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SynBioBeta 2025 Investor Report

Investment Trends in Synthetic Biology: 2024-4Q

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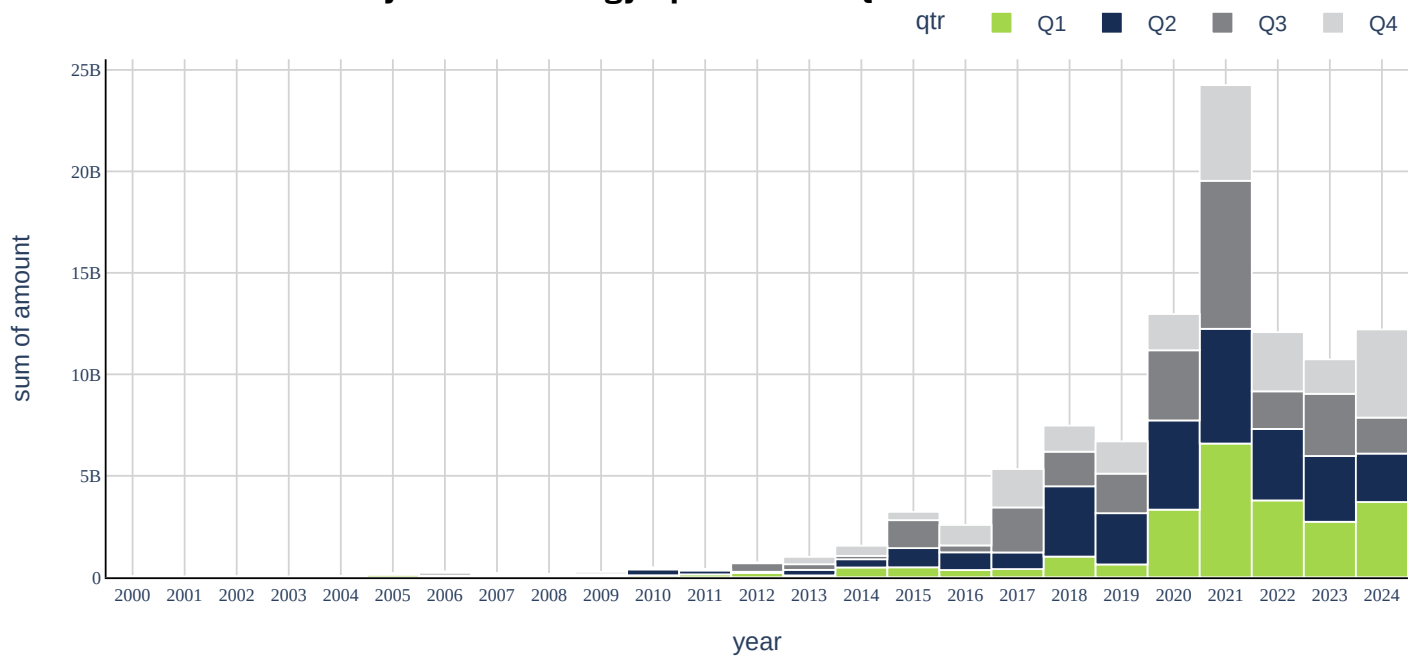
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Synthetic Biology Overall Investment Trends

Venture Investment in Synthetic Biology Rebounded in Q4 and for 2024 overall

In the fourth quarter of 2024, startups in the synthetic biology sector secured a total of \$4.3 billion in funding. This marked an increase of \$2.6 billion, or 59.2%, from the previous quarter's \$1.8 billion. In the same quarter of the previous year, startups raised \$1.7 billion, resulting in a \$2.6 billion change. Year-to-date, synthetic biology startups have raised \$12.2 billion, compared to \$10.7 billion at this point last year, reflecting a \$1.5 billion change.

Overall investment in Synthetic Biology up to 2024-4Q



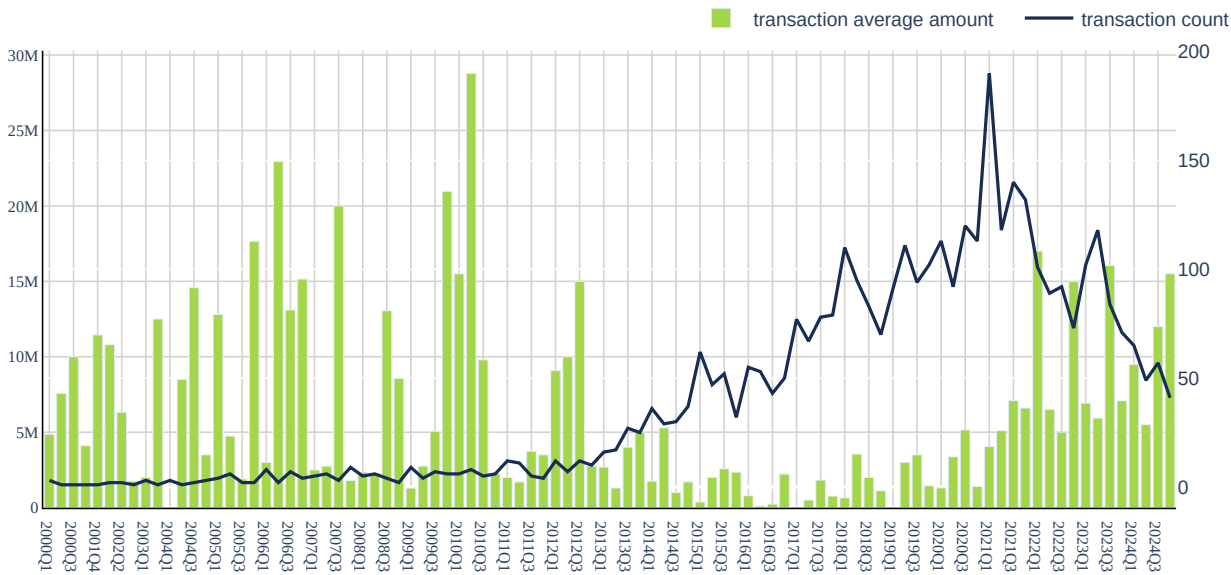
In 2024, new capital and new companies came back to synthetic biology

While venture investment is still down from 2021's high, its rise in 2024 can be attributed to both money entering existing firms, and a new cohort of companies entering the Synthetic biology space. Since 2018, about 150 companies have come in to the field. Venture investment in general between 2020 and 2022 were abnormally high, and synthetic biology has outpaced all VC in growth since then.

Average Investment Amount & Deal Count

Interestingly, average transaction amounts in 2024 were generally higher than the trend of the last five years, excepting the unusual quarters during the peak. It is primarily a reduction in deal count that is keeping the overall transaction volume from being higher.

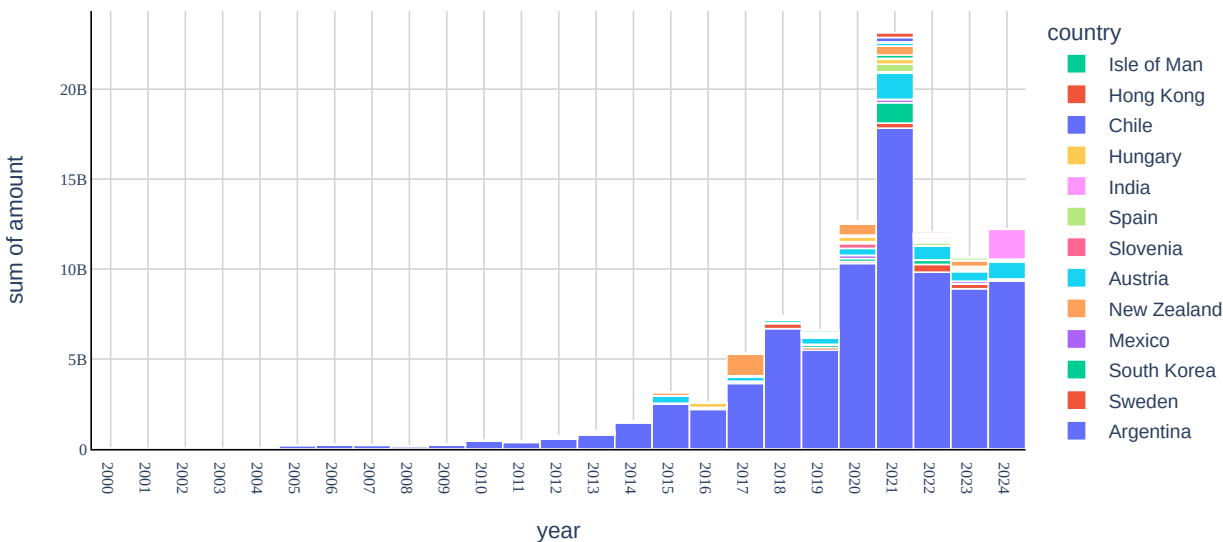
Average transaction amount and deal count in Synthetic Biology up to 2024-4Q



Synthetic Biology is a Global Undertaking

In this year's report, we analyzed the location of companies getting venture investment. Unsurprisingly, the United States leads by a large margin, which it does in every area of venture capital, for historical and economic reasons. The trend over time is seeing other countries' share of VC increasing, even while the US remains strong. The challenges synthetic biology startups address are global, and home-grown startups are emerging in more and more markets.

Overall investment by country up to 2024



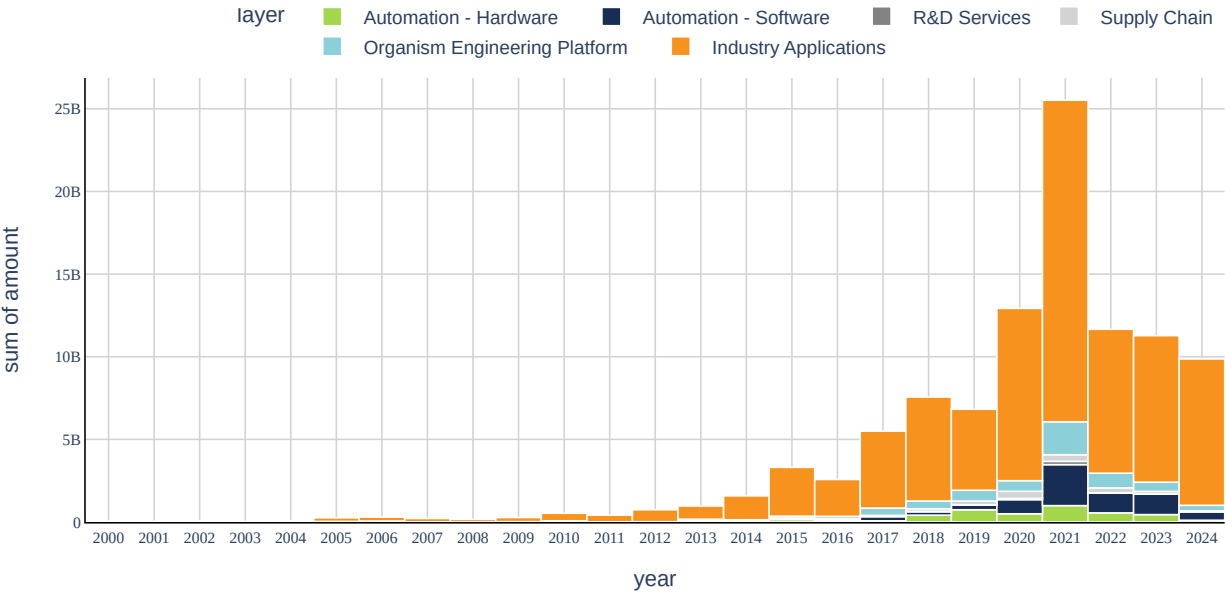
Investment Trends by Synbio Stack

As in years past, we break down the overall venture investment numbers into segments related to technology, application, and industry. The first dimension of segmentation is what SynBioBeta calls the "Synbio Stack". Like in computer systems where networks, data storage, and user interfaces all occupy different layers and process steps - the so called "stack", the outputs of research and manufacturing in synthetic biology also rely on layers. The ones we have identified are:

- Automation - Hardware
- Automation - Software
- R&D Services
- Supply Chain
- Industry Applications

Within each of these layers are subgroups, like Artificial Intelligence / Machine Learning and BioCAD in Software, lab robots in Hardware, or Food and Nutrition in industry applications. Looking at the investment in each layer over the years, we see that the industry applications layer remains far and away the segment that receives the most funding. Note that the amounts in this chart are greater than the non-segmented charts above, because some companies fall into more than one segment.

Overall Investment by SynBio Stack layer up to 2024



It is also instructive to see the number of transactions ever in each layer, where again Industry Applications is dominant. All in all, there are about 900 companies in the field since its inception, which have received more than 3800 transactions. As above, some companies fall into more than one segment, since as a given space matures, some firms leave through closure or aquisition, leaving one that straddles two areas. Additionally, new technologies can come along and open up new stack layers and subsegments, such as gene synthesis or CRISPR gene editing did in the past, and AI or quantum computing may do in the future.

