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INNOVATIVE TECHNOLOGY BASED ACTIVES FOR SKIN & HAIR

Active	Function
X50 Antiaging	Anti-wrinkles
X50 Silhouette	Anti-cellulite
X50 Myocept	Lines of expression
X50 Pure White	Whitening
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X50 Hyalufiller	Wrinkle Filling
X50 Skin Barrier	Skin Barrier
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MVP Platinum Matrix EM	Anti-wrinkles
MVP Diamond Sirt	Premature aging
MVP Sapphire Lift	Firming Lifting
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Activys® Anti-Glycation	Anti-wrinkles
Activys® Red-Out	Anti-redness
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HMA Silky	Enhancing Hair Silkiness
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ds date for device cos to Category-B PLI Scheme

ment from time to time.

"It has been decided to extend the timeline for submission of applications under the 'Production Linked Incentive (PLI) Scheme for promoting domestic manufacturing of medical devices' till November 21, 2022," said the DoP in a latest notice.

With the revised guideline, the list of medical devices in the Annexure 1 of the guideline has been referred as Category A, while a newly bifurcated Annexure 1A has been referred to as Category B. Changes were also been made in other clauses and Annexures based on this revision.

While in the previous guidelines issued on October 29, 2020, the indicative eligible products for the cancer care/radiotherapy medical devices segment were listed as brachytherapy systems, rotational cobalt machine, radiotherapy simulation systems, linear accelerator (LINAC), workstations - radiotherapy planning,

proton therapy system and other products, under the revised guideline, rotational cobalt machine and LINAC are in Category A and the rest of the products are in Category B.

Similar division has been applied in the other three segments - radiology & imaging medical devices (both ionising and non-ionising radiation products) and nuclear imaging devices; anaesthetics and cardio respiratory medical devices including catheters and renal care medical devices; and all implants including implantable electronic devices.

For instance, the cyclotrons and other products in the radiology and imaging segment, needles and syringes in anaesthesia, anaesthesia kits, masks for anaesthesia, biopsy kits for renal, dialyser reprocessing system, lithotripters-extracorporeal renal and other products in the target segment in the anaesthetics and cardio-respiratory medical devices are in the Category B.

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Emerging technologies in pharma industry: An overview

Dr. Sanjay Agarwal

THE pharmaceutical sector is undergoing a significant transformation. The industry, which has historically been sluggish to accept new technologies, is going through significant changes due to the development of various technologies. Artificial intelligence (AI), additive manufacturing, blockchain, and other Sector 4.0 technologies are important trends in the pharmaceutical industry.

Innovation in the pharma business is being sparked by rising investments, the expansion of technological companies, the expiration of several essential patents, growing inter-organizational cooperation, and a supportive regulatory framework.

An in-depth investigation into the top pharma industry trends is data-driven innovation intelligence. It is enhanced by strategic decision-making by providing you with a summary of developing technologies in the pharmaceutical sector.

These insights were obtained by utilizing our start-up insights discovery platform, which is powered by big data and artificial intelligence and covers over 2,500,000 start-ups and scale-ups worldwide. The platform finds pertinent scaleups early on and promptly provides a thorough overview of emerging innovations within a specific industry.

The top 10 pharma industry trends are:

- Artificial Intelligence
- Big Data & Analytics
- Flexible Production
- Precision Medicine
- Additive Manufacturing
- Blockchain
- Extended Reality
- Real World Data
- Digital Therapeutics
- Curative Therapies

Artificial intelligence is a significant force in the pharmaceutical sector, with applications ranging from drug discovery and development to medical imaging and patient involvement. More than a third of pharma start-ups are focusing on software solutions for the sector in addition to big data and analytics. Many parts of the world still lack access to essential medications, which has increased the demand for flexible pharmaceutical manufacturing.

The top 10 pharma sector

trends also include using blockchain to transact and maintain patient records, augmented, virtual security, mixed reality (AR, VR & MR) solutions, and real-world data to gather real patient experiences. However, the scope of innovation in the sector is much more comprehensive than what is represented by these trends.

Artificial Intelligence

The procedures of drug research and development are being sped up by artificial intelligence (AI). Start-ups are investigating how to employ these technologies to solve problems in the pharmaceutical sector, including the automation and optimization of manufacturing processes and the development

practically all sorts of medical data, including patient records, medical imaging, and hospital data, to mention a few, are used with these analytics tools.

