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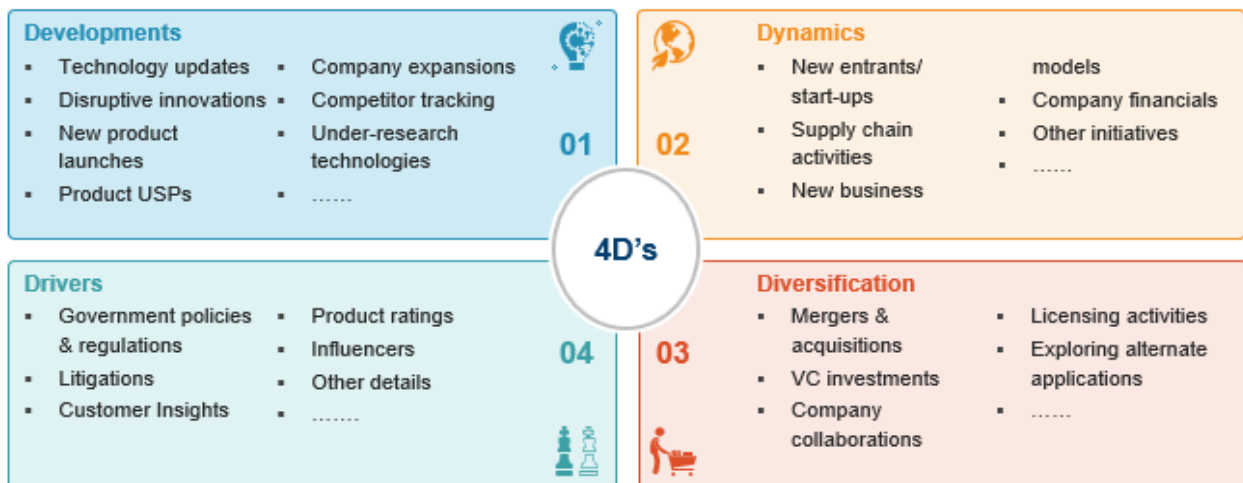
AI in Drug Discovery and Development

May 2023

ARANCA'S QUARTERLY SECTORIAL UPDATE ACROSS FOUR DIMENSIONS….

Developments
- Technology updates
- Disruptive innovations
- New product launches
- Product USPs
- Company expansions
- Competitor tracking
- Under-research technologies
- ....

01

Dynamics
- New entrants/ start-ups
- Supply chain activities
- New business
- models
- Company financials
- Other initiatives
- ....

02

4D's

Drivers
- Government policies & regulations
- Litigations
- Customer Insights
- Product ratings
- Influencers
- Other details
- ....

04

Diversification
- Mergers & acquisitions
- VC investments
- Company collaborations
- Licensing activities
- Exploring alternate applications
- ....

03

DEVELOPMENTS

Technology/ Innovations	MIT Massachusetts Institute of Technology	MIT researchers have developed DiffDock, a new molecular docking model for drug identification and discovery. It generates a series of potential poses for protein-ligand binding, an approach that could lead to dramatic changes in the traditional drug development pipeline. Source: *Massachusetts Institute of Technology*
Technology/ Innovations	UNIVERSITY OF TORONTO	University of Toronto scientists have successfully tested the use of artificial intelligence to guide the design of long-acting injectable drug formulations. Machine-learning algorithms can be used to predict experimental drug release from long-acting injectables and help guide their design. *Source: University News*
Technology/ Innovations	Insilico Medicine · UNIVERSITY OF TORONTO	University of Toronto and Insilico have employed AlphaFold, an artificial intelligence powered protein structure database, to accelerate the design and synthesis of a drug to treat hepatocellular carcinoma, the most common type of primary liver cancer. *Source: Phys.org*
Technology/ Innovations	University of Sheffield · AstraZeneca	University of Sheffield and AstraZeneca have developed an AI tool DrugBAN. The tool can predict whether a candidate drug will interact with its intended target protein molecules inside the human body and provides useful insights on how drugs engage with their protein partners at a molecular level. *Source: University News*
Technology/ Innovations	Exscientia	Exscientia announced that EXS4318, a compound precision designed by Exscientia and in-licensed by Bristol Myers Squibb, has entered Phase 1 clinical trials in the United States. The compound is in development for immunology and inflammation indications. *Source: Company Website*
Technology/ Innovations	absci.	Absci Corporation, a generative AI drug creation company, has created *de novo* therapeutic antibodies *in silico* with the use of zero-shot generative AI. It could potentially reduce the time it takes to get new drug leads into the clinic from as much as 6 years down to just 18-24 months while also increasing their probability of success in the clinic. *Source: Company Website*
Technology/ Innovations	Insilico Medicine	Insilico Medicine has integrated advanced AI chat functionality into its PandaOmics platform. The new feature "ChatPandaGPT" enables researchers to have natural language conversations with the platform and efficiently navigate and analyze large datasets, facilitating the discovery of potential therapeutic targets and biomarkers in a more efficient manner. *Source: EurekAlert*