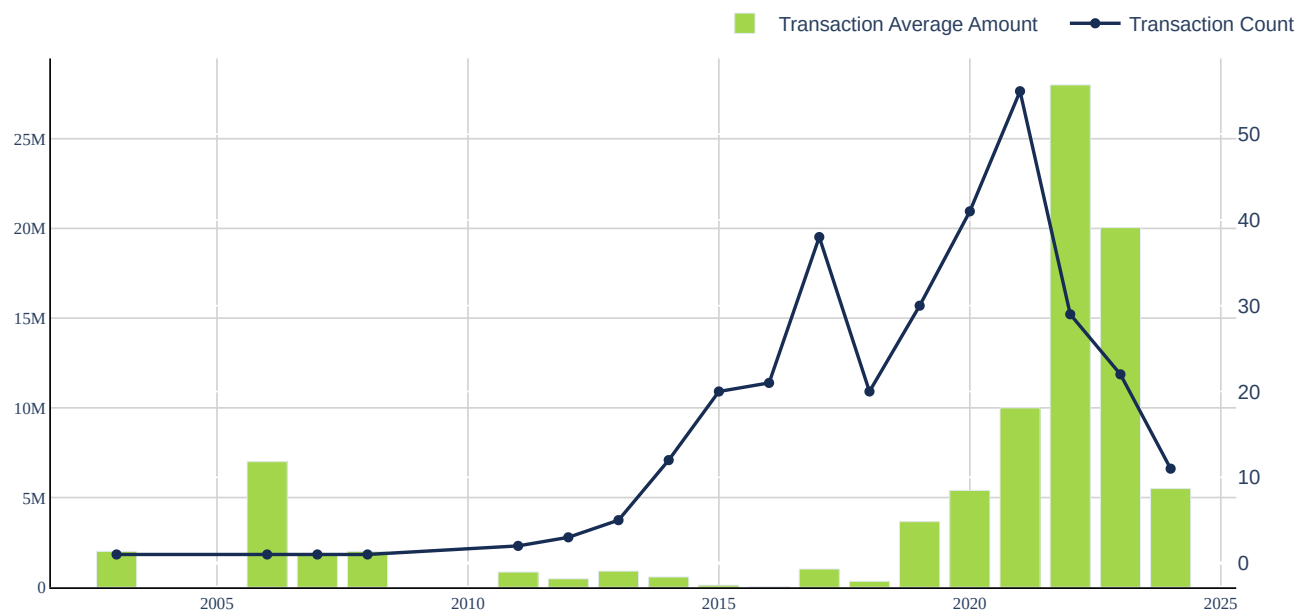
Investment Trends by Synbio Stack

Automation - Software

The category of Automation - Software expands on our previous category of Bio-CAD, adding Artificial Intelligence and Machine Learning (AI/ML), and Lab Operations tools:

- Bio-CAD (computer-aided design) includes software tools for bioengineering, used for design and simulation of biological tissues, metabolic pathways, gene expression, and modeling other biological processes and structures.
- Artificial Intelligence and Machine Learning is a rapidly advancing approach to modeling and predicting biological systems in silico before conducting experiments using physical biochemicals, cells, and organisms.
- Lab Operations software manages consumables, experiments, data, and other information about a lab's activities.

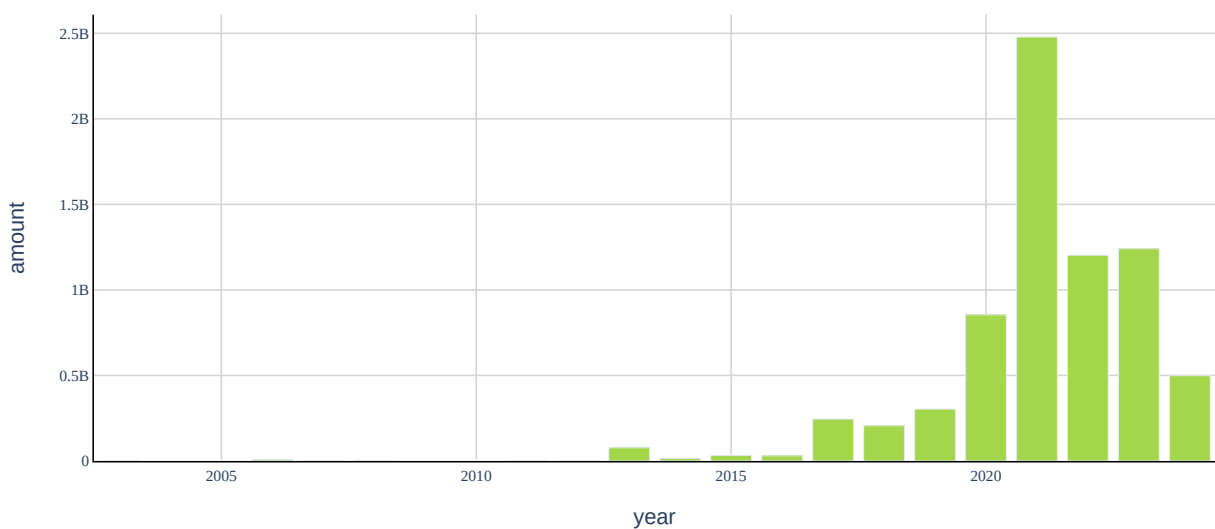
Count and Average Amount of transactions in Automation - Software by year as of 2024 Q4



Automation - Software

In the fourth quarter of 2024, startups in the Automation - Software industry secured funding of \$58.8 million, marking a decrease of \$90.7 million (154.4%) from the previous quarter's \$149.5 million. During the same period last year, startups raised \$781.1 million, reflecting a decrease of \$722.3 million. Year-to-date, Automation - Software startups have raised \$498.4 million, compared to \$1.2 billion at this point last year, representing a decrease of \$742.1 million.

Total investment in Automation - Software by year as of 2024 Q4



Transactions

Organization	Amount	Series	Investors	Qtr
Koloma	\$245,700,000	Series B	Climate Pledge Fund, unknown	Q1
Outpace Bio	\$144,000,000	Series B	Abstract, unknown	Q3
Koloma	\$50,000,000	Series B	Mitsubishi Heavy Industries and Osaka Gas, unknown	Q4
LabGenius	\$44,450,000	Series B	Atomico, unknown	Q2
Modulo Bio	\$5,845,788	Funding Round	unknown, unknown	Q4
Evogene	\$5,500,000	Post IPO Equity	unknown, unknown	Q3
Biotangents	\$2,921,000	Other Series	Eos, unknown	Q4
1910 Genetics	\$0	Other Series	Accenture Ventures, unknown	Q4
Avalo	\$0	Series A	IndieBio and SOSV, unknown	Q2
Cyrus Biotechnology	\$0	Series B	Alumni Ventures, unknown	Q1
Generate Biomedicines	\$0	Other Series	Samsung Life Science Fund, unknown	Q4

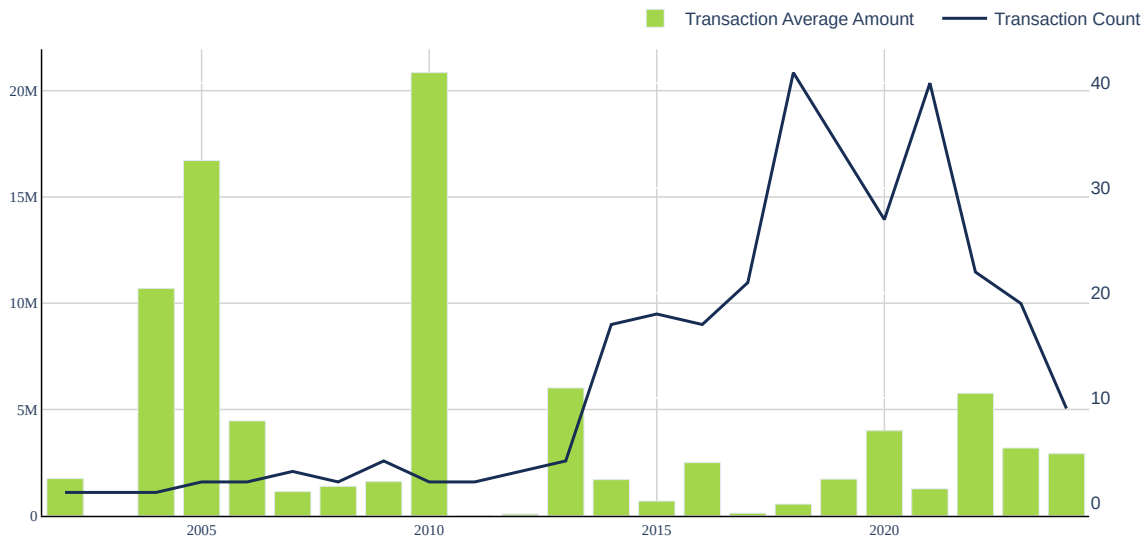
The **Automation - Hardware** segment includes everything from complete cloud Labs and biofoundries, to makers of lab robotics and individual instruments. These are the tools that make engineering biology less dependent on human hands and eyes, and able to evolve more rapidly.

- **Cloud Labs** are highly automated, centralized research laboratories that can be accessed remotely over the internet. Scientists can conduct experiments by issuing commands to the cloud lab through a user interface, without needing to physically be present in the lab. The experiments are then carried out using automation and robotics in the lab. The purpose of a cloud lab is to improve efficiency, reproducibility, and access to advanced research equipment for scientists conducting experiments in the field of biotechnology. Some companies offer cloud lab platforms as a service to scientists and researchers in the biotech industry.
- **Gene synthesis** refers to the process of creating or synthesizing a new DNA sequence by artificially stitching together nucleotides, the building blocks of DNA, in a specific order to match a desired genetic sequence. This can be used to create customized genes for scientific research, biotechnology, and gene therapy applications. With recent advancements in synthetic biology, gene synthesis has become a widely used method for creating new genetic sequences in a cost-effective and precise manner, with 100% sequence accuracy guaranteed by some service providers. The synthesized genes can be used for a variety of applications such as gene editing, gene therapy, and biomanufacturing.
- If synthesis is writing DNA, **gene sequencing** is reading it - determining the order of bases in a gene. Whole genome sequencing (WGS) goes beyond genes to determine the order of bases in the entire genome of an organism in one process. The first complete human genomes were sequenced 20 years ago in April 2003, at a cost of about \$3 billion. Today, costs have plummeted; whole genome sequencing has become the standard method for detecting and investigating foodborne outbreaks associated with bacteria, and is becoming more widespread in cancer diagnostics and other applications.

Other key categories in the space include:

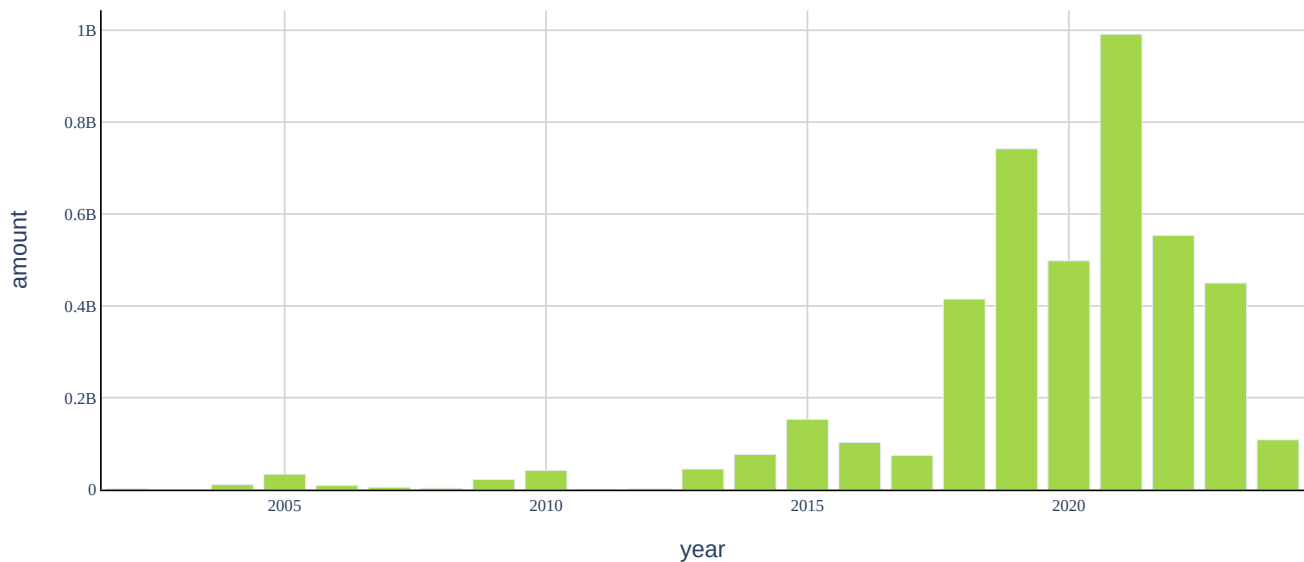
- Organism Engineering Platforms
- Semi/Fully Automated R&D (BioFoundry)
- Microfluidics
- Automation Equipment
- General Lab Equipment

Count and Average Amount of transactions in Automation - Hardware by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Automation - Hardware sector secured funding amounting to \$77.9 million. This represented an increase of \$64.4 million (82.7%) from the previous quarter's \$13.5 million. In the same period last year, startups in this sector raised \$19.0 million, reflecting a change of \$58.9 million. Year to date, Automation - Hardware startups have raised \$108.4 million, compared to \$449.5 million at the same time last year, resulting in a change of -\$341.2 million.