Flexible Production

Due to the shifting market dynamics, the pharmaceutical sector is investigating novel manufacturing techniques, such as small batches for precision medicine. Single-use bioreactors are also becoming more and more popular since they boost output and decrease downtime. These bioreactors accomplish this by omitting challenging tasks like cleaning and validation between various production phases.

The growing emphasis on biopharmaceuticals is being addressed by new varieties of bioreactor systems and

manufacturing procedures in response to the need for precision medicine. The development of sophisticated 3D printers that create tissues or cells is the subject of extensive research.

The creation of pharmaceuticals, the engineering of organs, and regenerative medicine benefit significantly from the 3D printing of human tissues. As a result, precision tablets and medical formulations based on physiology or age can be created. The development of bio-inks, tissue engineering, and microfluidics is also aided by bioprinters.

Blockchain

Every step of the manufacturing and distribution of pharmaceuticals benefits

tools, research teams can communicate in real time using location-based services that are useful and data-rich. Start-ups are using technologies and devices for extended reality to make human enhancement in the pharmaceutical industry a fact.

Real World Data

Real-world data (RWD) and Real-World Evidence (RWE) and real-world data (RWD) are reshaping pharmaceutical sector developments. RWD consists of routinely gathered health reports, treatment information, and patient health status information.

Due to its emphasis on research, the pharmaceutical business must ensure that its data is trustworthy and valuable. The pharma sector is changing due to the availability of real-world data made possible by the Internet of Things (IoT), sensors, and wearables.

Digital therapeutics

Software-based evidence-based therapy interventions are delivered through digital therapeutics to prevent, manage, or treat behavioural, mental, and physical problems. These technological, non-pharmaceutical alternatives can be employed in addition to treatments, devices, or drugs. Thanks to digital treatments, each person can have more influence over their health and outcomes.

Curative therapies

There is a paradigm shift taking place in the field of medicine from managing ailments to healing them entirely. By obviating the need for lengthy treatments, curative therapies like cell and gene therapies are altering how we handle chronic diseases or difficult-to-treat ailments.

In gene therapy, genetic material is inserted into the cells to generate a protein that will help treat a disease or to make up for defective genes. The most popular vectors used for gene therapy are viruses that have been genetically altered.

The use of AI for diverse R&D and supply chain requirements has begun to attract the attention of pharmaceutical companies in India. The most prevalent use of AI in the pharmaceutical sector is still in drug discovery, where computers

of successful marketing and post-launch strategies.

The method of finding and developing new drugs requires the identification of patients, mainly when performing clinical trials. AI streamlines the process of determining eligibility requirements and patient inclusion. It also makes cohort identification quicker and less expensive.

Analytics & Big Data

The medication discovery and development process generate enormous amounts of data, which the pharmaceutical industry needs to examine. Data management is essential for pharmaceutical businesses because they need third parties to share data with collaborators.

Historical and real-time data held by pharmaceutical companies are becoming significant assets for predictive, diagnostic, prescriptive, and descriptive analytics thanks to the development of analytical methodologies. Additionally,

continuous manufacturing techniques. Continuous manufacturing reduces waste, generates high productivity, and eliminates downtime and low energy requirements.

Precision medicine

The concept behind precision medicine is to approach every patient as a distinct individual. Omic and data analytic developments reveal fresh insights into how the body reacts to medications.

Personalized medicine is becoming a reality because of this information and cutting-edge production techniques like additive manufacturing. To identify the optimum dosage for pharmaceuticals based on age, sex, comorbidities, and other clinical characteristics, drug exposure models determine drug pharmacokinetic and pharmacodynamic features.

Additive manufacturing

Pharmaceutical companies are re-evaluating their

significantly from using blockchain technology. Due to the sensitive nature of the data, the stakeholders in the pharmaceutical sector are generally very secretive about it.

Blockchain technology is also being investigated to combat the use of fake medications and inferior pharmaceuticals, which enter the pharmaceutical supply chain and result in the deaths of thousands of people each year. Blockchain is a viable tool for monitoring and safeguarding the pharma transaction ecosystem due to the digitization of transactions.

