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Prime Minister shares article on India's growing strength in pharma sectorr

New Delhi: The Prime Minister, Shri Narendra Modi, has shared an article written by Union Minister, Shri Jagat Prakash Nadda. The article highlights that India's pharma sector is moving from being the 'pharmacy of the world' to a hub of innovation. It notes that under the present government, the focus has been on extensive research and development, biologics, biosimilars and cutting-edge therapies, as India prepares to lead the global race in this sector.

The Prime Minister's Office posted on X - "From the 'pharmacy of the world' to a hub of innovation, India's pharma sector is moving up the value chain. Under the present government, the focus has been on extensive R&D, biologics, biosimilars and cutting-edge therapies. A must-read retrospection by Union Minister Shri @ JPNadda on how India is preparing to lead the global race in this sector!

https://www.thehindubusinessline.com/opinion/india-moving-up-the-pharma-value-chain/article70858640.ece"

Swift progress witnessed of bulk drug parks in Gujarat

New Delhi: The Department of Pharmaceuticals is implementing the scheme for "Promotion of Bulk Drug Parks". The scheme for promotion of Bulk Drug Parks was approved by the Cabinet on 20.03.2020 to facilitate setting up of three Bulk Drug Parks in the country with the objective to bring down the cost of manufacturing of bulk drugs by creation of world class common infrastructure facilities. It would also help in creation of economies of scale for production of bulk drugs.

Under the scheme, three Bulk Drug Parks were approved in FY 2022-23 in the states of Andhra Pradesh, Gujarat and Himachal Pradesh. Financial assistance from the Central Government is provided for creation of Common Infrastructure Facilities (CIF), subject to a maximum of 1,000 crore per park, or 70 per cent of the project cost (90 per cent in the case of North-Eastern and Himalayan States), whichever is less.

The bulk drug parks are offering land and utilities such as power, water, effluent treatment plant, steam, solid waste management, warehouse facilities at a subsidized rate.

The State Implementing Agency, Gujarat Industrial Development Corporation, has utilised ₹341.44 crore out of the two instalments of ₹300 crore each received as Central Grant-in-Aid, and ₹206.92 crore out of ₹274.20 crore from State funds, towards the development of CIF.

Workshop on AI-Driven Drug Discovery focuses on Advanced Tools, Techniques & Applications

New Delhi: A three-day intensive workshop on "AI-Driven Drug Discovery: Advanced Tools, Techniques & Applications" was successfully organized at the CSIR-Human Resource Development Centre (CSIR-HRDC), Ghaziabad, from April 7 to 9, 2026. The programme was exclusively designed for CSIR scientists and technical officers, with the objective of equipping them with advanced knowledge and practical exposure to cutting-edge Artificial Intelligence (AI) tools transforming modern drug discovery.

The workshop was inaugurated in the presence of eminent dignitaries including Prof. G. N. Sastry, Department of Biotechnology, IIT Hyderabad; Dr. T. S. Rana, Head, CSIR-HRDC; Dr. Vinay Kumar, Scientist G & Programme Convener; and Mrs. Preeti Chaudhary, Programme Coordinator.

In his inaugural address, Prof. Sastry highlighted the transformative role of AI in revolutionizing the drug discovery process and emphasized the growing importance of interdisciplinary approaches in pharmaceutical research. Dr. Vinay Kumar also presented a comprehensive overview of the workshop, outlining its vision, objectives, and the rationale behind conceptualizing this programme to address emerging needs in AI-driven drug discovery.

Over the course of three days, the workshop featured a series of insightful lectures and interactive sessions delivered by distinguished experts from premier institutions. Notable contributors included Prof. Prabha Garg (NIPER, SAS Nagar), Prof. D. Sunder (Director, IBAB), Dr. Arijit Roy (TCS, Hyderabad), and Dr. S. Nagamani (CSIR-NEIST), who shared their expertise, real-world applications, and emerging perspectives in AI-enabled drug discovery.

The technical sessions on AI in Target Identification and Biomarker identification, AI-Assisted Molecular Docking & Scoring and AI in Bimolecular Simulation were particularly well-received. Experts such as Dr. Rajnish Kumar, Associate Professor (IIT BHU, Varanasi),

Dr. Firoz Khan (CSIR-CIMAP), and Dr. Tarak Karmakar (IIT Delhi) provided in-depth knowledge and hands-on insights, significantly enhancing participants' understanding of advanced computational approaches in drug discovery.

The workshop received highly positive and encouraging feedback from participants, which will serve as a guiding framework for organizing future programmes. The programme successfully provided a dynamic platform for knowledge exchange, skill enhancement, and fostering innovation in the rapidly evolving domain of AI-driven drug discovery.

Granules Life Sciences receives VAI classification following US FDA inspection

Hyderabad: Granules India Limited has announced that its wholly owned subsidiary, Granules Life Sciences Private Limited (GLS), has concluded a recent US FDA inspection of its manufacturing facility at Shamirpet, Telangana, with an inspection classification of Voluntary Action Indicated (VAI).

The Establishment Inspection Report (EIR) was issued following a current Good Manufacturing Practice (cGMP) and pre-approval inspection (PAI) of the oral solid dosage manufacturing operations conducted between December 15 and 19, 2025. The inspection is now closed, and no regulatory action has been recommended.

Dr. Krishna Prasad Chigurupati, Chairman and Managing Director, Granules India Limited, said, "While receiving the classification is a step in the right direction, we recognize that quality is not a one-time milestone but an ongoing commitment. It will continue to remain a core pillar of utmost importance across all Granules sites, guiding our actions, investments, and culture every day."

This development further strengthens Granules India's finished dosage manufacturing capabilities by enabling multi-site manufacturing for the approved products.

Aurobindo Pharma receives USFDA approval for Dextromethorphan Polistirex extended release oral suspension

Hyderabad: Aurobindo Pharma Limited (APL) has received final approval from the US Food & Drug Administration (USFDA) to manufacture and market Dextromethorphan Polistirex extended-release oral suspension, 30 mg/5 mL (OTC). The suspension is bioequivalent and therapeutically equivalent to the reference listed drug (RLD), Delsym Extended Release Oral Suspension, 30 mg/5 mL, of RB Health (US) LLC.

The product will be manufactured at Unit-IV of APL Healthcare Limited, a wholly owned subsidiary of the company, and will be launched in Q2FY27. The approved product has an estimated market size of US$ 138 million for the 12 months ending February 2026, according to Nielsen. Aurobindo Pharma now has a total of 580 ANDA approvals (557 final approvals and 23 tentative approvals) from USFDA.

Dextromethorphan Polistirex Extended-Release Oral Suspension (OTC) temporarily relieves cough due to minor throat and bronchial irritation as may occur with the common cold or inhaled irritants and also the impulse to cough to help one get to sleep.

Rusan Pharma achieves global GMP milestone with PMDA Japan approval

Dehradun (Uttarakhand) facility.

Mumbai: Rusan Pharma, a leading pharmaceutical company pioneering pain management, movement disorder, and addiction solutions worldwide, has achieved a global regulatory milestone with the successful Good Manufacturing Practice (GMP) approvals from Japan's Pharmaceuticals and Medical Devices Agency (PMDA). This achievement reinforces the company's commitment to world-class quality, compliance, and global manufacturing excellence.

Rusan Pharma's facilities in Ankleshwar (Gujarat) and Dehradun (Uttarakhand) have successfully secured GMP approval from the PMDA, Japan, one of the most stringent regulatory authorities globally. The approval covers the company's Active Pharmaceutical Ingredient facility in Ankleshwar and its Small Volume Parenterals (Ampoules) Finished

Dosage Formulation manufacturing line in Dehradun.

This milestone marks a significant step in Rusan Pharma's global growth journey, enhancing its ability to cater to highly regulated markets such as Japan while expanding its portfolio of high-quality pharmaceutical offerings.

Rusan Pharma continues to invest in strengthening its manufacturing infrastructure, quality systems, and regulatory preparedness, driven by a long-term vision to be a trusted global partner in pharmaceutical manufacturing and healthcare delivery.

CuraTeQ Biologics announces positive top-line results for Phase 3 study of Omalizumab Biosimilar BP11

Hyderabad: CuraTeQ Biologics Private Limited, a wholly owned subsidiary of Aurobindo Pharma Ltd and a biopharmaceutical company developing biosimilars, has announced positive top-line results from its Phase 3 study of BP11, an investigational biosimilar to Xolair® (omalizumab).

The study successfully met all primary endpoints, showing high comparability to the reference product in patients with Chronic Spontaneous Urticaria (CSU) at the 300 mg dose. The trial was conducted in 608 patients across approximately 80 sites in seven European countries and India, evaluating change from baseline in ISS7 (7-point Itch Severity Score) at week 12, the main primary endpoint applicable for both FDA and EMA approvals.

Results demonstrated precise equivalence, with tight confidence intervals well within the predefined margins (-2.5 to 2.0). The co-primary endpoint of relative potency, based on change from baseline in ISS7 at week 12 using a 4-point assay, also met its criteria, demonstrating parallelism between BP11 and Xolair across dose levels. The results support regulatory submissions targeting CSU, allergic asthma, and Chronic Rhinosinusitis with Nasal Polyps (CRSwNP).

Novartis to acquire Excellergy, Inc

Basel: Novartis has entered into an agreement to acquire Excellergy, Inc., a private biotech company developing next-generation anti-IgE therapies for IgE-driven diseases. The proposed acquisition adds Exl-111, a half-life extended, high-affinity anti-IgE antibody in Phase 1.

Exl-111 is designed as a next-generation extension of validated biology established by anti-IgE therapy, with the potential to complement the Novartis existing allergy portfolio across a range of allergic conditions and patient settings.

IgE is a central driver of multiple allergic diseases. Unlike conventional anti-IgE approaches, Exl-111 is designed to dissociate receptor-bound IgE with the potential to drive faster and deeper Fc epsilon RI alpha downregulation. Preclinical studies and early human pharmacokinetic data from ongoing Phase 1 evaluation support a differentiated profile, with evidence of sustained exposure consistent with its half life extended design. If confirmed clinically, this mechanism could support earlier symptom relief, stronger disease control, more convenient dosing and broader use across food allergy, chronic spontaneous urticaria, chronic inducible urticaria, allergic asthma and other IgE-mediated diseases, including potentially in pediatric populations.

Under the terms of the agreement, Novartis will pay up to USD 2 billion in upfront and milestone payments to acquire Excellergy. The transaction is expected to close in H2 2026, subject to the satisfaction or waiver of customary closing conditions, including regulatory approvals.

Lilly to acquire Centessa Pharmaceuticals to advance treatments for sleep-wake disorders

Indianapolis, Boston and London: Eli Lilly and Company and Centessa Pharmaceuticals plc, a clinical-stage company developing a new class of medicines for the treatment of excessive daytime sleepiness and other neurological conditions, have entered a definitive agreement for Lilly to acquire Centessa.

Centessa is advancing a pipeline of Orexin Receptor 2 (OX2R) agonists designed to address the neurobiological system critical to the sleep-wake cycle to treat excessive daytime sleepiness and disorders of impaired wakefulness. Its lead investigational candidate cleminorexton (formerly ORX750) has demonstrated a potential best-in-class profile in Phase 2a clinical studies across narcolepsy type 1, narcolepsy type 2, and idiopathic hypersomnia. Centessa's OX2R agonist portfolio includes additional clinical and preclinical-stage assets with potential utility across a broader range of neurological, neurodegenerative, and neuropsychiatric conditions.

"Orexin receptor biology represents one of the most compelling mechanistic opportunities in neuroscience as a direct intervention on the master switch of the sleep-wake cycle. Centessa has assembled a portfolio with the breadth and depth to improve wakefulness across a broad array of indications," said Carole Ho, Executive Vice President and President, Lilly Neuroscience.