Total investment in Automation - Hardware by year as of 2024 Q4

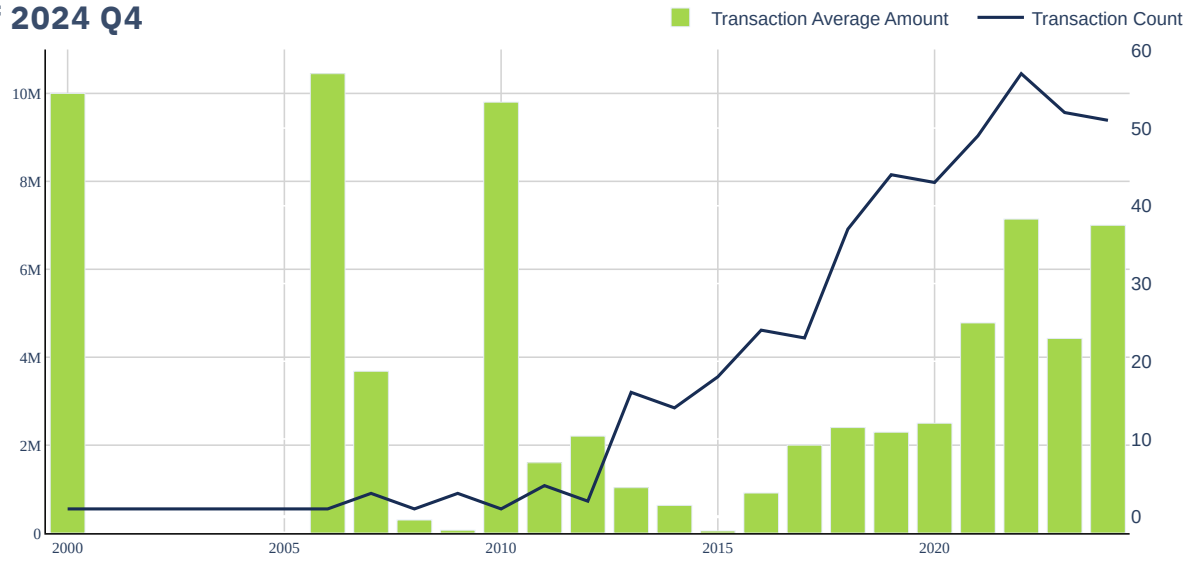


Transactions

Organization	Amount	Series	Investors	Qtr
Nuclera	\$75,000,000	Series C	British Patient Capital, unknown	Q4
CytoTronics	\$13,500,000	Seed	Anzu Partners, unknown	Q3
Volta Labs	\$12,681,692	Other Series	unknown, unknown	Q1
Volta Labs	\$4,260,001	Other Series	unknown	Q1
Biotangents	\$2,921,000	Other Series	Eos, unknown	Q4
Calyx	\$0	Series B	IndieBio and SOSV, unknown	Q3
DropGenie	\$0	Convertible Note	SOSV, unknown	Q1
Bionaut Labs	\$0	Series B	Alumni Ventures, unknown	Q2
Strados Labs	\$0	Convertible Note	HAX and SOSV, unknown	Q1

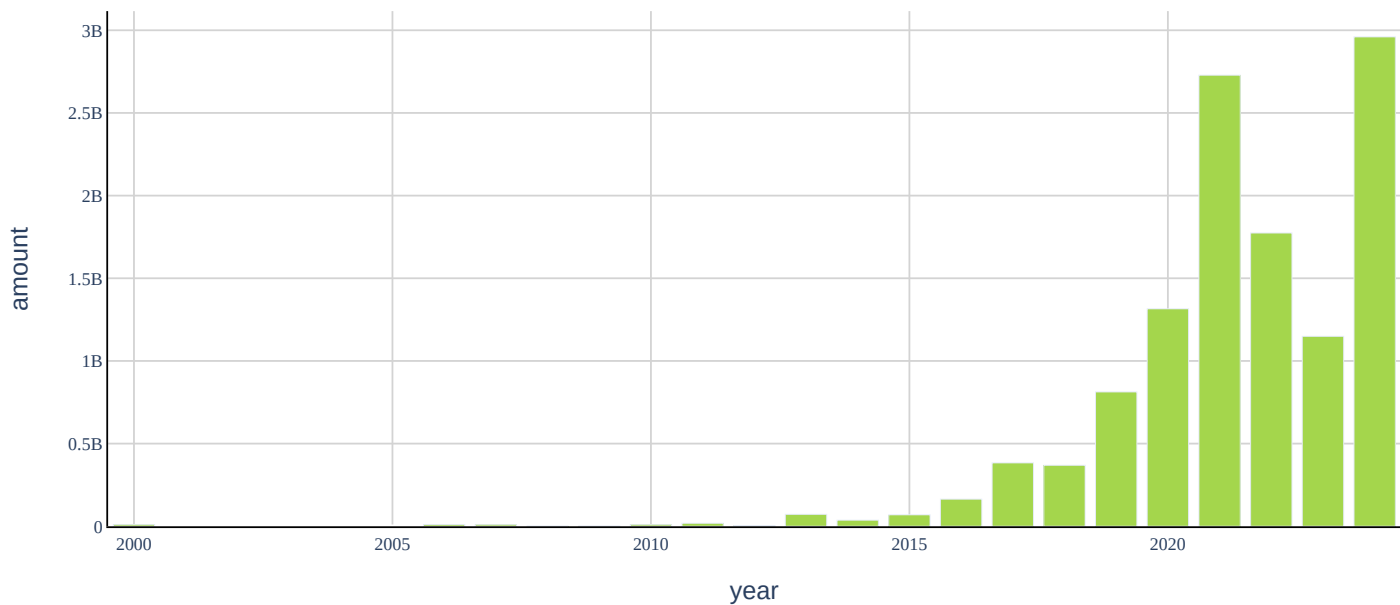
- **Nuclera** raised \$75.0 million in a Series C to further develop their protein prototyping system for drug discovery. The company offers a platform called eProtein Discovery™ that enables researchers to quickly produce and test proteins for drug discovery purposes.
- **Volta Labs** raised \$12.7 million. They are a biotechnology company that specializes in developing scalable automation solutions for genetic engineering processes.
- **Volta** raised an additional \$4 million in a second transaction.
- **Biotangents** raised \$2.9 million in a Series Other investment round. The company specializes in developing pen-side diagnostic devices for quickly detecting infectious diseases in livestock, using their Leapfrog Assembly platform technology.
- **Calyx** recently received an undisclosed amount of investment in a Series B round. The company harnesses biology to provide affordable and accurate sensors for real-time detection and analysis of air chemicals in various industries.
- **DropGenie** received an investment in a Convertible Note for an unknown amount. They are building connected hardware to automate gene editing and accelerating the pace of discovery through standardized scientific information.
- **Bionaut Labs** received a Series B investment for an undisclosed amount. The company develops remote-controlled micro-robots called Bionauts to revolutionize precision medicine treatment for central nervous system disorders, offering new therapeutic options for patients.
- **Strados Labs** received an investment in a Convertible Note for an unknown amount. The company specializes in respiratory monitoring innovation using smart biosensors and artificial intelligence to provide real-time data on respiratory health for informed decision-making.
- **CytoTronics** received Seed funding for designing and developing cell culture plates with embedded high-density electronic systems. The company specializes in creating advanced cell culture plates with integrated electronics.

Count and Average Amount of transactions in Research and Development Services by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Research and Development Services sector secured funding amounting to \$218.0 million. This represented a decrease of \$131.4 million (60.2%) from the previous quarter's \$349.4 million. In the same period last year, startups in this sector raised \$161.6 million, reflecting an increase of \$56.5 million. Year-to-date, Research and Development Services startups have raised a total of \$3.0 billion, compared to \$1.1 billion at this point last year, marking an increase of \$1.8 billion.

Total investment in Research and Development Services by year as of 2024 Q4



Top 25 Transactions

Organization	Amount	Series	Investors	Qtr
Xaira Therapeutics	\$1,000,000,000	Series A	ARCH Venture Partners, unknown	Q2
BlueHalo	\$723,160,139	Private Equity	unknown, unknown	Q1
EvolutionaryScale	\$142,000,000	Seed	Amazon Web Services, unknown	Q2
Superluminal Medicines	\$120,000,000	Series A	Catalio Capital Management, unknown	Q3
Triveni Bio	\$115,000,000	Series B	Atlas Venture, unknown	Q4
Attovia Therapeutics	\$105,000,000	Series B	Cormorant Asset Management, unknown	Q2
Inari	\$103,000,000	Series F	Canada Pension Plan Investment Board	Q1
Varda	\$90,000,000	Series B	Caffeinated Capital, unknown	Q2
Perfect Day	\$90,000,000	Series E	Horizons Ventures and SOSV, unknown	Q1
GRO Biosciences	\$60,300,000	Series B	Access Biotechnology, unknown	Q3
Spear Bio	\$45,000,000	Series A	Bio-Techne, unknown	Q3
Arda Therapeutics	\$43,000,000	Series A	Alumni Ventures, unknown	Q4
Senti Biosciences	\$37,600,000	Post IPO Equity	Celadon Partners, unknown	Q4
Elegen	\$35,000,000	Series B	8VC, unknown	Q2
Chai Discovery	\$30,000,000	Seed	Nitesh Banta, unknown	Q3
Asgard Therapeutics	\$30,000,000	Series A	Boehringer Ingelheim Venture Fund, unknown	Q1
Deep Origin	\$29,406,103	Funding Round	unknown, unknown	Q1
Dren Bio	\$25,000,000	Corporate Round	Novartis, unknown	Q3
Applied Carbon	\$21,500,000	Series A	Anglo American, unknown	Q3
CytoTronics	\$13,500,000	Seed	Anzu Partners, unknown	Q3
Kanvas Biosciences	\$12,500,000	Series A	DCVC, unknown	Q3
Somite	\$10,295,000	Pre Seed	Astellas Venture Management, unknown	Q2
Cauldron Ferm	\$9,500,000	Series A	Horizons Ventures, unknown	Q1
Baseimmune	\$9,000,000	Series A	Beast Ventures, unknown	Q1
General Galactic	\$8,000,000	Seed	BoxGroup, unknown	Q4

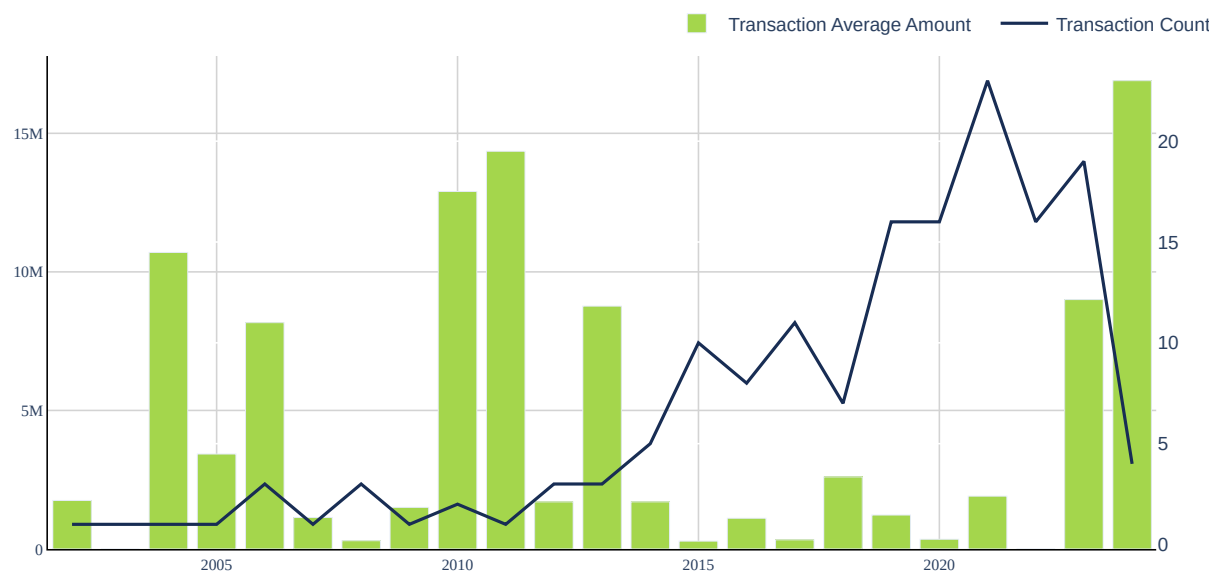
- **Xaira Therapeutics** raised \$1.0 billion in a massive Series A to drive advances in artificial intelligence for drug discovery and development. The company integrates AI technology to better understand biology and develop therapeutic products to treat disease.
- **BlueHalo** received \$723.2 million in Private Equity investment. The company manufactures advanced engineering products for the national security industry, specializing in training, simulation, technical expertise, and innovative engineering for next-generation solutions in defense, space, missile defense, cyber, and intelligence.
- **Superluminal Medicines** raised \$120.0 million in a Series A to accelerate drug discovery and development processes through their generative biological and chemical platform. The company leverages deep biology and chemistry expertise, machine learning, and proprietary big data infrastructure to quickly create candidate-ready compounds for novel drug candidates.
- **Inari** received \$103.0 million in a Series F funding round to support their mission of transforming agriculture and its impact on society and the environment. The company utilizes their SEEDesign platform, which uses predictive design and gene editing, to enhance crops for different regions and markets, ultimately revolutionizing the food system.
- **Perfect Day** received \$90.0 million in a Series E investment round. The company produces dairy proteins that are nutritionally identical to proteins from cow's milk, offering a more sustainable and compassionate alternative to traditional dairy products.
- **GRO Biosciences** received a \$60.3 million Series B investment to further develop its protein therapeutics technology for various diseases. The company develops advanced protein therapeutics using computational protein design and synthetic biology to improve treatments for conditions such as diabetes and growth disorders.
- **Senti Biosciences** raised \$37.6 million in a Post IPO Equity to further develop its synthetic biology platform for therapeutic applications. The company specializes in engineering gene circuits to selectively target and eliminate cancer cells while sparing healthy ones.
- **Elegen** raised \$35.0 million in a Series B to further develop their microfluidic technology for DNA synthesis. The company, founded in 2017 by Dr. Matthew Hill, aims to accelerate biomedical advances through their innovative technology.

