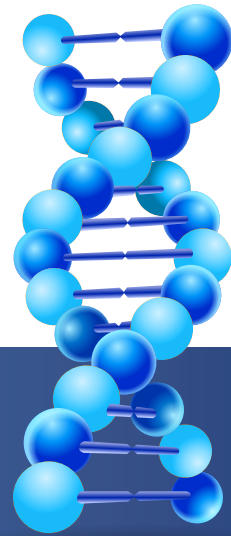




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Riyadh Valley Co

Biotechnology: Upward Trajectory Post COVID-19 Pandemic



September, 2023

Growth by Innovation

Riyadh Valley Co. A Quality Shift towards the Future



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Introduction

Biotechnology, a rapidly evolving field, has garnered significant attention with disruptive innovations¹, especially in the wake of the COVID-19 pandemic. Biotechnology involves the application of biological systems or the use of living organisms or their components in the development of products and technologies used in various sectors, including healthcare, agriculture, and chemicals. Biotechnology has helped in the production of genetically modified crops and other applications that have led to advancements in various sectors.

The estimated value of the global biotechnology market in 2022 was USD 1,224.31 billion and it is anticipated to expand at a CAGR of 12.8% from 2023 to 2030. Within the biotechnology sector, the bio pharmaceutical segment had the largest revenue share of 41.46% in 2022 and is expected to dominate the market due to rising prevalence of chronic diseases and increasing government expenditures on healthcare.² According to PwC, the combined value of mergers and acquisitions in the U.S. life sciences and pharmaceuticals industry alone might be between USD 225 billion and USD 275 billion in 2023.

Development of Biotechnology has been prioritized by the governments, with many countries formulating national strategies and initiatives to harness its potential. In the Middle East, especially the Gulf Cooperation Council (GCC) region, biotechnology has gained prominence as a strategic priority. The National Genome Strategy, which the UAE has recently established in March 2023, aims to map each citizen's DNA in order to give each one with personalised medical care and pave the way for the local production of cutting-edge cancer and diabetes medicines in the future. In Saudi Arabia, the Hevolution Foundation, a non-profit organisation announced intentions to invest up to USD 1 billion annually in fundamental research on the biology of ageing and potential pharmacological inhibitors in 2021.³

Digitalization and technological advancements play a pivotal role in unlocking the potential of biotechnology. With the application of novel technologies such as AI, the discovery and preclinical stages has been accelerated by 15 times faster to just less than two months compared to 2-3 years earlier.⁴ AI algorithms can analyse vast amounts of medical data, including medical images, patient records, and genetic information, to assist healthcare professionals in making more accurate and timely diagnoses. The region is placing a greater emphasis on preventive health services and plans to digitalize 70% of patient activities by 2030.⁵ The digitalization of laboratory processes, data analytics, and bioinformatics accelerates research and development, leading to faster breakthroughs and more efficient biotech solutions. Moreover, digital platforms, cloud-based systems, and artificial intelligence enable seamless collaboration, precision medicine, and personalized therapies. By embracing digital transformation, the biotech industry can unlock new growth opportunities, enhance operational efficiency, and deliver impactful solutions.

¹ Disruptive innovation refers to innovations and technologies that make expensive or sophisticated products and services accessible and more affordable to a broader market.

² Precedence Research

³ PwC

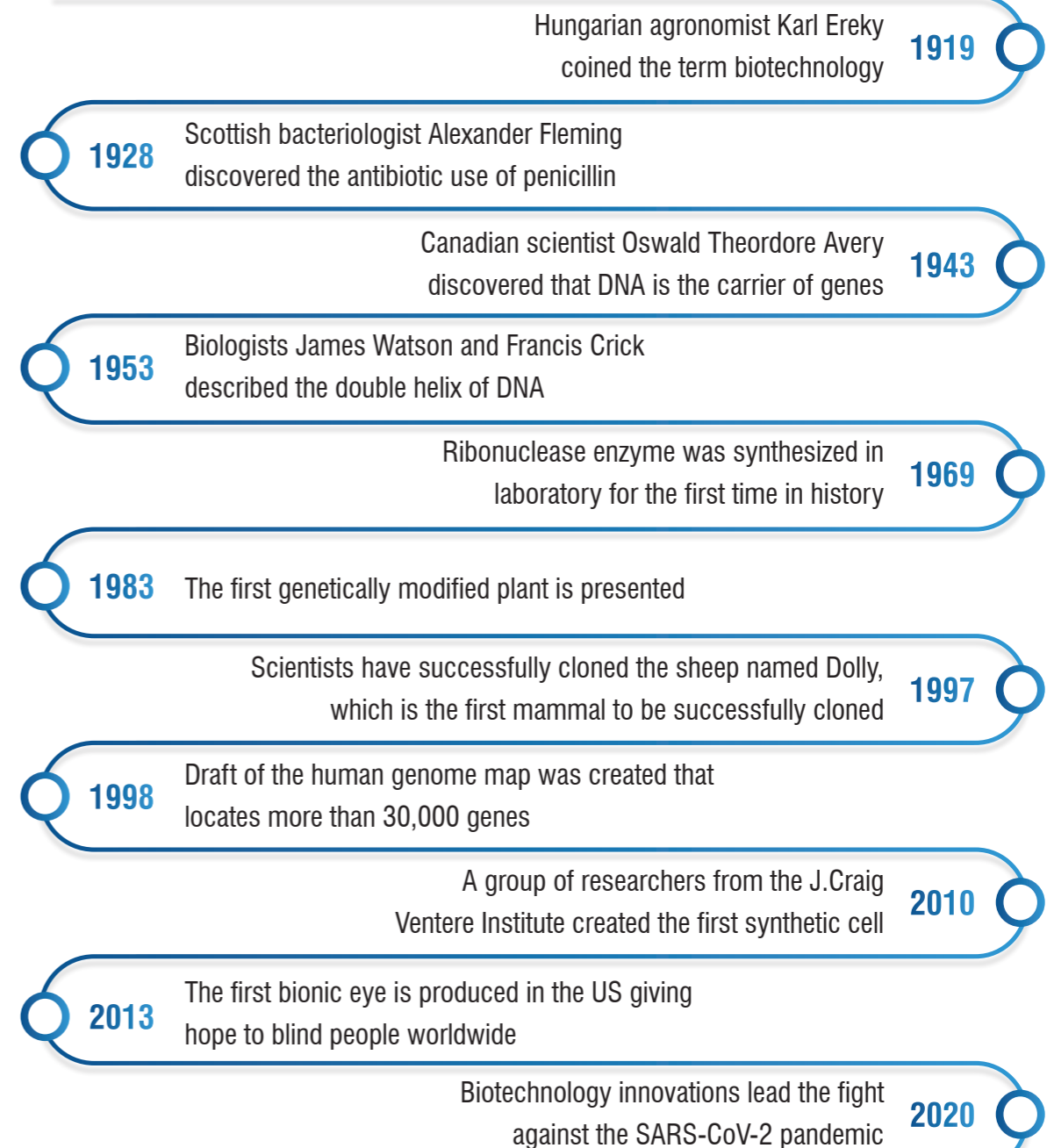
⁴ Deloitte

⁵ Arab News

Overview of Biotechnology

Biotechnology is the amalgamation of biology and technology. Biotechnology Innovation Organization (BIO), world's largest advocacy association, defines biotechnology as science-based technology which uses cellular and biomolecular processes to create technologies and products that enhance both the quality of our lives and the balances the ecological stability of the world's environment.

