers, vendors and well-wishers. We will continue to remain committed as ever to provide the most authoritative information, analyses and expert opinion pieces that will enrich and enhance the industry's growth.

For the first time in seven years, India's female labour force participation rate (FLFPR) has seen a significant rise, jumping from 23.3 per cent in 2017-18 to 41.7 per cent in 2023-24, according to the Economic Survey 2024-25 report presented by the Finance Minister Nirmala Sitharaman in the Parliament on January 31. As of October 31, 2024, over 73,151 startups with at least one woman director have been recognised under the Startup India Initiative, nearly half of all registered startups in India. While the number of women entrepreneurs in the country has been increasing over the years, there has not been much change at the women leadership level in both the public and private sectors. Very few women leaders have the opportunity to take charge of an entire academic institute or a government posting, thereby contributing to the growth of our country.

As we will be celebrating March 8 as International Women's Day, our cover story features 10 leading women influencers in the public sector who are involved with policy matters related to biotechnology, and directing academic institutes affiliated with the Indian Council of Medical Research and Council of Scientific and Industrial Research, thereby emerging as the driving forces of research and development in Indian life sciences space.

A growing number of Indian health research institutes and international healthcare organisations are realising that medical treatments by themselves are not enough to reduce the burden of chronic illnesses among women. It calls for broad social reforms, economic empowerment, and a fundamental reassessment of women's health as an essential national concern. In an expert piece, the author highlights how public-private partnerships (PPPs) that integrate medical science, social policy, and community engagement are the most promising approaches to achieving meaningful change among women.

Dr Rajeev Raghuvanshi, who was appointed as Drugs Controller General of India (DCGI) in February 2023, in an interaction, elaborates on the implementation of Schedule M, on concerns regarding repeated instances of Not of Standard Quality (NSQ) drugs by calling for industry-wide collaboration, urging larger pharma companies to mentor MSMEs and elevate standards.

India's clinical research sector is expected to grow significantly, providing professionals in various fields with numerous job options. Clinical research in India has a bright future thanks to the country's changing business climate, regulatory framework, and technology developments. An opinion leader points out how professionals with the appropriate skill set may significantly advance medical research and enhance patient care.

India is well-known for its capability to produce scalable and cost-effective vaccines, manufacturing a diverse range of vaccines, such as inactivated and live vaccines, protein subunit vaccines, and advanced vaccines like viral vector, mRNA, and DNA vaccines. The country produces 50 per cent of the world's vaccines, and in just the past year, India was responsible for 4 billion of the 8 billion vaccine doses manufactured and distributed worldwide. An expert discusses how investments in innovative vaccine technologies, production platforms, and logistical solutions will increase over the coming years, leading to significant changes in the Indian vaccine landscape.

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

Thanks & Regards,

Ravindra Boratkar,
Publisher & Managing Editor

COVER 20

10 Women 'Power Players' of Bio Research & Policy

As revealed in Finance Minister Nirmala Sitharaman's Economic Survey 2024-25, for the first time in seven years, India's female labour force participation rate (FLFPR) has seen a significant rise, jumping from 23.3 per cent in 2017-18 to 41.7 per cent in 2023-24. The Economic Survey underscores how women-led businesses thrive under government support. As of October 31, 2024, over 73,151 startups with at least one woman director have been recognised under the Startup India Initiative, nearly half of all registered startups in India. Additionally, Union Budget 2025-26 has listed new initiatives to support women entrepreneurs across various sectors within the industry. While the number of women entrepreneurs in the country has been increasing over the years, there has not been much change at the women leadership level in both the public and private sectors. There are very few women leaders who have the opportunity to take charge of an entire academic institute or a government posting, thereby contributing to the growth of our country.

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How is technology being leveraged for early cancer detection in India, and what are the challenges & opportunities in store? A key takeaway from Dr Ramesh Hariharan, CEO of Strand Life Sciences.

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Raghavendra Reddy, Director- Research Development, Purple Life Sciences talks about how the Indian pharma sector is addressing the issue of psoriasis.

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Regulars

Budget Undershot?

When it comes to the healthcare sector, the budget presented by Finance Minister Nirmala Sitharaman, no doubt, brings relief to patients, particularly those suffering from cancer, rare and severe chronic diseases, with making 36 more life-saving drugs basic customs duty free and reducing the duty on six more drugs to concessional 5 per cent.

The benefit will be passed on to even bulk drugs for the companies producing these drugs here. That will make the drugs available at a reduced rate, which is a major relief for suffering patients. Similarly, step in the right direction is exempting from the customs duty the drugs under patient assistance programme run by pharma companies if the medicines are provided free of cost to the patients and adding 37 more drugs and 12 new patient assistance programmes.

Cancer patients may find an equal relief announcement to set up 200 new cancer daycare centres in the next three years. However, experts find it impractical considering the specialised focused treatment that needs to be given. Additional 10,000 medical seats (75,000 in the next five years) is welcome. How many of them will turn to the public health system to serve is a question. For the healthcare system, a growing number of doctors will not make a substantial difference in bridging the demand-supply gap.

By November 2024, the country had 13.8 lakh registered allopathy doctors, the Lok Sabha was told. It is still a little less than the bare minimum World Health Organization (WHO) benchmark with one doctor and three nurses for 1,000 people. Quality of medical education is another sensitive issue that needs to be addressed by the administration.

The Indian public healthcare system has been grappling with human resource crunch and infrastructure inadequacy due to inadequate financial resources. It is good that the allocation on healthcare is growing in the budget each year. In the latest budget for the Ministry of Health Family Welfare it is increased by Rs 9,615 crore, over 10 per cent to Rs 99,858.56 crore against the revised estimates of 2024-25 and by Rs 8,702 crore, 9.5 per cent, over the previous budget allocation. Though the allocation has increased by around 9.5 per cent budget to budget, it is less than the stipulated 2.5 per cent of the GDP, envisaged in the National Health Policy of 2017. Earlier Dr Harsh Vardhan, the then Minister of Health and Family Welfare, had reiterated the goal to reach by 2025. But the target has not been met yet. In fact, the allocation, if compared to the total budget, this year has been reduced to 1.94 per cent of the total budget from around 2 per cent in the last few years till 2023.

Despite having a well-defined structure of level of healthcare, on an infrastructure front the shortfall was 19 to 30 per cent from sub centres to community health centres as per 2019 report to finance commission. The government has good intention to cover more beneficiaries under the Ayushman Bharat PM Jan Arogya Yojana. Even one crore gig workers, people above 70 are to be included in the scheme. However, will Rs 9,000 crore allocated for the scheme in the budget is adequate for the estimated 50 crore people to be covered is the question raised by experts.

The production linked scheme (PLI) for self-sufficiency in Active Pharma Ingredients (APIs) continues with an allocation of Rs 2445 crore. Among other various announcements, the promotion of domestic pharma production to continue, research institutions to get increased funding, push to digital health initiatives like telemedicine, AI driven diagnostics, encouragement to vaccine research etc. will surely move the healthcare sector ahead. But some expectations of the industry on tax related issues seemed to have not met, disappointing experts and industry alike.

Despite several positive thrusts in the budget, the overall approach appears to be working on a piecemeal basis rather than dealing with the core issues and moving towards permanent solutions. BS

Dr Milind Kokje
Chief Editor
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Centre establishes India's first Ferret Research Facility at THSTI

India's commitment to cutting-edge biomedical research and innovation has taken a significant leap forward with the dedication of the nation's first Ferret Research Facility at the Translational Health Science and Technology Institute (THSTI) in the NCR Biotech Science Cluster, Faridabad. The newly inaugurated THSTI Ferret Research Facility, a state-of-the-art establishment adhering to the highest biosafety and research standards, marks a pivotal moment in India's fight against infectious and non-communicable

diseases. This pioneering facility will serve as a crucial resource for vaccine development, therapeutic testing, and research into emerging infectious diseases, significantly bolstering India's pandemic preparedness strategy and positioning the nation at the forefront of global scientific endeavours. The government has also launched GARBH-INi-DRISHTI, the Department of Biotechnology (DBT) Data Repository and Information Sharing Hub at THSTI. This groundbreaking platform, developed under the GARBH-INi programme, provides access to an unprecedented wealth of clinical data, images, and biospecimens collected from over 12,000 pregnant women, newborns, and postpartum mothers.

S&T Minister calls on states to establish BioE3 Cells as part of India's biotechnology revolution

Union Minister Dr Jitendra Singh called on states to establish BioE3 Cells as part of India's biotechnology revolution, with the aim of realising Bio-Vision for Viksit Bharat by 2047. During the Centre-State Partnership Conclave on the BioE3 Policy, recently held at Vigyan Bhavan in New Delhi, Dr Singh emphasised the significance of strengthening Centre-State collaboration to advance India's bioeconomy. Dr Jitendra Singh has urged states to establish 'BioE3 Cells' in collaboration with the Centre through the Department of Biotechnology (DBT). These BioE3 Cells will serve as interconnected knowledge hubs, linking state and national stakeholders to facilitate the effective implementation of the BioE3 Policy. Established at the state level, these cells will act as central platforms for knowledge exchange, policy coordination, and technology adoption in the biomanufacturing sector. Dr Singh released a booklet on the Establishment of BioE3 Cells for Biomanufacturing Implementation, which aims to catalyse Centre-State partnerships to drive biotech innovations. In releasing the booklet, he highlighted that the primary goal of the BioE3 Cells is to ensure biomanufacturing initiatives are closely aligned with each state's specific priorities, resources, and strengths, while also staying connected to broader national objectives.

India inks health and pharma partnership with Indonesia

Indian Prime Minister Narendra Modi and President of Indonesia, Prabowo Subianto recently held comprehensive discussions covering the full spectrum of bilateral cooperation, including political, defence and security, maritime, economic, health and pharmaceuticals, food and energy security, amongst others. The two leaders reaffirmed their desire to enhance health sector cooperation and signed a MoU on Health Cooperation and an MoU in the Field of Traditional Medicine Quality Assurance. They noted that the signing of these MoUs would provide further impetus to cooperation in the health sector. Both leaders agreed to strengthen cooperation by sharing best practices on Digital Health initiatives and to increase capacity building programmes for training doctors, nurses and other healthcare professionals, including training programmes in mutually agreed areas.

Apex Kidney Care secures $9 M investment from Blue Earth Capital AG

Mumbai-based Apex Kidney Care (AKC) has received $9 million in Foreign Direct Investment (FDI) from investment vehicles of Blue Earth Capital AG (BlueEarth), a Switzerland-based global impact investment firm, for an undisclosed equity stake. This investment was facilitated by Tata Capital Healthcare Fund (TCHF), the healthcare-focused private equity fund of Tata Capital, reinforcing their collective commitment to enhancing accessible, high-quality kidney care in India. Last year, TCHF invested an equivalent amount in AKC, through a similar equity investment. Together with TCHF and BlueEarth, AKC will continue its mission to expand and strengthen a comprehensive ecosystem for kidney disease patients. AKC plans to collaborate with like-minded clinicians and hospitals, as well as partnering with the government through public-private partnership programmes.

InvAscent invests Rs 110 Cr in Geri Care Health Services

Geri Care Health Services, India's first integrated senior citizen-focused healthcare services provider, based in Chennai, has announced that healthcare & life sciences focused private equity investor InvAscent, through its India Life Sciences Fund IV (ILSF IV), has infused Rs 110 crore for a minority stake in the company in its first institutional fundraise. As pioneers of integrated geriatric care & leaders in the space with over 50 years of combined geriatric practice expertise, Geri Care is a trusted name in eldercare, serving tens of thousands of elders in South India, particularly in Chennai.
The startup intends to utilise the funds to expand its services across key cities in Southern India, including Bengaluru, Hyderabad, Kochi, & Coimbatore. The company is gearing up to launch its newest assisted living facilities this quarter in Ulsoor in Bengaluru, & Velachery in Chennai. The company is also building first of its kind speciality centres of excellence in Geriatric Oncology, Geriatric Urology, Geriatric Cardiology & Ortho-Geriatrics through its chain of multi-speciality hospitals exclusively for elders.

Form IV (See Rule 8)

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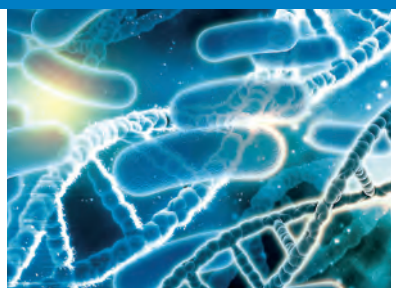
Date: 1st March 2025

Signature of Publisher



GV Research Platform and BeCytes partner to advance biopharma research in India

Hyderabad-based GV Research Platform (GVRP), a leading provider of preclinical research solutions, has announced a strategic partnership with Spanish startup BeCytes Biotechnologies to expand access to high-quality human and animal-derived biological materials for drug discovery and toxicology research in India. This collaboration leverages BeCytes' specialised expertise in tissue procurement, primary cell isolation, and in vitro models, enabling Indian researchers to utilise cutting-edge tools for more predictive and translational studies. As part of this partnership, GVRP will facilitate the availability of cryopreserved hepatocytes, hepatic and skin cells, subcellular fractions, and customised cell isolation services, critical resources for drug metabolism, safety assessment, and disease modelling. BeCytes Biotechnologies has a proven track record of supplying primary human and animal-derived cells to researchers worldwide. Their expertise in cell characterisation and in vitro model development ensures consistency and reliability, addressing a critical need in preclinical drug screening and toxicology studies.

Apollo Hospitals Group, Hackensack Meridian Health to advance healthcare innovation

Apollo Hospitals Group, the world's largest integrated healthcare provider, and Hackensack Meridian Health (HMH), New Jersey's largest and most comprehensive health network, have announced a strategic affiliation agreement to explore and implement innovative healthcare solutions. This collaboration brings together two prominent healthcare organisations with a shared vision of addressing global healthcare challenges and opportunities. The affiliation will leverage the strengths and resources of both Apollo and HMH to develop and implement joint initiatives focused on enhancing patient care, improving affordability, and promoting community health. By 2030, an estimated one million nurses in the US will retire. This partnership offers a unique opportunity to address these challenges through international recruitment and training programmes. Apollo and HMH oncologists will collaborate in areas such as second opinions, tumour boards, genomic sequencing, CAR-T therapy, and bone marrow transplantation (BMT). A Partnership Committee comprising of senior executives from both organisations will oversee the implementation of the affiliation and individual initiatives.

Metropolis & Roche introduce HPV DNA testing to accelerate cervical cancer screening

Metropolis Healthcare has announced its collaboration with Roche Diagnostics India and Neighbouring Markets to introduce the self-sampling human papillomavirus (HPV) DNA test for cervical cancer screening. The launch of this test aims to expand access to cervical cancer screening across India by addressing social and economic barriers, making early detection more convenient for women, including those in Tier 2, Tier 3, and Tier 4 towns. Cervical cancer is preventable and yet, India contributes to 21 per cent of the world's total cases of cervical cancer. Currently, it accounts for nearly 79,000 deaths among Indian women each year, which is roughly two thirds of diagnosed cases. This indicates late-stage intervention which can be avoided by taking precautionary measures such as early screening. The HPV DNA test, recognised by the World Health Organization (WHO) as a first-choice screening method for cervical cancer prevention, can help bridge the gap. This cutting-edge test detects 14 high-risk HPV types in a single tube and is a clinically validated, FDA-approved, and WHO-prequalified solution.

"We are expanding our single-use solutions portfolio with next-gen innovations that directly address industry needs"

With a five-year vision to establish Shah Brothers as the most trusted and innovative partner for single-use technologies in India, the company is making aggressive investments in expanding its manufacturing footprint, enhancing customer engagement, and building a world-class team. Shah Brothers is focused on scaling operations, driving localisation, and delivering globally competitive, high-performance bioprocess solutions that empower the future of Indian biopharma. Nishant Shah, Director, Shah Brothers reveals, in conversation, about how the company is ensuring sustained growth and market leadership.

« **Nishant Shah,**
Director,
Shah Brothers

SHAH BROTHERS
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How is the company empowering the Indian biopharma sector with single-use solutions? What are the unique and novel aspects being added by your products?