Supply Chain

The synbio supply chain includes companies upstream and downstream that provide services such as:

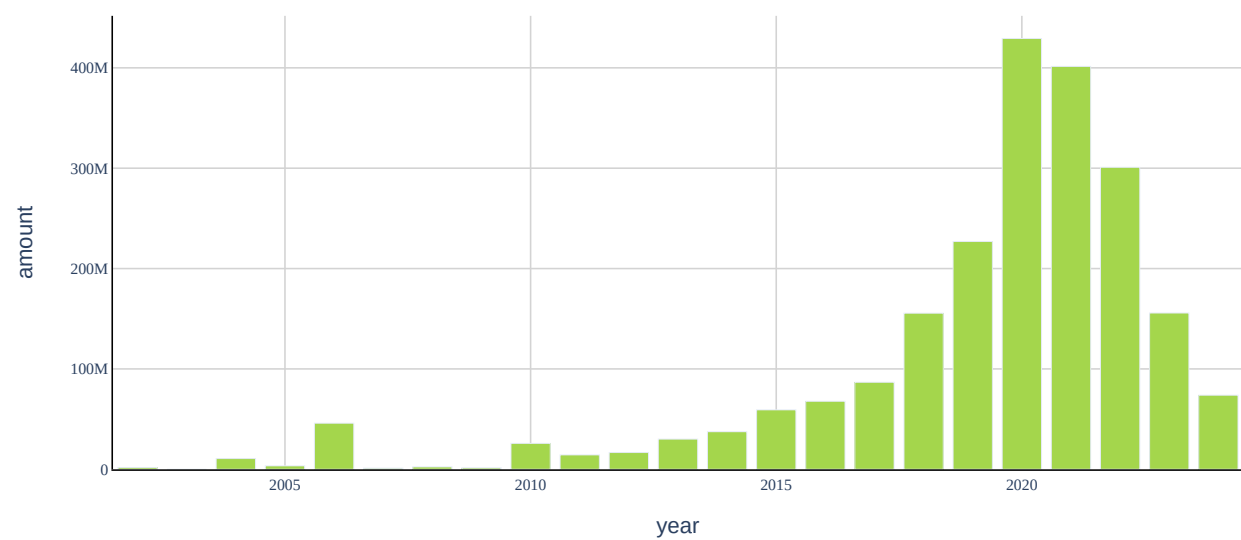
- Contract Manufacturing and Research Organizations (CMOs / CROs)
- DNA providers
- Enzymes & Reagents providers
- Genetic Tools companies

Count and Average Amount of transactions in Supply Chain by year as of 2024 Q4



A challenge arises when calculating the data as there may be periods with no transactions to compare.

Total investment in Supply Chain by year as of 2024 Q4



Transactions

Organization	Amount	Series	Investors	Qtr
Codexis	\$40,000,000	Post IPO Debt	Innovatus Capital Partners, unknown	Q1
Digestiva	\$18,400,000	Series A	Astanor Ventures, unknown	Q3
Teknova	\$15,400,000	Post IPO Equity	unknown, unknown	Q3
VALANX Biotech	\$0	Seed	SOSV, unknown	Q3

- **Codexis** raised \$40.0 million in a Post IPO Debt to further develop their biocatalysis technologies for pharmaceutical and chemical production. Codexis is an industrial biotechnology company that engineers enzymes to create improved versions of small molecule therapeutics through biocatalysis.
- **Digestiva** received \$18.4 million in a Series A funding round to develop food and feed proteins. The company specializes in enhancing the properties of proteins using targeted biocatalysts.
- **Teknova** received \$15.4 million in a Post IPO Equity investment. The company provides a wide range of biotechnology services and critical reagents for bioprocessing, bioproduction, and molecular diagnostics.
- **VALANX Biotech** received a Seed investment. The company specializes in site-specific protein conjugation for developing protein-drug-conjugates efficiently.

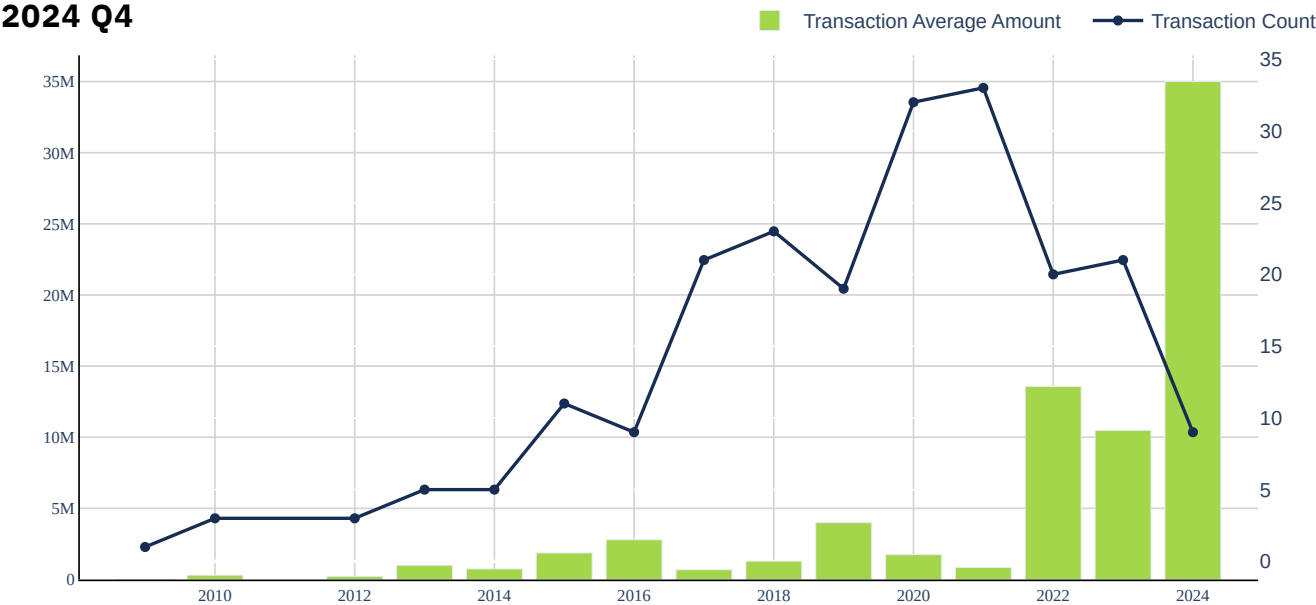
Organism Engineering Platforms

Organism engineering platforms refer to tools and techniques used in synthetic biology to engineer organisms for a variety of applications, such as biomanufacturing, environmental remediation, and healthcare. These platforms leverage advances in DNA synthesis, gene editing, and genetic engineering to modify the genetic code of an organism in a precise and targeted way. For example, organism engineering platforms can be used to create custom yeasts for brewing beer, or to engineer bacteria to produce specialized chemicals or enzymes. These platforms are a key aspect of synthetic biology and are constantly evolving as new tools and techniques are developed.

Some other examples of engineered organisms include:

- Enzyme-producing bacteria used in industrial processes, such as the production of biofuels and chemicals
- Bacteria engineered to consume oil spills or other environmental pollutants
- Algae engineered to produce biofuels or pharmaceutical products
- Mosquitoes engineered to be resistant to diseases such as malaria
- Plants engineered to produce higher yields or to be resistant to pests and diseases
- Yeast designed to produce specific flavors in beer and wine
- Animals engineered for medical research purposes, such as mice with specific disease mutations.

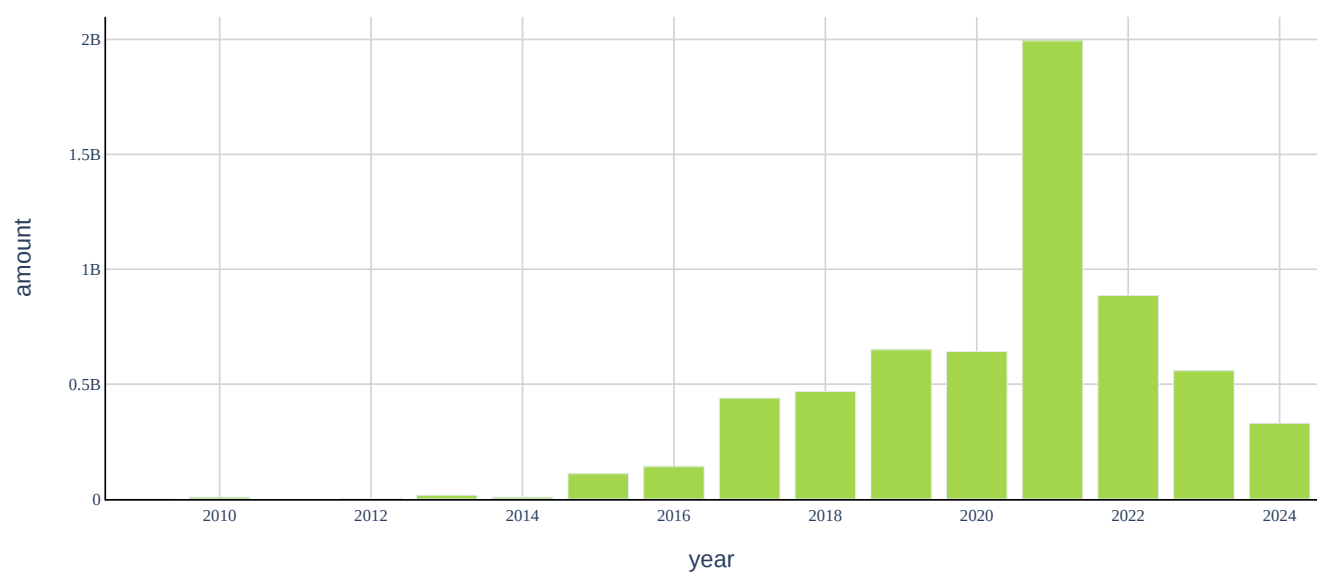
Count and Average Amount of transactions in Organism Engineering Platform by year as of 2024 Q4



Organism Engineering Platforms

During the fourth quarter of 2024, startups in the Organism Engineering Platform sector secured funding amounting to \$37.6 million. This represented a decrease of \$47.4 million (126.1%) from the previous quarter's total of \$85.0 million. In the same quarter last year, startups in this sector raised \$107.7 million, reflecting a decrease of \$70.1 million. Year-to-date, Organism Engineering Platform startups have raised a total of \$329.6 million, compared to \$558.1 million at the same point last year, indicating a decrease of \$228.5 million.

Total investment in Organism Engineering Platform by year as of 2024 Q4



Transactions

Organization	Amount	Series	Investors	Qtr
Inari	\$103,000,000	Series F	Canada Pension Plan Investment Board	Q1
Perfect Day	\$90,000,000	Series E	Horizons Ventures and SOSV, unknown	Q1
Arzeda	\$38,000,000	Series C	Bunge Ventures, unknown	Q3
Senti Biosciences	\$37,600,000	Post IPO Equity	Celadon Partners, unknown	Q4
Abolis Biotechnologies	\$35,000,000	Other Series	Business Opportunities for L'Oréal Development, unknown	Q3
Cibus	\$13,000,000	Post IPO Equity	Rory Riggs, unknown	Q2
Cibus	\$12,000,000	Post IPO Equity	unknown, unknown	Q3
Triplebar	\$1,000,000	Other Series	unknown, unknown	Q1
Concerto Biosciences	\$0	Non Equity Assistance	Springboard Enterprises, unknown	Q3

- **Inari** received \$103.0 million in a Series F investment round to further their mission of transforming agriculture and its impact on society and the environment. Inari is a biotechnology company that uses predictive design and multiplex gene editing through their SEEDesign platform to enhance crops for different regions and markets.
- **Perfect Day** raised \$90.0 million in a Series E to revolutionize the production of animal-free dairy proteins that are indistinguishable from traditional cow's milk proteins.
- **Arzeda** raised \$38.0 million in a Series C, and the company creates and manufactures proteins and enzymes for pharmaceuticals and industrial chemicals using intelligent protein design technology and AI algorithms.
- **Abolis Biotechnologies** raised \$37.8 million in a Other Series investment, and the company delivers high-impact biotechnological innovations and tailor-made industrial solutions based on micro-organisms to support industries in their transition towards a more sustainable future.
- **Senti Biosciences** received \$37.6 million in a Post IPO Equity investment. The company specializes in synthetic biology and gene circuit engineering for therapeutic applications, developing therapies with improved precision and control to target cancer cells while sparing healthy ones.
- **Cibus** raised \$13.0 million in a Post IPO Equity to further develop its precision gene editing technology for agriculture. The company specializes in using advanced breeding technologies to make farming more environmentally friendly, sustainable, and profitable without integrating foreign genetic material.
- **Triplebar** received \$1.0 million in funding for its sustainability, biotechnology, and synthetic biology research.
- **Concerto Biosciences** received a Non Equity Assistance investment. The company rebuilds microbial communities by mapping interaction networks to invent ensembles of microbes that restore health in medicine and agriculture.

Synbio Industry Applications

Scientists and engineers use the tools in the Synbio Stack in order to develop applications, such as medicines, diagnostics, bioenergy, and consumer goods. As synthetic biology has matured, more and more of the early experiments are becoming market-ready products, so this category has become dominant in its ability to raise venture capital.