Extended Reality (XR)

Visualizations are now more possible than ever because of Mixed Reality (MR), Virtual Reality (VR), and Augmented Reality (AR). Pharmaceutical entrepreneurs are looking at the potential of extended reality technologies in the manufacturing and development of pharmaceuticals.

Using comprehensive reality



Indian medical devices market in high growth orbit

Anurag More & New Delhi Bureau

THE Indian medical devices market is growing at an impressive rate and will register robust growth in the coming years. Increasing medical tourism is also one of the significant factors supporting this growth. As a result, of this, the Government of India has taken several initiatives to boost the status of the medical devices industry. These include the launch of the 'Production Linked Incentive (PLI) Scheme for medical device 2020' and the setting up of medical parks.

The establishment of various companies manufacturing medical devices in India is expected to create lucrative opportunities for the growth of medical devices market in India. Additionally, the medical devices market in India is attracting start-up companies to come up with innovative medical device solutions. Also, increasing research & development expenditure in the MedTech industry will create opportunities for the growth of the medical devices

market in India.

Medical devices market in India is expected to reach US \$49.54 billion by 2025 from US \$10.46 billion in the financial

India medical devices industry is an import-driven market. Around 75-80 per cent of medical devices are being imported to India from

population, an increase in the number of both private and government hospitals, and a resulting rise in demand for advanced medical technology

segments. The sector will also benefit from favourable laws and financial incentives for manufacturing in India, FDI influx, outsourcing of production and R&D to India, and government attempt to make healthcare accessible to all", said Satyaki Banerjee, Group Chief Operating Officer, Trivitron Healthcare

"The Indian healthcare sector is a fast-growing industry expected to reach US \$280 billion by 2025. India's medical devices market is one of the top 20 medical device markets in the world currently valued at US\$5.2 billion and is expected to reach US \$50 billion by 2025. India's healthcare industry comprises hospitals, medical devices, health insurance, clinical trials, telemedicine, and medical tourism. These market segments are expected to flourish as an aging population with a growing middle class increasingly becomes aware of preventative healthcare. The domestic telemedicine market is expected to reach US \$ 5.5 billion by 2025.

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year 2020. This can be ascribed to the growing prevalence of various communicable and non-communicable diseases, which require different medical devices for diagnosis and treatment, according to Karan Chechi, TechSci Research. Additionally, the increasing number of different healthcare facilities has significantly increased the demand for medical devices in India.

countries like the United States, China, and Germany, among others. The Indian medical devices market is the fourth largest one in the Asia Pacific region after Japan, China, and South Korea.

"Over the next 10 years, the Indian market for medical devices is expected to grow at an unparalleled rate. This can be linked to the country's expanding middle class

products. Other growth-promoting factors include changing disease prevalence, rising awareness of the importance of early detection and disease prevention, increasing socioeconomic inclusion of rural population in the mainstream economy, and increased manufacturing innovation to create customised products to meet the needs of all income

Cos investing in AI-driven technology

CONTINUED FROM p14▶

search through databases for a specific type of drug molecule.

It won't be sufficient for pharmaceutical corporations to acknowledge the two shifts—a change from treatment to prevention, diagnosis, and cure or to lower pricing and show more value from their therapies. The main difficulty will be to quickly and firmly adapt to these adjustments while also holistically translating the impact of these changes on business and operating models.

Several elements, including automation, effectiveness, and collaboration, will be crucial in changing the pharmaceutical sector to be more patient-centric.

It is anticipated that integrating these technologies would advance quickly and change the pharmaceutical value chain's overall view. The firms are increasingly letting go of control and investing in AI-driven technology through partnerships with AI-driven start-ups or internal capacity building.

Although only a small portion of the pharmaceutical value chain has fully adopted these technologies, in the coming years, a pharmaceutical company's ability to differentiate itself from competitors will depend heavily on how far its technologically advanced business processes have advanced.

The industry is likely to experience rapid adoption in the future, driven by two factors: first, the high return for the front-runners, which puts pressure on others to adopt; and second, the variety of applications that these technologies are finding, mainly thanks to the drive of the start-ups. The regulators will also need to modernize their conventional methods for approving medical devices and staff themselves with the necessary skills and personnel to review and approve these emergent technologies more quickly.

(The author is leading pharmaceutical consultant and Editor-in-Chief of IJMToday)



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CEO, PMBI