At Shah Brothers, our mission is to provide the Indian biopharma sector with Future-Ready single-use solutions that enhance process efficiency, ensure sterility, and are aligned with compliance. We bridge the gap between global advancements and local industry needs by offering customised, regulatory-compliant single use assemblies & fluid handling solutions tailored for bioprocessing through our ISO Class 7 cleanroom facility which we are enhancing by 5 times of the size of our existing facility to ensure supply chain reliability. Our decades-old partnerships with global leaders bring best-in-class components such as sterile connectors, tubing and manifolds, ensuring seamless and secure fluid transfer workflows. By leveraging open-architecture design, advanced materials, and process optimization, we drive next-generation innovation in single-use technology (SUT) , empowering Indian biomanufacturers with flexible, scalable, and cost-effective bioprocessing solutions.

Are you planning to launch new products in 2025? Please share details.

Yes, 2025 is going to be a game-changing year for Shah Brothers. We are expanding our single-use solutions portfolio with next-gen innovations that directly address industry needs. We're bringing advanced sampling systems for closed-loop processing, moulded assemblies with enhanced sterility, real-time monitoring solutions for critical bioprocess parameters, and modular process equipment for greater flexibility. Our strong focus on R&D and engineering ensures that we deliver cutting-edge, high-performance technologies that enhance efficiency, compliance, and scalability for biomanufacturers. At Shah Brothers, we are committed to driving the future of single-use bioprocessing with solutions that truly make a difference.

How are you addressing the challenges facing SUTs in India?

Despite the growing adoption of SUTs in India, regulatory clarity and validation concerns pose a challenge. Many companies still require stronger regulatory guidance for seamless SUT adoption. The perception that SUTs have higher costs compared to traditional systems is another challenge. Further, some manufacturers are still transitioning from stainless steel to SUTs. To address these barriers, we are conducting on-site roadshows, technical training, and hands-on workshops to drive industry awareness. We are also optimising supply chain efficiencies and offering localised assembly, making single-use solutions more cost-effective.

What trends do you foresee for strengthening your presence in the market?

The Indian biopharma industry is at an inflection point, and we see tremendous opportunities for progress. For instance, there is the rise of personalized medicine and advanced biologics: This demands flexible, scalable bioprocessing solutions, where SUTs play a critical role. Then there is increased local manufacturing of biosimilars & vaccines. We are aligning with industry leaders to support capacity expansion with single-use assemblies. For integration of smart bioprocessing, we foresee that real-time monitoring solutions using single-use sensors will drive efficiency and compliance. As regulatory clarity improves, we expect wider adoption of SUT in GMP environments. Also, government initiatives like 'Make in India', PLI schemes, and biomanufacturing incentives are accelerating the localization of high-end bioprocessing. Our focus is clear- Deliver Future-ready Solutions, strengthen industry collaboration, and support India's journey toward biomanufacturing excellence. ■

Union Budget 2025 targets healthcare, medical education & AI, omitting medical devices

The overall macro-economic and policy direction measures announced in the Union Budget 2025, particularly focusing on cancer care, medical education, AI, R&D and innovation, is appreciable. There are many key points in the budget announcements that will strengthen the economy and propel the GDP growth. However, without any mention of investment promotion measures for the 70 per cent imports-dependent medical devices sector in the budget speech, industry disappointment was an expected reaction. Let's delve further.

Union Minister of Finance and Corporate Affairs Nirmala Sitharaman presented the Union Budget 2025-26 in Parliament on February 1, 2025. While multiple new initiatives within the healthcare sector were announced such as the establishment of new Day Care Cancer Centres in district hospitals; Full exemption from Basic Customs Duty of 36 lifesaving drugs and medicines for treating cancer, rare diseases and chronic diseases; addition of 10,000 seats in medical colleges and hospitals next year; Announcement of National Manufacturing Mission; Promotion of medical tourism etc., expectations of the Medical Devices sector have not been met.

The Indian Medical Devices Industry was expecting an increase in Custom Duty to a nominal 10 per cent to 15 per cent (and as a Predictable Tariff Policy); Correction of Inverted Duty by levying Health Cess of 5 per cent custom duty on balance Medical Devices; Trade Margin Capping by monitoring MRP of Imports; Income Tax benefits for CAPEX and R&D investments in Medical Devices. The industry was also hoping that the government could consider standardising the GST rate of 12 per cent across all medical devices as it would simplify the tax structure, ensuring consistency and ease of doing business.

"The industry is disappointed that expectations of the Medical Devices sector and many of which had been supported by the Department of Pharmaceutical too as an investment enabler under the National Medical Device 2023 policy finds no mention in the budget speech. We were hoping to see the Finance Minister speak about Medical Devices as Make in India enabler and address the 70 per cent import dependence due to inadequate tariff protection with duties at zero to 7.5 per cent in most cases and an ever-rising imports bill that is expected to cross Rs 75,000 crore this year", said ***Rajiv Nath, Forum Coordinator, Association of Indian Medical Device Industry (AiMeD).***

Sharing his views on the budget announcements, ***Jatin Mahajan, Secretary, Association of Diagnostics Manufacturers of India (ADMI)*** said, "Many aspects have not been touched on in the budget, and thus leave a lot of unfulfilled expectations such as the establishment of a separate regulatory body for medical devices distinct from pharmaceuticals. GST rates remain unchanged. We were looking forward to some aspect of rationalisation. Dedicated technology transfer grants for MedTech innovation are expected; and fast-track approval for new diagnostic technologies is the need of the hour."

The industry was also hopeful on some announcements regarding import duty waivers on critical in vitro diagnostic (IVD) equipment components; grants for indigenous development of imaging technologies; government procurement preference for Indian MedTech products; and subsidised training programmes for medical lab technicians.

"While there are positive steps announced, the budget leaves room for more robust healthcare reforms. Given the evolving healthcare needs of the country, greater investments and policy interventions are expected to ensure accessibility and innovation in medical technology", said ***Dhaval Radia, Chief Financial Officer (India), ZEISS Group.***

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Key Budget Announcements

- 200 Day Cancer Care Centres to be set up in 2025-26
- 36 drugs and medicines fully exempted from Basic Customs Duty
- 37 medicines along with 13 new drugs and medicines under Patient Assistance Programmes exempted from Basic Customs Duty
- 10,000 seats to be added in medical colleges and hospitals next year, adding up to 75,000 seats in next 5 years
- Centre of Excellence in Artificial Intelligence (AI) for education to be set up with a total outlay of Rs 500 crore
- Additional infrastructure to be created in 5 Indian Institutes of Technology (IITs)
- 50,000 Atal Tinkering Labs to be set up in government schools in the next 5 years
- National Centres of Excellence to be set up for skilling
- Allocation of Rs 20,000 crore to implement private sector driven R&D
- Provision of 10,000 fellowships for IITs and IISc in next 5 years
- Announcement of National Manufacturing Mission
- A national framework for promoting Global Capability Centres in emerging tier 2 cities
- Promotion of medical tourism and Heal in India in partnership with private sector
- A new Fund of Funds, with fresh contribution of Rs 10,000 crore for startups
- Deep Tech Fund of Funds to be explored
- New scheme for 5 lakh women, Scheduled Castes and Scheduled Tribes, first-time entrepreneurs

Although the government has not put much emphasis on the growth of the medical technology sector, a major push for medical education and medical tourism has emerged as a critical part of the budget this year.

Rising focus on Medical Education & Medical Tourism

Highlighting new initiatives in the education sector, the government has stated that 10,000 seats will be added in medical colleges and hospitals next year, adding up to 75,000 seats in the next 5 years. The government has added almost 1.1 lakh undergraduate (UG) and post-graduate (PG) medical education seats in the past 10 years, which is an increase of 130 per cent.

Appreciating this step taken by the government, ***Shweta Rai, Managing Director for India and Country Division Head for South Asia, Bayer's Pharmaceuticals*** said, "The government's focus on increasing PG and UG in medical colleges, will improve the patient to healthcare professional (HCP) ratio and thereby the access and quality to care."

Adding another viewpoint, ***Prof. Dr Raj Nagarkar, MD & Chief of Surgical Oncology & Robotic Services, HCG Manavata Cancer Centre*** said, "The proposal to increase medical seats to 10,000 per year and 75,000 over five years, raises concerns. Expanding medical education must be accompanied by adequate infrastructure, trained faculty and a strong focus on maintaining the quality of education. Simply increasing numbers without addressing these factors could dilute the training and preparedness of future doctors."

Another key highlight of the budget is that the medical education sector has been well aligned with medical tourism. The government has identified tourism as a sector for employment-led growth. Nirmala Sitharaman said that medical tourism and Heal in India (an initiative of the government to promote medical tourism in the country) will be promoted in partnership with the private sector along with capacity building and easier visa norms.

"The Union Budget 2025 aims at capturing a fair share of the international medical tourism market while addressing the challenges of healthcare delivery and medical education. Strengthening Medical Value Travel is important with the increasing competition from countries like Turkey, Thailand & Malaysia who all are vying to increase their share from the same pie", said ***Dr SC Nagendra Swamy, President, Ramaiah Memorial Hospital.***

The focus on strengthening the healthcare sector is indeed evident in the budget's vision. Apart from boosting medical education and medical tourism sectors, the government has also put an emphasis on cancer care by announcing establishment of Day Care

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Cancer Centres in all district hospitals in the next 3 years, with 200 centres coming up in 2025-26.

On this note, ***Dr Aakaar Kapoor, CEO, City X-Ray & Scan Clinic,*** said, "Advanced diagnostics, particularly AI-driven radiology and low-dose computed tomography (LDCT) for lung cancer screening, will be game-changers in cancer detection. Daycare cancer centers must be equipped with cutting-edge digital pathology, MRI, and genetic screening tools to facilitate faster and more accurate diagnoses. A well-implemented public-private partnership (PPP) model in diagnostics will further accelerate accessibility and affordability."

Investment in technology is undoubtedly a major priority for the government, whether with respect to healthcare delivery, education or innovation.

Amplifying technology & innovation

As per the budget announcement, a Centre of Excellence in Artificial Intelligence (AI) for education will be set up with a total outlay of Rs 500 crore. Additional infrastructure will be created in 5 Indian Institutes of Technology (IITs), started after 2014, to facilitate education for 6,500 more students. Also, in the next five years, under the PM Research Fellowship scheme, provision of 10,000 fellowships for technological research in IITs and IISc with enhanced financial support is also proposed in the Budget.

"By fostering advanced research, AI-enabled learning tools, and industry-academia partnerships, we are equipping the next generation with the skills needed to drive transformative change. This is a pivotal moment as we close the AI talent gap, ensuring that India is not just a consumer of AI but a creator of cutting-edge solutions", pointed out ***Mahesh Makhija, Technology Consulting Leader, EY India.***

Also, 50,000 Atal Tinkering Labs will be set up in government schools in the next 5 years, to encourage innovation. The Union Finance Minister has announced to set up five National Centres of Excellence for skilling with global expertise and partnerships to equip youth with the skills required for "Make for India, Make for the World" manufacturing. The partnerships will cover curriculum design, training of trainers, a skills certification framework, and periodic reviews.

In addition to a National Manufacturing Mission being launched by the government, a national framework is to be formulated as guidance to states for promoting Global Capability Centres in emerging tier 2 cities. Further, as a major support to the industry, an allocation of Rs 20,000 crore has been announced to implement private sector driven Research, Development and Innovation.

"There has been an increased allocation for the Department of Biotechnology (DBT) in this year's Budget to support biomanufacturing, biotech research, entrepreneurship, innovation, skill development etc. DBT is perfectly positioned to contribute to the National Manufacturing mission for the development of biobased chemicals, enzymes, climate resilient crops, clean energy and various other sectors", highlighted Dr Rajesh Gokhale, Secretary, DBT.

Adding his perspective on these new developments, ***Abhay Karandikar, Secretary, Department of Science & Technology (DST)*** said, "The Finance Minister in her budget speech of July 2024 had announced setting up a Rs 1 lakh crore R&D fund. The allocation this year will kick start the fund and will be a major boost to support R&D in the private sector in the deep tech and sunrise sectors. This will be a major step towards creating strategic autonomy in some key technology sectors. We are happy that DST will be the Nodal ministry driving this fund."

The Union Budget 2025-26 has maintained a continuity to build upon India's growth story within the healthcare sector, but definite roadmaps will eventually be required to make the right executions.

"Given the evolving geopolitical and geo-economic landscape and the intensifying competition for investments, it remains to be seen whether the Budget has done enough to strengthen our competitiveness, incentivise investments in high-tech sectors, and align with global best practices to position India as a preferred destination for capital and innovation", said ***Kiran Mazumdar Shaw, Executive Chairperson, Biocon.*** BS

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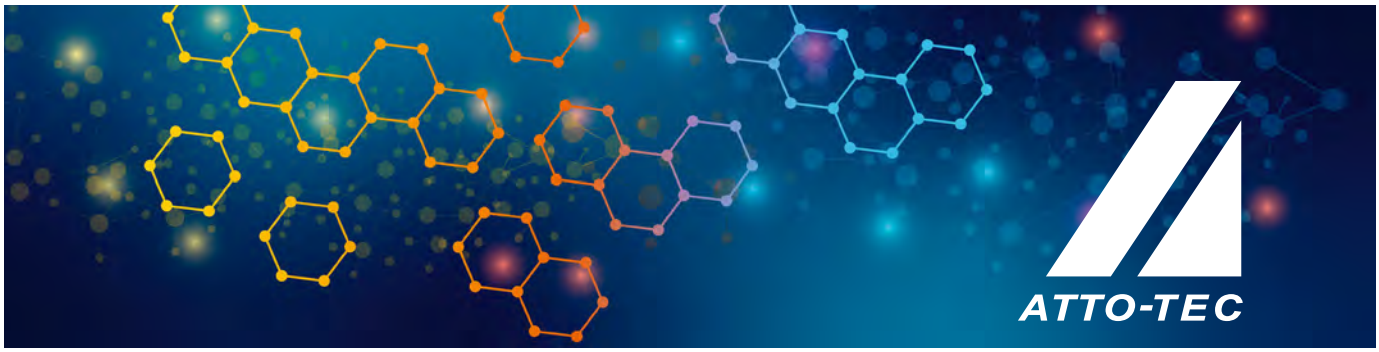

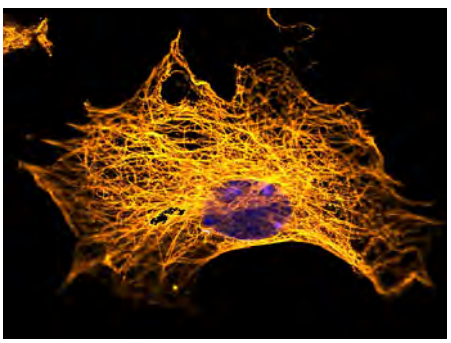

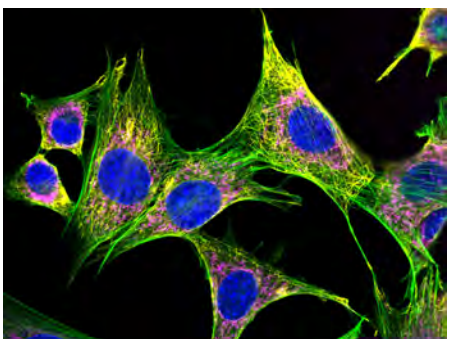

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10 Women 'Power Players' of Bio Research & Policy

As revealed in Finance Minister Nirmala Sitharaman's Economic Survey 2024-25, for the first time in seven years, India's female labour force participation rate (FLFPR) has seen a significant rise, jumping from 23.3 per cent in 2017-18 to 41.7 per cent in 2023-24.

The Economic Survey underscores how women-led businesses thrive under government support. As of October 31, 2024, over 73,151 startups with at least one woman director have been recognised under the Startup India Initiative, nearly half of all registered startups in India.

Additionally, Union Budget 2025-26 has listed new initiatives to support women entrepreneurs across various sectors within the industry. While the number of women entrepreneurs in the country has been increasing over the years, there has not been much change at the women leadership level in both the public and private sectors. There are very few women leaders who have the opportunity to take charge of an entire academic institute or a government posting, thereby contributing to the growth of our country.