By far, synbio's biggest impact so far is in Healthcare and BioPharma, specifically in Drugs and Therapeutics. Other subcategories within that industry include:

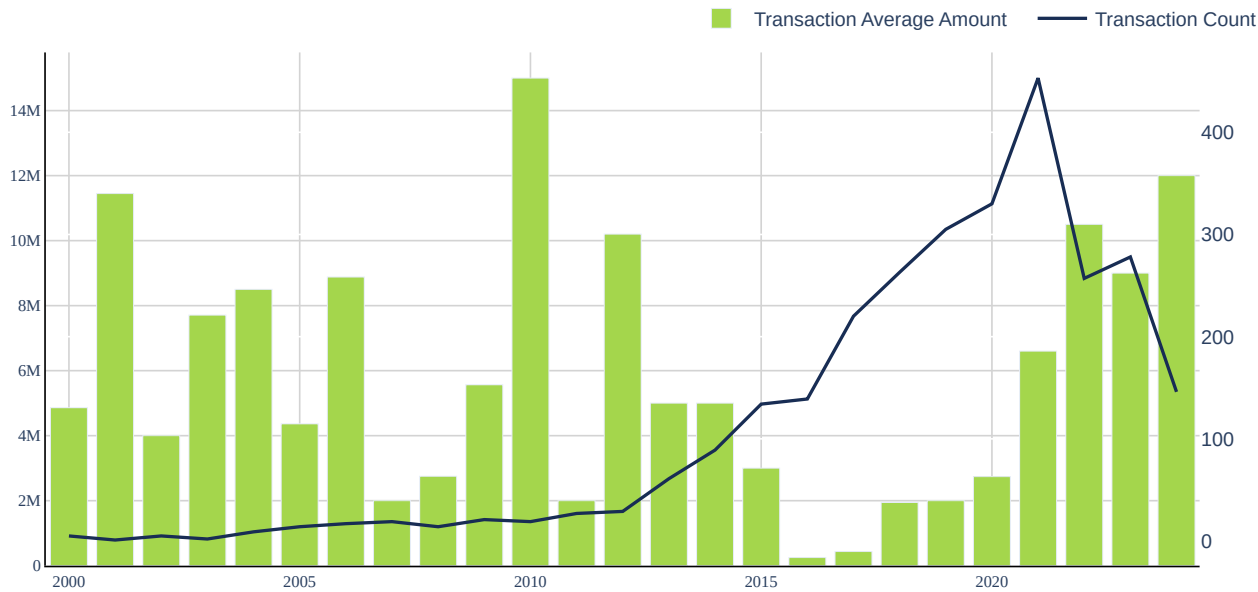
- Diagnostics
- Vaccines
- Gene Therapy
- Microbiome
- Personal Care and Skincare

Overall, synthetic biology has the potential to revolutionize the way that industrial and consumer goods are produced and to create new sustainable solutions for a wide range of products in industries like:

- Agriculture and AgTech
- Chemicals and Materials
- Energy and Environment
- Engineering
- Food and Nutrition
- Healthcare and BioPharma
- IT (such as Data Storage)
- NeuroTech

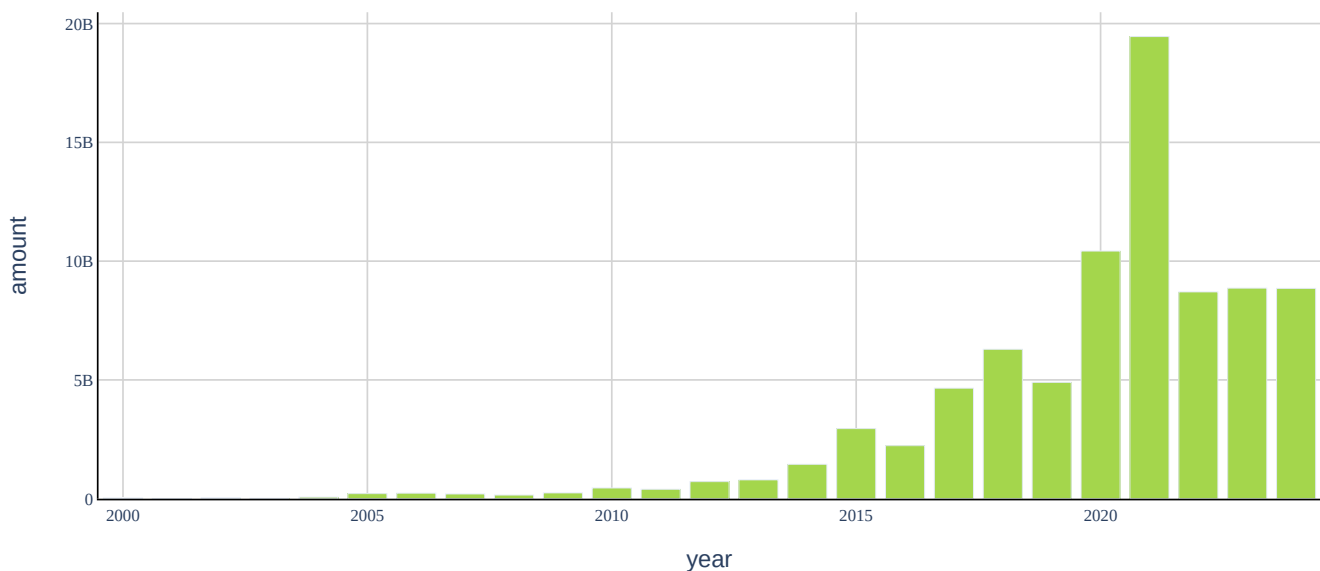
Synbio applications in consumer goods include the development of biodegradable plastics, bio-based chemicals and materials, and sustainable textiles like leather and silk. For example, some companies are using synthetic biology to produce plant-based alternatives to animal leather or to develop biodegradable packaging materials made from renewable resources. Other applications include the development of cosmetics and personal care products with enhanced properties and the use of synbio in the production of food ingredients and flavors.

Count and Average Amount of transactions in Industry Applications by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Industry Applications sector secured funding amounting to \$4.0 billion. This marked an increase of \$2.6 billion (65.4%) from the previous quarter's \$1.4 billion. In the same quarter last year, startups in this sector raised \$1.4 billion, reflecting a difference of \$2.5 billion. Year-to-date, Industry Applications startups have raised a total of \$8.9 billion, compared to \$8.9 billion at the same point last year, resulting in a change of -\$10.7 million.

Total investment in Industry Applications by year as of 2024 Q4

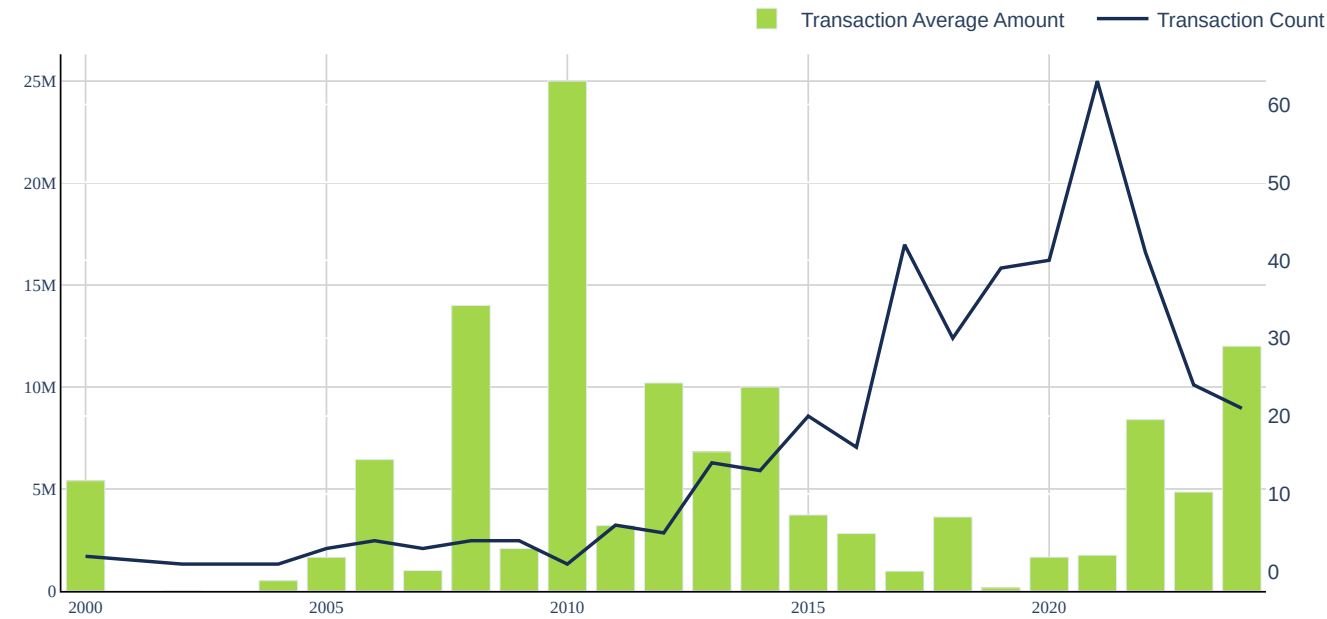


Top 25 Transactions

Organization	Amount	Series	Investors	Qtr
Godavari Biorefineries	\$1,660,000,000	Funding Round	Goldman Sachs (Singapore) Pte, unknown	Q4
Gevo	\$1,460,000,000	Post IPO Debt	US Department of Energy, unknown	Q4
Autolus	\$350,000,000	Post IPO Equity	unknown, unknown	Q1
Immunocore	\$350,000,000	Post IPO Debt	unknown, unknown	Q1
ArsenalBio	\$325,000,000	Series C	ARCH Venture Partners, unknown	Q3
Vera Therapeutics	\$300,000,000	Post IPO Equity	unknown, unknown	Q4
CRISPR Therapeutics	\$280,000,000	Post IPO Equity	EcoR1 Capital and SR One, unknown	Q1
Vera Therapeutics	\$250,000,000	Post IPO Equity	unknown	Q1
Vera Therapeutics	\$250,000,000	Post IPO Equity	unknown, unknown	Q1
Wave Life Sciences	\$200,000,000	Post IPO Equity	unknown, unknown	Q3
Recursion Pharmaceuticals	\$200,000,000	Post IPO Equity	unknown, unknown	Q2
EGenesis	\$191,000,000	Series D	Alta Partners, unknown	Q3
Sana Biotechnology	\$165,000,000	Post IPO Equity	unknown, unknown	Q1
Sana Biotechnology	\$165,000,000	Post IPO Equity	unknown	Q1
Obsidian Therapeutics	\$160,500,000	Series C	Atlas Venture, unknown	Q2
Outpace Bio	\$144,000,000	Series B	Abstract, unknown	Q3
Enveda Biosciences	\$130,000,000	Series C	Baillie Gifford, unknown	Q4
Allogene Therapeutics	\$110,000,000	Post IPO Equity	unknown, unknown	Q2
Varda	\$90,000,000	Series B	Caffeinated Capital, unknown	Q2
Absci	\$86,400,000	Post IPO Equity	unknown, unknown	Q1
Precigen	\$79,000,000	Post IPO Equity	Bill Miller, unknown	Q4
Sutro Biopharma	\$75,000,000	Post IPO Equity	unknown, unknown	Q2
Bluebird Bio	\$75,000,000	Post IPO Debt	Hercules Capital, unknown	Q1
Korro Bio	\$70,000,000	Post IPO Equity	Atlas Venture, unknown	Q2
GRO Biosciences	\$60,300,000	Series B	Access Biotechnology, unknown	Q3

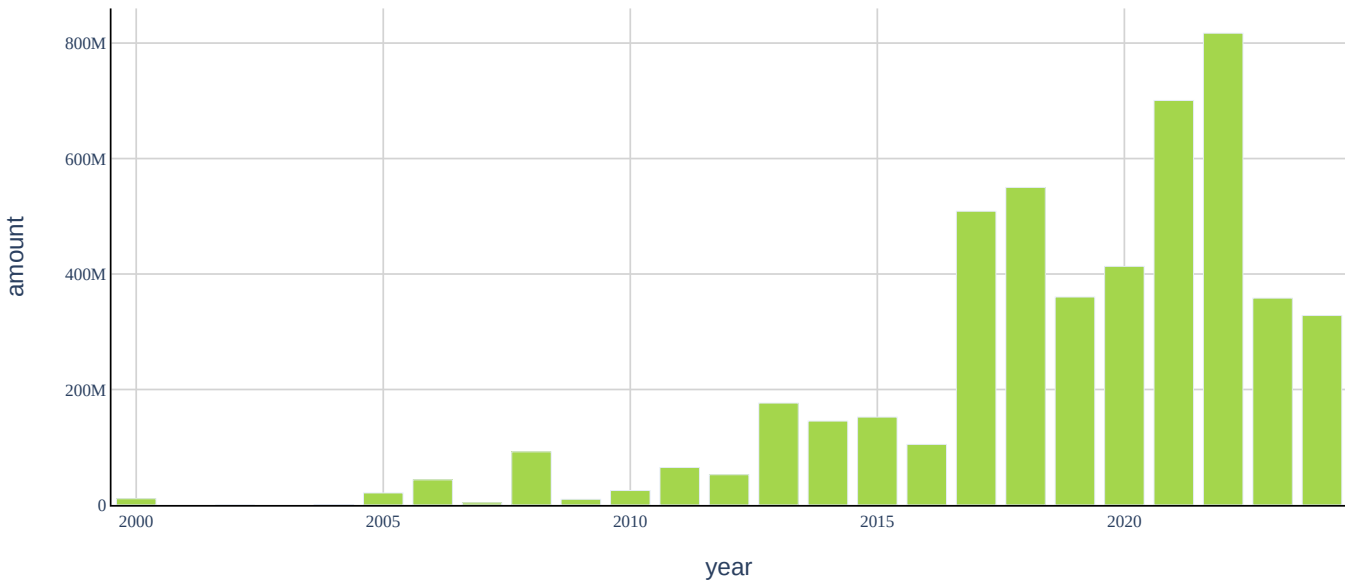
- **Godavari Biorefineries** is one of India's largest producers of ethanol and ethanol-based chemicals from sugarcane, and raised \$1.66 billion in an IPO, after prior venture backing from deeptech impact investors like Mandala Capital. In addition to at-scale chemical production, the company invests in research in new cane crop varieties and even human cancer treatments.
- **Gevo** received \$1460.0 million in a Post IPO Debt to continue producing isobutanol as a renewable and cost-effective fossil fuel alternative, essential for meeting increasing energy demands and combating global warming.
- **Immunocore** raised \$350.0 million in a Post IPO Debt to develop TCR bispecific immunotherapies. Immunocore is a biotechnology company that specializes in the discovery and development of novel T cell receptor-based drugs for diseases such as cancer and viral infections.
- **Autolus** received a \$350.0 million investment in Post IPO Equity. The company specializes in T-cell programming technology for cancer treatment.
- **ArsenalBio** raised \$325.0 million in a Series C to develop programmable cell therapies for solid tumors. The company focuses on integrating technologies like CRISPR-based genome engineering, synthetic biology, and machine learning to create more effective and accessible immune cell therapies for patients, particularly those with cancer.
- **Vera Therapeutics** received a \$300.0 million investment in Post IPO Equity. The company specializes in developing innovative biologic therapeutics and gene-editing technology to potentially cure genetic disorders such as sickle cell disease and cystic fibrosis.
- **CRISPR Therapeutics** received \$280.0 million in Post IPO Equity. They specialize in developing transformative medicines using their proprietary CRISPR/Cas9 gene-editing platform to cure serious human diseases at the molecular level.
- **Vera Therapeutics** received \$250.0 million in a Post IPO Equity investment. The company specializes in developing biologic therapeutics and gene-editing technology to potentially cure genetic disorders like sickle cell disease and cystic fibrosis.
- **Recursion Pharmaceuticals** received a \$200.0 million investment in a Post IPO Equity round. The company develops a drug discovery platform using machine learning to improve patient lives through innovative technologies in biology, chemistry, automation, data science, and engineering.