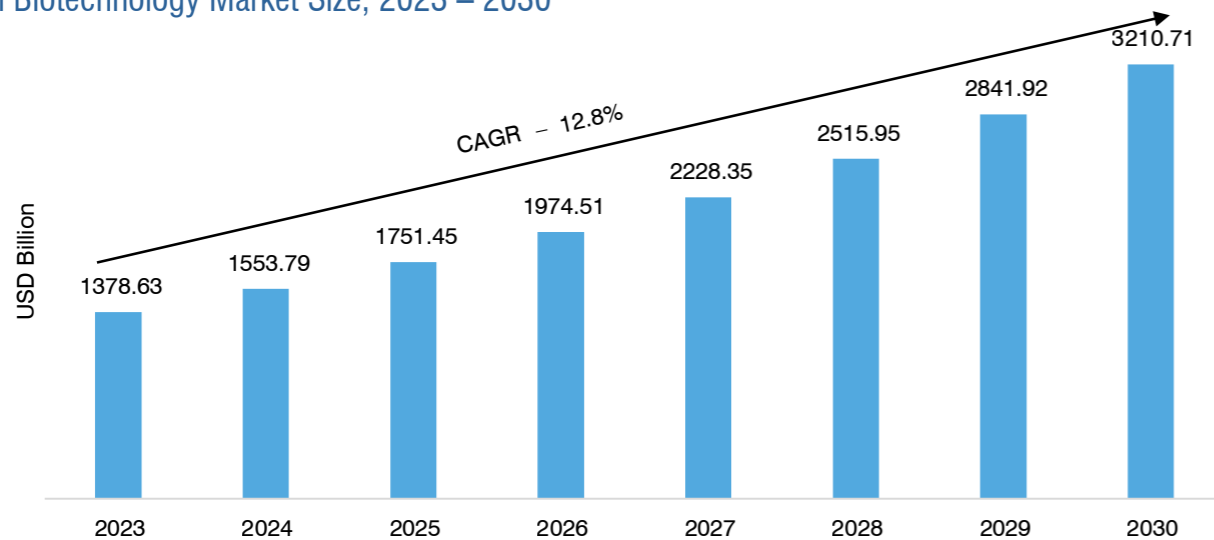
Evolution of Biotechnology



Source: Iberdrola

In addition to the prevalence of genetic disorders, technological advancements in agriculture including genetically modified crops, favourable government initiatives, increased investments, funds, and research grants are considered to be the key driving factors for the sector growth.

Global Biotechnology Market Size, 2023 – 2030



Source: Precedence Research

Biotechnology finds applications across various areas ranging from healthcare such as personalized medicine to industries such as the production of biofuels, enzymes, and bio-based materials. It plays a crucial role in sustainability through applications like bioremediation and wastewater treatment. These diverse applications demonstrate the wide-reaching impact of biotechnology on multiple sectors.

Application of Biotechnology



Medicine

- **Recombinant Insulin** is a form of insulin that is produced through genetic engineering/recombinant DNA technology. It is sequenced from Escherichia coli (E.coli) bacteria. Diabetic patients need external insulin to remove excess glucose from the blood.
- **Gene therapy** is a therapeutic approach employed to address genetic disorders, typically involving the introduction of a healthy or functional gene into individuals who possess a defective or inactive gene.
- **Molecular Diagnosis** is a technique utilized to detect and examine genetic material of the disease found within a cell.
- **Pharmacogenomics** has facilitated the development of medications tailored to an individual's genetic composition which can treat various diseases, including cancer, depression, HIV, and asthma.
- Antigenes in the form of **edible vaccines** can be produced from transgenic plants. For instance, Animal foot and mouth disease can be treated using transgenic sugarbeet, and cholera and hepatitis B can be treated with transgenic bananas and tomatoes.



Agriculture and Environment

- **Phytoremediation** uses genetically engineered plants and microbes to detoxify or absorb and accumulate pollutants in the soil. It is considered as a cost-effective process for restoring the environmental sustainability.
- **Bioremediation** uses the catabolic properties of microorganisms, fungi, plants and enzymes to restore contaminated ecosystems.
- **Genetically Modified Organism (GMO)** helps food to stay fresh longer thereby reducing obsolescence. It also enhances the nutritional value of food such as vitamin A infused rice (golden rice).
- Certain agricultural crops have been **genetically engineered** to increase the resistance to specific herbicides, plant diseases, and insects. Further, it helps to formulate climate-resilient crops to withstand drought conditions and space-resilient crops to minimize the farmland required for cultivation.