For instance, biologist Dr Chandrima Shaha became the first-ever woman president of the Indian National Science Academy (INSA), in 2020. In 85 years of its existence, the Academy had never had a woman president until she took over.

Quoting another example, Professor Anju Seth was appointed as the first woman director of the Indian Institute of Management in Kolkata in 2018, but she resigned amidst conflict with the board much before her term got over.

Dr Renu Swarup, who has served as the Secretary of the Department of Biotechnology, became the first woman to serve as the Secretary of the Department of Science and Technology, back in 2021, but the term lasted for only a few months. Senior electrochemical scientist Nallathamby Kalaiselvi became the first woman director general of the Council of Scientific and Industrial Research (CSIR) in 2022 and is still going strong. Then there is Dr Preeti Aghalayam who has been named the first woman director of the Indian Institute of Technology (IIT) in 2023, taking charge of a new division in Tanzania, thereby underlining the skewed gender ratio at the country's premier engineering institutions which still has a long way to go despite constant efforts to improve gender ratio.

In another significant milestone, Kanchan Devi was appointed as the first woman officer to hold the position of Director General (DG) of the Indian Council of Forestry Research Education (ICFRE) in 2023, under the Union Ministry of Environment, Forest, and Climate Change.

Recently, Surgeon Vice Admiral Arti Sarin became the first woman to head the Director General of the Armed Forces Medical Services (DGAFMS), as a boost to women's empowerment in the armed forces.

Sr. No.	Name	Designation
1.	Dr Radha Rangarajan	Director, Central Drug Research Institute
2.	Prof. Vibha Tandon	Director, Indian Institute of Chemical Biology
3.	Dr Manisha Madkaikar	Director, National Institute of Immunohematology
4.	Dr Sanghamitra Pati	Director- Public Health, Regional Medical Research Centre (Odisha) & Additional Director General, Indian Council of Medical Research
5.	Dr Shalini Singh	Director, National Institute of Cancer Prevention and Research
6.	Dr Sharmila Bapat	Director, National Centre for Cell Sciences
7.	Prof. Maneesha Inamdar	Director, Institute for Stem Cell Biology and Regenerative Medicine
8.	Dr Geetanjali Sachdeva	Director, National Institute for Research in Reproductive Health
9.	Dr Pratima Murthy	Director, National Institute of Mental Health and Neuro-Sciences
10.	Dr Ekroop Caur	Secretary, Department of Electronics, Information Technology, Biotechnology and Science & Technology, Government of Karnataka

Focusing specifically on the life sciences sector, there are currently less than 20 per cent women-led academic institutes within the public sector, working towards the development of new drugs, vaccines, diagnostic devices, medical equipment, etc. Likewise, there are very few women leaders within the Ministries and Departments in government settings, who have the opportunity to drive life sciences advancements in the country.

Since International Women's Day 2025 is observed on March 8, under the theme, "For All Women and Girls: Rights. Equality. Empowerment," BioSpectrum has featured 10 women leaders and influencers heading policy matters related to biotechnology, and directing academic institutes affiliated to the Indian Council of Medical Research (ICMR) and Council of Scientific and Industrial Research (CSIR), thereby emerging as the driving forces of research and development in India in life sciences space. BS

Dr Manbeena Chawla
(Inputs from Vrushti Kothari)

A True 'Champion of Change'

DR RADHA RANGARAJAN

Director, Central Drug Research Institute, Lucknow (Established in 1951)

"Industry should see academia as laboratories from which future products can emerge without having to invest in much of the high-risk early stage research. For such a model to become effective, academia must align its research with what industry is willing to bet on."

A leader in translational research, drug discovery, diagnostics, and medical devices, with over two decades of experience spanning academia, startups, and industry, Dr Radha Rangarajan took charge as the Director of Central Drug Research Institute (CDRI) in September 2022. CDRI is a constituent laboratory of the Council of Scientific and Industrial Research (CSIR) under the Department of Scientific & Industrial Research, Ministry of Science and Technology, Government of India. Dr Radha has played a pivotal role in advancing healthcare solutions, from early-stage drug development to affordable diagnostics. She began her career at Dr. Reddy's Laboratories (2003–09), contributing to early-stage drug development. She later co-founded Vitas Pharma, focusing on novel therapies for drug-resistant infections. As Chief Technology Officer at HealthCubed (2020), she spearheaded the development of accessible diagnostic solutions. She actively contributes to global health initiatives, serving on advisory boards for CARB-X, Tres Cantos Open Lab Foundation, BITS BioCyTiH, and other prestigious organisations. Her contributions have been widely recognised, earning her the FICCI Award for Women in R&D (2019) and the "Champion of Change" recognition by Prime Minister Narendra Modi (2017). BS

Spearheading the Biomedical Research

PROF. VIBHA TANDON

Director, Indian Institute of Chemical Biology, Kolkata (Established in 1935)

"Let us dedicate ourselves to create an unmatched ecosystem for nurturing creativity and innovation where "the mind will be without fear and head will be held high". As Swami Vivekananda said "arise, awake and stop not till the goal is reached", the goal for making a "Self-Reliant India."

Prof. Vibha Tandon is a distinguished Indian scientist and academician recognised for her contributions to chemistry and molecular medicine. With an illustrious career spanning research, academia, and leadership, she took charge as the Director of CSIR-Indian Institute of Chemical Biology (CSIR-IICB) in 2023 to further advance the scientific innovations in India. Her academic career took off in 2009 at Delhi University, where she became a full professor in 2013. In 2014, she joined Jawaharlal Nehru University (JNU) as Chair of the Special Centre for Molecular Medicine, making significant contributions to biomedical research. Her groundbreaking research in molecular medicine has earned her national recognition, including her election as a member of the National Academy of Sciences, India in 2023. With a steadfast commitment to scientific excellence and innovation, Prof. Vibha continues to lead research in chemistry, drug discovery, and molecular medicine, shaping the future of biomedical science in India. BS

Mentoring the Future Scientists & Policy Makers

DR MANISHA MADKAIKAR

Director, National Institute of Immunohematology (Established in 1957)

"We are focusing on local and national human resource development through training and academic programmes to encourage young aspirants to achieve their goals through MSc and PhD programmes."

A scientist and academician with over three decades of experience in translational research, teaching, and administration in haematology and immunology, Dr Manisha Madkaikar is the Director of National Institute of Immunohematology (NIIH), under the Indian Council of Medical Research (ICMR). A recognised guide for MSc and PhD programmes at the University of Mumbai, she has mentored numerous scholars. Dr Manisha has served as an Assistant Professor at KEM Hospital, Mumbai, and contributed significantly as an editor for the Pediatric Hematology and Oncology Journal. Her expertise spans Primary Immunodeficiency Disorders, Haematological Malignancies, Marrow Failure Syndromes, Flow Cytometry, and Molecular Biology. She has been the Principal Investigator (PI) and Co-PI for over 19 R&D grant-funded projects from DBT, ICMR, and WHO, along with 13+ intramural grants. Her scholarly contributions include 150+ publications, 15+ book chapters, and 45+ presentations at national and international conferences. Under her leadership, the institute provides services for comprehensive diagnosis and genetic counselling of the families affected with inherited diseases including prenatal diagnostic services. BS

Doctoring Public Health Research & Policy

DR SANGHAMITRA PATI

Director- Public Health, Regional Medical Research Centre, Odisha (Established in 1981) & Additional Director General, Indian Council of Medical Research (ICMR), (Established in 1911)

Dr Sanghamitra Pati is a physician, laboratory scientist, and public health researcher with over 25 years of experience in clinical medicine, epidemiology, and translational research. In 2000, Dr Sanghamitra was honoured with the Joint Japan/World Bank Graduate Scholarship (JJ/WBGSP), which allowed her to pursue a Master of Public Health (MPH) at the University of Maastricht in The Netherlands. She further advanced her education and achieved a PhD from the same university in 2023. Her leadership roles have been impactful, particularly in her tenure as the Director of the ICMR-Regional Medical Research Centre in Bhubaneswar, from August 2016 to December 2024. In December 2024, she took on the prestigious and responsible role of Additional Director General at the ICMR in New Delhi, continuing her significant contributions to public health research and policy. She played a crucial role during the critical time of COVID-19 by leading sero-surveillance studies, not only in Odisha, but also in adjoining states of Chhattisgarh and Jharkhand. She was also instrumental in co-developing the first 'Make in Odisha' rapid Antigen kit for COVID-19 diagnosis. In 2024, she was listed among the top 2 per cent of global scientists by Ioannidis, John P.A., in the "Updated Science-Wide Author Database of Standardised Citation Indicators" published by Elsevier. She is a Fellow of the National Academy of Medical Sciences (NAMS), India; the Royal Society of Public Health (FRSPH), UK; and the Union for International Cancer Control (UICC). BS

Emphasising Quality of Life as Patient Outcome

DR SHALINI SINGH

Director, National Institute of Cancer Prevention and Research, Noida (Established in 1989)

"Science should serve to make people healthier and happier and instead of a longer life with disease and drugs!"

A renowned leader in cancer prevention research and public health, Dr Shalini Singh is currently serving as the Director of Indian Council of Medical Research - National Institute of Cancer Prevention and Research (ICMR-NICPR), Noida. She started her journey in science at a very young age during a visit to her father's dental clinic where she learnt how to interact with patients, listen to their complaints, understand their socio-cultural background which gives insights regarding their compliance to treatment, willingness for follow-up and how to personalise the treatment to their needs. This culminated in her becoming a gynaecological cancer surgeon later. With extensive experience in noncommunicable disease (NCD) prevention and management, she has played a pivotal role in advancing strategies for early detection and screening of oral, breast, and cervical cancer in India. Under her leadership, NICPR has strengthened cancer prevention initiatives, focusing on capacity building, awareness programmes, and research-driven interventions. Dr Shalini has been instrumental in developing and implementing national guidelines for cancer screening, ensuring accessibility and efficiency in early detection efforts. She is also heading the WHO Framework Convention on Tobacco Control Knowledge Hub on Smokeless Tobacco and the National Tobacco Testing Laboratory, under the Ministry of Health and Family Welfare, Government of India. BS

Leading from Front in Cancer Research

DR SHARMILA BAPAT

Director, National Centre for Cell Sciences, Pune (Established in 1986)

Dr Sharmila Bapat, a scientist in cancer stem cell biology, has been serving as the Director of the National Centre for Cell Science (NCCS), Pune, since April 17, 2024. NCCS has been established as an autonomous organisation aided by the Department of Biotechnology, Government of India. A faculty member at NCCS since 2001, Dr Sharmila is recognised as a pioneer in cancer stem cell research, with her work focusing on unravelling cellular and molecular mechanisms in ovarian cancer. Her groundbreaking research aims to generate new knowledge and opportunities in precision cancer therapy. She has authored numerous research publications and holds a US patent and two Indian patents, demonstrating her contributions to translational research. Dr Sharmila is an elected Fellow of the National Academy of Sciences, India (Allahabad), the Indian Academy of Sciences (Bengaluru), and the Maharashtra Academy of Sciences. She has received numerous national and international accolades, most recent of which is the Shri RJ Kinarivala Cancer Research Award awarded by the Gujarat Cancer Society in 2023. With a strong vision for advancing cancer research, Dr Sharmila is focused on leading cutting-edge innovations in precision oncology. BS

Advancing the Frontiers of Developmental Biology

PROF. MANEESHA INAMDAR

Director, Institute for Stem Cell Biology and Regenerative Medicine, Bengaluru (Established in 2002)

A cell and developmental biologist, Prof. Maneesha Inamdar is recognised for her pioneering research in cardiovascular development and stem cell biology. She has played a key role in establishing both teaching and contemporary research in these fields at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru. Her research group was among the first in India to establish human embryonic stem cell lines, contributing significantly to the field of mammalian cardiovascular development. She took over the charge of Institute for Stem Cell Biology and Regenerative Medicine (inStem), Bengaluru in 2022. Her work has far-reaching implications for regenerative medicine, congenital heart defects, and translational biomedical research. With her trailblazing contributions to stem cell science and cardiovascular biology, Prof. Maneesha aims to advance the frontiers of developmental biology, shaping the future of biomedical research and healthcare innovations in India. Her lab is dedicated to analysing mammalian development using stem cell models, alongside clinical studies that bridge fundamental research with medical applications. She has trained over 18 researchers in stem cell culture and is currently the member of WHO expert advisory committee on developing global standards for governance and oversight of Human Genome editing. BS

Building Reproductive Biology's Future

DR GEETANJALI SACHDEVA

Director, National Institute for Research in Reproductive Health, Mumbai (Established in 1970)

"It is necessary that multi-disciplinary skills are acquired by women who are getting trained in life sciences. Gender-neutral collaborations and networking skills are some of the areas where women have to improve."

Dr Geetanjali Sachdeva is a distinguished scientist and academician, specialising in reproductive biology with over 24 years of experience. Serving as the Director of National Institute for Research in Reproductive Health (NIRRH) since 2021, her research laboratory has been addressing the pathogenesis of lesion formation in women with endometriosis, a morbidity affecting approximately 43 million women in India. Towards that, she has identified that DNA damage response machinery is altered in ectopic lesions and this offers a pro-survival advantage to ectopic lesions. She believes that devising strategies to block this pathway may lead to new therapeutic modalities. During 2024, the institute, under her leadership, made more strides to reach rural and tribal populations and conducted studies to identify effective strategies for addressing hemoglobinopathies such as sickle cell anaemia in neonates, anaemia and preeclampsia in pregnant women, and birth defects in children. In recognition of her outstanding contributions over the years, she has received several prestigious awards, including the ICMR Swaran Kanta Dingley Award, GP Talwar Midlevel Career Award, and Royan International Research Award. Through her scientific excellence, mentorship, and contributions to national health initiatives, Dr Geetanjali continues to shape the future of reproductive biology and healthcare research in India. BS

Making Difference to Mental Health Patients and Research

DR PRATIMA MURTHY

Director, National Institute of Mental Health and Neuro-Sciences, Bengaluru (Established in 1954)

"Take others together and remember, leadership is not always gauged by the position you hold, but the changes you are able to catalyse. So in whatever you do, try to emerge as a leader! "

A psychiatrist and mental health expert with nearly 30 years of experience in addiction psychiatry and mental healthcare, Dr Pratima Murthy has played a pivotal role in developing the state-of-the-art Centre for Addiction Medicine at National Institute of Mental Health and Neuro-Sciences (NIMHANS), significantly advancing treatment and research in substance use disorders. She has been serving as the director of the institute since 2021, for a period of 5 years. She has made efforts towards increasing revenue for the hospital through both governmental and CSR grants; expanded infrastructure including a platinum jubilee auditorium, a new administrative block, a centralised lab complex and a psychiatry specialty block. Two new departments and three specialised centres have been established during her term as the director. Under Dr Pratima's leadership, the institute has developed the national Tele MANAS programme, which has provided telephone counselling services through more than 18 lakh calls, and helped to network with professional mental health services. It has been a moment of pride for Dr Pratima to receive the WHO Geneva's Nelson Mandela Prize for health promotion on behalf of the Institute in 2024 and maintain the fourth prize consecutively in the national institutional ranking framework (NIRF) rating. Another major highlight, under Dr Pratima's directorship, is perhaps the visit of the President of India, Droupadi Murmu to commemorate the golden jubilee of NIMHANS! BS

Influencing Biotech Governance

DR EKROOP CAUR

Secretary, Department of Electronics, IT, Bt and S&T, Government of Karnataka

A distinguished Indian Administrative Service (IAS) officer of the 2001 batch, and currently serving as the Secretary to the Government of Karnataka in the Department of Electronics, Information Technology (IT), Biotechnology (Bt), and Science & Technology (S&T), since August 2023, Dr Ekroop Caur, a PhD holder from Punjab University, has over two decades of experience in public administration. She has played a pivotal role in shaping policies across multiple domains, including finance, urban governance, infrastructure, and technology. Emerging as one of Karnataka's most influential bureaucrats, Dr Ekroop has been instrumental in the launch of India's first GCC policy in 2024. The government aims to attract the establishment of 500 new global capability centres (GCCs) achieving a total number of 1,000 GCCs in Karnataka by 2029; and to support creation of 3.5 lakh new jobs in Karnataka by 2029. She also led the government's efforts in launching Karnataka Biotechnology Policy 2024-2029 that aims to accelerate the bioeconomy by streamlining regulations, promoting bio-manufacturing, attracting investments and advancing R&D. Initiatives provide essential infrastructure and incentives for sustained sectoral growth. Dr Ekroop is also playing a major role in strengthening biotech education in the state through skilling programmes, promoting scale-up of biotech startups; streamlining biotech regulations to facilitate business setups and attract investment; and supporting biomanufacturing aligned with health, climate goals. Throughout her career, she has held several significant positions including Secretary of Finance in the Karnataka government. BS

PPPs Transforming Chronic Diseases Burden Among Indian Women

More and more Indian health research institutions and the World Health Organization (WHO) are realising that medical interventions alone are insufficient to alleviate the burden of chronic diseases among women. Economic empowerment, extensive social reforms, and a radical rethinking of women's health as a vital national priority are all demanded. The public-private partnerships (PPPs) that combine medical science, social policy, and community involvement are the most promising method to bring about significant change. The PPPs' capacity to transform healthcare by developing accessible, reasonably priced interventions has been continuously demonstrated.