Count and Average Amount of transactions in Agriculture by year as of 2024 Q4



During the fourth quarter of 2024, startups operating in the AgTech sector secured a total funding of \$46.6 million. This represented a decrease of \$88.2 million (or -189.2%) from the previous quarter's funding of \$134.8 million. In the fourth quarter of the previous year, AgTech startups raised \$170.0 million, reflecting a decrease of \$123.4 million. Year-to-date, AgTech startups have raised a total of \$328.1 million, compared to \$242.9 million during the same period last year, representing an increase of \$85.2 million.

Total investment in Agriculture by year as of 2024 Q4



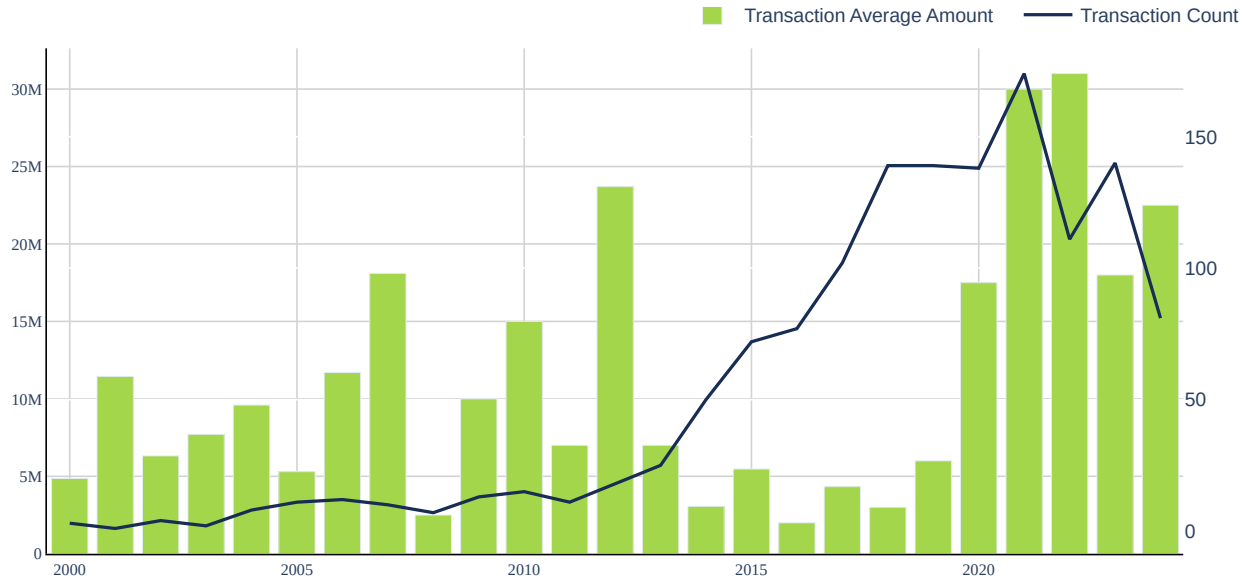
Transactions

Organization	Amount	Series	Investors	Qtr
Prolific Machines	\$55,000,000	Series B	Breakthrough Energy Ventures, unknown	Q2
Prolific Machines	\$55,000,000	Series B	Breakthrough Energy Ventures, unknown	Q2
Pairwise Plants	\$40,000,000	Series C	Aliment Capital, unknown	Q3
GALY	\$33,000,000	Series B	Agronomics, unknown	Q3
Sound Agriculture	\$25,000,000	Series B	BMO Capital Markets and S2G Investments, unknown	Q4
NovoNutrients	\$18,000,000	Series A	Audacy Ventures, unknown	Q3
MiAlgae	\$17,780,000	Series A	Ananke Ventures, unknown	Q3
Biotalys	\$16,200,000	Post IPO Equity	a.s.r., unknown	Q4
BioConsortia	\$15,000,000	Series F	Otter Capital, unknown	Q2
Cibus	\$13,000,000	Post IPO Equity	Rory Riggs, unknown	Q2
Cibus	\$12,000,000	Post IPO Equity	unknown, unknown	Q3
AgroSpheres	\$12,000,000	Series B	Bidra Innovation Ventures, unknown	Q3
5Metis	\$5,500,000	Series A	unknown, unknown	Q2
Arborea	\$5,400,000	Other Series	Banco Portugues de Fomento and Indico Capital Partners, unknown	Q4
Ceragen	\$1,998,000	Seed	1517 Fund, unknown	Q3
Puna Bio	\$1,650,000	Seed	At One Ventures, unknown	Q2
CroBio	\$1,566,000	Seed	Catapult Ventures, unknown	Q2
Hudson River Biotechnology	\$0	Other Series	Eurosemillas and OostNL, unknown	Q2
Avalo	\$0	Series A	IndieBio and SOSV, unknown	Q2
Agragene	\$0	Other Series	Missouri Technology Corporation, unknown	Q3
ClimateCrop	\$0	Seed	IndieBio and SOSV, unknown	Q2

Agriculture

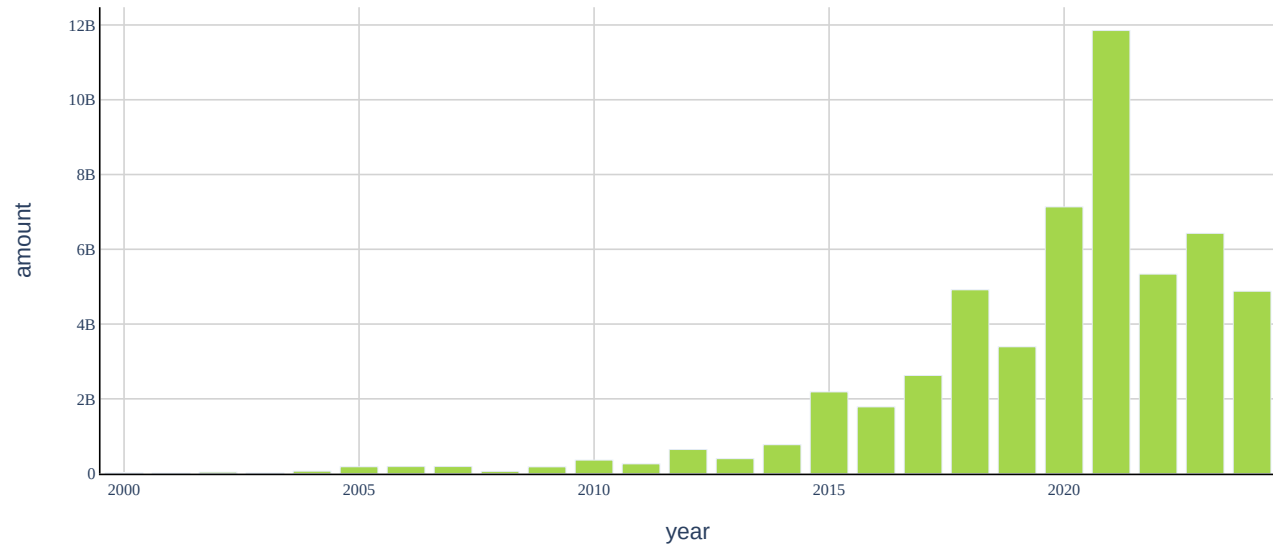
- **Prolific Machines** raised \$55.0 million in a Series B to further develop their innovative cell production technologies. The company, founded in 2020 and based in San Francisco, is focused on redefining how cells are produced for a sustainable and healthy future through cutting-edge technology.
- **Pairwise Plants** received \$40.0 million in a Series C investment to continue its mission of building a healthier world through better fruits and vegetables. The company, founded in 2017 by a team of experts in agriculture, CPG food, and research and development, is focused on growing new types of fruits and vegetables with improved traits using base editing and high-fidelity enzymes.
- **GALY** raised \$33.0 million in a Series B round, to support their cellular agriculture business. They produce agricultural products from cells in a controlled facility, rather than traditional farming methods in the field.
- **Sound Agriculture** raised \$25.0 million in a Series B to further develop their molecular discovery technology for creating climate-resilient crops. Sound Agriculture is a company that uses molecular discovery to create climate-resilient crops, enhancing harvest yields for growers in a sustainable way.
- **NovoNutrients** raised \$18.0 million in a Series A to develop technology that turns waste CO2 into proteins and oils for aquaculture and food production. The company uses proprietary microbes and gas fermentation systems to convert waste CO2 into valuable proteins, oils, and additives for various industries.
- **MiAlgae** raised \$17.8 million in a Series A to revolutionize the global livestock feed industry with their innovative microalgal products. MiAlgae is a company specializing in the production of high-quality omegas and proteins from microalgae grown on wastewater, aiming to provide nutrient supplements for fishmeal in livestock feeds and reduce operating costs through circular economy practices.
- **Biotalys** received a \$16.2 million investment in a Post IPO Equity. Biotalys is an AgTech company that develops protein-based biocontrol solutions for crop and food protection using its proprietary AGROBODY™ technology platform.
- **BioConsortia** raised \$15.0 million in a Series F to develop microbial consortia for increasing agricultural yields through their Advanced Microbial Selection process. The company utilizes plant-microbe interactions to optimize crop traits and offers commercial seed treatments and other products for improved fertilizer utilization and growth.
- **Cibus** raised \$13.0 million in a Post IPO Equity to further develop its precision gene editing technology in agriculture. The company specializes in utilizing patented advanced breeding technologies to make farming more environmentally friendly, sustainable, and profitable without integrating foreign genetic material.

Count and Average Amount of transactions in Healthcare and BioPharma by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Healthcare and BioPharma industry secured funding amounting to \$751.5 million. This represented a decrease of \$212.7 million (28.3%) from the previous quarter's total of \$964.2 million. In the same period in the prior year, startups in this sector raised \$1.1 billion, reflecting a decrease of \$344.6 million. Year-to-date, Healthcare and BioPharma startups have raised \$4.9 billion, compared to \$6.4 billion at this point last year, indicating a decrease of \$1.5 billion.