Industry

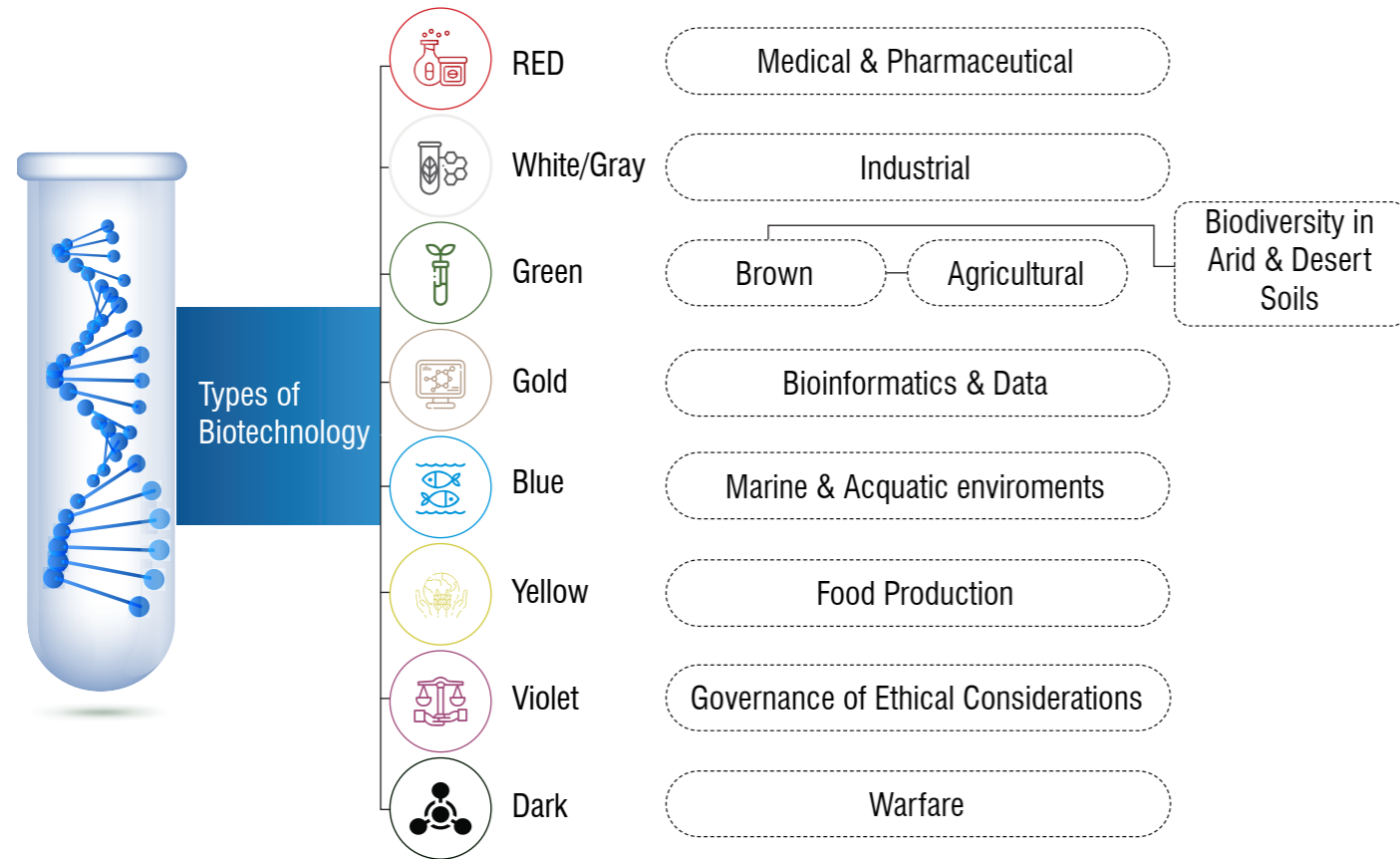
- **Biodegradable Products** including textiles and plastics can help the environment since they generate less waste at the time of degradation.
- **Biocatalysts** including the use of enzymes, yeast, and other microbes help in the fermentation process and in streamlining chemical manufacturing thereby improving efficiency, and reducing operational costs and chemical emissions.
- **Biofuels** from crops such as corn and sugarcane help to reduce the dependence on fossil fuels which may lessen the impact of greenhouse gases on global warming.

Source: International Research Journal of Biotechnology, Iberdrola, USDA, Tech Target

In 2012, Polish Chemist Pawel Kafarski developed a color-coded scheme to distinguish the various research areas of biotechnology due to its wide variety of applications.⁶



Applications of biotechnology based on color-coding scheme



Source: TechTarget, Iberdrola

Biotechnology is experiencing significant trends that are shaping its future. There is a growing focus on environmental biotechnology, aiming to develop sustainable solutions for pollution remediation and eco-friendly industrial processes. These trends reflect the ongoing advancements and potential of biotechnology in revolutionizing healthcare, agriculture, and environmental sustainability.

Biotechnology Trends

Gene Editing

- Medical professionals can modify genes or replace faulty genes with healthy ones to potentially treat, cure, or prevent a disease or medical condition. Cancer treatment is a key area of focus for targeted therapies.
- With the help of the Clustered Regularly Interspaced Short Palindromic Repeats (CRISPR) gene editing technology, the tests can be performed at patient's home itself, thereby reducing the cost and the time needed.

Precision/Personalized Medicine

- With advancements in the field of robotics and AI, precision medicine helps doctors to predict more accurate treatment and preventive strategies for a particular disease thereby reducing the risk of human complications.
- Precision medicine can be made feasible by gene editing and sequencing and will find its use in gene therapy, drug discovery, and other drug delivery systems.

Synthetic Biology

- It involves engineering or re-designing biological systems by manipulating the biological entities and then integrating them into cell walls to provide desirable biotechnological processes.
- Innovations in synthetic biology may include engineering soil bacteria for regenerative agriculture, bioproduction of essential chemicals, and engineering human gut microbes for medicinal purposes.

Bioprinting and tissue engineering

- Similar to 3D printing technology, bioprinting is aimed at printing cells or biomaterials to create organ-like structures and will be beneficial during health-emergency situations. It is even expected to benefit industries including drug discovery, regenerative and personalized medicine.
- Tissue engineering, similar to bioprinting, has made it feasible to produce tissue grafts from the patient's own body to cure burns. These tissue grafts can also be employed in regenerative medicine and organ transplantation.

Source: Esco LifeScience, Big Think, Nasdaq

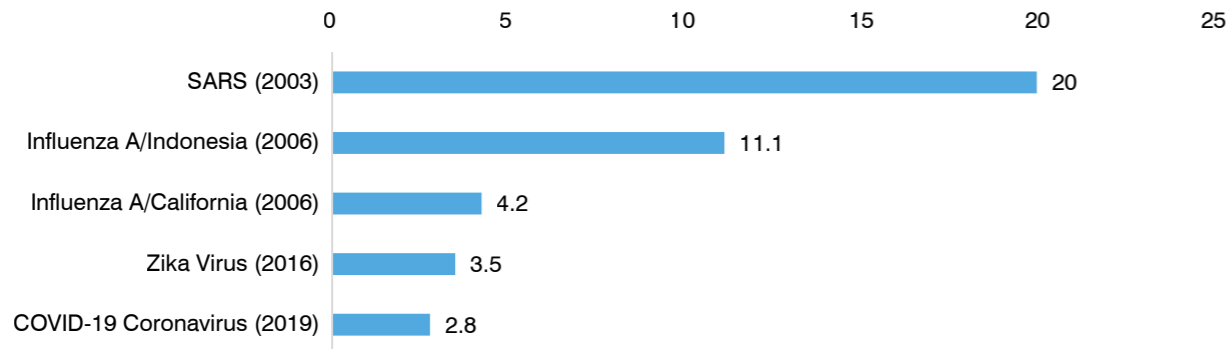
Biotech companies have revolutionized vaccine development, contributing to the rapid response to emerging infectious diseases and advancing the field of immunization. Biotechnology allows for the precise manipulation of viral or bacterial components, which assists in the development of novel vaccine platforms, and the commercial production of vaccines.