« **Prof. (Dr) Dorairaj Prabhakaran,** Executive Director, Centre for Chronic Disease Control

Communities and countries and ultimately the world are only as strong as their women's health."

– Michelle Obama

The upsurge in chronic diseases such as diabetes, heart and lung diseases, and cancer portends a potential healthcare catastrophe of significant magnitude, with women bearing a disproportionate burden of this unfolding scenario. The burden of chronic diseases among women in India represents a critical public health challenge, with cardiovascular diseases (CVD) or heart diseases and cancers emerging as health concerns. Addressing this crisis in India demands a comprehensive, collaborative approach that leverages public-private partnerships across multiple sectors.

India can develop relevant and scalable solutions by fostering innovative alliances between government agencies, healthcare providers, research institutions, civil society organisations, and private sector partners. These alliances can play a pivotal role in driving targeted health interventions, enabling widespread access to quality care. By focusing on preventive measures and integrating community-driven insights, such collaborations can ensure that healthcare initiatives are responsive to the specific needs of women across diverse socio-economic and geographical contexts.

Need for Innovative Solutions

The Global Burden of Disease Study reveals that CVD is the leading cause of female mortality in India, claiming 18 per cent of all deaths. As per data shared by ICMR – National Institute of Cancer Prevention and Research, cancer follows, with one in every two women newly diagnosed with breast cancer succumbing to the disease. Cervical cancer compounds this, with one woman dying from the disease every 8 minutes in India. Approximately 23 per cent of worldwide cervical cancer fatalities occur in India, representing 3,41,831 deaths in 2020—a statistic that urgently demands early diagnosis and treatment strategies.

What Ails Women's Health Care in India?

Several challenges prevent women in India from receiving their share of healthcare. Economic constraints, limited health literacy, and deeply entrenched social stigmas surrounding women's health discussions amplify these challenges.

With only 6 per cent of doctors being women in rural areas, there exists a gender-based healthcare provider deficit that compounds existing cultural and socioeconomic barriers. These systemic constraints create complex obstacles for women seeking medical interventions. Many women prioritise family needs over personal health, leading to delayed medical consultations and missed preventive care opportunities. A significant proportion of women, particularly in rural areas, lack basic knowledge about disease risk factors, early symptoms, and treatments that may be available. This low or lack of awareness translates into poor health-seeking behaviour, delayed diagnosis, and, ultimately, compromised health outcomes.

The healthcare access divide further exacerbates this crisis with a stark urban-rural disparity. While urban areas—representing merely 28 per cent of the population—consume 66 per cent of healthcare resources, rural women are left navigating very limited medical options. The result is a growing

health crisis where preventable conditions transform into life-threatening conditions.

Each missed vaccination, postponed screening, and delayed diagnosis is not just an individual health risk but a broader systemic failure that demands immediate, strategic, multi-sectoral interventions to reshape India's approach to women's healthcare. This is further compounded by a lack of knowledge and poor access to a balanced healthy diet, adequate physical activity and restful sleep, all of which are seminal in preventing chronic diseases.

A Fresh Approach

The World Health Organisation (WHO) and Indian health research institutions increasingly recognise that addressing women's chronic disease burden requires more than medical interventions. It demands comprehensive social reforms, economic empowerment, and a fundamental reimagining of women's health as a critical national priority.

Recommendations emphasise a holistic approach, including developing culturally sensitive health communication strategies, expanding community-based screening programmes, leveraging digital health technologies, and creating affordable, easily accessible healthcare models. Targeted interventions for high-risk populations are also gaining traction as potential solutions.

Interdisciplinary public-private partnerships integrating medical science, social policy, and community engagement represent the most promising pathway to meaningful transformation.

Public-Private Partnerships in Healthcare – An Innovative Pathway

Women's health, particularly in chronic diseases, requires tailored solutions that address medical, social, and economic determinants of well-being. Public-Private Partnerships (PPPs) offer a practical pathway to bridge resource gaps, encourage innovation, and ensure equitable healthcare delivery for women. PPPs can deliver sustainable interventions by integrating community insights with advanced medical capabilities. For instance, governments can leverage private sector technology to deploy mobile health clinics and telemedicine platforms to address women's specific challenges in underserved and remote areas. The Pune Municipal Corporation's "Vaccine on Wheels" initiative exemplifies how such mobile screening models can bring critical healthcare services directly to vulnerable populations in underserved regions.

India's history of employing PPPs to overcome healthcare challenges underscores their transformative potential. Recent successes, such as the Arogya Setu and CoWIN App rollouts, demonstrate how multi-stakeholder collaborations can deliver groundbreaking outcomes on a global scale. Across the world, numerous successful examples of PPPs have demonstrated their ability to address healthcare access challenges and improve health outcomes in resource-constrained settings. The Beyond Zero Campaign, initiated by the Kenyan government in collaboration with private sector partners and international organisations, focused on reducing maternal and child mortality by deploying mobile clinics to underserved rural areas. By leveraging private sector resources and expertise, the initiative provided essential healthcare services such as antenatal care, immunisations, and disease screenings to communities with limited access to medical facilities.

The PPPs have consistently proven their ability to reshape healthcare by creating affordable, accessible interventions. Programmes under the National Health Mission have leveraged such collaborations to address vulnerabilities in rural and marginalised communities through public awareness campaigns, expanded healthcare access, reduced costs, and innovative solutions for emerging health conditions. Private sector contributions, such as advanced diagnostic technologies, AI-driven early detection systems, and online health platforms, further amplify these efforts. By combining the strengths of public institutions, private sector capabilities, and community insights, PPPs can create solutions that can significantly improve health outcomes for women across India. These collaborations will enhance the reach and efficiency of healthcare delivery and also ensure that interventions are sustainable and culturally relevant, propelling long-term systemic change. BS

“Quality shouldn’t be an afterthought but an integral part of manufacturing process”

At the 63rd Annual Day Celebrations of the Indian Drug Manufacturers' Association (IDMA) held in Mumbai on February 8, Dr Rajeev Raghuvanshi, Drugs Controller General of India (DCGI), emphasised the importance of execution over excessive regulation. Speaking at the event, themed “Innovating Today For Healthier Tomorrow”, he advocated for a balanced approach where compliance is strengthened through practical implementation rather than regulatory overreach. In an interaction with BioSpectrum he has called for industry-wide collaboration, urging larger pharma companies to mentor MSMEs and elevate standards. ***Edited excerpts:***

« **Dr Rajeev Raghuvanshi,** Drugs Controller General of India (DCGI)

How does the revised implementation of Schedule M align India’s pharmaceutical sector with global GMP standards?

Schedule M has been revised to align Indian pharmaceutical manufacturing with global Good Manufacturing Practices (GMP), bringing India closer to international regulatory expectations, and making our pharmaceutical products globally more competitive. The objective is to ensure consistent quality, safety, and efficacy, thereby strengthening India's reputation as a trusted supplier of medicines.

MSMEs often struggle with regulatory compliance. You had announced an extension for the compliance deadline to December 2025. What prompted this decision?

MSMEs play a crucial role in the pharmaceutical ecosystem, but many of them face financial and infrastructural challenges in meeting stringent compliance requirements. The extension to December 2025 gives them additional time to upgrade their facilities, adopt new technologies, and implement best practices without disrupting their operations. The goal is to enable them to comply effectively rather than rush and face setbacks.

There have been concerns regarding repeated instances of Not of Standard Quality (NSQ) drugs. What are the key areas that require urgent attention to improve quality?

The most common quality concerns involve dissolution, assay content, and microbial control. By focusing on these areas, we can significantly reduce the occurrence of NSQ drugs. Companies must invest in robust quality control measures, regular training, and stringent internal audits to ensure that their products consistently meet the required standards.

Collaboration was a key theme of your speech. How can larger pharmaceutical companies support MSMEs?

Larger pharmaceutical companies have the resources, expertise, and infrastructure that MSMEs may lack. By mentoring smaller players—offering technical guidance, helping with compliance strategies, and even sharing best practices—they can elevate the overall industry standards. This will create a stronger, more self-reliant pharmaceutical ecosystem where quality and affordability go hand in hand. "Give the regulator a chance not to regulate." This statement is meant to highlight the importance of self-regulation. If the industry proactively adheres to quality standards and best practices, there will be less need for regulatory intervention. The goal is for companies to take ownership of compliance rather than seeing regulations as an external burden. A proactive approach will not only reduce regulatory pressure but also boost confidence in Indian pharmaceuticals globally.

Do you have a final message for industry stakeholders?

I urge all stakeholders—regulatory bodies, pharmaceutical companies, and MSMEs—to work together in a spirit of collaboration. Quality should not be an afterthought but an integral part of the manufacturing process. If we focus on execution with sincerity, India’s pharmaceutical industry will continue to thrive and set new benchmarks globally. BS

Bhagwati Prasad

"There is limited investment in the area of infection control in Indian hospital settings"

« **Philippe Rocher,** President South Asia Pacific, Getinge

Getinge, a Swedish medtech company, has recently opened its new Experience Centre in Mumbai, which is designed to recreate hospital and other healthcare settings including operating rooms and intensive care units. The Experience Centre showcases innovative solutions, including the Getinge IN2 OR Modular Room System, designed to meet the evolving needs of modern surgery. With a revenue generation of Rs 449 crore in India, for 2024, Getinge's priority is to strengthen its presence in ventilators, anaesthesia machines, and hemodynamic monitoring, where the demand is increasing. In conversation with BioSpectrum India, Aruna Nayak, Managing Director of Getinge India and Philippe Rocher, President South Asia Pacific, Getinge talked in detail about the growing medtech sector in India, and about the company's growth plans. ***Edited excerpts:***

What are some of the new technologies being introduced by Getinge, to make surgeries smarter and safer for Indian patients?

Philippe Rocher: The transformation of Operating Rooms (ORs) has already started to support the development of new surgical techniques such as minimally invasive surgery, guided surgery or robotic surgery that are safer for patients. These techniques require the integration of new equipment inside the OR. We also see an increasing demand for providing the surgical team with comprehensive patient information in a seamless and consolidated manner. Rooms with high technology density must be designed intelligently to respond to these changing trends.

Within our portfolio, we offer complete turnkey solutions to our customers using the IN2 Modular System combined with our medical equipment such as anaesthesia machines, operating tables, ceiling pendants and surgical lights. We have recently introduced the Maquet Corin, a next-generation premium operating table with intuitive user controls, patient recognition, and a unique colour-coding system; and the Maquet Ezea surgical light, which offers user-friendly simplicity and robust reliability for a wide range of surgical applications. These products are innovative and comply with the latest and most stringent international quality standards.

We have also recently launched Torin, an OR management software that is using artificial intelligence to improve OR scheduling. It helps in better planning surgeries by managing resources, accurately predicting the duration of interventions, and notifying all relevant stakeholders in real-time. This ensures efficient scheduling, minimises wait time, and maximises operating room utilisation; ultimately improving patient care and safety.

How does Getinge plans to further strengthen its presence in the Indian market? Are you looking for partnerships with more hospitals?

Aruna Nayak: India is today in the top 12 of our leading markets in terms of net sales. It has been a high-growth market, and we have observed significant advancements in healthcare infrastructure. The government's focus through initiatives like Ayushman Bharat and its goal of establishing an All India Institute of Medical Sciences (AIIMS) in every state is creating substantial opportunities.

We are very excited about the rapidly growing healthcare infrastructure in India, particularly driven by the government's efforts. This will help India catch up to global norms on average bed capacity. We have worked with about 10,000 hospitals and clinics in tier

I and tier II cities to create world-class infrastructure.

Another major trend is the increasing adoption of digital solutions, essential not only to address cost pressures but also to manage the shortage of trained clinical staff. Our digital health solutions and modular operating room enable hospitals to optimise workflows, including patient management, hospital operations, and central sterile service department (CSSD) workflows. This allows healthcare providers to get more out of their existing infrastructure.

Additionally, our Innovation Center in Bengaluru has recently supported the development of software called Twin View. It replicates the interface of our ventilator screen and allows clinicians to monitor parameters remotely, even outside the ICU. This software not only supports better patient monitoring but also acts as a valuable training tool for clinicians to be more efficient.

We find clinicians in India are highly supportive and eager to adopt newer technologies. For example, we have introduced advanced technologies like Fluoptics, NAVA, advanced hemodynamic monitoring, which address key challenges in the patient treatments and helps in decision making and improving clinical outcomes.

Right next to our Mumbai Experience Center, we have a dedicated training room where we will conduct sessions for healthcare professionals on cardiovascular and critical care. We also have an Experience Center in Chennai where we organise numerous training sessions. We also offer hands-on training for the technicians and clinicians directly in their hospitals. For government hospitals, we typically conduct on-site training sessions. We have organised programmes at AIIMS, R&R (rest and recuperation) and other prominent government hospitals.

In India, we have around 250 employees, a combination of sales and service teams. We have one of the largest service teams based throughout India, with coverage across the country. Our sales team operates nationwide, primarily covering metro cities and tier-1 cities. We work with about 150 distributors who help cover the entire country.

What is the company's current share within the Indian market?

Aruna Nayak: We have a 90 per cent market share for Endoscopic Vessel Harvesting (EVH), 85 per cent for Extra Corporeal Membrane Oxygenation (ECMO), 70 per cent for Intra-aortic Balloon Counterpulsation and 30 per cent for Advanced Ventilation in India. We have a very broad portfolio across Critical Care, Cardiovascular Surgical Workplaces, Infection Control, and Life Sciences. We have a large portfolio, and we face competition from around 5 to 10 major manufacturers, but the competition overlaps in specific areas only. We provide equipment used in the research and production of sterile injectables including biosimilars and vaccines. Specifically, we supply GMP sterilisers, GMP washers, sterile transfer equipment, isolators, and bioreactors. We work with leading sterile manufacturers in India, both in the biologics and small molecules sectors, particularly for injectables.

What are some of the challenges within the healthcare settings that Getinge is addressing through its innovative products?

Philippe Rocher: Getinge is a leading player in Infection Control worldwide. In India, however, the focus and the budget allocated to central sterile service departments (CSSD) are currently limited. While we would be happy to equip more hospitals, there has been limited investment in this area so far. That said, we are committed to expanding our presence and have developed more affordable products for the mid-segment to help address this issue.

Our offering includes a large range of washers, sterilisers and consumables designed to improve hospital standards and reduce cross-contamination. Our washer and steriliser systems are user-friendly, featuring two doors: one for the loading and one for the unloading. The dirty instruments enter through the loading door and undergo the washing cycle, and the clean instruments exit through the other door, creating a single flow to avoid cross-contamination. After washing, the instruments are moved to the steriliser, where they pass through a similar process. This design ensures that no instrument skips any step in the cycle. We have designed these systems to be foolproof and guarantee the complete cycle of washing and sterilisation is followed.