"Centessa is at the forefront of orexin science, and we've built a potential best-in-class portfolio of OX2R agonists with a level of depth and breadth that could help redefine what's possible in neuroscience," said Mario Alberto Accardi, PhD, Chief Executive Officer of Centessa and Founder of the Orexin Program. "Driven by a bold vision, our team has advanced an innovative portfolio with the speed, rigor and conviction needed to lead a new era of orexin-based therapeutics. Now, we are thrilled to take our next step toward a potential combination with Lilly who shares our vision.

Symrise invests in Bond Pet Foods to accelerate sustainable innovation in pet nutrition

Colorado: Symrise has announced a strategic equity investment in Bond Pet Foods, a U.S.-based biotechnology company that uses precision fermentation to produce animal-identical proteins complementing the existing pet food portfolio of Symrise. The partnership supports Symrise's ambition to develop biotech-enabled ingredients that work better for pets and the planet, strengthening the long-term competitiveness and sustainability leadership of Symrise Pet Food.

With this partnership, Symrise will leverage Bond Pet Foods' technology to help address key industry challenges, including supply-chain continuity and growing consumer demand for sustainable products that diversify the source of pet food ingredients. For pet food manufacturers, the collaboration aims to broaden access to high-quality proteins while supporting resilience and responsible sourcing.

Founded in 2017, Bond Pet Foods develops animal-identical proteins for pet nutrition using precision fermentation. The company has progressed its platform through several development agreements, building expertise in bringing novel protein ingredients toward real-world application.

Zydus receives EIR for oncology injectable manufacturing facility

Ahmedabad: Zydus has received the Establishment Inspection Report (EIR) and approval letter from the USFDA for the Pre-Approval Inspection (PAI) conducted at SEZ oncology injectable manufacturing site in SEZ1, Ahmedabad, in relation to the new isolator injectable line. The inspection was conducted from 4th to 13th November, 2025.

In another major development, Zydus has received final approval from the USFDA for Dapagliflozin tablets, 5 mg and 10 mg (USRLD: Farxiga® tablets, 5 mg and 10 mg). Dapagliflozin is a sodium-glucose cotransporter 2 (SGLT2) inhibitor indicated as an adjunct to diet and exercise to improve glycaemic control in adults with type 2 diabetes mellitus.

With this approval, Zydus is eligible for 180 days of shared generic drug exclusivity for Dapagliflozin tablets, 5 mg and 10 mg. Dapagliflozin tablets will be manufactured at the group's formulation manufacturing facility at SEZ, Ahmedabad. Dapagliflozin tablets had annual sales of USD 10.2bn in the United States (IQVIA MAT February 2026). The group now has 436 approvals and has so far filed 505 (as on 31-Dec-2025) ANDAs, since the commencement of the filing process in FY 2003-04. ■

Eugia Pharma launches Pomalidomide Capsules in US

Hyderabad: Eugia Pharma Specialities Limited, a wholly owned subsidiary of Aurobindo Pharma Limited, has launched Pomalidomide Capsules, 1 mg, 2 mg, 3 mg and 4 mg, in the US market. The product is the generic equivalent of Pomalyst® Capsules, 1 mg, 2 mg, 3 mg and 4 mg, of BMS Pharmaceuticals Corp.

Eugia Pharma Specialities Limited was one of the First-to-File ANDA applicants for this product. The product will be manufactured at Eugia Unit-I. According to IQVIA MAT data for the 12 months ending January 2026, Pomalidomide Capsules have an estimated market size of approximately US$ 3.3 billion in the U.S.

Pomalidomide is a third-generation immunomodulatory drug used in combination with dexamethasone (and sometimes bortezomib) to treat relapsed or refractory multiple myeloma and AIDS-related Kaposi sarcoma.

Agilent opens new customer experience center in Mumbai

Jonah Kirkwood, Senior Vice President & Chief Commercial Officer, Agilent Technologies, and Bharat Bharadwaj, Vice President & General Manager, APAC, Agilent Technologies, inaugurate the Customer Experience Center in Mumbai.

Mumbai: Agilent Technologies Inc. has announced the opening of its Customer Experience Center (CEC) and office in Mumbai, reinforcing its long-term commitment to India and strengthening engagement with customers across the country's life sciences, pharmaceutical, and applied markets.

As part of the launch, customers across pharmaceuticals, biopharma, diagnostics, chemicals, food safety, and environmental testing visited the center, participated in application led discussions, and explored solutions addressing real world laboratory challenges.

The CEC marks the next phase of Agilent's growth in India, bringing together hands on technology demonstrations, application expertise, and commercial operations in a modern, integrated facility.

The Customer Experience Center forms part of Agilent's global investment in customer facing infrastructure, including Centers of Excellence and experience centers across major innovation hubs worldwide. In India, it complements Agilent's expanding footprint alongside the India Solution Center in Manesar, the Refurbishment Center, and the Hyderabad Biopharma Experience Center, creating a connected network that links local scientific needs with global expertise and best practices.

"India's pharma and applied markets are evolving rapidly, with increasing focus on quality, compliance, and advanced analytical capabilities," said Bharat Bhardwaj, Vice President, Asia Pacific, Agilent Technologies.

The CEC, Mumbai provides a platform for hands-on learning, application focused discussions, and real-world workflow demonstrations, supporting customers as they respond to evolving scientific and regulatory requirements.

Hetero launches export of generic semaglutide injections under brand names Truglyx, Rolmodl and Moto G

Hyderabad: Hetero has announced the export launch of its generic semaglutide portfolio, marking a significant step toward expanding access to GLP-1 therapies for the treatment of type 2 diabetes and obesity. The launch represents the beginning of a strategic, multi-year global rollout across more than 75 countries, as part of Hetero's focus on improving access to advanced cardio-metabolic therapies. Initial launches are underway in Africa, Asia, and the Middle East, with further rollouts planned, subject to regulatory approvals.

The injectable semaglutide therapies will be marketed under the brand names Truglyx, Rolmodl and Moto G across markets. Hetero is currently awaiting approval from India's national regulator, CDSCO, following the completion of clinical trials in type 2 diabetes and

obesity. Launch in India is anticipated post regulatory approvals.

The portfolio will be available in multi-dose disposable pen devices designed in line with innovator formats, and across multiple dose strengths including 0.25 mg, 0.5 mg, 1 mg, 2 mg, 1.7 mg and 2.4 mg, supporting both type 2 diabetes and weight management, and enabling flexible, patient-centric dosing.

NIPER Mohali signs grant agreement with Novartis Healthcare Private Limited (NHPL) to support faculty research through development pioneer grant

New Delhi: In a significant step towards fostering academia-industry collaboration and strengthening research and innovation in the pharmaceutical sector, the National Institute of Pharmaceutical Education and Research (NIPER), Mohali, signed an agreement with Novartis Healthcare Private Limited (NHPL). The agreement was signed in the presence of Shri Manoj Joshi, Secretary, Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers in New Delhi.

As part of this collaboration, a faculty member from NIPER Mohali has been selected as the recipient of the Development Pioneer Grant for NIPERs, a prestigious initiative supported by NHPL. The grant aims to promote cutting-edge research and encourage innovation-driven partnerships between academia and industry.

Shri Manoj Joshi stated that this is a good initiative and that expanding such efforts will significantly enhance the usefulness and impact of a researcher's work in line with industry requirements. He stressed on the need to move beyond pilot stages and ensure that research efforts are effectively aligned with industry requirements, thereby strengthening the impact of industry-academia collaboration.

The Development Pioneer Grant provides a competitive platform for faculty members across all seven NIPERs to submit their Research & Development proposals. The call for applications witnessed an overwhelming response, with a total of 42 proposals submitted by distinguished faculty members. Following a rigorous and structured evaluation by an independent jury, one faculty member from NIPER Mohali was selected as the grant recipient.

The Development Pioneer Grant for NIPERs is designed to align with the vision of the Department of Pharmaceuticals to nurture strong industry-academia linkages. It seeks to enhance academic research capabilities, support innovation, and drive pioneering advancements in healthcare in India. This collaboration is expected to further integrate NIPER into the broader pharmaceutical innovation ecosystem and reinforce the shared commitment to scientific excellence.

Shri Awadhesh Kumar Choudhary, Senior Economic Advisor, Department of Pharmaceuticals; Dr. Kinny Singh, Deputy Secretary, Department of Pharmaceuticals; Prof. Dulal Panda, Director, NIPER Mohali; Prof. Joydev Kumar Laha, Professor, NIPER Mohali; Mr. Amitabh Dube, Country President India, Novartis; and Ms. Sadhna Joglekar, Head Development India, Novartis were present during the signing ceremony.

NATCO Pharma launches Semaglutide Generic Injection multi dose vials in India starting from ₹1,290

Hyderabad: NATCO Pharma Limited has launched Semaglutide Injection (multi dose vials) in the India market. NATCO received Central Drugs Standard Control Organisation (CDSCO) approval to manufacture and market generic Semaglutide in India in February 2026 for multi dose vials and pen device based on the clinical comparison study.

Semaglutide is indicated for the treatment of adults with insufficiently controlled type 2 diabetes mellitus as an adjunct to diet and exercise. NATCO plans to launch

Semaglutide injection in the form of multi dose vials of strengths 2mg/1.5ml, 4mg/3ml and 8mg/3ml under the brand names SEMANATTM and SEMAFULLTM. Multi dose vials will be launched at MRP of ₹1,290 per month for 2 mg/1.5ml and 4mg/3ml and MRP of ₹1,750 for 8mg/3ml.

Pen device will be priced at MRP of ₹4,000, ₹4,200 and ₹4,500 per month for the strengths 2mg/1.5ml, 4mg/3ml and 8mg/3ml respectively. NATCO is the first company to offer generic Semaglutide in multi dose vials with customised syringes. NATCO is also offering the product to third parties for co-marketing. NATCO is the first company to offer Semaglutide in the vial dosage form. It is the most affordable GLP-1 currently in the Indian market as it is approximately 70 per cent cheaper in cost than the pen device and 90 per cent cheaper than the price of the innovator's brand.

Roche inaugurates new research home for the Institute of Human Biology

Basel: Roche recently inaugurated the new research home for the Institute of Human Biology (IHB). The opening marks a significant milestone in Roche's strategy to unlock the transformative potential of human model systems to revolutionise the future of drug discovery and development.

Thomas Schinecker, CEO of the Roche Group, said, "The inauguration of the Institute of Human Biology reinforces our commitment to Switzerland as a global innovation hub, where Roche invests around CHF 3.5 billion in research each year. By combining human organoid models with artificial intelligence, IHB has the potential to change how we discover and develop new medicines — making research and development more predictive and more efficient. Together with our partners, we aim to bring innovative treatments to patients faster."

IHB leverages human disease biology, computational biology and translational bioengineering to pioneer advanced systems that replicate human disease biology with unprecedented precision. Bringing this diverse expertise together across multidisciplinary projects allows scientists the chance to generate sophisticated models, such as complex cultured tissue samples, organoids, microfluidic 'organ-on-chip' technologies and in silico modelling.

Building 92 will house up to 250 researchers and provide a collaborative environment designed to bridge the gap between fundamental and industry sciences. It includes modular laboratories that will allow sustainable growth and foster interdisciplinary exchange.

Roche is currently investing CHF 1.4 billion in the site development in Basel and Kaiseraugst.

Covation Biomaterials' first commercial plant for bioTHF and bioPTMEG reaches mechanical completion

China: Covation Biomaterials LLC, a biomaterials company with advanced technology in the bio-based materials industry, has announced that its first commercial plant for the C4 product platform, including bioTHF and bio-based polytetramethylene ether glycol, achieved mechanical completion in April 2026. In addition, CovationBio officially launched the Xatryx® brand for the portfolio of new, non-food, bioPTMEG products to be produced at the plant.

The C4 facility is located in Qidong, Jiangsu Province, China. It utilizes an innovative, new-to-the-world process technology developed by CovationBio. With a total investment of RMB 10 billion, the plant is planned in three phases, targeting a future total capacity of 500,000 tons per year of bio-based materials. The first phase, which is now mechanically complete, has a 50,000ton-per-year commercial production capacity for both bioTHF and bioPTMEG. Commercial production is expected to begin in the second half of 2026.