Xenotransplantation

- Xenotransplantation is a procedure that uses genetically engineered animal organs to treat human diseases.
- In the past, researchers have been successful in transplanting animal hearts and kidneys, and going forward, it is expected to reduce the waiting period for organ transplantation.



Vaccine Development Timeline - Months from viral genetic-sequence selection to first human study



Source: Biotechnology Innovation Organization (BIO);

Note: Timeline for Wuhan virus vaccine is projected. Timelines for first four vaccines published in JAMA in 2018.

Biotechnology has facilitated the rapid development and production of diagnostic tests for detecting the SARS-CoV-2 virus. Further using the drug-repositioning process, it helped to find the effectiveness of other approved drugs to be used in the treatment of COVID-19.

Role of Biotech during COVID-19 pandemic

Understanding the spread and severity of diseases

- Collaboration of biotechnology with other domains such as robotic automation and sensors in labs has made it possible to estimate the nature of illness before becoming severe.

Developing vaccinations

- Modern biotechnology techniques, such as genetic engineering and cell culture, made it possible for the efficient, rapid, and affordable creation of vaccinations.
- Bioprocessing, a branch of biotechnology, was followed for the commercial production of vaccines. It involves two processes:
 1. Upstream including preparation of growth media, production cells, and optimisation of production conditions
 2. Downstream including product harvest, product purification, and waste production management.

Source: TC Global, I3L, CDC

Genomic Surveillance of COVID Variant

- Genomic sequencing technique was employed to understand the genetic makeup and mutation of the virus, SARS-CoV-2.
- Researchers then tracked the spread of variants and monitored the changes in the genetic code which then helped them to better understand how variants might impact public health.

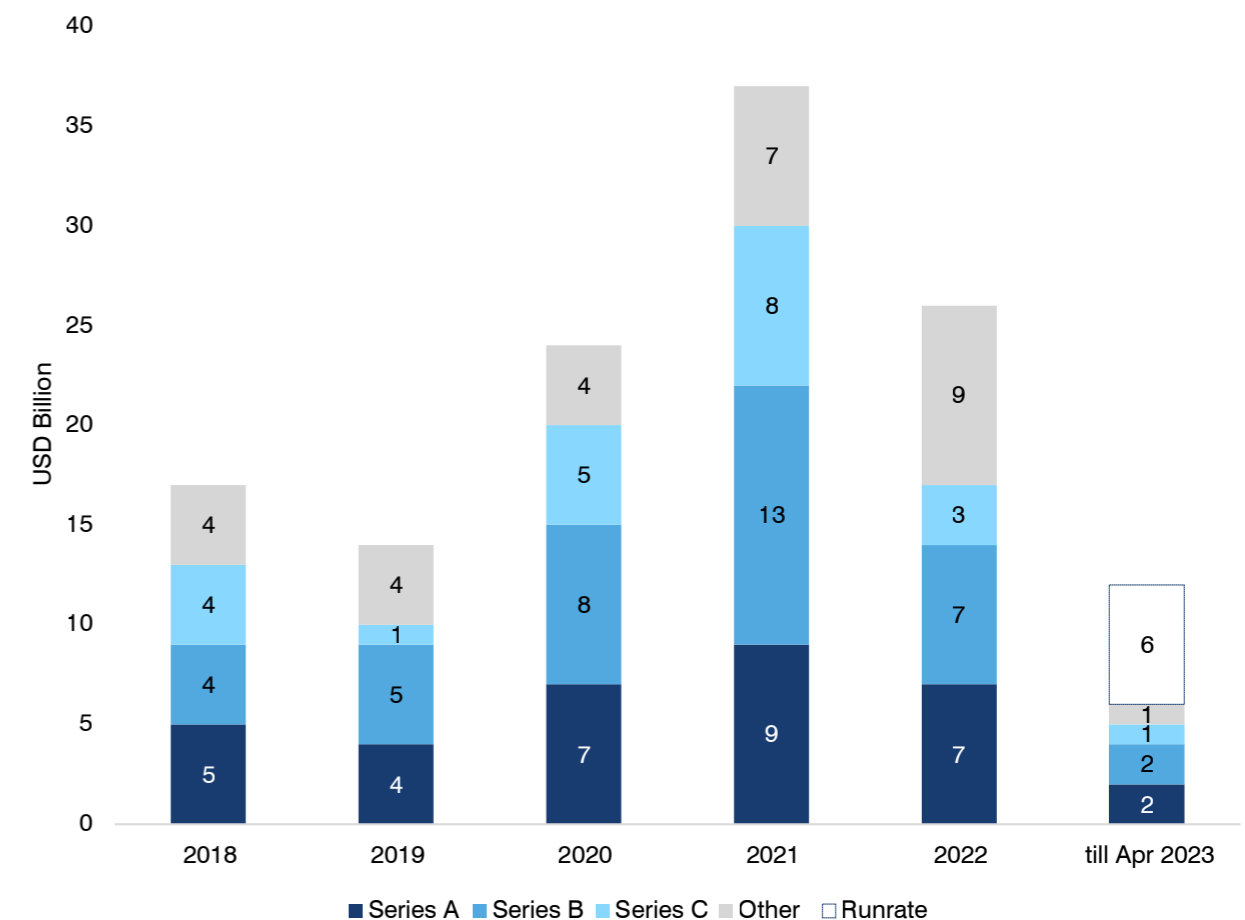
Medical kits and Life-support system

- Biotech firms aided the development and creation of medical kits that support front-line staff members including doctors, nurses, and other healthcare professionals. These kits were intended to safeguard both the users and the patients undergoing treatment.
- They also played a critical role in designing miniature versions of immobile medical equipments.

Global VC funding in Biotechnology

In 2021, VC firms invested USD 36.6 billion in biopharma companies in the US, UK, and European Union, up 281% compared to 2017.⁷ Global venture investments in biotech have been down from USD 37 billion in 2021 to USD 26 billion in 2022, with series B rounds declining close to 50%. Due to the tight monetary environment in 2022, investors have been wary of the results of clinical trials before participating in series B funding rounds. Nevertheless, the industry is showing signs of stabilization with a funding of USD 6 million funding till April 2023 and an additional run rate (estimated funding) of USD 6 billion.