Given that India is such a vast country, another big challenge that we face is geographical coverage. But there is a strong motivation among many clinicians in India to adopt newer technology. This is very encouraging for us. We have a portfolio of innovative products, and our focus is on continuing to provide the necessary training to ensure that they can be used safely and effectively on patients. BS

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“We recognise the growing demand for skilled talent in fields like AI, Gen AI, Robotics, and Data Analytics”

Tilak Banerjee,
Head of
Takeda ICC India

Takeda, a global leader in biopharmaceutical innovation from Japan has opened its Innovation Capability Center (ICC) in Bengaluru. This marks Takeda’s first ICC in Asia, following successful establishments in Slovakia and Mexico. The ICC supports the company’s dedication to advancing healthcare through innovative solutions. These cutting-edge solutions will help advance its operations and have an impact on Takeda’s workforce, the patients that it serves and the planet for years to come. In an interaction with BioSpectrum, Tilak Banerjee, Head of Takeda ICC India shared how this centre is different from other centres and the kind of partnerships it will have in place to support Takeda Group of Companies. ***Edited excerpts:***

Takeda has opened its third Innovation Capability Center (ICC) in Bengaluru, India, following those in Slovakia (2021) and Mexico (2024). How is this centre different from the other locations?

Takeda’s ICC India stands out by leveraging the country’s unique technological strengths and innovation ecosystem to enhance the company’s global innovation efforts. The Bengaluru centre draws from the country’s rich pool of engineering talent and its culture of creative problem-solving to address complex challenges with innovative solutions. This ICC is designed to create smart, efficient solutions that can be rapidly developed and deployed across various global contexts. In addition to developing patient-centric technologies, the centre focuses on designing applications that transform the employee experience, further demonstrating its commitment to innovation. The ICC India’s emphasis on integrating local talent and expertise into Takeda’s global framework ensures it brings distinct value to the company’s digital transformation and operational excellence.

With 275 skilled professionals already on board in Bengaluru, what kind of digital solutions is the India centre offering to the Takeda Group of Companies?

The ICC India is focused on advancing innovation in key areas such as Artificial Intelligence (AI), device engineering, data science, and customer-facing technologies to enable Takeda’s global digital transformation. The centre serves as a specialised hub for developing cutting-edge digital capabilities that not only enhance patient outcomes but also drive operational efficiencies. These solutions align with Takeda’s broader mission to deliver transformative treatments, supporting the company’s ongoing efforts to improve healthcare on a global scale. Through its work, the ICC India plays a crucial role in accelerating Takeda’s digital evolution and enhancing its ability to innovate within the biopharmaceutical industry.

How many projects is Takeda Innovation India Private Limited (Takeda India ICC) working on?

The Takeda ICC India is focused on delivering impactful solutions that combine technology and innovation to address various needs across healthcare. Currently, the centre is working on several key projects, including A global donor management system for Takeda’s Plasma Derived Therapies (PDT); Data-driven tools to personalise and simplify interactions with healthcare professionals (HCPs), recommending next-best actions that enhance customer experiences and improve outcomes for both HCPs and patients; A digital platform for patients managing complex conditions, offering multi-language support for symptom tracking, appointment management, medication reminders, and more. This scalable solution improves patient outcomes and enhances

quality of life finally on a global platform to simplify the management of HCP data by consolidating multiple sources into a single, reliable system. This initiative has improved compliance reporting, accelerated payment processes, and integrated research and commercial systems, leading to better patient recruitment and more efficient operations;

These projects demonstrate Takeda's commitment to leveraging innovation for meaningful healthcare improvements. By the end of 2025, ICC India aims to continue advancing these initiatives, driving digital transformation across Takeda's global operations and contributing to the company's broader mission of delivering transformative treatments.

What kind of technologies is the Takeda India ICC currently using, and what skillsets will it be looking for to further its focus on developing a pipeline of innovative biopharma products/solutions?

The Takeda Innovation Capability Center (ICC) India is utilising a wide array of cutting-edge technologies to support its innovation initiatives. These include Data analytics to process large datasets and identify valuable patterns and insights; Artificial Intelligence and GenAI technologies, which employ machine learning algorithms to analyse data and derive actionable insights; Collaboration platforms that enhance communication and engagement among teams, such as project management tools, virtual meeting platforms, and document-sharing systems; Digital health technologies, including wearables and mobile applications, to drive patient engagement and improve health outcomes and Innovation management software to track and manage projects, from idea generation and project planning to resource allocation.

To support these technologies and further its mission of developing a pipeline of innovative biopharma solutions, ICC India will be looking for skilled professionals in areas such as AI, data science, machine learning, software development, and digital health technologies. These skill sets will be critical in driving the next wave of innovation at Takeda and advancing the company's mission to deliver transformative treatments to patients worldwide.

With many companies already having their GCCs in India, do you foresee a dearth of skilled talent in the space of AI, Gen AI, Robotics, and Data Analytics? If so, how do you plan to attract a skilled workforce?

Takeda recognises the growing demand for skilled talent in fields like AI, Gen AI, Robotics, and Data Analytics, particularly as many companies establish their GCCs in India. However, the company remains optimistic about its ability to access and nurture top talent, both locally and globally. Takeda's talent strategy is rooted in a strong commitment to developing technology professionals at various career levels, ranging from entry-level to senior roles.

To address the evolving needs of the industry, Takeda has partnered with academic institutions to build a robust talent pipeline, ensuring that its workforce is equipped to navigate emerging technologies and stay ahead of the curve.
The company also emphasises its learning initiatives, such as Generative AI learning, Agile methodologies, DevOps, and digital dexterity, all of which are tailored to prepare employees for future technological advancements.

Moreover, as AI and digital technologies continue to reshape Takeda's operations, particularly in areas like drug discovery, predictive analytics, and personalised healthcare, the company is dedicated to providing opportunities for employees to gain the knowledge and tools necessary to drive meaningful transformation in the healthcare sector. Through this comprehensive approach, Takeda plans to attract and retain the skilled talent required to meet the challenges of the evolving digital landscape.

What kind of partnerships (public and private) does the Takeda ICC India have in place now, and what further collaborations is it looking for to support the Takeda Group of Companies?

Takeda ICC India has established strong partnerships with local startups, universities, and research institutions, aiming to foster innovation and address healthcare challenges. In addition, collaborations with organisations such as the Biotechnology Industry Research Assistance Council (BIRAC) support healthcare entrepreneurs and promote innovation. These partnerships integrate global expertise with local insights, contributing to a vibrant ecosystem for healthcare advancement. Moving forward, Takeda plans to expand its network of collaborations, seeking further partnerships that enhance its ability to deliver transformative solutions and continue its global digital transformation. BS

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"Our goal is to make new molecules with new mutations to develop an RSV vaccine in India"

« **Dr Raghavan Varadarajan,** Professor, Indian Institute of Science (IISc)

Dr Raghavan Varadarajan, Professor, Indian Institute of Science (IISc), Bengaluru has won the Tata Transformation Prize 2024 in the healthcare category, with a prize money of Rs 2 crore. Dr Varadarajan is currently working to develop a cost-effective Respiratory syncytial virus (RSV) vaccine that will allow for greater access to wide-spread deployment of vaccination programmes. To find out more about his research and the current scenario of RSV vaccine development in India, BioSpectrum spoke, at length, with Dr Raghavan Varadarajan. ***Edited excerpts:***

At the outset, congratulations for winning the prestigious Tata Transformation Prize 2024. What are your plans post this achievement?

We will be using the prize money to make the antigens for the RSV vaccine and to test them in small animals for their ability to elicit neutralising antibodies and to protect the animals from viral challenges. Once we have the results in hand, we will engage with other partners to take the final formulation forward, first into clinical trials and subsequently commercialisation. Our immediate industry partner is Mynvax, which is a startup that I co-founded a few years ago, and we work closely with them.

Could you shed light on the RSV vaccine that your lab is working on?

Talking about our approach; on the RSV virus, there's a protein called the F protein which is one of the two major surface proteins of the virus, that helps the virus to infect cells. The challenge is that we need to make it in the proper shape because it's a very unstable protein and during the process of infection it undergoes a change in its shape. Thus, we need to focus on that pre-infection shape, and make mutations to increase both the level of expression and to tie it down into the correct shape, that will permit the virus to enter the host cells. We know that antibodies elicited by this form of the protein prevent infection. Currently, we are in the process of screening the F protein for different kinds of mutations that will stabilise it in the correct shape.

Once the molecule is identified, we need to engage with other partners; it has to be produced under GMP conditions, following which we have to do safety toxicity studies prior to subsequent clinical trials which we expect to initiate after 2-3 years.

What are the current challenges facing the RSV vaccine space in India and globally, and how is your research addressing those challenges?

The main challenge is that the current vaccines are priced at around $300 per dose. RSV vaccines in the west have only been approved about a year ago, one from Pfizer, one from GSK and an mRNA one from Moderna. There is also a lot of IP around the vaccines. In order to strike a difference, our goal is to make new molecules with new mutations. Since the RSV surface protein is quite unstable, this is not easy. Early attempts to make an RSV vaccine in the 1960s failed because of a lack of understanding of this issue.

Besides RSV vaccine development, what other projects are you working upon? Are there any industry partnerships in the pipeline for commercialising your research projects?

We have a flu vaccine for which Mynvax has completed a clinical trial in Australia. We also have another version of the vaccine, which will be starting trials in India and then in the EU in the next couple of years. Those are the two immediate things that we have. We earlier developed thermostable vaccines to combat COVID-19 as well as other sarbecoviruses. For those, there is no commercial interest at the moment but we have them available, should there be another outbreak. BS

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Biopharma Chromatography: Segregating Opportunities of all Sizes

Chromatography systems are essential in a variety of fields, including the biological sciences. Biopharma accounts for almost 30 per cent of this market, making it a key sector for chromatography systems. The main forces behind India's dominant market position would be the enabling government policies and the growing number of foreign research and industrial contracts. Beginning in 2028, India will create a demand for more than 1000 biopharma chromatography systems yearly.

Aditya Joshi,
Co-Founder and Marketing Head, Stratview Research

Chromatography systems play a critical role across different industries, in processes like drug development, nutritional analysis, toxin detection, pollutant analysis, among others. This being one of the most preferred methods for the separation and purification of compounds across the aforementioned industries, its market share is worth $10+ billion as of 2025. Approximately 30 per cent of this market is driven by biopharma, making it a cornerstone industry for chromatography systems.

Biopharma Chromatography Market

Ever since the outbreak of COVID-19, the world has been on its toes regarding healthcare operations. Governments and the public have become more alert towards healthcare facilities and 2020 can be seen as a landmark year that reshaped several trends within the healthcare sector, including chromatography.

To tackle COVID-19 at its peak, the year 2020 saw the highest increase (>10 per cent higher compared to 2019) in global healthcare spending and the Biopharma sector saw its highest ever ~130 per cent increase in funding from $58 billion in 2019 to ~$134 billion in 2020. For chromatography systems specifically, the pandemic led to an increased usage of single-use systems (SUS) to avoid cross-contamination and to support the then-necessary rapid vaccine production. As a result, the acceptance of SUSs in different clinical and commercial production processes has increased from an average of ~50 per cent in 2019, to ~70 per cent in 2024.

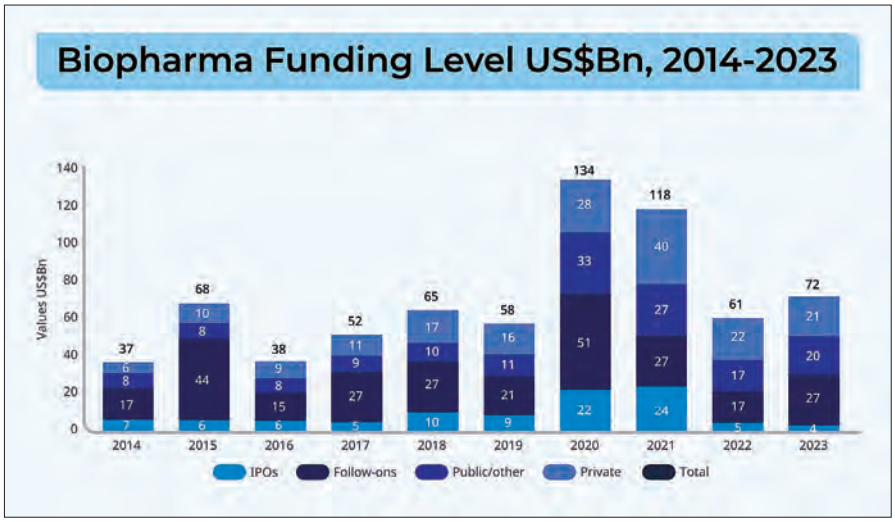
The trend though, in terms of the selection of the media type has been rather unaffected by the major shifts and Liquid Chromatography (LC) still reigns over Gas Chromatography (GC) by a significant factor. The dominance of LC can be mainly attributed to its compatibility with a wide range of biomolecules and currently, the industry is rapidly adopting more advanced LC techniques like High-Performance Liquid Chromatography (HPLC) and Ultra-High-Performance Liquid Chromatography (UHPLC).

According to reports, the top 5 players in the Biopharma Chromatography Market namely Thermo Fisher Scientific Inc., Shimadzu Corporation, Waters Corporation, Danaher Corporation, and Agilient Technologies Inc., capture >60 per cent of the market, and all of them have a strong portfolio for LC systems. But, as of January 2025, only two of them offer single-use systems.

It should also be noted that three out of the above-mentioned five leading players are US-based and that, combined with the United States' $180 billion annual healthcare R&D budget, positions the US as the leading player in the Biopharma Chromatography Market. While the US is expected to maintain its dominance in the market for another decade, if we look at the immediate next five years, not the US or China, but India is expected to be the fastest growing country, according to Stratview Research.

Presence in Indian Market

The demand for biopharma chromatography systems in India will emanate both from domestic as well as international needs. As per the India Brand Equity Foundation (IBEF) India has the largest number of the United States Food and Drug Administration (USFDA)-compliant pharmaceutical plants outside the US and currently supplies over 50 per cent of the global demand for various vaccines, 40 per cent of generic demand in the US, and 25 per cent of all medicine in the UK. This is primarily because of the presence of a skilled workforce, in combination with cheaper operations. Conducting clinical trials in India is anywhere between 40 and



70 per cent cheaper as compared to the US and Europe, and the manufacturing of drugs is also 30-35 per cent cheaper. Thus, India already is one of the most preferred hubs for pharmaceutical process outsourcing, in the West.

Moreover, recent policies like the US Biosecure Act, which was introduced in 2024 and restricts US pharma companies from doing business with certain Chinese companies, will open even newer avenues for the Indian market. Since chromatography systems are critical in both clinical trials as well as drug testing and manufacturing operations, an increase in the number of Contract Manufacturing Organisation (CMO) and Clinical/Contract Research Organisation (CRO) deals with India will drive significant demand for chromatography systems.

Apart from the external demand, there are several factors that will drive the market internally. In the past 5 years, India's biotechnology R&D expenditure has increased >3x, from ~$300 million in 2020 to $1 billion in 2024 and, the Common Healthcare Expenditure (CHE) as a per cent of GDP has also been increasing consistently for the same period. Additionally, several schemes like the Strengthening of Pharmaceutical Industry (SPI), the BIO-E3 biotechnology policy, and the PRIP (Promotion of Research and Innovation in Pharma MedTech Sector) further strengthen the development of the pharmaceutical industry in India.

The BIO-E3 biotechnology policy announced in 2024 for instance, is the nation's 1st ever Biotechnology policy and has been given Rs 1000 crore to further accelerate innovations in biotechnology, demanding advanced analytical techniques.

The PRIP scheme, proposed by the Department of Pharmaceuticals in 2024 has a budget outlay of Rs 5000 crore and aims at transforming the Indian pharmaceuticals sector by strengthening the research infrastructure in the country. The supporting government policies and the increasing number of CRO and CMO contracts from overseas will act as the primary drivers behind India's strong positioning in the market and according to Stratview Research, India will generate a demand for 1000+ biopharma chromatography systems annually, every year, starting 2028.

Next Step is Integration

The direction in which the industry is headed currently, is the direction of integration, automation, and collaboration. Integrating blocks like mass-spectrometry into chromatography operations helps achieve improved separation of more complex mixtures and not to mention, automating the process leads to an increase in sample throughput and the overall efficiency thus.