TheraNym Biologics signs additional product schedule with Merck Sharpe & Dohme Singapore Trading

Mumbai: TheraNym Biologics Pvt. Ltd., a subsidiary of Aurobindo Pharma Ltd, has announced the addition to the existing Contract Manufacturing Organization (CMO) agreement with Merck Sharp & Dohme Singapore Trading Pte Ltd, Singapore, (MSD), by execution of an additional product schedule.

This agreement serves to further expand the existing CMO relationship initiated pursuant to the previously disclosed arrangement in May 2024. Under this newly signed product schedule, TheraNym Biologics will construct greenfield project for commissioning a large scale mammalian Drug Substance manufacturing facility (Unit 2).

TheraNym Unit 2 shall encompass the installation of mammalian cell culture bioreactors with an aggregate capacity of 60,000 litres, together with requisite downstream purification infrastructure to produce drug substance.

Theranym will invest around USD 150 to 175 million for establishing manufacturing facility. It will build the manufacturing facility, manufacture the products and supply to MSD as per the arrangement.

Rubicon Research enters Indian CNS formulations market with acquisition of Arinna Lifesciences

Mumbai: Rubicon Research Limited has acquired 85 per cent equity ownership in Arinna Lifesciences Limited from its current shareholders.

With a portfolio of over 60 brands in chronic therapies, Arinna is one of the few domestic formulations companies principally focused on drugs treating conditions of the Central Nervous System (CNS) with more than 4,000 prescribers backed by an established distribution network of distributors, stockists and retail pharmacies in India. This acquisition furthers Rubicon's strategy of leveraging its IP and chronic products portfolio to unlock growth in key markets, particularly in the CNS therapeutic category which has always been a core focus area for Rubicon.

Arinna's sales and distribution network provides Rubicon access to patients and prescribers in India for its differentiated offerings, including a strong pipeline of specialty products and drug-device combinations. The transaction values Arinna at an enterprise value of ₹200 crores on a cash and debt free basis.

After accounting for net cash and other necessary adjustments to the enterprise value of Arinna, the purchase consideration has been determined to be approximately ₹175.92 crore for secondary acquisition of 85 per cent equity shareholding at a price of ₹158.53 per share. For the 9 months ended 31 December 2025, Arinna's provisional revenue and EBITDA were ₹56.7 crores and ₹9.5 crores respectively.

Novonesis expands global footprint with acquisition of production facility in Southeast Asia

Denmark: Novonesis has signed an agreement with Meihua to acquire a production facility in Rayong, Thailand, for around USD 50 million, increasing the company's footprint in Southeast Asia and strengthening its ability to serve customers worldwide.

Expanding in Asia is core to Novonesis' GROW strategy towards 2030. Emerging markets already account for one third of the company's sales and are expected to grow faster than developed markets. By investing in geographically well-positioned facilities, the company strengthens its capabilities to supply both local and global markets with its unique global multipurpose production setup.

Novonesis is acquiring a facility with advanced fermentation capabilities that can be further expanded to support the company's growth journey, including the production of Human Milk Oligosaccharides (HMO). Novonesis plans to invest further in the facility over the

coming years to maximize its potential and establish a strong operational setup. The company expects the site to be commercially operational in 2027.

The Rayong acquisition is one of several investments Novonesis has made in recent years to strengthen its resilience and global production setup – enabling the company to serve local customers more effectively and drive growth. Facilities in Franklinton, North Carolina, Taicang, China, Araucaria, Brazil, and West Allis, Wisconsin, have been expanded as part of this effort.

Over the current strategy period towards 2030, Novonesis expects to increase its growth-focused capital expenditure and cater for the increasing demand for biosolutions among customers and consumers.

Sentynl Therapeutics enters into agreement with PRG S&T to license molecule for Hutchinson Gilford Progeria syndrome

Ahmedabad, India and Solana Beach, CA: Sentynl Therapeutics Inc., a U.S.-based biopharmaceutical company and wholly-owned subsidiary of Zydus Lifesciences Limited, announced that it is entering into an agreement with PRG S&T, a Korean company specializing in the development of medicine for rare genetic diseases. The agreement is with an aim to license its investigational molecule Progerinin (SLC-D011) for Hutchinson-Gilford Progeria Syndrome (HGPS).

The agreement will allow Sentynl to begin working with PRG S&T immediately to advance the clinical development of Progerinin (SLC-D011) for HGPS, which has been designated as an orphan drug by the United States Food and Drug Administration (FDA). Under the conditions that certain milestones are met, Sentynl will acquire full rights to the molecule for HGPS upon closing, making Progerinin the company's second therapy intended for the treatment of HGPS.

The program is currently finalizing a Phase 2A clinical trial and data are expected before the end of 1H 2026. Progerinin is an investigational, orally active small-molecule drug being developed as a potential treatment for HGPS, a rare genetic disorder characterized by accelerated aging in children. The disease is caused by the accumulation of progerin, an abnormal form of the lamin A protein produced by mutations in the LMNA gene, which disrupts nuclear structure and leads to premature cellular aging.

Progerinin is designed to inhibit the interaction and harmful effects of progerin within cells, thereby improving nuclear integrity and reducing cellular damage. It is not currently approved by FDA or any other health authority.

WuXi Biologics and Earendil Labs enter collaboration

Dr. Chris Chen (L), CEO of WuXi Biologics, and Dr. Jian Peng, CEO of Earendil Labs, signed the partnership agreement.

Suzhou: WuXi Biologics, a global leading Contract Research, Development and Manufacturing Organization (CRDMO), and Earendil Labs, a global leader in AI-driven research and development of next-generation biologics therapeutics, have signed a strategic collaboration agreement on the development and manufacturing of multiple novel bispecific and multispecific antibodies and ADC candidates in Earendil Labs' pipeline targeting autoimmune disease, cancer and other diseases.

Under the agreement, WuXi Biologics will provide end-to-end biologics development and manufacturing services, including cell line development, process and bioassay development, drug product formulation development, and GMP manufacturing. The collaboration is designed to accelerate regulatory timelines, enhance CMC execution reliability, and support scalable global clinical development across Earendil Labs' programs.

Sun Pharma launches semaglutide injection under brand names, Noveltreat and Sematrinity in India

Mumbai: Sun Pharmaceutical Industries Limited has launched its semaglutide injection under the brand names Noveltreat and Sematrinity in India, in all strengths. Noveltreat is indicated for chronic weight management in adults as an adjunct to a reduced calorie diet and increased physical activity and is available in five dose strengths – 0.25 mg/0.5 mL, 0.5 mg/0.5 mL, 1 mg/0.5 mL, 1.7 mg/0.75 mL, and 2.4 mg/0.75 mL.

Sematrinity is indicated for treatment of adults with insufficiently controlled type 2 diabetes mellitus as an adjunct to diet and exercise and is available in two dose strengths – 2 mg/1.5 mL and 4 mg/3 mL. Priced significantly lower than the innovator brand, weekly therapy costs, from initiation to the highest dose, range from approximately ₹900 to ₹2,000 for Noveltreat and ₹750 to ₹1,300 for Sematrinity, supporting greater affordability.

Noveltreat's prefilled pen uses a concealed needle to help ease injection fear and improve both handling safety and dosing accuracy. Sematrinity comes in a multi-dose pen format that offers flexible dosing, with a smooth dialer that enables accurate dose delivery. The easy-to-use, pre-filled pens, developed by leading global pharmaceutical device suppliers, are manufactured in Europe.

Orbicular Pharmaceutical Technologies secures tentative U.S. ANDA approval for generic version of Ozempic®

Bangalore: OneSource Speciality Pharma Limited has announced that its partner Orbicular Pharmaceutical Technologies, together with its U.S.-based front-end partner (the ANDA holder), has secured tentative U.S. Food and Drug Administration (FDA) approval for an Abbreviated New Drug Application (ANDA) for a generic version of Ozempic® (Semaglutide Injection).

OneSource is the contract development and manufacturing organization (CDMO) partner for this product. This milestone highlights a closely integrated development-to-submission model: Orbicular led the product development and technical program for this complex peptide, while OneSource supported the program as the CDMO partner, providing end-to-end manufacturing capabilities for the U.S. market filing.

The collaboration is designed to ensure reliable commercial supply from OneSource's US-FDA approved flagship site in Bangalore.

Roche India partners with Punjab Government to launch 'NeuroSakhi'

Punjab: In a landmark step toward strengthening neurological care, the Government of Punjab and Roche Pharma India have launched NeuroSakhi, a first-of-its-kind patient support and awareness initiative. The programme is designed to strengthen care and support systems for women living with Multiple Sclerosis (MS) in the state.

The programme aims to strengthen care pathways, awareness and support systems for women navigating this complex neurological condition. The initiative was formalised through a Memorandum of Understanding (MoU) signed between Directorate of Medical Education and Research (DMER), Punjab Government and Roche Pharma India at the Punjab Civil Secretariat.

MS is a chronic neurological disorder that attacks the central nervous system and can lead to progressive disability if not diagnosed and treated early. An estimated 1.8 lakh people are living with MS in India, with nearly 2,900 patients in Punjab alone. Striking most often between the ages of 20 and 40 — the prime of life — the disease disproportionately affects women, who account for nearly 70 per cent of cases.

The NeuroSakhi initiative aims to address challenges by fostering stronger awareness, enabling patient support and strengthening engagement between healthcare professionals, patients and caregivers across Punjab.

Torrent Pharma launches oral and injectable formulations of Semaglutide

Ahmedabad: Torrent Pharmaceuticals has launched its Semaglutide brands - Sembolic and Semalix - in India, in both oral and injectable formulations. The launch expands the company's presence in metabolic disorders such as type-2 diabetes and obesity.

Commenting on the launch, Amal Kelshikar, CEO – India Business, Torrent Pharma, said, "Our entry into the GLP-1 therapy segment reflects Torrent's commitment

to expanding treatment options available to healthcare professionals managing complex metabolic conditions at affordable prices. We are proud to be the first Indian company to offer this treatment across oral and injectable formulations, giving healthcare professionals a holistic choice for treating patients."

GLP-1 (glucagon-like peptide-1) receptor agonists are well-established prescription medications for the management of type 2 diabetes and obesity. They work by enhancing insulin secretion, reducing glucagon levels and help regulate appetite. They have been shown to be effective at decreasing haemoglobin A1c (HbA1c), promoting weight loss and reducing the risk of cardiovascular events by mimicking the hormone GLP-1.

Rubamin and Distil announce exclusive strategic partnership to scale high-performance Zinc derivatives

Mumbai and Vadodara: Distil, an R&D-led specialty chemicals platform and Rubamin Private Limited, a versatile producer of Zinc compounds globally with a manufacturing legacy of almost four decades and over 50,000 tons per annum of production capacities, have signed a strategic commercial agreement.

Under this partnership, Distil will serve as an exclusive co-development, marketing and distribution partner for Rubamin's high-performance Zinc Oxide powders, dispersions, and derivatives across the United States and Canada.

The collaboration combines Rubamin's world-class manufacturing with Distil's specialized application R&D and distribution geared for global supply chains. The partnership focuses on supplying Zinc derivatives for sun-care, cosmetics and over the counter (OTC) pharmaceutical applications, ensuring compliance with stringent U.S. FDA and GMP standards.

Atanu Agarrwal, Co-founder & CEO of Distil, said, "Our mission is to redefine specialty chemical manufacturing by providing a transparent, high-performance platform for global brands. By bridging the gap between Indian manufacturing excellence and North American demand, we are enabling brands to access sustainable, high-quality ingredients with full IP protection and operational visibility."

Kiro Rizk, Head of Personal Care at Distil, said, "Zinc Oxide is a cornerstone of modern sun-care, and the demand for specialized particle engineering – focusing on transparency and SPF efficacy – has never been higher. Rubamin's technical capability to produce high-purity, low-impurity profiles allows us to offer ingredients that meet the most rigorous aesthetic and stability requirements of leading global personal care brands."