DYNAMICS

Market Expansion	NEC	NEC and NEC OncoImmunity (NOI) announced that NOI will be realigned as a subsidiary of NEC Bio B.V. in Netherlands. NEC has also established another new company, NEC Bio Therapeutics (NBT) in Germany, also a subsidiary of NB. The new structure will enable NEC to drive long-term growth. The focus of NB will be to streamline all AI, drug research and development activities. *Source: Company Website*
Market Expansion	NVIDIA	NVIDIA announced an expanded set of generative AI cloud services for customizing AI foundation models to accelerate the creation of new proteins and therapeutics, as well as research in the fields of genomics, chemistry, biology, and molecular dynamics. *Source: Company Website*
New Facility	Insilico Medicine	Insilico Medicine has announced the opening of the Insilico Medicine Generative Artificial Intelligence and Quantum Computing Research and Development Center in Abu Dhabi, the region's largest AI-powered biotechnology research center. *Source: EurekAlert*

DIVERSIFICATION

VC Investment	IKTOS	Iktos, a company specializing in artificial intelligence for new drug discovery raised € 15.5m Series A funding to further develop its AI and drug discovery capabilities, expand its SaaS software offering and launch Iktos Robotics (a unique, end-to-end, drug discovery platform combining AI and automation of chemical synthesis to significantly accelerate drug discovery timelines). Source: *PR Newswire*
VC Investment	accenture · OCEAN GENOMICS	Accenture (through Accenture Ventures) has made a strategic investment in Ocean Genomics to help biopharma companies better utilize genomic and transcriptomic data and AI in drug discovery to develop targeted therapeutics at a higher pace and bring them to market faster. *Source: Company News*
Company Collaboration	BAYER · Google	Bayer has collaborated with Google to speed up its in-silico research and development. The Collaboration will enable Bayer to run large quantum chemistry calculations at scale using Google Tensorflow Processing Units. *Source: Company Website*

Company Collaboration	Exscientia / CHARITÉ	Exscientia announced a new collaboration with Charité – Universitätsmedizin Berlin (Charité) to utilize Exscientia's AI-driven precision medicine platform in hematological cancers. *Source: Company Website*
Acquisition/Mergers	BIONTECH / InstaDeep™	BioNTech acquires InstaDeep, a leading global technology company in the field of artificial intelligence and machine learning. The acquisition supports BioNTech's strategy to build world-leading capabilities in AI-driven drug discovery and development of next-generation immunotherapies and vaccines to address diseases with high unmet medical need. *Source: Company Website*

DRIVERS

Government Grant	🇺🇸	Governor Kathy Hochul announced the establishment of a $50 million pilot "Lab of the Future" in Midtown Manhattan that will rely on automation, artificial intelligence, and machine learning to make the preclinical drug discovery process faster, more data-driven and cost-effective. *Source: New York State*
Government Approval	🇺🇸 Insilico Medicine	U.S. FDA has granted orphan drug designation to Insilico Medicine's INS018_055 for the treatment of idiopathic pulmonary fibrosis. *Source: EurekAlert*
Government Approval	🇨🇳 Insilico Medicine	Insilico Medicine announced that China National Medical Products Administration (NMPA) has approved the Investigational New Drug (IND) application for ISM3312, an orally available 3CLpro inhibitor generated and designed with the support of Insilico's proprietary generative chemistry platform Chemistry42 for the treatment of COVID-19. *Source: EurekAlert*
Government Regulation	🇺🇸	U.S. FDA is soliciting feedback on how to incorporate artificial intelligence (AI) and advanced manufacturing techniques into the current regulatory framework for pharmaceutical manufacturing. *Source: Regulatory Affairs Professional Society*
Government Regulation	🇮🇳	The Indian Council of Medical Research (ICMR) released the first ethical guidelines for application of artificial intelligence in Biomedical Research and Healthcare. These guidelines are aimed at "an ethics framework which can assist in the development, deployment and adoption of AI-based solutions" that can benefit all stakeholders. *Source: India Today*

SOLUTION PORTFOLIO – TECHNOLOGY RESEARCH & ADVISORY

IP Strategy	Technology Intelligence	Growth & Strategy
How best can we proactively manage and monetise our technical knowhow / intellectual property?	How best can we keep abreast of technology trends, competitor activity and headwinds / tailwinds in our domain?	Which technologies do we invest in? How do we ensure quick wins? Speed to market?
▪ IP Portfolio Analysis	▪ Competitor Benchmarking	▪ R&D Strategy Roadmaps
▪ IP Monetisation	▪ Tech / IP Landscapes	▪ Technology Scouting
▪ IP Valuation	▪ Technology Watch	▪ Open Innovation
▪ Prior Art Searches	▪ Market Analysis / Trends	▪ Product Development

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RESEARCH
& ADVISORY

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SUPPLY CHAIN
INTELLIGENCE