AI, just like every other domain, has found application in bioprocessing systems as well. Integrating AI technology in autosamplers allows for streamlined workflow and when combined with cloud-based data management systems, allows better collaboration between researchers and analysts. For instance, in 2024, Waters Corporation announced the launch of the HPLC CONNECT software, which is an all-in-one software platform enabling full digital synchronisation between HPLC/UPLC systems and multi-angle light scattering instruments (MALS) – vital instruments for complex and critical biopharmaceutical processes. The software enables users to control and monitor HPLC modules including pumps, column ovens, UV detectors, and autosamplers from a single dashboard view.

The penetration of AI has seen such a surge that in 2023 alone, combined deals worth $12 billion were announced between life sciences and AI companies, which is worth ~4x the deals announced in 2022.

As AI, automation, and cloud-based solutions become increasingly central, they will not only enhance efficiency but also foster unprecedented levels of collaboration and adaptability. This integration marks the beginning of a new era, where technology and science will converge to address complex challenges and unlock the full potential of biopharmaceutical processes. BS

Exploring Careers in Clinical Research: Pathways, Roles, and Future Prospects in India

With India's evolving regulatory landscape, business environment and technological advancements, the future of clinical research in the country is promising and full of potential. This is creating the demand for proficient researchers which is increasing and offering exciting career opportunities for individuals prepared to influence the future of Medicines, Vaccines, Diagnostics, and Medical Devices.

« **Anirban Roy Chowdhury,** Treasurer, Indian Society for Clinical Research

Clinical research plays a crucial role in the development of new treatments, bridging scientific knowledge with real-world applications. It encompasses a range of sub disciplines or domains, including clinical science, operations, data management, biostatistics, pharmacovigilance, and regulatory science. As the healthcare industry evolves, mastering these technical aspects is essential for professionals aspiring to make an impact. At its core, clinical research involves understanding disease mechanisms, evaluating therapeutic interventions, and rigorously testing new treatments. Professionals in this field ensure that clinical trials are conducted ethically, adhering to protocols, regulatory guidelines, and Good Clinical Practices (GCP). With India's expanding role in global clinical trials, the need for skilled researchers is growing, offering exciting career prospects for those ready to shape the future of Medicines, Vaccines, Diagnostics and Medical Devices.

Key Domains and Career Opportunities

Clinical Science: Clinical science or Clinical Development focuses on understanding the Target Product Profile, designing clinical trials, ensuring scientific rigor, and providing medical oversight throughout the study. Professionals in this field collaborate with investigators, regulatory bodies, and other cross functional teams to develop study protocols, analyse trial data, and ensure ethical and regulatory compliance.

Potential Roles: Clinical Scientist, Medical Director, Medical Monitor, Clinical Research Physician.

Clinical Operations: Clinical operations are responsible for the execution of trials, including site monitoring, project management, and ensuring adherence to protocols and timelines. Clinical operations teams work closely with investigators and study coordinators to ensure high-quality data collection and regulatory compliance across trial sites. Managing clinical trials efficiently requires expertise in planning, risk assessment, budgeting, and resource allocation. Strong project management skills help keep studies on track, within budget, and compliant with global and local regulations.

Potential Roles: Clinical Research Associate (CRA), Clinical Trial Manager, Clinical Project Manager, Clinical Program Manager, Clinical Research Coordinator.

Biostatistics & Statistical Programming: Biostatistics plays a crucial role in designing studies, analysing clinical trial data, and ensuring statistical validity, helping researchers draw meaningful conclusions that impact drug development and regulatory decisions. Biostatisticians work closely with data management and clinical teams to interpret trial results.

Potential Roles: Biostatistician, Statistical Programmer, Data Scientist, SAS/R Programmer, Clinical Data Analyst.

Pharmacovigilance: Pharmacovigilance is essential in monitoring drug safety, identifying adverse events, and ensuring that medicines continue to meet safety and efficacy standards post-approval. This field involves analysing real-world drug use data and collaborating with regulatory agencies to maintain patient safety.

Potential Roles: Drug Safety Associate, Pharmacovigilance Scientist, Risk Management Specialist, Signal Detection Analyst, Medical Reviewer.

Data Management: Technology has revolutionised clinical trials, transforming how vast amounts of data are collected, analysed, and interpreted. Experts in this domain ensure seamless data collection, maintaining accuracy, integrity, and compliance with global standards like CDISC.

Potential Roles: Clinical Data Manager, Data Coder, Database Programmer.

Regulatory Affairs: Regulatory Affairs play a crucial role in ensuring that drugs are developed, tested, and approved in compliance with evolving global regulatory standards while maintaining patient safety and product efficacy. Regulatory science is the disciple which combines scientific and technical methods to ensure the safety, quality, and efficacy of products. The Regulatory Affairs professionals act as the bridge between pharmaceutical companies and regulatory agencies such as the Food and Drug Administration (FDA) (U.S.), the European Medicines Agency (EMA) (Europe), the Central Drugs Standard Control Organisation (CDSCO) (India), and other global health authorities. Their role involves preparing and submitting Investigational New Drug (IND), New Drug Application (NDA), Biologics License Application (BLA), and Marketing Authorization Application (MAA) dossiers and facilitating drug approvals. They are also responsible for lifecycle maintenance activities, including labelling updates, post-approval variations, and renewals. The Regulatory Scientists apply data-driven approaches to optimise drug development and regulatory decision-making.

Potential Roles: Regulatory Affairs Associate, Regulatory Affairs Manager, Regulatory Submissions Lead, CMC Regulatory Affairs Specialist, Regulatory Scientist, Regulatory Policy Analyst, Regulatory Intelligence Specialist, Expert Reviewer in Regulatory Agencies.

Medical Writing: Medical Writing plays a crucial role in clinical research by developing clear, accurate, and regulatory-compliant documents essential for drug development and approval. It involves drafting protocols, investigator brochures, informed consent forms, clinical study reports, and regulatory submissions to ensure scientific and regulatory clarity. Effective medical writing facilitates communication between researchers, regulatory agencies, and healthcare professionals.

Potential Roles: Medical Writer, Regulatory Writer, Scientific Communications Manager.

Quality Assurance: Quality Assurance ensures compliance with Standard Operating Procedures (SOPs), protocols, and ethical standards in clinical research and drug development. It focuses on risk management, regulatory adherence, and maintaining data integrity to ensure high-quality outcomes.

Potential Roles: Quality Assurance (QA) Auditor, GCP Compliance Specialist, Quality Management Lead.

Future of Clinical Research in India

India's clinical research landscape is rapidly evolving, driven by significant regulatory advancements, technological growth, and the expansion of Global Capability Centres (GCCs). These factors are creating new career opportunities, positioning India as a key player in the global drug development and clinical research industry.

A career in clinical research typically requires a background in life sciences, pharmacy, medicine, or allied health sciences. While a Bachelor's or Master's degree (MBBS, BDS, BAMS, BHMS, B.Sc., M.Sc.) enables entry into the industry, advanced degrees like PhD or MD help in career development.

To pursue a career as a Biostatistician or Statistical Programmer in drug development, a Bachelor's degree in Mathematics, Statistics, Computer Science, or Life Sciences is required, with a master's or PhD in Biostatistics, Statistics, or Epidemiology preferred for specialised roles. Proficiency in statistical analysis and programming languages like SAS, R, Python, STATA, or SPSS is essential, along with a strong understanding of clinical trial design, regulatory guidelines, and GCP.

Many pharmaceutical companies and Contract Research Organizations (CROs) offer internship programmes that provide hands-on experience in clinical trials and research methodologies. Aspiring clinical research professionals should pursue these opportunities to gain practical knowledge, enhance their skills, and improve their job prospects.

Beyond technical expertise, soft skills play a pivotal role in clinical research. Leadership, teamwork, conflict resolution, and critical thinking are essential in ensuring smooth collaboration and problem-solving. Professionals must analyse data, address unexpected challenges, and make informed decisions quickly, particularly in high-pressure situations.

Growing Demand in India

The clinical research industry in India is poised for significant growth, offering diverse career opportunities for professionals across various domains. A career in clinical research requires a balance of scientific expertise, ethical commitment, and interpersonal skills. It is a field that not only drives healthcare innovation but also impacts patient lives. The journey demands continuous learning, intellectual curiosity, and emotional intelligence. Ultimately, clinical research professionals are more than just scientists or managers—they are leaders, innovators, and advocates for ethical, effective, and transformative medical advancements.

As India continues to expand its footprint in global drug development, opportunities in clinical research are growing rapidly. Professionals with the right skill set can make significant contributions to advancing medical science and improving patient care. BS

How India's Vaccine Renaissance Rests on Innovative & Equitable Solutions

Thanks to its strong R&D ecosystem and smart partnerships, India will be able to play a bigger role in redefining global health equality by making innovative vaccines accessible. The Indian vaccine environment will undergo a dramatic transformation in the next few years due to a spike in investments in innovative vaccine technologies, production platforms, and logistics solutions.

« **Ruplekha Choudhurie,** Research Manager, Advanced SciTech, Everest Group

India is renowned for its prowess in scalable and affordable vaccine manufacturing, producing a diverse range of vaccines, including inactivated and live vaccines, protein subunit vaccines, and next-generation vaccines like viral vector vaccines, mRNA, and DNA vaccines. It manufactures 50 per cent of the world's vaccines, and in the last year alone, 4 billion doses of the 8 billion vaccine doses manufactured and distributed globally, were produced in India. Key developers, including global leaders like Serum Institute of India (SII), Bharat Biotech, and Biological E have been instrumental in addressing many globally relevant health challenges and improving preventive healthcare for millions of people.

Improved R&D ecosystem to develop cutting-edge vaccines for global access

In recent years, Indian companies have shifted their focus from mass manufacturing to a more streamlined approach that aims to improve R&D capabilities, building innovative platforms, vaccines, and delivery solutions indigenously. Some of the groundbreaking vaccines launched in the last 2 years include innovative ones such as ZyCoV-D, the world's first COVID DNA vaccine and GEMCOVAC-19 - India's first indigenously developed mRNA vaccine. World Health Organization (WHO) also granted emergency use listing (EUL) for CORBEVAX-India's first protein subunit COVID vaccine developed by Biological E in 2024. Besides COVID, India has also been at the forefront of innovations launching many "First in India" vaccines for infectious diseases with high unmet needs. Indian Immunologicals Limited (IIL), a fully-owned subsidiary of the National Dairy Development Board (NDDB), launched India's 'first' indigenously developed Hepatitis A vaccine, Havisure, earlier in 2024. In August 2024, Bharat Biotech launched Hillchols, India's first oral cholera vaccine (OCV), developed in collaboration with MSD, Wellcome-Trust Hilleman Laboratories, to address the critical shortage of OCVs.

Another innovation-driven organisation, Novo Medi Sciences, has been making rapid progress and is set to launch its three next-gen vaccines for Meningitis, Pneumonia, and Shingles in 2025. These are already in Phase 3 clinical trials in India, and the commercialisation of this shingles vaccine will make it India's first and only indigenous live vaccine requiring a single dose to provide lifetime immunity. The company also aims to roll out phase 3 trials for India's first Hand Foot Mouth disease in 2025, as well as other vaccines for cervical cancer and typhoid.

Malaria, Zika and other vector borne diseases are a critical concern in many tropical countries and the demand for effective vaccines is on the rise. The only two WHO-approved malaria vaccines, which were developed by UK scientists at GSK and Oxford University, are now manufactured at scale in India by Bharat Biotech and Serum Institute of India. These next-gen malaria vaccines can be manufactured at scale and low costs, enabling wide adoption across countries where the disease burden is very high. Public private partnerships (PPPs) are also notable to foster innovation and recently, IIL entered a collaboration with the Indian Council of Medical Research (ICMR) to develop India's first codon-deoptimised live attenuated virus-based Zika vaccine.

Transforming challenges into opportunities through innovation

Few Indian companies are working on developing stable formulations and easier-to-deliver oral,

needle-free, and intranasal formulations for mass immunisation. After, iNCOVACC, which was the world's first and India's indigenously developed intranasal COVID-19 vaccine, the launch of Indian Immunologicals Limited's needle-free intranasal COVID-19 vaccine is another milestone in advancing delivery by using live-attenuated virus and codon deoptimisation platform. The industry buzz around mRNA vaccines and therapeutics continues, and there is a notable surge in developments around this versatile and flexible platform.

PopVax, an Indian full-stack biotechnology company that used computational tools to develop mRNA vaccines and therapeutics, received a $1.5 million grant from Bill & Melinda Gates Foundation in October 2023 to develop thermostable vaccines using lipid-polymer delivery. It also received a $$2 million "Patch Forward Prize" from BARDA grant in January 2025 to develop its seasonal influenza vaccines using its novel mRNA platform that will be delivered via a dissolvable microarray patch.

Developing pain-free vaccines will significantly impact improving adoption, and other companies are also working on integrating needle-free technologies into their solutions. For example, SII made a strategic investment in IntegriMedical in May 2024, acquiring 20 per cent stake in the company to advance the patented Needle-Free Injection System technology to develop accessible vaccines.

Addressing last-mile challenges with robust supply chain solutions that can address cold chain challenges is highly relevant in many emerging nations. To address cold chain gaps in delivering life-saving vaccines and drugs, Indian health tech company Enhanced Innovations launched its portable cooling solution Phloton in May 2024, designed for vaccine delivery in resource-limited areas. This cold chain solution aims to address the last-mile delivery challenge by maintaining the required temperature of vaccines using integrated solar panels. The solution addresses the last-mile challenges in healthcare delivery, particularly in remote areas with limited access.

Enhancing preparedness and vaccine delivery

Global collaboration in vaccine research and development is critical in navigating the public health crisis. National agencies and organisations are collaborating to build a robust vaccine landscape and a resilient supply chain. In May 2024, Department of Animal Husbandry & Dairying (DAHD), entered a memorandum of understanding with the United Nations Development Programme (UNDP) to improve vaccine cold chain digitalisation in India and build manufacturing capacity.

International organisations and vaccine networks, such as WHO, GAVI (the Vaccine Alliance), the Coalition for Epidemic Preparedness Innovations (CEPI), and the Gates Foundation are partnering with many Indian companies and research organisations, to boost vaccine innovation, manufacturing, and distribution. GAVI inked a new partnership with the Government of India in 2023 that aims to provide vaccinations to children who haven't received routine vaccinations. Gavi will pump in $250 million in this three-year partnership, which will provide vaccinations to millions of children and reduce the number of zero-dose children in India by 30 per cent by 2026.

In addition to prophylactic vaccines, developing therapeutic vaccines for cancer and other serious diseases is also a growing R&D focus in the US and a few European nations. India has also embarked on its journey to develop therapeutic vaccines for common cancers like Human papillomavirus (HPV) and is a part of the Quad Countries Cancer initiative, the Quad Cancer Moonshot will serve to strengthen the overall cancer care ecosystem in the Indo-Pacific. India has also committed a $7.5 million grant to strengthen local efforts for the prevention and detection of HPV and aims to provide 40 million vaccine doses to combat cervical cancer as a part of this Cancer Moonshot initiative.

The threat from emerging pathogens is looming, and nations must brace themselves to face such possible endemics and pandemics with a robust and resilient healthcare infrastructure to roll out vaccines for both known and novel pathogens within a short turnaround time. Recently, Indian Immunologicals, in collaboration with the government of India, hosted a scientific conclave in Hyderabad. The conclave called for collaboration and focused on pandemic preparedness and vaccine innovation. Including SII in the CEPI vaccine manufacturing network is a notable measure to address possible future infectious disease outbreaks by supporting an organisation like SII. CEPI will invest $30 million in SII to improve and build its capabilities. Being a part of this network would enable SII to produce large doses of vaccines within 100 days of an outbreak.

Not just a manufacturing powerhouse

The future of India's vaccine innovations is expected to be transformative, and the country's role in redefining global health equity by making cutting-edge vaccines accessible will be augmented with its robust R&D ecosystem and strategic collaborations. In the next few years, investments into novel vaccine technologies, manufacturing platforms, and logistics solutions will surge, and the Indian vaccine landscape will evolve significantly. BS

Protect Public Health by Safeguarding Indian Gloves Sector

The global demand for high-quality protective gloves has been steadily increasing, and India's domestic manufacturing sector is in position to offer safe, compliant, and cost-effective alternatives to the substandard chlorinated gloves that continue to flood the market illegally. By shifting to the widespread use of nitrile gloves, India could significantly impact its pharmaceutical industry, tackling key issues related to public health, safety, and environmental sustainability.