Boehringer Ingelheim expands investment in computational innovation

(L-R): Steve Bates OBE, UK Office for Life Science; Maria Tereno, Country Managing Director and Head of HP UK Boehringer; Lord Patrick Vallance, UK Science Minister; Nicola Richmond, Head of AI and Machine Learning UK Boehringer; Jan Nygaard Jensen, Head of Global Computational Innovation Boehringer.

Germany: Boehringer Ingelheim has announced the expansion of its global Computational Innovation footprint with the launch of a new center for AI and machine learning in King's Cross, London, UK, part of the Knowledge Quarter ecosystem. As the company continues to innovate and expand its AI capabilities in pharmaceutical R&D, this significant investment recognizes the UK's commitment to AI and the life sciences sector.

With this latest investment, Computational Innovation now has locations in Austria, Germany, UK and USA specializing in AI, machine learning, human genetics, and computational biology. The addition of London to the company's global footprint and clear focus on AI will further understanding of the biology that drives patient outcomes, identify biological mechanisms with a higher probability of success, and enable the organization to move faster, make smarter decisions, and deliver innovative therapies to patients with unmet medical needs.

Paola Casarosa, Global Head, Innovation Unit and Member of the Board of Managing Directors, Boehringer Ingelheim, said, "The UK has a strong legacy in AI, and the government's continued commitment to advancing data-driven innovation in life sciences and healthcare makes it an ideal location. Establishing a presence in London allows us to leverage the UK's rich data resources and infrastructure, while connecting with world class talent across academia, biotechnology and AI ecosystems to enable innovation for patient benefit."

Biogen enters into agreement with TJ Biopharma for Felzartamab Assets in China

China: Biogen Inc. and TJ Biopharma have entered into a definitive agreement under which Biogen has agreed to acquire TJ Bio's exclusive rights to felzartamab in the Greater China region. With this agreement, Biogen now owns exclusive worldwide rights to felzartamab, which is currently being evaluated in global Phase 3 clinical studies across multiple immune-mediated diseases.

Under the terms of the agreement, TJ Bio will receive a $100 million upfront payment and is eligible to receive up to $750 million in potential commercial and sales milestone payments, for a total potential consideration of up to $850 million, plus mid-single-digit to low-double-digit percentage of royalties on potential net sales in the Greater China Region. The upfront payment is expected to be recorded by Biogen as an acquired in-process research and development expense in the second quarter of 2026. With this transaction, Biogen will assume responsibilities for milestone payment and royalty obligations under the prior MorphoSys (a wholly-owned subsidiary of Novartis) licensing agreement.

Lilly to acquire Kelonia Therapeutics to advance in vivo CAR-T cell therapies

Indianapolis and Boston: Eli Lilly and Company and Kelonia Therapeutics, Inc. , a clinical-stage biotechnology company pioneering in vivo gene delivery, has entered a definitive agreement for Lilly to acquire Kelonia. Kelonia has developed a proprietary in vivo gene placement system (iGPS®) that uses specially engineered lentiviral-based particles designed to efficiently and selectively enter T-cells inside the body, allowing the patient's own body to generate chimeric antigen receptor T-cell (CAR-T) therapies that can treat underlying disease.

Kelonia's lead program, KLN-1010, is an investigational, one-time intravenous gene therapy that generates anti-B-cell maturation antigen (BCMA) CAR-T cells, targeting the BCMA protein expressed on the surface of multiple myeloma cells. Encouraging early clinical results were presented in the plenary session of the 2025 American Society of Hematology Annual Meeting, providing initial clinical validation and demonstrated promising tolerability.

Evinova secures ISO 27001 certification, elevating data security standards

BAAR, Switzerland: Evinova, a global health tech company with proven, published outcomes for sponsors, sites, and patients, has achieved the International Organization for Standardization (ISO) 27001:2022 certification, the leading international standard for information security management systems (ISMS). This globally recognized certification confirms that Evinova follows best practices to protect data and manage risks effectively to uphold the highest standards of cybersecurity.

Evinova applies a rigorous security approach across its digital and AI-native solutions, giving sponsors and sites trusted tools to accelerate development while protecting sensitive data.

"Achieving ISO 27001 demonstrates a strong link of our ISMS with our robust quality management system, enabling Evinova to show the proper level of control with evidence to support an ongoing state of compliance," added Evan Grunbaum, Head of Quality, Compliance, and Audit at Evinova. Evinova's certification was issued by the British Standards Institution. ■

CHEMTECH LEADERSHIP & EXCELLENCE AWARDS 2026

Chemtech Leadership and Excellence Awards are conferred to esteemed leaders for their excellence and exceptional contribution in their respective fields. Over the last few decades, it has built an elite group of Chemtech award recipients who have graced the industries with their work. The winners of Chemtech Leadership & Excellence Awards 2026 are:

- **Dr. Purnendu Chatterjee, Chairman & Founder, The Chatterjee Group (TCG)**

  HALL OF FAME AWARD

- **Mr. Deepak C. Mehta, Chairman & Managing Director, Deepak Nitrite Limited**

  LIFETIME ACHIEVEMENT AWARD

- **Mr. Ashwin Shroff, Executive Chairman, Excel Industries Limited**

  BUSINESS LEADER OF THE YEAR SPECIALTY CHEMICALS AWARD

- **Ms. Vartika Shukla, Chairman & Managing Director, Engineers India Ltd**

  WOMEN ACHIEVER OF THE YEAR AWARD

- **Mr. Hital Meswani, Executive Director, Reliance Industries Limited**

  BUSINESS LEADER OF THE YEAR - REFINING & PETROCHEMICALS

- **Mr. B. S. Rajpurohit, Chairman Emeritus, Chemical Process Piping Private Limited**

  BUSINESS LEADER OF THE YEAR – MSME

- **Dr. Ashish Lele, Director, CSIR- National Chemical Laboratory**

  OUTSTANDING ACHIEVEMENT - RESEARCH & INNOVATION

- **Mr. Davendra Kumar, Managing Director - India, Technip Energies**

  BUSINESS LEADER OF THE YEAR - ENGINEERING SERVICES

- **Bharat Heavy Electricals Limited**

  BUSINESS LEADER OF THE YEAR - PLANT & MACHINERY

- **PI Industries Limited**

  BUSINESS LEADER OF THE YEAR – ESG

- **Padcare**

  OUTSTANDING ACHIEVEMENT - START-UP

MR. ASHWIN SHROFF, EXECUTIVE CHAIRMAN, EXCEL INDUSTRIES LIMITED

BUSINESS LEADER OF THE YEAR – SPECIALTY CHEMICALS

Dr. R. A. Mashelkar, FRS, Former Director General, CSIR, & Jury Chairman, Chemtech Leadership & Excellence Awards 2026, presenting the Business Leader of the Year – Specialty Chemicals award to Mr. Ashwin Shroff, Executive Chairman, Excel Industries Limited.

Mr. Ashwin Shroff represents a rare bridge between India's industrial history and its sustainable future. Having joined Excel Industries in 1965, his journey of six decades is deeply rooted in the 'Swadeshi' spirit instilled by the founders in 1941: a belief that Indian industry must serve a 'purpose beyond profit' and act as a trustee for society. Under his guidance, Excel has transformed raw materials once considered abundant into value-added solutions, becoming a pioneer exporter of chemicals from India. His leadership style is best captured by the description given by a senior colleague: *"Kum Bolo, Dhima Bolo, Mitha Bolo"* (Speak less, speak softly, speak sweetly). In recognition of a lifetime dedicated to indigenous science, sustainable agriculture, and ethical leadership, the Chemtech Foundation conferred the CHEMTECH Leadership & Excellence Awards 2026 - Business Leader of the Year: Specialty Chemicals upon Mr. Ashwin Shroff.

MR. DEEPAK C. MEHTA, CHAIRMAN & MANAGING DIRECTOR, DEEPAK NITRITE LTD

LIFETIME ACHIEVEMENT AWARD

Mr. Deepak C. Mehta has led Deepak Nitrite for over four decades, guiding its expansion from a trusted domestic manufacturer into a diversified global conglomerate. He was the architect of Deepak Phenolics, a landmark initiative that successfully substituted massive imports of Phenol and Acetone, securing the feedstock for India's pharmaceutical and agrochemical sectors. Continuing this legacy of self-reliance, he is now spearheading India's first fully integrated Polycarbonate project, a massive ₹5,000 crore investment that promises to reduce the nation's dependence on imported engineering plastics.

In recognition of his pioneering role in building national assets, his foresight in material innovation, and his lifelong dedication to "Make in India," the Chemtech Foundation has bestowed the CHEMTECH Leadership & Excellence Award 2026 for Lifetime Achievement upon Mr. Deepak C. Mehta.

Dr. R. A. Mashelkar, FRS, Former Director General, CSIR, & Jury Chairman, Chemtech Leadership & Excellence Awards 2026, presenting the Lifetime Achievement award to Mr. Deepak C. Mehta, Chairman & Managing Director, Deepak Nitrite Limited.

DR. PURNENDU CHATTERJEE, CHAIRMAN & FOUNDER, THE CHATTERJEE GROUP

HALL OF FAME

Dr. R. A. Mashelkar, FRS, Former Director General, CSIR, & Jury Chairman, Chemtech Leadership & Excellence Awards 2026, presenting the Hall of Fame award to Dr. Purnendu Chatterjee, Chairman & Founder, The Chatterjee Group (TCG).

Dr. Purnendu Chatterjee, a visionary who transitioned from a celebrated career as a global management consultant to an industrialist driven by a singular conviction: that real impact comes from ownership and long-term commitment. He founded The Chatterjee Group (TCG) to build Indian institutions that compete globally and serve the nation's long-term development. Motivated by a love for his home state of West Bengal and a promise made to his mother to contribute to the region's growth, Dr. Chatterjee revived Haldia Petrochemicals (HPL) by restoring confidence, empowering people, and anchoring the organization in operational discipline. Similarly, under his guidance, MCPI transformed from a stressed asset into a resilient, forward-integrated polyester player, proving that an Indian workforce could operate complex global assets to world-class standards.

DR. ASHISH LELE, DIRECTOR, CSIR – NATIONAL CHEMICAL LABORATORY (NCL)

OUTSTANDING ACHIEVEMENT – RESEARCH & INNOVATION

Since taking charge as Director, Dr. Ashish Lele has steered CSIR-NCL with a singular focus: bridging the "Valley of Death" that often separates laboratory science from industrial reality. Recognizing that industry needs technologies at Technology Readiness Levels 8-9, not just early-stage research, he operationalized the NCL Roadmap 2030, anchoring the institute's work in seven themes of national priority, including clean energy, circular economy, and sustainable chemicals. Under his leadership, NCL's fuel cell technology, licensed to KPIT, has been deployed in India's first fuel cell bus and the fuel cell catamaran now ferrying passengers in Varanasi. Similarly, addressing India's energy security, he has championed Dimethyl Ether (DME) as a clean substitute for LPG and diesel. NCL has not only developed this "world-beating technology" but scaled it to a pilot plant, successfully demonstrating its use in cooking stoves and autorickshaws.

Dr. R. A. Mashelkar, FRS, Former Director General, CSIR, & Jury Chairman, Chemtech Leadership & Excellence Awards 2026, presenting the Outstanding Achievement – Research & Innovation award to Dr. Ashish Lele, Director, CSIR – National Chemical Laboratory.

AI & Emerging Technologies to Strengthen India's Pharma Ecosystem

As part of Sādhana Saptah 2026, the Department of Pharmaceuticals (DoP), Ministry of Chemicals and Fertilizers, Government of India, recently organised a webinar on "AI and Emerging Technologies in Pharmaceuticals and Regulations".

The webinar highlighted the transformative potential of Artificial Intelligence (AI) across the pharmaceutical value chain, spanning drug discovery, development, and regulatory science. The session was addressed by Prof. Manoj Kumar, Professor, Department of Pharmacoinformatics, National Institute of Pharmaceutical Education and Research (NIPER), Mohali.