Global Venture investments in Biopharma, 2018-2023



Source: Bay Bridge Bio, * Series A, B, C and Other indicate Funding and Run Rate indicates estimated funding

Drug research and clinical trials have long gestation periods. However, technological developments in the research areas are critical to the evolution and application of biotechnology. Venture capital companies (VCs) play an important role in supporting the research and clinical trial phases in the biotech industry. 2021 had been the busiest year for the biotech industry which saw investments around USD 65 billion.⁸

⁷ Bloomberg

⁸ Crunchbase

Top five biotech VC firms by number of investments

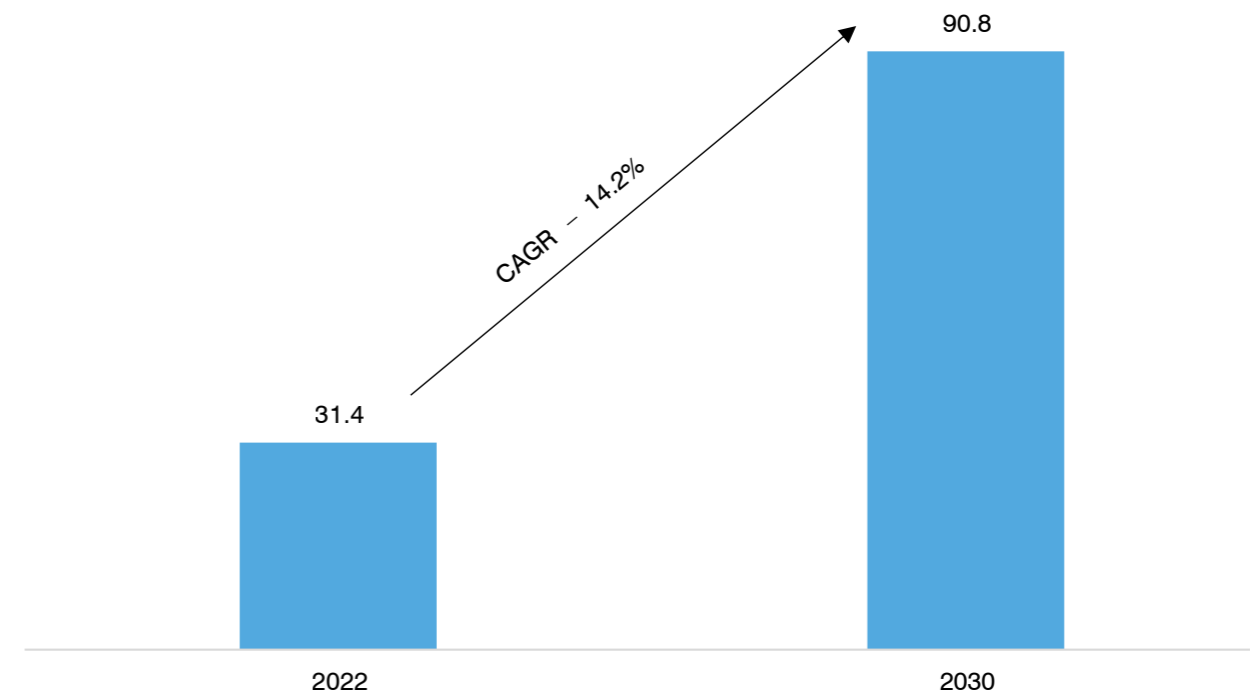
Biotech VC firm	Year founded	Incorporated country	Description	Number of investments
Arch Venture Partners	1986	Chicago, Illinois	It invests in early-stage companies and prefers to hold minority stakes	296
SOSV	1994	Princeton, New Jersey	It invests in pre-seed, seed, series A-plus, and growth-stage companies.	293
Novo Holdings	1999	Copenhagen, Denmark	It manages the assets and wealth of the Novo Nordisk Foundation. It invests in the life science sector.	291
RA Capital Management	2001	Boston, Massachusetts	It invests in early-stage companies in healthcare and life science companies developing drugs, medical devices, services & research tools, and diagnostics sectors based in the United States and Europe.	290
Alexandria Venture Investments	1996	Pasadena, California	It invests in seed-stage, early-stage, and growth-stage companies from sectors including healthcare, disruptive life science, agrifood technology, climate innovation, and information technology.	267

Source: Pitchbook; Note: Number of investments as of February 9, 2023.

Biotechnology in Middle East

The market size of the biotechnology sector in the region was estimated to be USD 31.4 billion in 2022 and it is anticipated to grow at a CAGR of 14.3% between 2022-2030, with the UAE and the Saudi Arabia accounting for the largest share of the market.⁹

Market Forecast of Biotech



Source: Coherent Market Insights

The growth of biotechnology in the Middle East is being driven by several factors including increasing government investments in research and development (R&D), rising demand for healthcare solutions and strategic partnerships with international biotech companies.



⁹ Coherent Market Insights, PwC

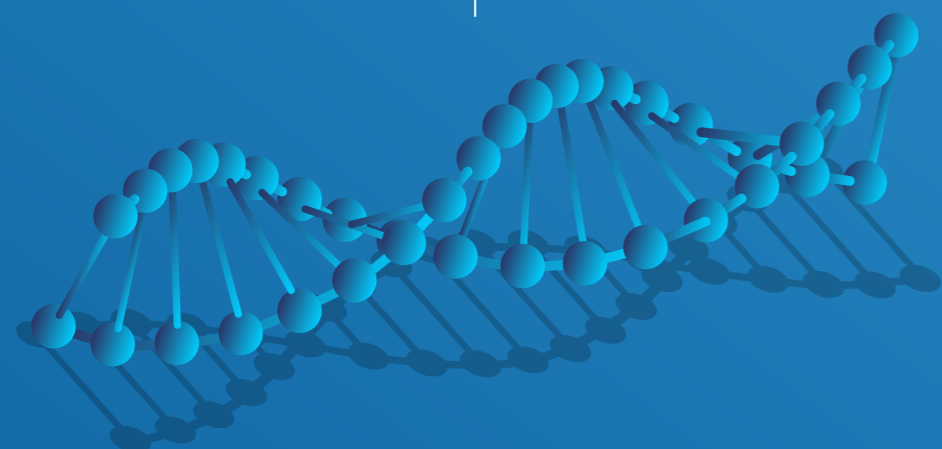
Growth Drivers

01 Proactive Preventive Healthcare

- After facing unprecedented times such as COVID - 19 pandemic, countries in the middle east have made biopharma a strategic priority by ensuring supply chain resilience and drug supply security.
- Saudi Arabia has the largest market share of production in medicines in the GCC, followed by the UAE.