Total investment in Healthcare and BioPharma by year as of 2024 Q4

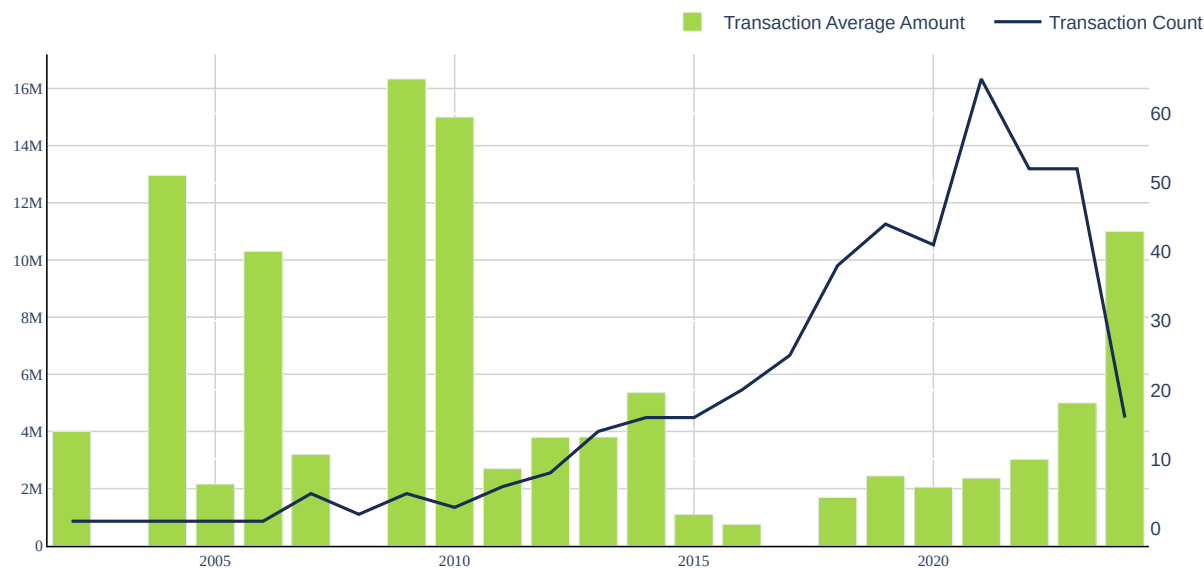


Top 25 Transactions

Organization	Amount	Series	Investors	Qtr
Immunocore	\$350,000,000	Post IPO Debt	unknown, unknown	Q1
Autolus	\$350,000,000	Post IPO Equity	unknown, unknown	Q1
ArsenalBio	\$325,000,000	Series C	ARCH Venture Partners, unknown	Q3
Vera Therapeutics	\$300,000,000	Post IPO Equity	unknown, unknown	Q4
CRISPR Therapeutics	\$280,000,000	Post IPO Equity	EcoR1 Capital and SR One, unknown	Q1
Vera Therapeutics	\$250,000,000	Post IPO Equity	unknown	Q1
Vera Therapeutics	\$250,000,000	Post IPO Equity	unknown, unknown	Q1
Recursion Pharmaceuticals	\$200,000,000	Post IPO Equity	unknown, unknown	Q2
Wave Life Sciences	\$200,000,000	Post IPO Equity	unknown, unknown	Q3
EGenesis	\$191,000,000	Series D	Alta Partners, unknown	Q3
Sana Biotechnology	\$165,000,000	Post IPO Equity	unknown	Q1
Sana Biotechnology	\$165,000,000	Post IPO Equity	unknown, unknown	Q1
Obsidian Therapeutics	\$160,500,000	Series C	Atlas Venture, unknown	Q2
Enveda Biosciences	\$130,000,000	Series C	Baillie Gifford, unknown	Q4
Allogene Therapeutics	\$110,000,000	Post IPO Equity	unknown, unknown	Q2
Absci	\$86,400,000	Post IPO Equity	unknown, unknown	Q1
Precigen	\$79,000,000	Post IPO Equity	Bill Miller, unknown	Q4
Sutro Biopharma	\$75,000,000	Post IPO Equity	unknown, unknown	Q2
Bluebird Bio	\$75,000,000	Post IPO Debt	Hercules Capital, unknown	Q1
Korro Bio	\$70,000,000	Post IPO Equity	Atlas Venture, unknown	Q2
GRO Biosciences	\$60,300,000	Series B	Access Biotechnology, unknown	Q3
Earli	\$60,000,000	Funding Round	unknown, unknown	Q4
Enveda Biosciences	\$55,000,000	Series B	FPV Ventures, unknown	Q2
Prime Medicine	\$55,000,000	Corporate Round	Bristol-Myers Squibb, unknown	Q3
Skye Bioscience	\$50,250,000	Post IPO Equity	5AM Ventures, unknown	Q1

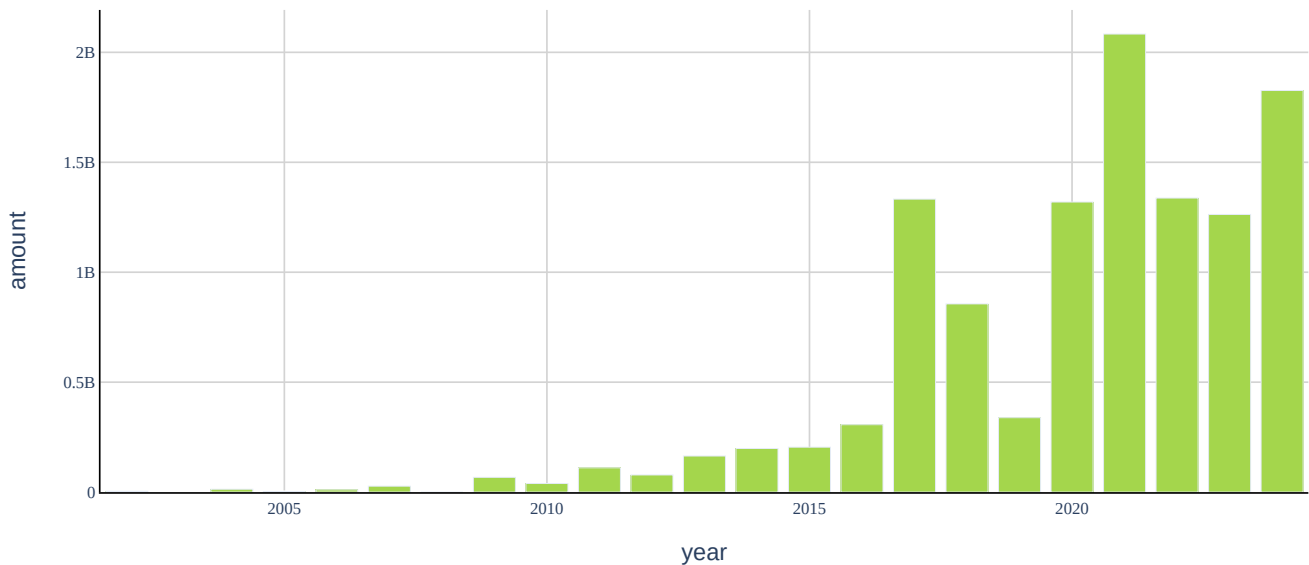
- **Autolus** received \$350.0 million in a Post IPO Equity investment. Autolus is a biopharmaceutical company developing next-generation programmed T cell treatments for cancer.
- **Immunocore** raised \$350.0 million in a Post IPO Debt for their biotechnology company specializing in TCR bispecific immunotherapies. Immunocore is a biotechnology company that focuses on the development of T cell receptor-based drugs to treat diseases such as cancer and viral infections, using their expertise in engineering TCRs and linking them to antibody fragments.
- **ArsenalBio** raised \$325.0 million in a Series C to develop CAR T-cell therapies for solid tumors. The company is focused on creating highly effective and accessible immune cell therapies for a broader range of patients, particularly those with cancer, by integrating CRISPR-based genome engineering, synthetic biology, and machine learning.
- **Vera Therapeutics** received a \$300.0 million investment in Post IPO Equity. The company specializes in developing biologic therapeutics and gene-editing technology to potentially cure genetic disorders such as sickle cell disease and cystic fibrosis.
- **CRISPR Therapeutics** raised \$280.0 million in a Post IPO Equity to further develop transformative medicines using its CRISPR/Cas9 gene-editing platform. The company specializes in curing serious human diseases at the molecular level through precise, directed changes to genomic DNA.
- **Vera Therapeutics** received \$250.0 million in a Post IPO Equity investment. The company specializes in developing biologic therapeutics and gene-editing technology to potentially cure genetic disorders like sickle cell disease and cystic fibrosis.
- **Wave Life Sciences** raised \$200.0 million in a Post IPO Equity to further develop their RNA medicines. The company specializes in developing life-changing treatments for diseases using their proprietary PRISM platform for precise drug development, targeting genetically defined diseases to provide hope for patients and families.
- **Recursion Pharmaceuticals** raised \$200.0 million in a Post IPO Equity to further develop their drug discovery platform using machine learning. The company specializes in integrating technological innovations across biology, chemistry, automation, data science, and engineering to improve patient lives and industrialize drug discovery.
- **eGenesis** raised \$191.0 million in a Series D to further develop their gene editing and genome engineering technology for human-compatible engineered organs.

Count and Average Amount of transactions in Chemicals and Materials by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Chemicals and Materials sector secured a total of \$1.7 billion in funding. This represented a significant increase of \$1.6 billion (93.7%) compared to the previous quarter's \$105.3 million. In the same period last year, startups in this sector raised \$90.5 million, reflecting a change of \$1.6 billion. Year-to-date, Chemicals and Materials startups have raised \$1.8 billion, a notable increase from the \$1.3 billion raised at this point last year, marking a change of \$563.8 million.

Total investment in Chemicals and Materials by year as of 2024 Q4

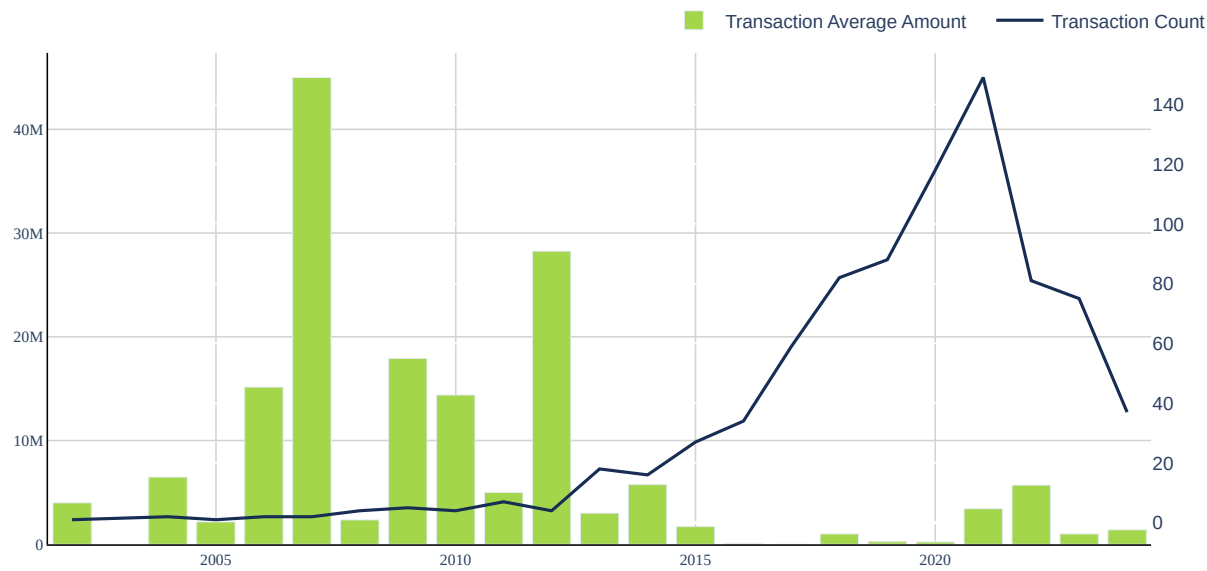


Transactions

Organization	Amount	Series	Investors	Qtr
Godavari Biorefineries	\$1,660,000,000	Funding Round	Goldman Sachs (Singapore) Pte, unknown	Q4
LanzaTech	\$40,000,000	Post IPO Equity	Carbon Direct Capital, unknown	Q3
Applied Carbon	\$21,500,000	Series A	Anglo American, unknown	Q3
Zymochem	\$21,000,000	Series A	Accelr8, unknown	Q1
Insempra	\$20,000,000	Series A	Acequia Capital (AceCap), unknown	Q2
Oakbio	\$17,284,998	Other Series	unknown, unknown	Q3
Axine Water Technologies	\$15,000,000	Corporate Round	Veralto, unknown	Q4
Citroniq	\$12,000,000	Series A	Lummus Technology, unknown	Q3
Ambercycle	\$10,000,000	Corporate Round	Shinkong Synthetic Fibers, unknown	Q3
Hyzon Motors	\$4,500,000	Post IPO Equity	unknown, unknown	Q3
Algenesis	\$3,000,000	Other Series	unknown, unknown	Q4
Ecovia Renewables	\$2,047,729	Funding Round	unknown, unknown	Q4
Epoch Biodesign	\$0	Other Series	Planet Fund, unknown	Q1
Epoch Biodesign	\$0	Other Series	Planet Fund	Q1
MycoWorks	\$0	Series D	IndieBio and SOSV, unknown	Q3
Anodyne Chemistries	\$0	Seed	Plug and Play, unknown	Q2