The session provided a comprehensive overview of the pharmaceutical lifecycle, emphasizing the catalytic role AI can play at various stages such as Research & Development Phase (Target identification and lead optimization), Pre-clinical Studies (In vitro and in vivo modelling using AI-enabled simulations), Clinical Trials (Improved trial design, patient stratification, and advanced data analytics) and Regulatory Review & Approval (Enhanced evidence generation and AI-enabled decision support systems).

Prof. Kumar elaborated on the growing integration of AI in drug discovery, highlighting key advancements such as prediction of 3D protein structures and drug–target interactions, AI-driven drug design and de novo molecule generation, and the application of AI in polypharmacology and multi-target drug development.

He further discussed the use of AI in chemical synthesis and retrosynthetic pathway prediction, identification of therapeutic targets, and drug repurposing opportunities. Additionally, AI-based prediction of toxicity, bioactivity, and physicochemical properties is significantly improving early-stage research outcomes.

Prof. Kumar also explained how AI tools are enabling faster and more efficient screening of compounds, thereby substantially reducing the time and cost associated with early-stage drug discovery.

The webinar emphasized the need for capacity building within government systems to effectively leverage AI for evidence-based regulatory decision-making, accelerated approval pathways, enhanced monitoring of drug safety and post-market surveillance and strengthening India's position as a global pharmaceutical leader.

Strengthening Adaptive Development and Humane Aptitude for National Advancement (Sādhana) Saptah 2026, organised from 2 to 8 April 2026, is among the largest collaborative capacity-building initiatives in India aimed at fostering skills for citizen-centric governance. Spearheaded by the Department of Personnel and Training, the Capacity Building Commission, and Karmayogi Bharat, the initiative brings together Central Ministries, States, Union Territories, and training institutions on a common platform to promote responsive and accountable governance. With the tagline 'Ham Bane Karmayogi', the initiative also commemorates the Foundation Day of the Capacity Building Commission and marks five years of Mission Karmayogi, reinforcing the Government's commitment to building a future-ready civil service. ■

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BioNEST Incubation Centre to Boost Food Start-ups & Support Advanced Research in Food Bioprocessing and Biotechnology

Union Minister for Science and Technology Dr. Jitendra Singh inaugurated the BIRAC-BioNEST Incubation Centre at Central Food Technology & Research Institute (CFTRI) and reviewed an exhibition of start-up-driven technologies and products, positioning the institute's incubation ecosystem as a key platform for bridging laboratory research with commercial applications.

Designed as a state-of-the-art facility with dedicated incubation suites and shared infrastructure, the BioNEST Incubation Centre is expected to boost food start-ups, support advanced research, scale-up validation and regulatory facilitation in food bioprocessing and biotechnology, enabling conversion of scientific ideas into market-ready solutions.

As of March 2026, the BioNEST facility has supported 26 start-ups, including physical and hybrid incubates as well as graduated ventures — with several already achieving product commercialisation. Incubated companies have collectively filed 12 patents and contributed to research publications, reflecting a growing emphasis on innovation aligned with market outcomes.

The start-ups operate across emerging domains such as nutraceuticals, precision fermentation, probiotics and postbiotics, CRISPR-based technologies and botanicals, indicating a shift towards high-value, science-driven segments within the food and biotechnology sectors.

During his interaction with entrepreneurs and stakeholders, Dr. Jitendra Singh underlined that while starting a venture has become easier, sustaining it requires continuous value addition, market access and stronger industry linkage. He called for deeper engagement between research institutions and the private sector, and emphasised aligning innovation with consumer demand, including in ready-to-eat and convenience food segments.

The Minister also highlighted the government's push to expand private sector participation in emerging technology areas, pointing to new funding mechanisms and institutional support frameworks aimed at

accelerating research, development and innovation. He stressed that scientific institutions must enhance outreach through digital platforms and targeted communication strategies to improve awareness and adoption of technologies, while also encouraging convergence across sectors such as biotechnology, space and specialised nutrition.

The event also saw the signing of four Memoranda of Understanding and the launch of two products developed at CFTRI, signalling continued industry engagement and commercialisation of in-house technologies. Officials said such collaborations are critical for scaling innovations and strengthening linkages with micro, small and medium enterprises (MSMEs).

Marking the institute's 75th year, a set of publications documenting its research legacy and technological contributions was released, including a coffee table book, a compendium of research and development achievements, a photo journey and a collection of traditional recipes. A commemorative postal cover and picture postcard were also unveiled to mark the milestone.

The exhibition functioned as a live demonstration of the institute's lab-to-market pipeline, showcasing technologies, processed food products and start-up innovations developed at CFTRI and by its licensees. With over 450 technologies developed and transferred to thousands of licensees, the institute has emerged as a key national hub for food research, industry collaboration and enterprise development.

Officials said the BioNEST ecosystem is increasingly drawing national and international interest, with start-ups participating in global programmes, achieving commercial milestones and technology transfers, and attracting attention from strategic sectors such as defence for specialised food applications.

The developments collectively signal a shift from a research-led approach to a market-linked food innovation ecosystem, with CSIR-CFTRI positioning itself as an integrated platform combining scientific research, incubation support and industry collaboration to drive the next phase of growth in India's food processing sector. ■

India's Biotech Push Targets Affordable Diabetes Devices, Industry Collaboration: Dr. Jitendra Singh

International Diabetes Federation President-elect, Dr. Niti Pall and Union Minister Dr. Jitendra Singh

International Diabetes Federation (IDF) President-elect, Dr Niti Pall, during her India visit, called on Union Minister Dr Jitendra Singh, who is also a noted Professor of Medicine & Diabetes, and among other things, discussed indigenous biosimilar Insulin production as well as diabetes related indigenous biomanufacturing prospects.

The meeting underscored the importance of strengthening India's capabilities in insulin manufacturing, particularly biosimilar insulins and Continuous Glucose Monitoring (CGM) instruments.

The discussion brought into focus growing global concerns over the future availability of insulin, with Dr. Paul flagging the risk of supply constraints as major multinational manufacturers increasingly shift their focus towards newer therapies such as GLP-1 drugs. She noted that insulin production globally is currently concentrated among a limited number of companies, making supply chains vulnerable and affordability a continuing challenge, especially for Type 1 diabetes patients who are dependent on lifelong insulin therapy.

Against this backdrop, biosimilar insulin — highly similar versions of existing insulin therapies designed to deliver comparable safety and efficacy at lower cost — emerged as a key area of discussion.

Dr. Jitendra Singh acknowledged that while India has established strengths in pharmaceuticals and medical devices, domestic insulin manufacturing remains relatively limited, indicating a critical gap alongside a significant opportunity.

Dr Jitendra Singh informed that the Department of Biotechnology is already supporting efforts to enhance insulin production capacity, including recent steps to scale up manufacturing by an Indian company. The Minister emphasised that augmenting insulin

availability is both a national requirement, given India's high diabetes burden, and a global responsibility in view of rising demand across developing regions.

Dr. Paul highlighted that countries across Asia and Africa are increasingly looking to India for affordable diabetes care solutions, drawing parallels with India's role in supplying cost-effective vaccines. She pointed out that high insulin prices in many regions continue to limit access, reinforcing the need for alternative manufacturing hubs capable of delivering quality products at lower cost.

The interaction also covered the broader ecosystem of diabetes care technologies, including Continuous Glucose Monitoring (CGM) systems and insulin pumps. Dr. Paul noted the rapid expansion of low-cost devices from countries such as China, with significant price advantages over Western products, and cautioned that these manufacturers are already capturing substantial market share.

Dr. Jitendra Singh observed that Indian companies possess the technological capability to develop comparable devices, including CGMs, and stressed that scaling up production would require stronger industry participation and targeted support. He indicated that efforts are underway within the domestic ecosystem to develop cost-effective monitoring technologies.

Both sides discussed the potential for deeper collaboration involving Indian researchers, industry stakeholders and international partners in areas such as clinical trials, technology development and financing models.

Dr. Jitendra Singh suggested convening a stakeholder meeting during Dr. Paul's proposed next visit to India in July to bring together relevant actors and explore pathways for scaling up manufacturing and global outreach.

The exchange reflects a broader policy emphasis on strengthening India's bio-manufacturing base while addressing the growing burden of diabetes. With limited global suppliers, rising demand and persistent affordability challenges, the focus on biosimilar insulin and indigenous medical devices positions India within an evolving global conversation on equitable access to essential therapies. ■

Key Highlights:

- *Indigenous biosimilar Insulin production discussed and*
- *Diabetes-related indigenous biomanufacturing prospects*
- *Minister flags biosimilar Insulin gap, highlights scope for domestic manufacturing*

The exchange reflects a broader policy emphasis on strengthening India's bio-manufacturing base while addressing the growing burden of diabetes. With limited global suppliers, rising demand and persistent affordability challenges, the focus on biosimilar insulin and indigenous medical devices positions India within an evolving global conversation on equitable access to essential therapies.

Dr. Reddy's Laboratories launches India's first DCGI-approved Semaglutide injection 'Obeda®' for Type 2 Diabetes

Dr. Reddy's Laboratories Ltd., a global pharmaceutical company, has launched its injectable semaglutide under the brand name Obeda®, marking an important step in expanding access to advanced GLP 1 receptor agonist–based therapy for the management of type 2 diabetes in India. Dr. Reddy's has been the first Indian company to receive Drugs Controller General of India (DCGI) approval for generic semaglutide. This launch underscores the company's Day 1 entry into the segment upon patent expiry.

India faces one of the world's largest diabetes burdens, with over 101 million adults living with the condition, according to the ICMR INDIAB study. The study estimates diabetes prevalence at 11.4 per cent, with nearly four in ten adults experiencing abdominal obesity. An additional 136 million individuals are estimated to be pre diabetic, placing them at high risk of developing the disease.

In such a scenario, semaglutide, a GLP-1 receptor agonist, has a globally proven track record in improving glycaemic control and supporting weight management when used as part of a comprehensive treatment plan[1]. In a head to head Phase III clinical study enrolling 312 participants, Dr. Reddy's Obeda® established non inferior efficacy and a safety profile comparable to the innovator drug. It showed similar glycaemic reduction.

India faces one of the world's largest diabetes burdens, with over 101 million adults living with the condition, according to the ICMR INDIAB study. The study estimates diabetes prevalence at 11.4 per cent, with nearly four in ten adults experiencing abdominal obesity. An additional 136 million individuals are estimated to be pre diabetic, placing them at high risk of developing the disease.

Additionally, comparable results were observed for fasting glucose control, post prandial glucose control, and therapeutic glycaemic response (achieving HbA1c <7.0 per cent) at the end of the study. No anti drug antibodies were detected, and the immunogenicity profile was similar to that of the innovator drug[2]. With both API development and manufacturing, as well as formulation development conducted entirely in house, Obeda® reflects Dr. Reddy's strength in complex product development and peptide science.

It also showcases the company's decade long expertise in peptide technology and its commitment to bringing GLP 1 therapies to market to ensure access to high quality, affordable medicines and addressing India's evolving healthcare needs. As part of its future plans for GLP-1 therapies, the company will be looking at a fully integrated API and formulation approach, encompassing both development and manufacturing in-house.

Erez Israeli, Chief Executive Officer of Dr. Reddy's, said, "Our foray into GLP-1 therapies reflects our capabilities in complex product development and peptide science. As part of phase-1 launch, we aim to introduce generic semaglutide in several countries and, through our 'One Product, One Quality' approach, we are committed to ensure the same high quality product across all markets."

M.V. Ramana, Chief Executive Officer, Branded Markets (India and Emerging Markets), Dr. Reddy's, said: "With the country facing a rapidly rising diabetes burden, we aim to offer effective treatment options and enable more patients to benefit from globally established

As part of its patient support programme for Obeda®, Dr. Reddy's has developed SemaKare™, a comprehensive support system to enhance and streamline the patient journey. Supported by a digital app, SemaKare™ offers onboarding guidance, field device counsellor assistance, injection training, tele support, therapy adherence monitoring, and so on, to help improve treatment outcomes for patients.

therapies. The launch of this important drug strengthens our diabetes portfolio and reinforces our broader commitment to improving long term health outcomes for people living with chronic metabolic diseases. GLP 1 therapies represent an important area of focus for us, and we will continue working toward building a full breadth portfolio for multiple metabolic indications across all formats."