02 Healthcare Investments

- Rising chronic illnesses and the need for improving healthcare services have attracted investments in the sector.
- For instance, in 2023, the UAE government devoted USD 1.3 billion to healthcare and community protection in their federal budget. Furthermore, in June 2023, Saudi Arabia's Public Investment Fund (PIF) created a new entity, Liferia, to attract biotech firms to invest in the region.



03 Personalized Medicine

- The Personalized Medicine segment is estimated to reach USD 2.51 billion by the end of 2023.
- The Genomics segment is also forecasted to expand at a CAGR of 9.3% between 2020 and 2025, driven by increased investment in genomics research and rising demand for personalized medicine.

04 Partnerships and Creation of Biocluster hubs

- Increasing partnerships and creating biocluster hubs with global pharma companies will enable the region to develop advanced clinical trial and testing capabilities.
- For instance, UAE's G42 Healthcare collaborated with AstraZeneca to improve the region's R&D and clinical trials.

Source: PwC, Bloomberg

Active Biotech VC Investors in the Middle East

Biotech VC firm	Year founded	Incorporated country	Description
Middle East Venture Partners	2010	Dubai, UAE	With more than USD 260 million in Assets Under Management, MEVP is the largest and most established VC firm in this region, with clear cross border investment appetite.
Riyadh Valley Company	2010	Riyadh, Saudi Arabia	Riyadh Valley Company is the investment arm of King Saud University. It is a strategic investor that focuses on leveraging local capabilities and invests both domestically and internationally in companies in early stages and growth stages. The company invests in biotechnology, healthcare, internet and communications technologies, sustainable resources, financial technology, logistics and transportation, and education sectors.
Flat6Labs	2011	Cairo Egypt	Flat6Labs is a seed and early-stage venture capital firm that primarily invests in tech-driven startups.
Silicon Badia	2011	Jordan	Silicon Badia is a venture capital investment firm which invests in the enterprise, b2b, technology, developer tools, education, finance, consumer, agriculture, health, insurance, life sciences, mobility, and logistics sectors.
VentureSouq	2013	Dubai, UAE	VentureSouq is a venture capital firm which invests in early-stage technology companies operating in the Agritech, environmental tech, food tech, fintech, enterprise software, mobility, health tech, food tech, and digital media sectors.
TRAngels	2015	Istanbul, Turkey	TRAngels is an angel network which brings together angel investors and venture projects and are particularly interested in start-ups that are in the seed or incubation stage.
Diffusion Capital Partners	2015	Istanbul, Turkey	Diffusion Capital Partners is a venture capital firm which invests in technology firms with an emphasis on biotech, green-tech, Agri-tech, life sciences, materials and nanotechnology, IT, robotics, and mechatronics.
Prosperity7 Ventures	2019	Dhahran, Saudi Arabia	Prosperity7 Ventures is a venture capital arm of Saudi Aramco. With a fund size of USD 1 billion, it invests in enterprise tech, fintech, deep tech & artificial intelligence, blockchain, b2b, b2c, software as a service, and MedTech sectors.

Source: Forbes, Shizune, Crunchbase, Pitchbook

Biotechnology in Saudi Arabia

Saudi Arabia is well-positioned to cultivate a biotech ecosystem which can compete on a global scale. There is immense potential for the country to emerge as a prominent biotech hub, paving the way for substantial economic opportunities in the coming decade.

Future key enablers supporting the growth of biotech market

Investments towards Research & Commercialization

- According to the General Authority for Statistics (GASTAT) of the Kingdom, Saudi Arabia spent USD3.86 billion on research and development in 2021.
- Saudi Arabia intends to invest USD 1 billion annually in research into anti-aging therapies. It has set up Hevolution Foundation, a non-profit organization, for this purpose.

Skilled and Knowledgeable Human Capital

- As a result of the Human Capability Development Program, the number of scientific research papers in the area grew by 120%.
- The Saudi STEM Education summit held every year aims to give students the specialised abilities they need to meet the challenges of the modern world in areas like life science.

State-of-the-art Infrastructure

- The digital infrastructure in the region has been boosted by receiving investments of around USD 25 billion over the past six years.
- The King Abdullah International Medical Research Centre in Saudi Arabia carries out cutting-edge research in genetics, immunology, and cancer and is further making enormous investments in biotech infrastructure, research and development, and talent acquisition.

Source: Vision 2030 Document, Arab News

In 2021, the first edition of the Riyadh Global Medical Biotechnology Summit (RGMBS) was organized by the Ministry of National Guard – Health Affairs in collaboration with King Abdullah Medical Research Centre, and Saudi Arabian National Guard. It was jointly sponsored by the Arab National Bank, Tibbiyah (Arabian International Healthcare Holding Company), and Abdulrehman Algosaibi Co (healthcare solution provider). The summit gathered the industry pioneers from scientific communities and pharmaceutical industries both regionally and internationally, to discuss the current prevailing trends in the biotechnology sector and to formulate a future growth plan. The second edition took place on 25th and 26th January 2023.

2nd Edition of Riyadh Global Medical Biotechnology Summit (RGMBS) 2023



Themes

- Cell and Gene Therapy
- Vaccines for Infectious Diseases
- Vaccines for Cancer
- Genomics & Precision Medicine for Rare Diseases
- Clinical Trials & Real World Evidence



Objectives

- Pushing the boundaries of the nation's perspective and practises towards a targeted and sustainable medical biotechnology enterprise.
- Proposing models and opportunities for biotechnology development and academic-industrial partnerships.
- Addressing challenges and opportunities that will have a impact on the nation, the region and the rest of the world.



Key Takeaways

- The global biotechnology sector will shape the future by
 - » addressing more than 45% of the world's unmet medical needs
 - » increasing the value of global manufacturing inputs from 25% to more than 60%
 - » encouraging the private sector to increase investment in R&D from 15% to more than 30%
- Saudi Arabia has well established pharmaceutical sector which exports close to SR 1.5 million.



Memorandum of Understandings (MoUs)

- 11 MoUs and cooperation agreements were signed between government agencies and industry leaders from international and national companies.
- Further, Ministry of Investment has signed two MoUs with
 - » Boehringer Ingelheim Company and
 - » Saudi Novo Nordisk Trading Company and King Abdullah University of Science and Technology .

Source: RGMBS, Saudi Press Agency



Spotlight: Epidarex Capital

Epidarex Capital Fund is one of the investments in the portfolio of Riyadh Valley Company, specializing in bold investments focused on early-stage investments in the most innovative startups in the fields of life sciences and healthcare. It operates in four sub-sectors: pharmaceuticals, biotechnology, medical devices and equipment, and information technology, software, and services.