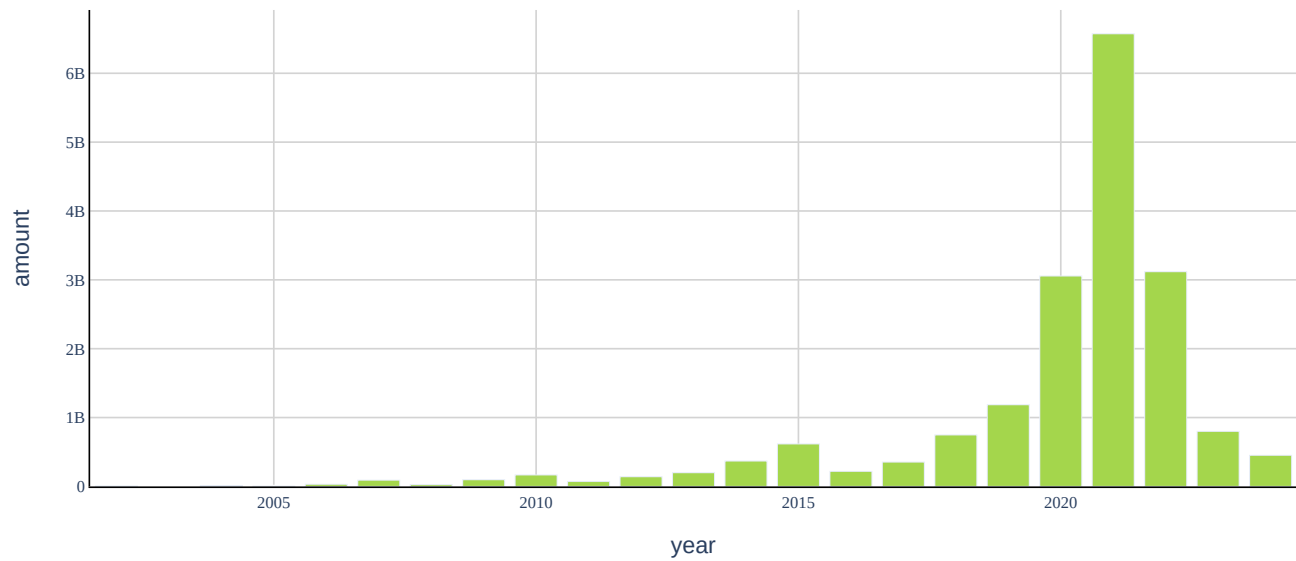
- **LanzaTech** received \$40.0 million in Post IPO Equity. The company reduces emissions and creates new products for a circular carbon economy by converting industrial off-gases and biomass.
- **Oakbio** received \$17.3 million in funding for its technology that transforms carbon emissions into high value products. Oakbio is a Carbon Capture and Utilization company that partners with industrial businesses to create profitable biofactories using its expertise in microbial metabolism.
- **Ambercycle** raised \$10.0 million in a Corporate Round to further develop its technology for converting textile waste into new polyester yarns. Ambercycle is a material science company that uses molecular regeneration techniques to transform textile waste into raw materials for apparel brands and manufacturers, facilitating the reuse of waste products in supply chains.
- **Ecovia Renewables** raised \$2.0 million in a Funding Round to develop and commercialize high-performing biobased ingredients and materials from sustainable processes. Ecovia Renewables Inc. specializes in developing biobased ingredients and materials from microbial ecosystems using sustainable processes as affordable and functional alternatives to conventional polymers for various applications.
- **Epoch Biodesign** received an investment in an unknown amount in a Series Other round. The company develops enzymes to enable biorecycling, converting plastic waste into everyday chemicals using a tuneable enzymatic process.

Count and Average Amount of transactions in Food and Nutrition by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Food and Nutrition sector raised a total of \$22.7 million, representing a decrease of \$149.9 million (660.2%) from the previous quarter's \$172.6 million. In the same period last year, startups in this sector raised \$77.0 million, reflecting a decrease of \$54.3 million. Year-to-date, Food and Nutrition startups have raised \$451.0 million, compared to \$798.6 million at the same time last year, indicating a decrease of \$347.6 million.

Total investment in Food and Nutrition by year as of 2024 Q4

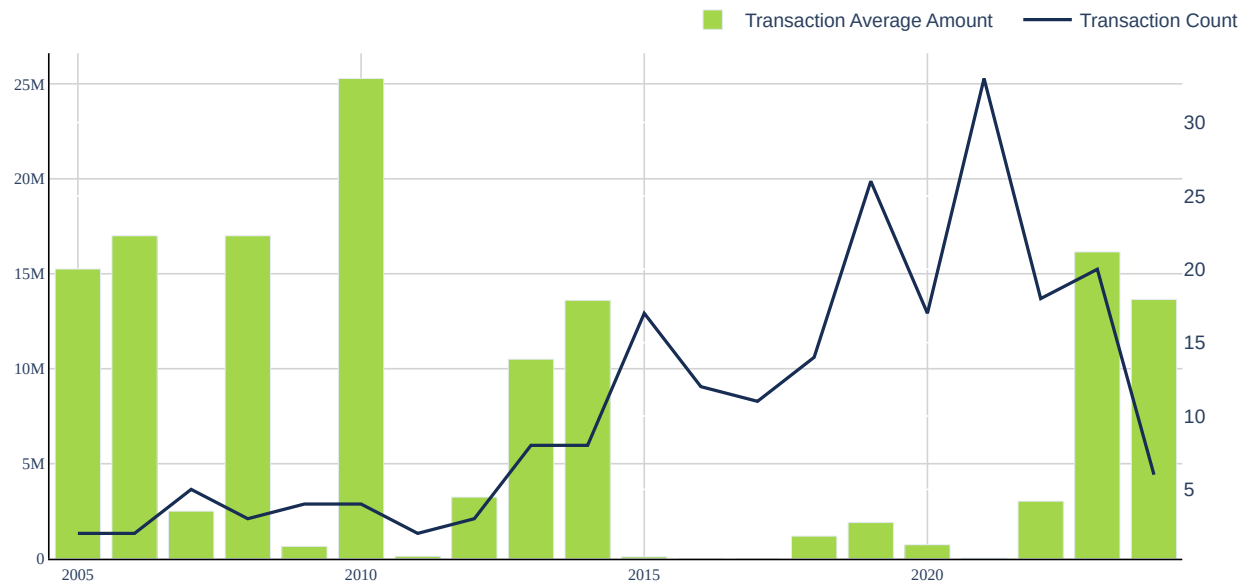


Top 25 Transactions

Organization	Amount	Series	Investors	Qtr
Inari	\$103,000,000	Series F	Canada Pension Plan Investment Board	Q1
Perfect Day	\$90,000,000	Series E	Horizons Ventures and SOSV, unknown	Q1
Helaina	\$45,000,000	Series B	Avidity Partners, unknown	Q3
Pairwise Plants	\$40,000,000	Series C	Aliment Capital, unknown	Q3
Elo Life Systems	\$20,500,000	Series A	Accelr8	Q1
Elo Life Systems	\$20,500,000	Series A	Accelr8, unknown	Q1
Digestiva	\$18,400,000	Series A	Astanor Ventures, unknown	Q3
NovoNutrients	\$18,000,000	Series A	Audacy Ventures, unknown	Q3
MiAlgae	\$17,780,000	Series A	Ananke Ventures, unknown	Q3
Oakbio	\$17,284,998	Other Series	unknown, unknown	Q3
Shiru	\$16,000,000	Series B	CPT Capital, unknown	Q4
microTERRA	\$9,698,762	Other Series	unknown, unknown	Q3
Cauldron Ferm	\$9,500,000	Series A	Horizons Ventures, unknown	Q1
Arborea	\$5,400,000	Other Series	Banco Portugues de Fomento and Indico Capital Partners, unknown	Q4
NoPalm-Ingredients	\$5,000,000	Seed	Fairtree Elevant Ventures, unknown	Q3
MyForest Foods	\$3,499,516	Other Series	unknown, unknown	Q1
MyForest Foods	\$3,499,516	Other Series	unknown, unknown	Q1
Open Book Extracts	\$2,000,000	Convertible Note	OrganiGram, unknown	Q1
BY BUG	\$1,400,000	Seed	Arpeggio, unknown	Q3
Concert Bio	\$1,300,000	Funding Round	Ascension, unknown	Q4
Glycos Biotechnologies	\$1,125,000	Other Series	unknown, unknown	Q1
C16 Biosciences	\$1,000,000	Other Series	Elemental Excelerator	Q1
C16 Biosciences	\$1,000,000	Other Series	Elemental Impact, unknown	Q1
Unlocked Labs	\$100,000	Pre Seed	Seaside Ventures, unknown	Q2
ENOUGH	\$0	Series C	Cargill, unknown	Q1

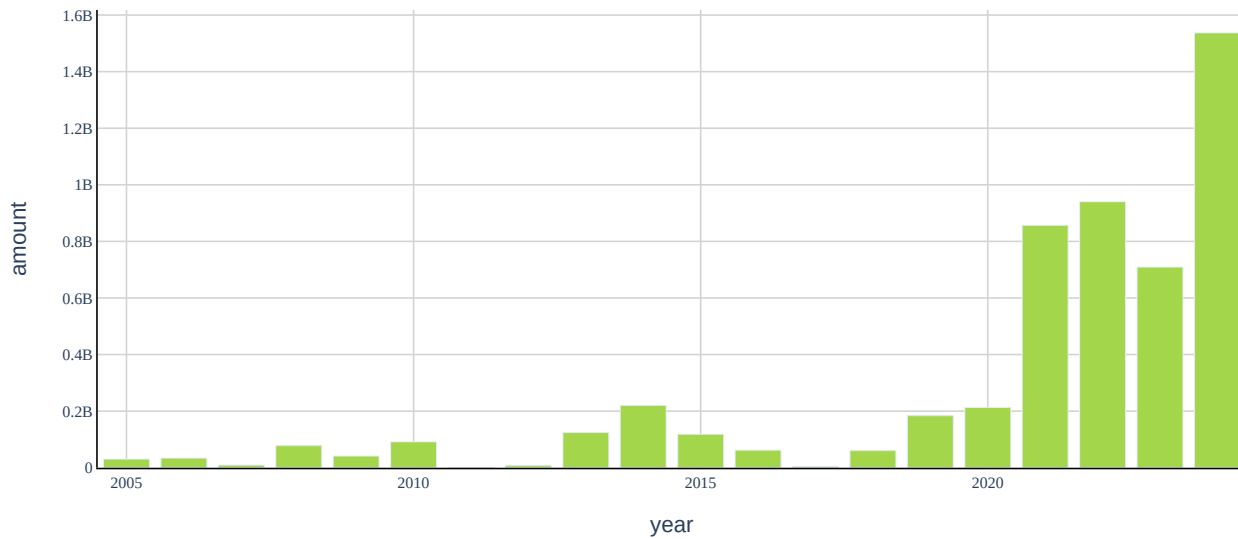
- **Inari** received \$103.0 million in a Series F to revolutionize agriculture through its SEEDesign platform. The company's mission is to transform agriculture and its impact on society and the environment by leveraging diversity and innovative technologies.
- **Perfect Day** raised \$90.0 million in a Series E to produce dairy proteins that are nutritionally identical to proteins from cow's milk. The company is revolutionizing the production of animal-free dairy proteins that are indistinguishable from traditional cow's milk proteins, offering a more sustainable and compassionate alternative.
- **Helaina** raised \$45.0 million in a Series B funding round. The biotechnology company specializes in replicating functional proteins for advanced nutrition, particularly in producing milk-equivalent baby formula through fermentation to provide immune benefits and nutritional options.
- **Pairwise Plants** received \$40.0 million in a Series C investment to grow new varieties of fruits and vegetables. The company, founded in 2017 by a team of experts, is dedicated to building a healthier world through better fruits and vegetables by utilizing base editing and high-fidelity enzymes to develop new products.
- **Elo Life Systems** raised \$20.5 million in a Series A to enhance human health and wellness through food. The biotechnology company focuses on bridging gaps between food, agriculture, and health to improve productivity and nutritional demand.
- **Digestiva** raised \$18.4 million in a Series A for developing food and feed proteins with targeted biocatalysts. The company specializes in enhancing the properties of proteins to improve the nutritional and sensory aspects of food and feed products.
- **NovoNutrients** raised \$18.0 million in a Series A to develop their technology. The company is working to turn waste CO2 into high-value proteins, oils, and additives for aquaculture and food production.
- **MiAlgae** received \$17.8 million in a Series A to revolutionize the global livestock feed industry with their innovative microalgal products grown on wastewater.
- **Oakbio** received a \$17.3 million investment in a Other Series. Oakbio is a Carbon Capture and Utilization company that transforms carbon emissions into high-value renewable products through partnerships with industrial businesses.

Count and Average Amount of transactions in Energy and Environment by year as of 2024 Q4



During the fourth quarter of 2024, startups in the Energy and Environment sector secured funding amounting to \$1.5 billion. This marked a significant increase of \$1.4 billion (95.5%) from the previous quarter's total of \$65.8 million. In the same quarter last year, startups raised \$374.9 million, resulting in a difference of \$1.1 billion. Year-to-date, Energy and Environment startups have raised \$1.5 billion, compared to \$659.3 million at the same point last year, representing a change of \$877.8 million.

Total investment in Energy and Environment by year as of 2024 Q4



Transactions

Organization	Amount	Series	Investors	Qtr
Gevo	\$1,460,000,000	Post IPO Debt	US Department of Energy, unknown	Q4
LanzaTech	\$40,000,000	Post IPO Equity	Carbon Direct Capital, unknown	Q3
Oakbio	\$17,284,998	Other Series	unknown, unknown	Q3
iMicrobes	\$10,000,000	Seed	First Bight Ventures and Universal Materials Incubator, unknown	Q4
Puraffinity	\$8,547,100	Series A	Business Growth Fund, unknown	Q3
bluShift Aerospace	\$1,300,000	Seed	Late Stage Capital, unknown	Q2

- **Gevo** raised \$1460.0 million in a Post IPO Debt to continue producing renewable and cost-effective fossil fuel alternatives, primarily isobutanol.
- **LanzaTech** received a \$40.0 million investment in Post IPO Equity. The company repurposes emissions for a circular carbon economy, potentially displacing crude oil usage by 30% and reducing global CO2 emissions by 10%.
- **Oakbio** raised \$17.3 million in a Series to further develop its technologies for transforming carbon emissions into high-value products. Oakbio is a Carbon Capture and Utilization company that focuses on creating profitable partnerships with industrial businesses to develop biofactories based on its core technologies.
- **iMicrobes** raised \$10.0 million in a Seed round to create sustainable materials from greenhouse gases using biomanufacturing. The company designs and builds microbes that produce better chemicals with lower costs and carbon emissions by utilizing greenhouse gases as raw materials and collaborating with global chemical producers to scale their processes.
- **bluShift Aerospace** received a \$1.3 million investment in a Seed round to support its sustainable space launch services. The company offers cost-effective and environmentally friendly propulsion for defense and space missions, catering to the growing market of sending small payloads to space.