Dr. Reddy's Obeda® injection is available in 2 mg and 4 mg strengths and comes in a pre filled, disposable pen designed for subcutaneous, once a-week administration, with robust cold chain integrity maintained throughout distribution. Each pen of both strengths will deliver a minimum of 4 weekly doses. The cost to the patient will be ₹4,200 per month for both the strengths.

Additionally, in a human factors study involving 41 participants completing approximately 20 key tasks aligned with the USFDA's guidance for drug–device combination products, the Obeda® pen demonstrated non inferior user performance outcomes compared with the innovator pen[3]. As part of its patient support programme for Obeda®, Dr. Reddy's has developed SemaKare™, a comprehensive support system to enhance and streamline the patient journey. Supported by a digital app, SemaKare™ offers onboarding guidance, field device counsellor assistance, injection training, tele support, therapy adherence monitoring, and so on, to help improve treatment outcomes for patients.

Further, Dr. Reddy's aims to build an integrated care ecosystem by setting up metabolic centres of excellence across India. These centres will serve as integrated hubs for advancing diabetes and other metabolic disorders treatment by focusing on healthcare professional (HCP) education, evidence-based management, and real-world evidence generation. The initiative will help in strengthening diagnostic capabilities and infrastructure, while building the skills of support staff through structured training programmes.

Also, the centres will drive patient awareness and empowerment initiatives, ensuring individuals are better informed and engaged in their care journey. The centres will also feature dedicated drop box to ensure the safe and sustainable disposal of used pens. Additionally, Dr. Reddy's aims to address the nutritional requirements of patients on GLP 1/GIP therapies by leveraging key products from its joint venture, Dr. Reddy's Nestlé Health Science, including Celevida GLP+, Optifast and so on.

These products support improved nutrient intake and muscle mass maintenance, offering targeted nutrition that is essential for sustaining metabolic and functional health. Dr. Reddy's Obeda® is a prescription-based drug. Patients are advised to consult their doctors for more details. ■

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2. *Date on file*
3. *Data on file*

GUEST COLUMN

Drug Discovery - Identifying Targets and Lead Molecules to Fight Disease

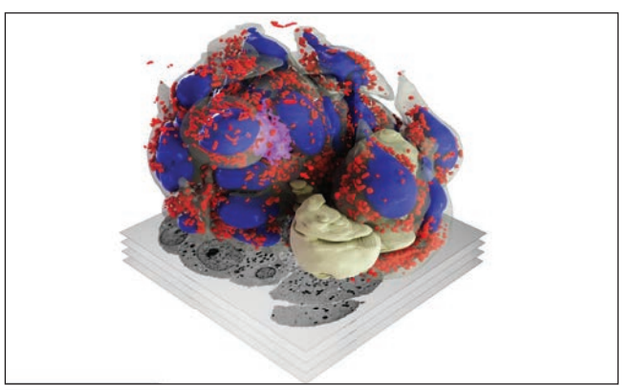
Amarjeet Singh Tak
Head – Research and Microscopy Solutions
ZEISS India

The future of drug discovery is being rewritten at the intersection of biology, imaging, and data science. As diseases such as cancer become increasingly understood as disorders of complex cell biology, involving intricate pathways, receptors, and biomarkers, the need for deeper, spatially resolved insights has never been greater. Today, microscopy is no longer just a visualization tool, it is a strategic driver in identifying targets and accelerating the discovery of lead molecules. ***Amarjeet Singh Tak, Head – Research & Microscopy Solutions, ZEISS India****, further elaborates on this topic.*

Cancer and tumors are not just masses of abnormal cells, they are highly dynamic ecosystems shaped by the tumor microenvironment. Understanding how cells interact spatially, how immune cells infiltrate tumors, how receptors are expressed, and how signaling pathways evolve, is central to identifying effective therapeutic targets.

Understanding Cancer through Spatial Biology

This is where spatial biology, powered by advanced microscopy, is transforming research. Technologies such as confocal and super-resolution imaging, enable scientists to map the distribution of biomarkers and receptors within tissues, with extraordinary precision. ZEISS platforms, including the LSM series and Celldiscoverer 7, allow researchers to capture high-resolution, multidimensional datasets bringing clarity to biological complexity.



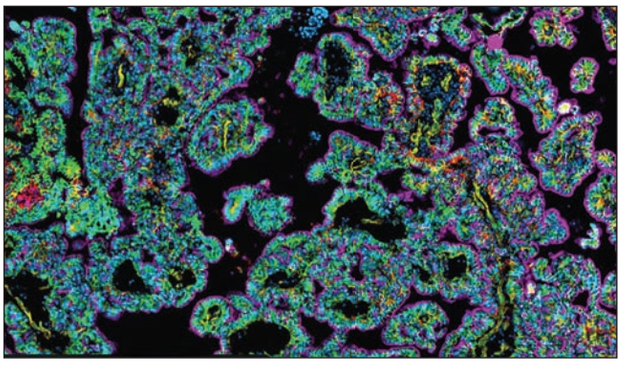
3D ultrastructural investigations of Tumorspheres with SBF-SEM.

From Imaging to Insight: The Power of Digitization and AI

Modern drug discovery generates vast volumes of imaging data. The real breakthrough lies in converting this data into actionable insights. Digitization of microscopy workflows, combined with AI-powered image analysis, is enabling researchers to move beyond qualitative observations to quantitative and reproducible science.

High-content screening systems can now analyze thousands of cellular conditions simultaneously, tracking subtle changes in morphology, protein localization, and biomarker expression. AI algorithms identify patterns that are often invisible to the human eye, uncovering new correlations between cellular behavior and disease mechanisms.

For India's growing biotech and pharmaceutical ecosystem, this shift is critical. It enables faster target validation, reduces human bias, and accelerates decision-making, ultimately shortening the path from discovery to development.

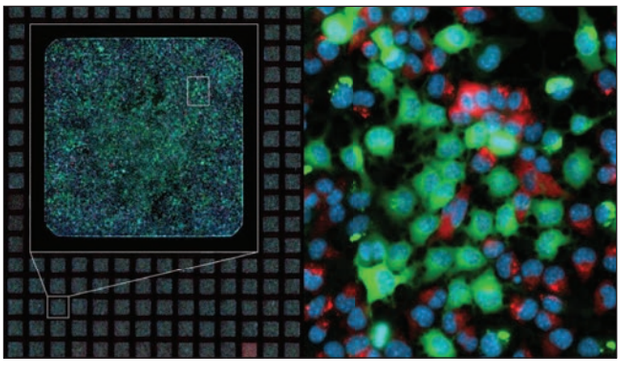


Brain tumor microenvironment spatial biology with high-throughput hyperplexed imaging.

Decoding Pathways, Receptors, and Biomarkers

Drug discovery increasingly relies on understanding how specific receptors and biomarkers influence disease pathways. Advanced live-cell imaging allows researchers to observe drug interactions in real time revealing how compounds modulate signaling pathways or alter cellular responses.

At the molecular level, electron microscopy, including cryo-EM, provides near-atomic resolution of protein structures. This enables structure-guided drug design, where lead molecules are optimized to precisely interact with target receptors improving efficacy while minimizing off-target effects. ZEISS microscopy solutions integrate these capabilities across scales, enabling seamless workflows from cellular imaging to structural analysis.



AI-powered image analysis for neuro-degenerative disease.

Accelerating Lead Molecule Discovery

The transition from target identification to lead molecule discovery is often the most resource-intensive phase. By combining high-resolution imaging, automation, and AI-driven analytics, microscopy is significantly improving efficiency and success rates.

Researchers can now screen large compound libraries, visualize their effects on complex cellular systems, and rapidly identify promising candidates. This integrated approach is particularly valuable in oncology, where heterogeneity and evolving resistance mechanisms demand continuous, data-driven insights.

In an era defined by precision medicine, the ability to understand cell biology in its spatial and functional context is fundamental. Microscopy, enhanced by digitization and AI, is enabling scientists to decode the complexity of cancer, tumors, pathways, receptors, and biomarkers with unprecedented depth.

As India advances toward innovation-led drug discovery, these technologies will play a pivotal role, transforming how we identify targets, design lead molecules, and ultimately deliver more effective therapies to patients. ■

The Future of Drug Delivery: One Solution, Multiple Use Cases

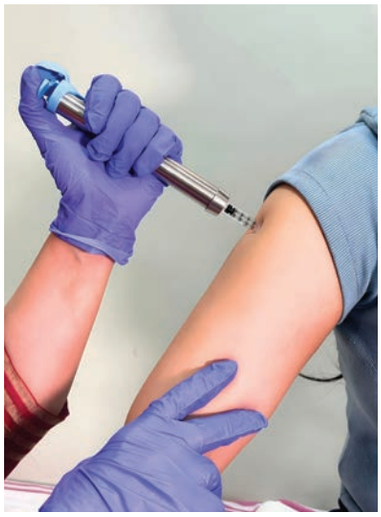
Each year, millions of injections are administered, for vaccinations, hormone therapies, chronic conditions, and treatments that extend over months, sometimes years. They have become a standard part of patient care but the experience of delivery is not merely a procedural detail. It stays with the patient in ways the prescription often does not. It shows up later, in hesitation, in missed doses, in how patients approach the next cycle of treatment. This is where needle-free drug delivery begins to emerge as an important evolution in how care is administered, a shift that is already becoming visible across the broader healthcare landscape.

Mr. Sarvesh Mutha
Managing Director, IntegriMedical

Modern medicine has made significant progress in what it can treat. Chronic diseases, fertility care, and metabolic conditions are now managed with therapies that are far more precise and effective than they were even a decade ago. But for many patients, treatment doesn't begin with the therapy itself. It begins with how that therapy is delivered. And in most cases, that still means an injection.

Needle-free Drug Delivery Market

The needle-free drug delivery market, valued at USD 16.64[1] billion in 2025, is projected to reach USD 44.99 billion by 2034. Growth at that scale rarely happens in isolation. It usually reflects a deeper change in how a problem is being understood.



A needle-free era

The advances in the needle free injection system now enable drug delivery through jet stream technology, which operates using a high-velocity, precision-controlled jet stream that delivers the drug through a fine micro-stream into the required tissue layer with speed and accuracy, without the use of a conventional needle. In this case, the shift is not in the therapy itself, but in the experience around it.

Beyond the Molecule: Why Delivery Now Matters More Than Ever

For years, needle-based injections have remained central to drug administration across therapeutic areas — from vaccines and hormones to fertility treatments and chronic disease care. Their reliability made them indispensable, yet despite being one of the most feared aspects of medical treatment for patients across age groups, the technology itself has seen little evolution over the last century.

Pain, fear, needle anxiety, risk of needle stick injuries, and biomedical waste challenges continue to impact both patients and healthcare providers. These are no longer peripheral concerns; they directly affect adherence and continuity of care.

For children, early vaccination experiences can shape long-term attitudes toward healthcare. For adults undergoing repeated therapies such as IVF, hormone treatments, or chronic metabolic care, the burden

is more gradual. Discomfort and fatigue begin to influence how consistently treatment is followed. As therapies extend over longer durations, the experience of delivery becomes part of treatment itself.

Importantly, needle-free delivery also offers the advantage of integrating seamlessly with existing drug manufacturing and packaging systems, enabling easier collaboration and adoption across therapeutic pathways.

One Platform, Multiple Therapeutic Use Cases

A shift is beginning to take shape in how drug delivery is approached. For a long time, different therapies have relied on different systems, insulin delivered through pens, fertility hormones through daily injections, vaccines through standard syringes, and newer metabolic treatments through weekly injectables.

While this model has worked clinically, it has also meant that patients continue to experience the same discomfort, fear, and fatigue associated with repeated needle-based administration.