Strategy and Investment Criteria

Mission	To build extraordinary companies that transform novel science into the next generation of highly successful drugs and medical devices.
Funding Stage	Seed and Series A
Investment Universe	Medical Research Universities and Institutions
Sector	Life Sciences including biotechnology and pharmaceuticals, medical devices, and health tech
Investment Geography	US and UK
Evaluation Factor	<ul style="list-style-type: none"> Disruptive platform technologies that address large and unmet medical needs. Novel innovations that offer a sustainable competitive advantage. Future pipeline of high value products deliverable to the patient or customer. Robust Intellectual Property portfolios (patents, trade secrets and “know how”). Prospective commercial partners and early evidence of market validation. Early traction and support from key opinion leaders and health practitioners. Clear regulatory (and where applicable, insurance reimbursement) strategies. Efficient use of capital. Highly driven and tenacious founders and entrepreneurs. Potential for outstanding financial return and significant patient impact.

Source: Epidarex

Portfolio Companies

#	Company Logo	Country of Incorporation	Description
1		Edinburgh, UK	AdoRx is developing new modulators of the adenosine pathway for the treatment of cancer.
2		Louisville, Kentucky, US	Apellis Pharmaceuticals is a NASDAQ listed company developing therapies for a broad range of debilitating diseases that are driven by uncontrolled or excessive activation of the complement cascade, including those within haematology, ophthalmology, and nephrology.
3		Edinburgh, UK	Caldan, a spin-out company from the Universities of Glasgow and Southern Denmark, is developing novel therapeutics targeting free fatty acid receptors for metabolic diseases. The lead programme aims to develop a selective FFA4 (GPR120) agonist for Non-Alcoholic Steatohepatitis (NASH).
4		Glasgow, UK	Clyde Biosciences, a spin-out company from the University of Glasgow, has developed a pioneering technology (CelloPTIQ) to rapidly evaluate cardiotoxicity risk in pharmaceuticals.
5		London, UK	Curve a spin-out from the University of Southampton. Curve is deploying its Microcycle™ platform to build a pipeline of first-in-class therapeutics targeting protein-protein interactions. Curve's goal is to transform the discovery of new therapeutics through functional screening against intractable targets in their native cellular environment.
6		Cambridge, UK	Dunad is focusing on the development of next-generation small molecule therapeutics based on its highly differentiated, tuneable, and targeted protein degradation technology.
7		Edinburgh, UK	Edinburgh Molecular Imaging, a spin-out company from the University of Edinburgh, is a clinical phase biotechnology company with a highly novel C-Met molecular targeting technology platform. It is developing a radiotherapeutic agent for treatment in cancer, alongside its fluorescent optical imaging agent.
8		Brighton, UK	Enterprise Therapeutics is a clinical stage company dedicated to the research and development of novel therapies for the treatment of respiratory diseases through the modulation of ion channels.
9		Berlin, Germany	Eternigen is focused on the discovery of inhibitors of NaCT, a novel target which, “as the longevity gene,” is also known as INDY (“I am Not Dead Yet”), for the treatment of dietary-related metabolic diseases.
10		London, UK	EpsilonGen (formerly IGEM Therapeutics) is a clinical stage company, spun-out from King's College London, is developing IgE-based antibody therapeutics for the treatment of cancer.
11		Edinburgh, UK	Kynos Therapeutics, a spin-out from the University of Edinburgh, is an immune metabolic company with world-leading expertise in the kynurenine pathway and kynurenine 3monooxygenase (KMO) biology.
12		London, UK	Leucid Bio, a spin out company from King's College London is focused on the development of new treatments for cancer. The company is developing a pioneering technology utilising engineered T cell.

13		San Diego, California, US	Libra Therapeutics is a US biotech focused on developing novel therapeutics for neurodegenerative diseases by normalizing intracellular trafficking and autophagy in neuronal cells.
14		Leeds, UK	LUNAC Therapeutics, a spin-out company from the University of Leeds, is developing next generation oral anticoagulants for the treatment and prevention of life
15		Edinburgh, UK	Macomics, an early-stage immuno-oncology company, spun-out from the University of Edinburgh, its developing next-generation therapies to modulate macrophages, increasing the body's immune defence against tumours.
16		Glasgow, UK	Mironid is developing proprietary drug candidates that modulate the activity of key phosphodiesterase 4 (PDE4) enzymes in chronic inflammatory and degenerative kidney diseases.
17		Cambridge, UK	NodThera is a clinical stage company developing NLRP3 inflammasome inhibitors for the treatment of diseases driven by chronic inflammation.
18		Miami, Florida, US	RapidPulse, a spin out from medical device incubator and engineering firm Syntheon, is developing a novel RapidPulse aspiration system to treat ischemic stroke.
19		Charlottesville, Virginia, US	Slate Bio, a spin out from the University of Virginia, is developing next generation IL-2 therapies that restore the body's natural immunological response in various diseases.
20		Oxford, UK	Theolytics, is a UK biotech focused on creating a step-change in the oncolytic viral therapy field, by using its patient-centric phenotypic screening platform.
21		Hamburg, Germany	Topas is a clinical stage therapeutics company using ground-breaking nanoparticle technology to target autoimmune and inflammatory diseases via the induction of antigen-specific immune tolerance in the liver.
22		Cambridge, UK	Transine Therapeutics is an RNA platform company developing a novel class of therapeutic RNAs (SINEUPs) capable of upregulating protein expression with a superior level of control and specificity.

Source: Epidarex

Conclusion

Biotechnology plays a pivotal role across the entire healthcare spectrum, encompassing research, drug development, diagnostics, and personalized medicine. The COVID-19 pandemic has emphasized the significance of biotechnology, particularly in areas like vaccine development and therapeutics. The integration of biotech with digital technologies, such as data analytics and artificial intelligence, offers immense potential for advancements in disease management and personalized treatments.

Globally, the biotech sector continues to witness strong investor interest and funding indicating its promising growth prospects. The market size of the global biotech industry is anticipated to achieve USD 3,210.71 billion by 2030.¹⁰ According to McKinsey, between 2022-2026, there are 96 product launches anticipated with worldwide sales expected to exceed USD 1 billion annually. Most of the product launches would be from new market entrant companies.¹¹

In the Middle east, the biotech sector is projected to reach USD 90.8 million by 2030. Government-funded projects shall play a significant role of worldwide efforts to fully utilize the genetic data. For instance, the King Abdulaziz City for Science and Technology (KACST), a scientific government institution initiated the Saudi Genome Program in 2013 which aimed to sequence 100,000 human genomic samples to develop effective methods for early diagnostics and treatment of genetic diseases.¹² Further, Sovereign Wealth Funds will be the key growth driver transforming the biotech sector in the region. The Saudi Public Investment Fund (PIF) founded the Pharmaceutical Investment Company to aid start-ups in innovative treatments and pharmaceutical research.