Anindith Reddy,
Managing Director,
Wadi Surgicals
(Enliva)

Nitrile gloves are essential for safeguarding workers in the pharmaceutical sector from harmful contaminants, allergens, and toxins. With stringent regulatory oversight and a focus on manufacturing standards, India can become a global leader in producing high-quality gloves.

Challenges in Regulation and Enforcement

The Union Government banned the use of chlorinated gloves in India through the Biomedical Waste Rules of 2016, aiming to protect both healthcare professionals and the environment. However, weak enforcement and regulatory loopholes have allowed substandard products to thrive in the market. Profit-driven importers are bypassing quality checks imposed by the Central Drugs Standard Control Organisation (CDSCO) and the Bureau of Indian Standards (BIS) by misclassifying and under-declaring these gloves, thus evading customs duties and other checks. Domestic manufacturers, such as Enliva, adhere to stringent global and Indian standards, investing heavily in quality control and compliance. With the right government support, these manufacturers could reach their full potential. However, the influx of substandard gloves—imported in bulk and packed in gunny bags from countries like Malaysia, Thailand, China, and Vietnam—distorts the competitive landscape, undermines local efforts, and stifles growth.

Economic Impact

Indian importers not only bring in substandard gloves but also often misclassify these products as healthcare goods to take advantage of a lower GST rate of 12 per cent, instead of the standard 18 per cent rate for gloves. This misclassification results in a loss of 6 per cent in tax revenue for the government, which impacts national revenue. In addition to this financial loss, it also affects employment opportunities across manufacturing, distribution, and retail sectors. According to industry associations, over Rs 500 crore worth of gloves were imported into India in 2023, undermining the government's "Make in India" initiative and causing significant revenue loss for the exchequer. Industry bodies like the Indian Rubber Gloves Manufacturers Association (IRGMA) have submitted multiple petitions to relevant ministries, urging the implementation of stricter regulations to eliminate banned chlorinated gloves from the Indian market. Additionally, IRGMA has long been advocating for the introduction of a Quality Control Order (QCO) for gloves to prevent substandard imports and ensure better compliance.

Protect the interest of local players

The production cost of high-quality nitrile gloves in India ranges from Rs 1.2 to Rs 1.5 per piece, while substandard gloves enter the market at Rs 0.8 to Rs 1.0 per piece. This price disparity, combined with the lack of stringent quality controls on imported gloves, gives foreign manufacturers an unfair advantage. To protect domestic manufacturers and promote the growth of small and medium enterprises (SMEs), the government should introduce Production Linked Incentive (PLI) schemes, anti-dumping duties, and other policy measures. Industry bodies, including IRGMA, are urging the Union Government to enforce rigorous customs inspections, introduce a Minimum Import Price (MIP), impose penalties for non-compliance, and increase surveillance of imports. These actions will help protect public health, safeguard domestic manufacturers, and ensure a sustainable future for India's healthcare sector. By working together, the government and industry associations can build a stronger, more self-reliant India. BS

BioEconomy Conclave 2025

We're on a mission to make India a global leader in Frontier Tech: Debjani Ghosh

Priyank M Kharge, Minister - Rural Development & Panchayat Raj, IT & BT, Government of Karnataka addressing the gathering while, (L-R) G S Krishnan, President, ABLE; Dr Kiran Mazumdar-Shaw, Non-Executive Chairperson, ABLE, and Executive Chairperson - Biocon & Biocon Biologics and Dr PM Murali, President, ABLE Council of Presidents look on at the inaugural session of the BioEconomy Conclave 2025 held on February 13 in Bengaluru.

"From AI breakthroughs revolutionising healthcare to bioengineering innovations addressing food security and renewable energy advancements driving sustainability, Frontier Technologies offer solutions to the world's most pressing challenges," said Debjani Ghosh, Distinguished Fellow & Chief Architect - NITI Frontier Tech Hub, NITI Aayog, New Delhi.

Speaking at the BioEconomy Conclave 2025 organised by the Association of Biotechnology Led Enterprises (ABLE), a not-for-profit pan-India forum that represents the Indian biotechnology sector in Bengaluru on February 13, in a virtual mode Debjani said, "As we innovate, we must also create ethical frameworks, invest in R&D, and build partnerships that ensure these technologies drive progress safely and inclusively. The NITI Frontier Tech Hub is committed to accelerating this vision by enabling India's readiness for innovation and adoption."

She added "The era of Frontier Technologies is set to redefine our world—a Force Multiplier moment, comparable to the advent of electricity or the internet. This is a time of unparalleled innovation, where new industries will emerge, economies will transform, and societal shifts will redefine how we live and work."

Speaking about India's quest for the top spot, Debjani concluded, "We are on a mission to make India a global leader in Frontier Tech. We're looking for passionate young minds in tech to join us in shaping this vision. This is your chance to be part of something truly transformative."

Speaking at the event, Dr Kiran Mazumdar-Shaw, Non-Executive Chairperson, ABLE, and Executive Chairperson - Biocon & Biocon Biologics, said that Chinese life sciences organisations, with the support of government agencies have been contributing a lot with use of novel, disruptive and deep technologies. It should be seen as a call for us to focus on frontier technologies, and learn from biology using genomics data.

In his address Priyank M Kharge, Minister - Rural Development & Panchayat Raj, IT & BT, Government of Karnataka said, "Bio-entrepreneurship is deeply rewarding because it tackles real-world challenges with innovation. Karnataka is at the forefront of this innovation, contributing $31 billion to India's bioeconomy. We have more than 1,000 startups registered in the biotech space with the IT & BT department, Government of Karnataka and we are doing everything we can to ensure they thrive. However, to truly accelerate growth, we need greater focus on skilling, R&D and funding."

As part of the "BioEconomy Conclave 2025", a one-day programme on the theme "Focusing on Emerging Technologies in Shaping the World" was packed with sessions on BioPharma, BioIndustrial, TechMed, BioAgri, BioStartups & BioInvestors. The mega event brought under one roof, over 150 key stakeholders, innovators, and leaders from across the biotech spectrum. BS

Dvara Health Finance, IIHMR unveil diploma in community health and digital healthcare operations

Dvara Health Finance (DHF) and the Institute of Health Management Research (IIHMR), Bengaluru, have signed a Memorandum of Understanding (MoU) to jointly develop and launch a Diploma in Community Health and Digital Healthcare Operations. This pioneering programme is designed to train healthcare workers to bridge gaps between patients, digital health technologies, and licensed healthcare providers, particularly in rural and underserved areas. The 11-month diploma

programme is structured into four competency-based levels: Community Health Facilitator; Digital Health Technician; Digital Multipurpose Health Worker; Community Health Leader.

With a strong practical and field-based training component, the programme ensures that graduates are equipped to strengthen primary healthcare services and improve health outcomes through digital tools and community-driven interventions. The curriculum is aligned with Health Sector Skill Council (HSSC) standards, ensuring graduates are job-ready and equipped with industry-recognised competencies. The course is likely to be launched in August 2025.

IIT-D to launch transformative co-innovation centres in Deep Tech, AI & Robotics

I-Hub Foundation for Cobotics (IHFC), Technology Innovation Hub of the Indian Institute of Technology Delhi (IIT-D) is embarking on a transformative journey by collaborating with ten prestigious institutes in India to establish Co-Innovation Centres (CiC). Among the other premier institutes ready for immediate launch of their CiCs are the Indian Institute of Engineering Science and Technology (IIEST) Shibpur, Kolkata; Thapar Institute, Patiala; SRM University of Science and Technology, Chennai; Indian Institute of Technology Gandhinagar; and many others, representing a wide geographic and academic reach. In the near future, CiC will be further opened in collaboration with the following institutes: Karunya Institute of Technology and Sciences (KITS), Coimbatore; Crescent Innovation Incubation Council (CIIC), Vandalur, Tamil Nadu; Nitte Meenakshi Institute of Technology (NMIT), Bengaluru; Delhi Technological University (DTU), Delhi; and Indraprastha Institute of Information Technology, Delhi.

UPES announces strategic partnership with Medical University of the Americas

The School of Health Sciences and Technology (SOHST) at UPES, a multi-disciplinary university in India, has announced a strategic first-of-its-kind partnership with the Medical University of the Americas (MUA). This collaboration marks a significant milestone in advancing medical education opportunities for aspiring doctors in India. Under this partnership with MUA, UPES will offer an accelerated pathway into medical education with admissions to the prestigious 5-Year BSc/MD undergraduate programme (1+2+2 years), with applications commenced in February 2025 for August 2025 intake. The programme consists of one year at UPES, followed by two years of pre-clinical education at MUA's campus on St. Kitts, Nevis Island, and two years of clinical rotations in affiliated hospitals in the US. In the first year, students will be enrolled at the SOHST at UPES, in the Pre-Medical Certificate Programme. Upon successful completion of the first year, they will earn around 47 credits which can be transferred for progression to the MUA. Contingent on clearing all assessments and meeting MUA's eligibility criteria, students will receive a $50,000 scholarship, distributed over 13 semesters at MUA. This special inaugural scholarship is available exclusively to students who complete the Pre-Medical Certificate at UPES.

Bhavin Mukund Mehta steps in as Vice-Chairman of Pharmexcil

Pharmaceuticals Export Promotion Council of India (Pharmexcil), a leading authorised body of the Government of India for promotion of pharmaceutical exports from India has appointed Bhavin Mukund Mehta, Wholetime Director, Kilitch Drugs (India) Limited as the Vice-Chairman of the council. Mehta is an industry veteran with over 25 years of experience in the pharmaceutical industry. As the Director at Kilitch Drugs (India) Ltd, he took the initiative to establish the company's export business, expanding its reach beyond Indian boundaries while leading in the domestic market. His extensive knowledge and expertise in leadership, business development, strategy management, international marketing, and operations will greatly benefit the esteemed members of Pharmexcil. In 2012, Mehta was appointed Chairman of the Exhibition Committee for Pharmexcil by the Ministry of Commerce. He played a key role in establishing IPHEX, India's largest exhibition to promote pharmaceutical exports to other countries.

Lilly India names Winselow Tucker as President and General Manager

Eli Lilly and Company (Lilly) has announced the appointment of Winselow Tucker as President and General Manager for Lilly India, effective immediately. Winselow will lead all of Lilly's operations in India, including the Lilly India commercial organisation and the Lilly Capability Centre India (LCCI) in Bengaluru and Hyderabad. In a related move, Vineet Gupta, Associate VP, Managing Director, India, will transition to a new leadership role in Lilly's headquarters in Indianapolis, USA. Since joining Lilly in 2022, Winselow has served as Group Vice President and Chief Commercial Officer of Lilly Oncology. In this role, he led the commercialisation activities for the Oncology Business, including overseeing US and global teams in the development of go-to-market strategies, new product development, and leadership of the US oncology business.

Roche Pharma India appoints Rajwinder Mehdwan as new Country General Manager

Roche Pharma India has announced the appointment of Rajwinder (Rajji) Mehdwan as country General Manager, effective April 1, 2025. She will also join the CEETRIS (Central Eastern Europe, Turkey, Russia & Indian Subcontinent) region leadership team, reporting to Francois du Toit, Area Head of CEETRIS, Roche Pharmaceuticals. Rajji joins at a time when Roche has been increasing its commitment to India by expanding into new therapy areas through innovative launches, strategic partnerships and investments. Rajji brings over 20 years of experience in the healthcare industry, having held key leadership positions at Roche and prior to that at Johnson & Johnson. She joined Roche in 2010 as Associate Director, Virology and Specialty Care business for Genentech. Rajji has since contributed significantly to Roche's success through her diverse leadership roles - as Portfolio Operations Leader for BioOncology, Portfolio Strategy Director for Denmark, and as the General Manager for Roche Pharma Norway.

Centre announces winners of Padma Awards 2025

The government has announced Padma Awards - one of the highest civilian Awards of the country, on January 25. These are conferred in three categories, namely, Padma Vibhushan, Padma Bhushan and Padma Shri. The Awards are given in various disciplines/ fields of activities, viz.- art, social work, public affairs, science and engineering, trade and industry, medicine, literature and education, sports, civil service, etc. The winners in the medicine field include- Duvvur Nageshwar Reddy

(Telangana) (Padma Vibhushan); Jose Chacko Periappuram (Kerala) (Padma Bhushan); Ashok Kumar Mahapatra (Odisha); Budhendra Kumar Jain (Madhya Pradesh); Hemant Kumar (Bihar); Neerja Bhatla (NCT Delhi); Sheikha Shaikha Ali Al-Jaber Al-Sabah (Kuwait); Soniya Nityanand (Uttar Pradesh); and Vijayalakshmi Deshamane (Karnataka), Vilas Dangre (Maharashtra) (Padma Shri). Dr Chetan Chitnis (Science and Engineering) (France) (Padma Shri) and Pankaj Patel (Trade and Industry)(Gujarat) (Padma Bhushan) are some of the other winners working in the area of life sciences.

Dr Cyrus S. Poonawalla receives 2nd Dr. K. Anji Reddy Memorial Fellowship

The Institute of Chemical Technology (ICT Mumbai), under its flagship initiative, the Mumbai Biocluster, has awarded 2nd Dr. K. Anji Reddy Memorial Fellowship for Affordable Biopharmaceuticals to Dr Cyrus S. Poonawalla, Chairman, Serum Institute of India, a revolutionary entrepreneur, in recognition of his exceptional contributions to biopharmaceutical innovation and global healthcare. Dr Cyrus S. Poonawalla's extraordinary contributions to global healthcare have established India as a hub for affordable vaccines, saving billions of lives worldwide. As the visionary chairman of the Serum Institute of India, Dr Poonawalla has demonstrated how innovation and unwavering dedication can drive transformative change. His remarkable legacy, delivering over 1.5 billion vaccine doses annually to more than 170 countries, and his pivotal role in combating the COVID-19 pandemic stand as enduring testaments to his leadership and commitment to humanity.

Intuitive announces new Vice President and General Manager in India

Medtech firm Intuitive, a global technology leader in minimally invasive care and the pioneer of robotic-assisted surgery, has announced its appointment of Rohitt Mahajan as vice president and general manager for India. Mahajan will lead the company's business strategy and operations. Mahajan brings more than 17 years of diverse experience in sales, marketing, strategy, and operations in the healthcare, consumer durables, and IT sectors. Since joining Intuitive in 2018, he has held key leadership roles, including area sales director for India and director of commercial operations for Asia, where he contributed to the expansion of Intuitive's commercial operations capabilities and range of global offerings across India and broader Asia region including China, Japan, South Korea, and Taiwan. Intuitive began direct operations in India in 2018 and has focused on advancing minimally invasive care across the country through the adoption of its robotic-assisted surgical systems.

IIT-M launches first-of-its-kind cancer genome database

The Indian Institute of Technology Madras (IIT-M) in collaboration with Karkinos Healthcare, Mumbai, the Chennai Breast Clinic and Cancer Research and Relief Trust, Chennai, has announced the completion of the Indian breast cancer genome sequence generation and released the 'Bharat Cancer Genome Atlas' (BCGA). The institute has made this database publicly accessible at bcga.iitm.ac.in to researchers and clinicians in India and abroad. The research was led by the Institute's Centre of Excellence on Cancer Genomics and Molecular Therapeutics, which was funded under the Government of India's 'Institutions of Eminence' initiative. This database aims to be an invaluable resource to identify cancer-specific biomarkers in India, which will enable early detection of breast cancers. Further, it will also be very useful to identify novel drug targets for developing better treatment strategies specific to the Indian population. This Genome Atlas also provides knowledge on the genetic basis of cancer progression and evolution and may help the biomedical research and healthcare system in India shift toward a vision of "personalised medicine" which may improve the standard of medical care by including an individual's genetic and molecular information in the clinical decision-making process.