That is where the current evolution becomes significant. There is increasing movement toward something more consistent. Instead of separate systems for each need, a single delivery platform can support multiple use cases with the same level of precision and comfort. Needle-free injection technology is one example of this shift.

Such platforms can be applied across pediatrics, adult immunization, IVF treatments like gonadotropin injections, pain management therapies, and the growing GLP-1 and metabolic health space. For healthcare professionals, this simplifies protocols and reduces exposure to sharps. For patients, it reduces the repeated pain point associated with injections while creating greater familiarity across different treatment journeys. In therapies that rely on repetition, that familiarity can influence how consistently treatment is followed over time.

Needle-Free Injection system (N-FIS)

A Meaningful Shift for IVF and Gynaecology Care

IVF treatments are built around timing. Patients go through cycles that require multiple hormone injections, across stimulation, ovulation induction, and luteal phase support. These aren't one-off interventions. They repeat, often within a short span, and each one is part of a process where consistency matters.

They also come at a time when patients are already under strain. In India, roughly 300,000 to 350,000 IVF cycles[2] take place each year, with that number expected to grow. Each cycle involves several injections. Across the system, that adds up to millions.

At that scale, the experience of those injections starts to carry weight. It doesn't change the treatment itself. But it can affect how patients move through it — whether they stay consistent, whether they hesitate, whether they continue as planned. In fact, we are increasingly witnessing patients actively exploring treatment options in other countries where needle-free administration is available, driven by the desire for a more comfortable and less stressful treatment experience.

Beyond IVF, the same relevance extends to broader gynaecological hormone therapies and reproductive health support, where repeat injectables are common.

Reimagining the Vaccination Experience

For many children, vaccination is their first interaction with the healthcare system.

It is a brief moment, but it tends to stay. The fear associated with needles does not end with the appointment. It often carries forward into missed follow-ups, resistance to booster doses, and hesitation around routine care. These reactions are rarely recorded, but they are grim reality for both parents and providers.

When this shifts to a needle-free experience, the change is often immediate. Vaccination sessions are easier to manage. Children are less resistant. Parents are more willing to return for subsequent doses.

Smooth, simple, stress-free – needle-free shots for adults.

In a country like India, where immunization programs operate at scale, these small shifts begin to influence how consistently care is delivered at a country level.

Emerging Opportunity in GLP-1 and Chronic Therapies

One of the strongest future use cases for needle-free drug delivery lies in the rapidly growing GLP-1 therapy segment. As injectable treatments for diabetes, obesity, and metabolic health continue to expand globally, long-term therapy adherence is becoming increasingly important. Industry estimates suggest that the anti-obesity and GLP-1 drugs market is expected to become a USD 100 billion-plus opportunity by 2030, driven significantly by injectable therapies and sustained patient use.

For therapies that require regular administration over months or years, a more comfortable and less intimidating needle-free delivery experience method can significantly improve patient confidence and long-term adherence. This is where a needle-free delivery system becomes more than a device and it becomes an enabler of outcomes.

A Safer, More Scalable Future for Healthcare Systems

The implications of needle-free injections are not limited to patients alone, it is beneficial to caregivers as well. Needle stick injuries remain a persistent occupational risk for healthcare workers. Additionally, the management of biomedical waste associated with sharps, continues to place pressure on healthcare systems, particularly in high-volume settings. These challenges are well understood.

Reducing reliance on needles addresses both. It improves safety for providers and simplifies large-scale delivery, especially in programs such as immunization campaigns. In a country like India, where healthcare delivery operates at scale across both urban and underserved settings, solutions that combine ease of administration with safety and operational efficiency become increasingly valuable.

Looking Ahead

The future of drug delivery is unlikely to be defined by a single use case. It is moving toward approaches that can work across different areas of care from pediatrics and vaccination to fertility and chronic disease management. What connects these is not the therapy, but the need for consistency in how it is delivered. Needle-free injection systems are part of that shift. Not as a replacement for existing methods, but as an adjustment to how treatment is experienced over time. Because as therapies become more prolonged, delivery is no longer a separate step. It becomes part of whether treatment is followed at all. ■

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Computational Evaluation of Phytochemicals as Inhibitors of SARS-CoV-2 Main Protease Using Molecular Docking

The rapid emergence of viral diseases has highlighted the need for efficient strategies in antiviral drug discovery. Computational approaches such as molecular docking provide a cost-effective method for screening potential therapeutic compounds prior to experimental validation. ***Shravani Bhalerao, Integrated MSc Biotechnology, MIT World Peace University, Pune****, explains the technology in detail.*

The global outbreak of COVID-19 has accelerated the search for effective antiviral therapeutics. Among the viral proteins involved in replication, the SARS-CoV-2 main protease (Mpro) plays a critical role in cleaving viral polyproteins into functional units necessary for viral replication and transcription. Because human cells lack closely related homologous proteases, Mpro represents a promising and selective therapeutic target.

Advances in computational biology have significantly enhanced early-stage drug discovery. Molecular docking allows researchers to predict interactions between small molecules and target proteins, thereby enabling rapid screening of potential inhibitors before experimental validation.

Natural products and phytochemicals have historically served as valuable sources of bioactive compounds. Molecules such as resveratrol and apigenin possess diverse pharmacological activities including antiviral, antioxidant, and anti-inflammatory effects. Investigating their interactions with viral targets may provide insights into potential therapeutic strategies.

In this study, molecular docking analysis was performed to evaluate the binding potential of resveratrol and apigenin against the SARS-CoV-2 main protease. A known protease inhibitor, Nirmatrelvir, was included as a reference compound to benchmark docking performance.

Materials and Methods

Protein Structure Preparation: The three-dimensional structure of the SARS-CoV-2 main protease was obtained from the Protein Data Bank (PDB ID: 6LU7). The structure was prepared by removing water molecules and the co-crystallized ligand to avoid interference during docking. Polar hydrogen atoms were added,

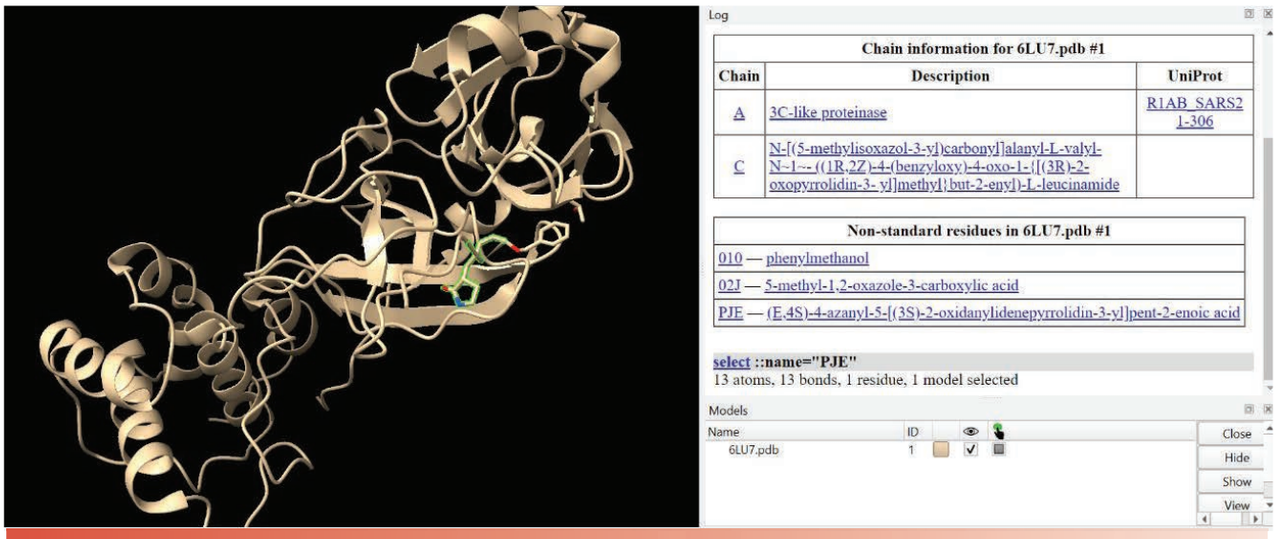
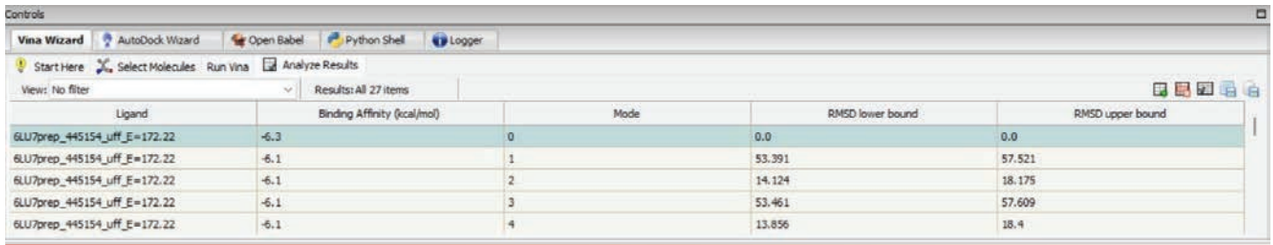


Figure 1: *Co-crystallized inhibitor (N3) bound to the active site of the SARS-CoV-2 main protease (Mpro) (PDB ID: 6LU7). The native ligand highlights the catalytic pocket and serves as a reference for defining the docking grid and validating binding site selection.*



Ligand	Binding Affinity (kcal/mol)	Mode	RMSD lower bound	RMSD upper bound
6LU7prep_445154_uff_E=172.22	-6.3	0	0.0	0.0
6LU7prep_445154_uff_E=172.22	-6.1	1	53.391	57.521
6LU7prep_445154_uff_E=172.22	-6.1	2	14.124	18.175
6LU7prep_445154_uff_E=172.22	-6.1	3	53.461	57.609
6LU7prep_445154_uff_E=172.22	-6.1	4	13.856	18.4

Figure 2: *Molecular docking results obtained using PyRx (AutoDock Vina), showing binding affinity scores and multiple docking conformations of the selected ligands within the active site of Mpro. The best binding pose was selected based on the lowest binding energy and RMSD values.*

and partial charges were assigned to ensure accurate simulation of intermolecular interactions. Energy minimization was performed to stabilize the protein structure prior to docking analysis.

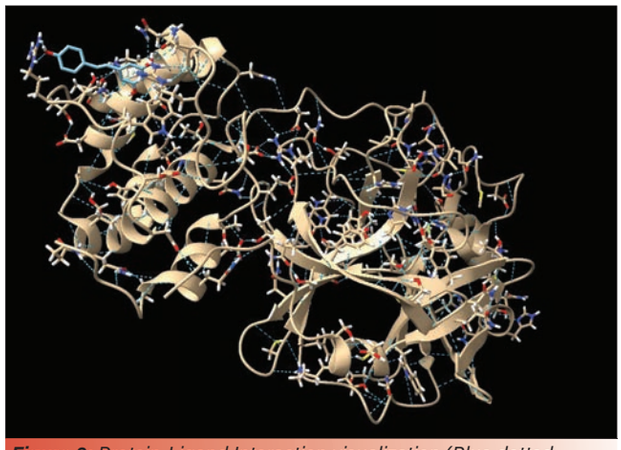


Figure 3: *Protein-Ligand Interaction visualization (Blue dotted lines represent Hydrogen Bonds. Ligand is properly positioned in the active site of the protein.)*

Ligand Preparation: The phytochemicals resveratrol and apigenin, along with the reference inhibitor Nirmatrelvir, were selected as ligands for docking analysis. Their chemical structures were retrieved from PubChem in SDF format.

Ligands were optimized using the MMFF94 force field to obtain energetically favorable conformations. Hydrogen atoms were added, and rotatable bonds were defined to allow conformational flexibility. The optimized structures were then converted to PDBQT format, which is required for docking simulations.

Molecular Docking Procedure: Docking simulations were carried out using AutoDock Vina implemented in PyRx (version 0.8). A grid box was defined around the catalytic pocket of the protease, specifically covering the catalytic dyad residues His41 and Cys145.