AI-enabled drug discovery will have a remarkable impact on the biopharma sector. It may accelerate and enhance preclinical testing and discovery, allowing new research avenues, and may reduce costs by improving the success rates of the clinical trial stage. Insilico Medicine, a biotechnology company, has been on the forefront by opening the largest AI-Powered Biotechnology Research Centre in the UAE.

¹⁰ Precedence Research

¹¹ McKinsey

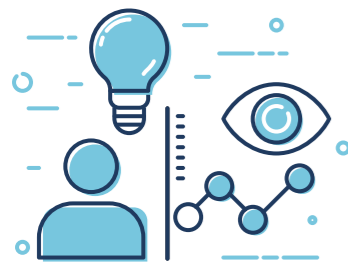
¹² Harvard Kennedy School



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Riyadh Valley Company established in 2010 by Royal Decree No.116 dated 13/4/1431 AH to be the investment arm of King Saud University in the fields of Knowledge Economy and the university strategic projects.



Vision

To be the regional leader in knowledge-based investment and technology.



Mission

Riyadh Valley Company is a strategic investor, focused on leveraging the local capabilities, investing locally and globally in growth - stage businesses to create financial and strategic returns that will support the future of economic development in the Kingdom.

Investment Sectors:

Venture Capital Investments



Healthcare Investment



FinTech



Renewable energy & Sustainable Resources



Education



Information & Communication Technology



Logistics and Transportation

Strategic Investments



Innovation and R&D Projects



Commercial Projects



Educational Projects



Residential Projects

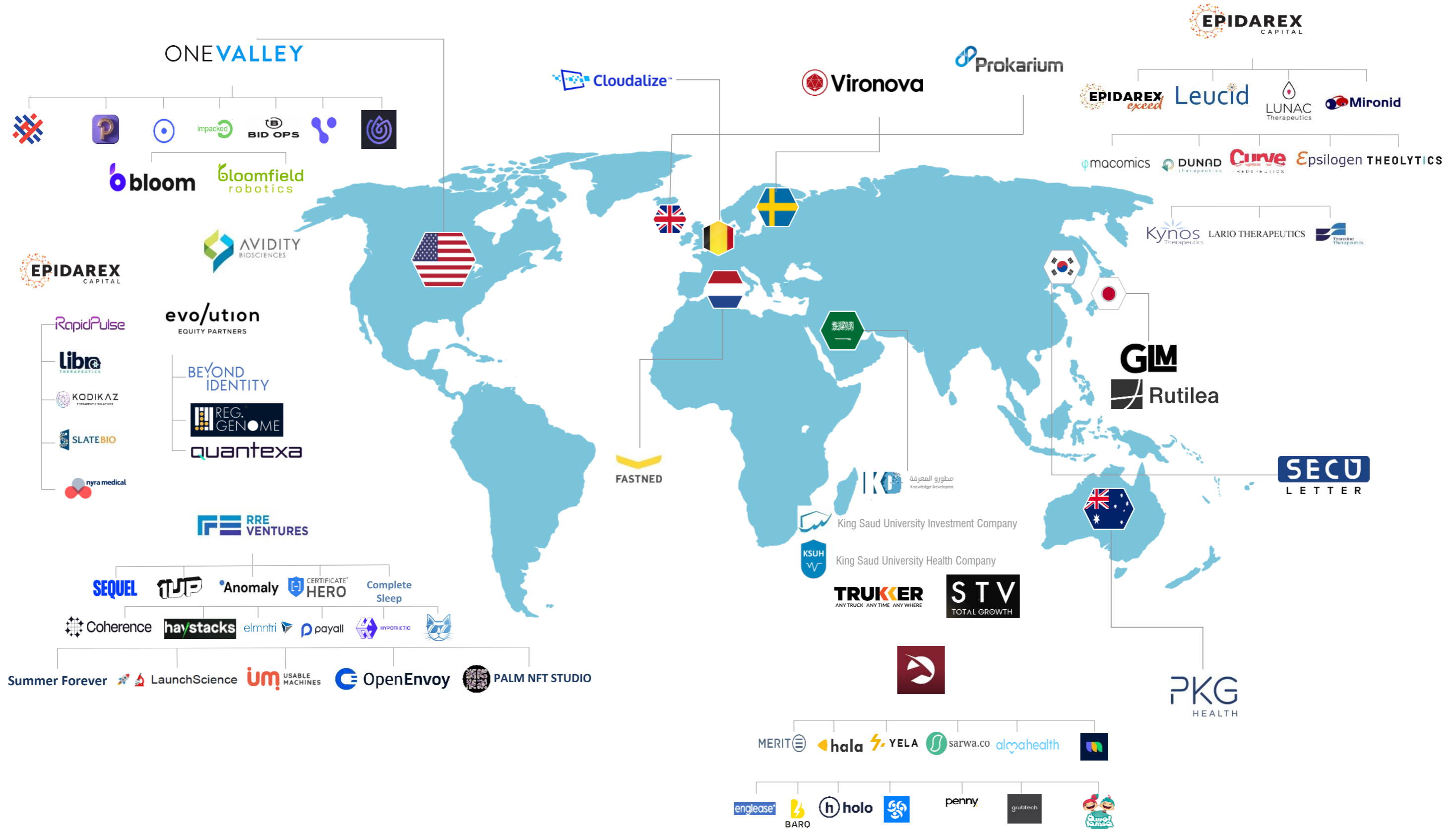


Healthcare Projects



Mixed-use Projects

Knowledge Investment Portfolio



Strategic Investment Portfolio



Sudair Pharma Company Project

Research center and offices



ELM Information Security Company Project

Research & Innovation center



Four Directions Company Project

Office project



Majd Real Estate Company Project

Offices project



Al-sorooah Al-Mubarakah Company Project

Offices project



Obeikan Company Project

Commercial project



Derma Clinic Company Project

Residential project



City Lights Real Estate Company Project

Mixed-use project



Four Directions Company Project

Commercial project



Omnia Real Estate Development Company Project

Commercial project



Qasr Alaaredh Company Project

Building



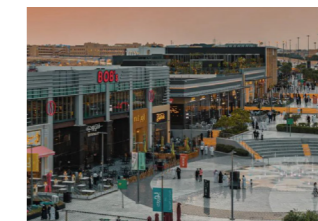
Sahat Al-Ardh Company Project

Mixed-use project



The Esplanade Project

Commercial project



U WALK Project

Commercial project



NMR Real Estate Company Project

Mixed-use project



Takween Altanmia Company Project

Offices project



Arrowad Education Company Project

Educational project