IIT-G designs multi-stage clinical trial method for revolutionising personalised medical care

Researchers at the Indian Institute of Technology Guwahati (IIT-G), in collaboration with leading institutions worldwide, have developed an innovative multi-stage clinical trial method aimed at revolutionising personalised medical care. This cutting-edge approach adapts treatment plans in real-time based on each patient's unique responses during trials, enabling highly tailored and effective healthcare solutions. The research, conducted in partnership with Duke-NUS Medical School, the National University of Singapore, Singapore, and the University of Michigan, USA, focuses on Dynamic Treatment Regimes (DTRs) designed through Sequential Multiple Assignment Randomised Trials (SMARTs). Together, these frameworks tackle the critical challenge of optimising treatment strategies, a sequence of treatments, for patients with varying responses to therapies over time. Multi-stage clinical trials are essential for developing effective DTRs, and SMART methodology enables researchers to test various treatment sequences to find the best fit for each patient. Unlike traditional trials, SMART involves multiple stages of treatment, where patients are reassigned based on their responses to earlier interventions.

INST Mohali develops drug delivery system to revolutionise treatment of Rheumatoid Arthritis

Researchers from Institute of Nano Science and Technology (INST) Mohali, an autonomous institution of the Department of Science and Technology (DST), have developed an innovative "self-actuating" drug delivery system that could revolutionise the treatment of rheumatoid arthritis (RA) by targeting inflammation directly within the joints so that therapeutic agents are released only when needed. It is a smart system that responds directly to the biochemical signals in the inflamed synovial environment. By targeting specific inflammatory enzymes present in the joints, the system ensures that therapeutic agents are released only when needed, offering a more precise and safer treatment option for RA patients. This breakthrough could offer a safer, more effective alternative to current RA treatments by eliminating the need for frequent drug injections and reducing systemic toxicity. The system enhances drug effectiveness by improving bioavailability and retention in the affected joints, leading to longer-lasting relief with fewer doses.

IIIT Hyderabad and NIMS create pathology datasets for cancer & kidney disease

In a boost to India-centric clinical research and development, International Institute of Information Technology, Hyderabad (IIIT-H), in collaboration with Nizam's Institute of Medical Sciences (NIMS), Hyderabad has unveiled publicly available datasets comprising digitised histopathological images of brain cancer and kidney disease (Lupus Nephritis). The India Pathology Dataset (IPD) project, is a multi-stakeholder joint venture between academia, hospitals, industry, and the government to digitise slide images of tissue biopsies for reaping benefits that range from reduced risk of damaging physical slides to improved clinical decision-making, to improve turnaround time and bettering research opportunities with the help of artificial intelligence (AI). As part of the initiative supported by iHub-Data, IIIT-H installed a whole slide digital scanner at the premises of NIMS, Hyderabad. One of the first datasets that has been released is the IPD-Brain dataset in Nature Scientific Data – a prestigious, open-access, online-only journal for descriptions of scientifically valuable datasets.

IIT-G develops nanomaterial for mercury detection in cells & environment

A team of researchers at the Indian Institute of Technology Guwahati (IIT-G) has developed an innovative approach to detecting harmful metals in living cells and the environment. The team has introduced a cost-effective method for identifying toxic metals like mercury in human cells. This innovation could revolutionise disease diagnostics and environmental monitoring by improving the detection and management of metal toxicity in biological systems. Central to this research are perovskite nanocrystals, cutting-edge materials known for their exceptional properties, making them ideal for detecting metal ions. These nanocrystals, about 100,000 times smaller than a human hair, interact with light in significant ways, enabling them to serve as fluorescent probes inside living cells. However, their quick degradation in water has previously limited their applications. To address this, the researchers encapsulated the perovskite nanocrystals in silica and polymer coatings, significantly enhancing their stability and luminescent intensity in water.

JNCASR brings new system for wearable devices that can detect stress

Using a silver wire network on a stretchable material, scientists from Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), Bengaluru, have developed a device that senses strain, mimics pain perception and adapts its electrical response accordingly. By recreating these pain-like responses, the device paves the way for future smart wearable systems that can help doctors detect stress. When the material is stretched, small gaps appear within the silver network, temporarily breaking the electrical pathway. An electric pulse can then prompt the silver to fill these gaps, reconnecting the network and essentially "remembering" the event.

The device sets itself apart by combining sensing and adaptive response in a single, flexible unit and offers a streamlined, efficient way for technology to adapt to its environment naturally, without complex setups or external sensors. The research could lead to more advanced health monitoring systems that "feel" stress like the human body and adapt in real-time, giving feedback to doctors or users. Such technology could also improve robotic systems, helping machines become safer and more intuitive to work with humans.

Revvity unveils revolutionary solution for cellular imaging

Revvity, Inc. has unveiled its groundbreaking new Phenologic.AI software. Designed to redefine cellular imaging workflows for Revvity's Harmony and Signals Image Artist software packages, the Phenologic.AI software leverages pre-trained deep-learning models to analyse brightfield images, providing an additional multiplexing channel and streamlined workflows for live cell analysis. This significant advancement expands the possibilities for understanding cellular behaviours and disease mechanisms. The Phenologic. AI offering provides scalable, efficient, and objective analysis and can be integrated with Revvity Signals Research Suite to provide more in-depth data analytics. Complementing this launch, Revvity has also introduced other notable products, including the latest Harmony 5.3 software, which simplifies data management for high-content imaging and analysis, providing faster and more intuitive data handling. With 2023 revenue of more than $2.7 billion and over 11,000 employees, Revvity serves customers across pharmaceutical and biotech, diagnostic labs, academia and governments.

Sartorius opens new bioprocessing automation lab in Ontario

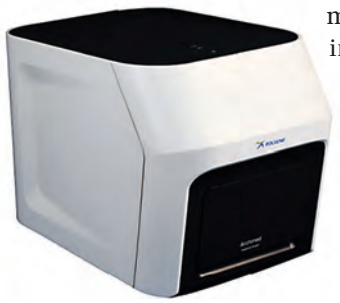
The life science group Sartorius and Canada's McMaster University have opened a new bioprocessing automation lab at the university's Faculty of Engineering in Hamilton, Ontario. The state-of-the-art, 1,600-square-foot research facility was created complementing a substantial contribution of advanced biomanufacturing equipment from Sartorius, a long-standing partner of the university. The lab will serve as a training and development hub, where McMaster students and Sartorius employees work with other industry partners to accelerate developments in bioprocess modelling, simulation and advanced control. The funding for the new facility comes via stage two of the Biosciences Research Infrastructure Fund (BRIF) competition, the center-piece of a $2.2 billion CAD national programme developed to build a strong and resilient domestic biomanufacturing and life sciences sector. This makes it the first BRIF-funded facility to open in Canada. Building on these contributions, a team of McMaster researchers has secured additional Alliance Grant funding from the Natural Sciences and Engineering Research Council of Canada (NSERC) to launch an extensive four-year collaboration with Sartorius.

Shimadzu strengthens business operations in India with new plant in Bengaluru

In order to strengthen business operations in India, which is expected to experience high economic growth, Japan's Shimadzu Corporation will establish the manufacturing subsidiary Shimadzu Manufacturing India Private Limited (SMI) in Bengaluru, Karnataka. Construction of the new plant is scheduled to be completed and operations are to be started in the spring of 2027. Currently, Shimadzu products are supplied to India from Japan or Shimadzu Malaysia Sdn. Bhd. (SML) in Malaysia. Building the new plant will not only strengthen the supply chain but also respond to governmental incentives for domestic production ("Make in India"). SMI will begin manufacturing liquid chromatograph (LC), gas chromatograph (GC), UV-VIS spectrophotometer (UV), liquid chromatograph mass spectrometer (LC-MS), and gas chromatograph mass spectrometer (GC-MS) products in 2027. In addition to analytical and measuring instruments, future manufacturing of medical systems and industrial machinery products are also being considered. Similarly, Shimadzu also plans to merge the analytical and measuring instruments and medical systems sales subsidiaries in India to establish Shimadzu India Private Limited (SIP) by the summer of 2025.

VFL Sciences announces cooperation with RocGene Technology

Chennai-based VFL Sciences and RocGene Technology, based in China, have signed an agreement of cooperation wherein VFL Sciences will exclusively sell the entire range of products from RocGene in India. This multiyear cooperation will enable both companies to explore the Indian market and devise strategies and road map to further strengthen their presence.



India is one of the largest markets for scientific instruments and RocGene is cooperating with VFL Sciences to grow its business further. This cooperation will also enable RocGene to become a prominent player in the molecular research and diagnostics market. RocGene, founded in 2016, has become one of the leading players in the PCR & qPCR market in China and is also present across the globe. The experience from the Chinese and global market will help VFL in the product positioning in India and will also help to explore further possibilities of collaboration in India.

Waters Corp launches new thermogravimetric analyser smart-seal pans

US-headquartered Waters Corporation has announced the launch of thermogravimetric analyser (TGA) Smart-Seal Pans from its TA Instruments Division. The innovative, self-opening sample container is designed to enable analysis of atmosphere-sensitive samples in laboratory benchtop-installed Discovery Series Thermogravimetric Analysers. Designed to be user-friendly, the TGA Smart-Seal Pans allow air-sensitive materials to be prepared, loaded, and sealed in a completely airtight environment. The self-opening pan uses a proprietary temperature-sensitive shape memory alloy configuration to open the sealed pan at around 55°C. This opening occurs automatically without user interaction in the closed TGA to help ensure samples are never exposed to ambient conditions. TGA Smart-Seal Pans can also reduce operating expenses and workflow bottlenecks by enabling preparation of multiple humidity and/or air-sensitive samples at one time. Analysis of air- and humidity-sensitive materials typically requires installation of a TGA device inside an atmosphere-controlled environment. Laboratory gloveboxes can double the cost of a TGA setup and increase maintenance costs. Waters TGA Smart-Seal Pans offer accurate and precise thermogravimetric analysis of atmosphere-sensitive samples without requiring the TGA to be installed in the glove box.

Agilent introduces IDP-35 and IDP-45 dry scroll pumps for high-capacity applications

US-based Agilent Technologies Inc. has announced the launch of Agilent IDP-35 and IDP-45 dry scroll pumps, designed to provide quiet, efficient, oil-free, and worry-free vacuum solutions for applications requiring higher pumping capacity. Consistent with the high standards of all Agilent IDP scroll pumps, the new IDP-35 and IDP-45 pumps offer several key benefits to customers. These pumps are ideal for applications needing higher pumping capacity without the drawbacks of oil-sealed pumps. They operate quietly and are oil-free, ensuring a cleaner work environment and eliminating the risk of oil leaks and contamination. Additionally, maintenance is minimal, simple, and infrequent, required only every two to three years. It can be performed in-house in about half an hour, significantly reducing downtime and service costs. These new Agilent pumps also present a greener alternative to oil-sealed pumps, previously the only option at these higher pump speeds. The pumps are energy-efficient, eliminating harmful oil emissions and the need for hazardous waste disposal.

Further Enhancing Women's Healthcare

The growing focus on women's healthcare announced during the Union Budget 2025-26 is well aligned with International Women's Day which falls on March 8 every year. An allocation of Rs 4.49 lakh crore has been reported for the welfare of women and girls in the gender budget statement of 2025-26, from the gross budgetary support allocation of Rs 3.27 lakh crore in 2024-25, according to a statement from the Ministry of Women and Child Development.

81.79 per cent of the Women and Child Development Ministry's budget will go toward gender-based initiatives, underscoring the government's focus on improving outcomes for women and children.

Another recent development by the government that marks its increased focus on women's healthcare is the launch of GARBH-INi-DRISHTI by the Department of Biotechnology (DBT). As one of South Asia's largest maternal and child health databases, GARBH-INi-DRISHTI has been launched to empower researchers worldwide to conduct transformative research aimed at improving maternal and neonatal health outcomes. Its foundation lies in collaborative efforts across India's leading research institutions and hospitals, representing a powerful synergy of expertise.

The programme focuses on finding solutions for better birth outcomes utilising a multi-pronged approach of integrating clinical epidemiology, multi-omics biomarkers and artificial intelligence (AI)-driven tools for personalised predictions.

The recent partnership between the Federation of Obstetric and Gynecological Societies of India (FOGSI) and the National Accreditation Board for Hospitals & Healthcare Providers (NABH), at a national level sets another example to improve quality healthcare for women in India.

On the other hand, a first-of-its-kind health insurance plan for women called 'HERizon Care', has been introduced by Bajaj Allianz General Insurance. This comprehensive policy addresses critical illnesses, maternal and reproductive health, wellness, and empowering women with financial security throughout their life stages. HERizon Care is the first health insurance plan in India that offers multiple specialised covers in a single policy, providing holistic protection tailored to women's unique needs.

With an investment of Rs 220 crore, Aster DM Healthcare, one of the largest integrated healthcare providers in India, will soon be launching the largest Women & Children Hospital in Hyderabad. This 300-bed state-of-the-art facility will cater to the unique healthcare needs of children and women of all ages, by offering specialised services in obstetrics, comprehensive gynaecological care and complete neonatal & paediatric care.

Further, in a path-changing initiative to combat the rising prevalence of breast cancer among young women in India, the Cancer Research Institute at the Himalayan Institute of Medical Sciences (HIMS), Swami Rama Himalayan University in Dehradun has recently opened India's first dedicated Young Breast Cancer Clinic. Unlike older women, young women with breast cancer encounter distinct challenges, including higher prevalence of aggressive subtypes such as triple-negative breast cancer; and increased likelihood of long-term side effects from treatments.

On a global scale, the United States, Australia, India, and Japan are launching a groundbreaking effort to help end cancer as we know it in the Indo-Pacific, starting with cervical cancer, a largely preventable disease that continues to be a major health crisis in the region, and laying the groundwork to address other forms of cancer as well. This initiative is part of a broader set of announcements made at the Quad Leaders Summit in 2024.

In addition, Quad countries will work together with United Nations agencies on bulk purchasing of HPV diagnostics to bring down the cost of cervical cancer screening and work with the International Atomic Energy Agency to improve access to and quality of medical imaging and radiation therapy.

While multiple initiatives are being taken to improve access to advanced healthcare delivery for women in India, further investment is required into new technologies by both the public and private sectors, along with raising better awareness. Enhancing women's healthcare in India is a crucial need of the hour, and requires a multifaceted approach. BS

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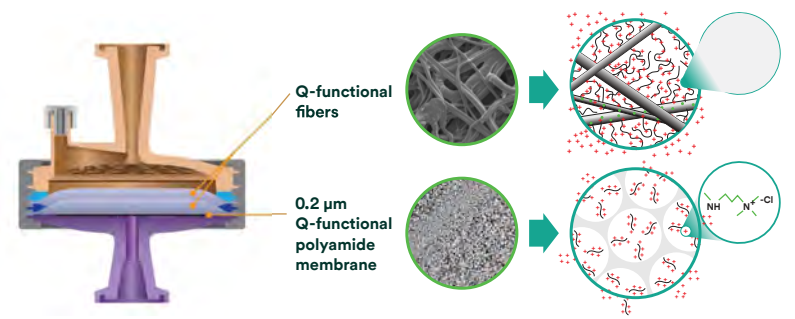

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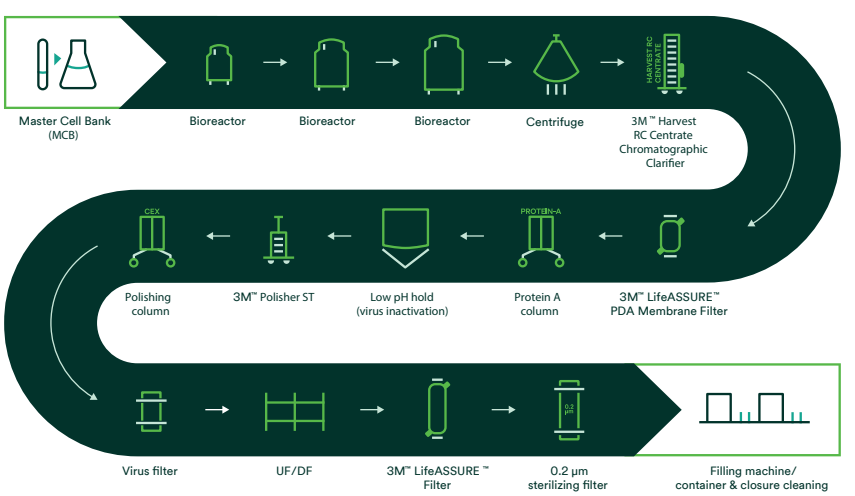

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