The exhaustiveness parameter was set to 8 to control the thoroughness of the search algorithm. For each ligand, multiple docking poses were generated, and the conformation with the lowest predicted binding energy was selected as the most favorable binding pose.

Interaction Analysis and Visualization: Protein ligand interactions were analyzed to identify hydrogen bonding within the binding pocket. Visualization and interaction mapping were performed using UCSF Chimera and Discovery Studio Visualizer. These tools allowed detailed examination of ligand orientation and interactions with active site residues.

Results and Discussion

Binding Affinity Analysis: Docking results revealed that both phytochemicals bind within the catalytic pocket of the SARS-CoV-2 main protease.

The docking results were evaluated based on binding affinity and RMSD values. The ligand showed a binding affinity of –6.3 kcal/mol, indicating moderate interaction with the target protein, where more negative values represent stronger binding. Among the generated docking poses, Mode 0 was selected as the best conformation as it exhibited the lowest binding energy and an RMSD value of 0.0 Å, indicating a stable and reliable pose. Other docking modes showed significantly higher RMSD values (13–57 Å), suggesting less stable

Ligand	Chemical Class	Binding Affinity (kcal/mol)	Inference
Resveratrol	Polyphenol	-6.3	Stable moderate binding
Apigenin	Flavonoid	-6.0	Consistent moderate binding
Nirmatrelvir	Protease inhibitor	-7.8	Strong binding reference

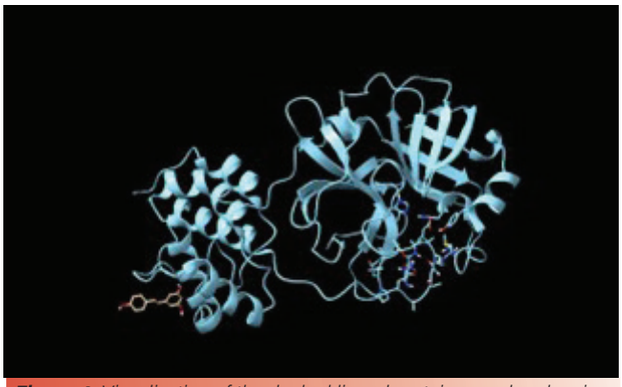


Figure 4: *Visualization of the docked ligand protein complex showing the ligand positioned within the active site of the SARS-CoV-2 main protease (Mpro). The ligand occupies the catalytic pocket and interacts with key residues, indicating stable binding conformation.*

binding orientations. Since RMSD values below 2 Å are generally considered reliable, Mode 0 was selected for further interaction analysis.

Although the phytochemicals demonstrated measurable binding within the catalytic pocket of the protease, their predicted binding affinities were weaker than that of the reference inhibitor and several natural compounds reported in the literature. This suggests that while resveratrol and apigenin may not act as potent inhibitors in their native form, they could serve as lead scaffolds for further structural optimization. Modifications through structure–activity relationship studies may improve binding efficiency and therapeutic potential.

Docking Visualizations and Structural Interpretation

Kindly refer Figures 1, 2, 3 and 4. Visual inspection of docked complexes reveals that ligands occupy the catalytic pocket effectively. The orientation of functional groups allows interaction with key residues, supporting binding stability.

Residue-Level Interaction Analysis

Detailed interaction analysis showed that the ligands interact with several key residues in the catalytic pocket of the protease. Resveratrol formed hydrogen bonds with residues such as Glu166 and His163, which contribute to substrate stabilization within the binding site.The reference inhibitor Nirmatrelvir exhibited strong interactions with the catalytic dyad residues His41 and Cys145, along with additional hydrogen bonds involving Gln189 and Glu166. These multiple stabilizing interactions explain its higher predicted binding affinity.

Conclusion

This study demonstrates the application of molecular docking as a preliminary screening approach for identifying potential inhibitors of the SARS-CoV-2 main protease. The phytochemicals resveratrol and apigenin exhibited moderate binding affinity within the catalytic pocket and interacted with key residues involved in protease activity. Although their binding strength was lower than that of the reference inhibitor Nirmatrelvir, the observed interactions suggest that these compounds may serve as promising lead scaffolds for further structural optimization. Future studies involving molecular dynamics simulations, ADMET profiling, and experimental validation will be essential to confirm their therapeutic potential.■

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Zydus launches Aerolife Mini™, to simplify inhaler use for asthma and COPD patients

Zydus Lifesciences Limited, an innovation-led life-sciences company with an international presence, has launched Aerolife Mini™, a next-generation pMDI enhancer marking a significant step in the company's strategy to drive drug device led innovation in respiratory care.

Aerolife Mini™ is India's first portable and foldable spacer, making it highly convenient to use. Zydus has launched this device under an exclusive licensing arrangement with AeroDel Technology Innovations Pvt. Ltd.

Aerolife Mini™ introduces a compact, foldable, and ready to use design that fundamentally redefines how spacers are used. The drug device is expected to achieve better drug deposition, improve compliance, enhance patient confidence and provide greater convenience. ■

Merck Launches First Bio-Based Solvent Portfolio for HPLC

Merck, a leading science and technology company, has launched the first bio-based solvent portfolio specifically for High-Performance Liquid Chromatography (HPLC). These bio-based solvents are compatible with established HPLC and liquid chromatography mass spectrometry (LC-MS) methods and instruments, supporting easy adoption in routine and regulated environments.

Merck developed this innovative portfolio using proprietary manufacturing processes & deep scientific expertise. New portfolio includes drop-in replacements for acetonitrile, methanol & ethanol. Because these newly launched bio-based solvents are designed to match conventional performance, laboratories can transition to these alternatives without redeveloping analytical methods. In HPLC, solvents serve as the mobile phase that transports samples through the chromatographic system, enabling separation and quantification of components. This step is critical for generating reliable data in applications such as drug research and development, quality control in manufacturing, environmental monitoring & diagnostics. ■

All-rounder 1600 t: Rotary Table Machine Produces Fully Automated Mobility Component

Arburg has launched the allrounder 1600 t, with a clamping force of 2,000 kn. The new product has a servo-electric three-station rotary table with a table diameter of 1,600 millimetres for simultaneous insertion, overmoulding and removal. The 4+2-cavity mould for overmoulding the metal inserts comes from Arburg's regional partner concraft (Taiwan), the temperature control technology from hb-therm and the drying system from motan. The injection-moulded part is manufactured in two steps.

First, a small six-axis robot feeds two insert pins at a time via a transfer system to the machine. Then a large six-axis robot takes over the metal inserts and positions them in the first mould half. There they are overmoulded with glass fibre reinforced pbt. It then transfers two pre-moulded parts to the second station of the rotary table, where the finished connector module is created by overmoulding again. The shot weight is 138.4 grams and the cycle time is around 60 seconds. At the third rotary table station, the moulded parts are removed without affecting the cycle time. The large six-axis robot transports them back to the transfer platform. Here, the small six-axis robot picks them up and stacks them downstream. Arburg's allrounder t vertical injection moulding machines are ideal for the production of sophisticated injection-moulded parts. Their rotary table can move through various rotary sequences. The free space system offers plenty of room for moulds and media connections. ■

Sonoma Pharmaceuticals launches new dermatology product line for sensitive skin

Sonoma Pharmaceuticals, Inc., a global healthcare leader developing and producing patented Microcyn® technology based stabilized hypochlorous acid (HOCl) products for a wide range of applications, including wound care, eye care, dermatological conditions, podiatry, and animal health care, has announced the launch of Aquanil® AD, a hypochlorous acid based dermatology product line for sensitive skin, developed exclusively for Persōn & Covey, Inc. for distribution through its established over-the-counter dermatology channels in the United States.

The Aquanil AD product line includes Aquanil AD Repair Mist, a soothing spray for irritated or damaged skin; Aquanil AD Recovery Gel, designed to help reduce the appearance of scars; and Aquanil AD Rescue Serum for relief from rashes, itching and irritation. Each product is specifically designed for sensitive or reactive skin. ■

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UPCOMING ISSUE - MAY 2026

QA & QC - Lab & Analytical Solutions

Artificial Intelligence, Machine Learning, Sustainability are the growing trends, being witnessed in quality assurance and quality control in lab and analytical solutions. Prediction of potential quality issues, automation of routine tasks and allowing quality managers to focus on strategic decision-making – these are the trends, which are expected to redefine the landscape of quality assurance and quality control.

The May 2026 edition of **Pharma Bio World**, will focus on these trends in quality assurance and quality control, and include authored articles in the form of technical features, case studies, guest columns and innovation write-ups. Besides, the issue will also feature regular columns such as Industry News, Project Updates and Products.

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- Transportation Warehousing
- Supply Chain Management
- Material Handling & Supply Chain Management
- Logistics Services

CORROSION CONTROL
- Surface Engineering
- New metallurgies
- Industrial Coatings
- Corrosion Control Technologies & Services

PROCESS PLANTS & PLANT EQUIPMENT
- Distillation Columns
- Reactors
- Heat Exchangers, Cooling Towers & Boilers
- Storage Tanks
- Compressors , Pumps & Valves
- Plant instrumentation & automation
- IT Infrastructure & Digital Technologies

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EPC 2028 | Specialty Chemical | Health Safety & Environment World Expo 2028 | Refining Petro Chemicals 2028 | Global Meet Agrochemicals & Fertilizers Innovations and R&D World Expo & Conferences 2028 | Industry Automation & Control 2028 | PVF Pumps, Valves & Fittings World Expo 2028

BIO-India World Expo & Conferences 2028 | WaterEX World Expo 2028 | Surface Engineering Coating & Corrosion World Expo 2028 | SCALE@ CHEMTECH World Expo 2028 | Student Outreach Program 2028 Develop Future Leaders

Scope for ChemTECH World Expo

- Plant Machinery & Industrial Consumables
- Engineering Consultants
- OEMs for Chemicals & Pharmaceutical Processing Equipment
- Metals & Metallurgy
- Bioprocessing Equipment
- Construction Services Providers
- Plant Maintenance Services Providers
- Logistics & Supply Chain Solutions Providers
- Instrumentation & Process Control
- Industry Automation (Process & Factory)
- Systems Integration & ERP Solutions Providers
- Water & Waste Water Treatment Consultants
- Environment Solutions Providers
- Waste Management Consultants
- Financial Institutions
- Fire & Safety Solutions Providers
- Material Handling Solutions
- Certification Bodies
- Welding Solutions
- Quality Health & Environment Solutions
- Analytical & Laboratory
- Packaging Materials, Machinery & Systems
- Business Consultants

Scope for Specialty Chemicals World Expo

- Agrochemicals Intermediates
- Adhesives & Sealants
- Agrochemicals & Crop Protection
- Bulk Drugs & Intermediates
- Enzymes
- Colorants, Dyes & Pigments
- Cosmetics & Personal Care Ingredients
- Hygiene & Cleaning Chemicals
- Laboratory Chemicals
- Surfactants
- Water Treatment Chemicals
- Catalysts
- Electronic Chemicals
- Flavours & Fragrances
- Contract Manufacturers

Scope for Biopharma World Expo

- Materials Processing
- Pharma Machinery
- Pharma Ingredients
- Plant Engineering, Process Plants & Equipment
- Laboratory & Analytical Solutions
- Process Measurement & Inspection
- Sterilization & Clean Room Solutions
- Biopharma R&D And Manufacturing
- IT Solutions
- Water & Waste Treatment Solutions

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- **26000+ VISITORS** FROM 50+ COUNTRIES
- **9** TECHNICAL **CONFERENCES**
- **1500+** BUSINESS **DELEGATES**
- **250+** GLOBAL **SPEAKERS**
- SCALE@ CHEMTECH World Expo: **100+ GLOBAL CLIMATE TECH STARTUPS** FROM 20 COUNTRIES
- **1200+** ENGINEERING PHARMA & SCIENCE STUDENTS AT **STUDENT OUTREACH PROGRAM** FROM 28 STATES & UNION TERRITORIES
- **40 TECHNICAL PRESENTATIONS**

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