Resource: List of Biotechnology Companies to Watch

By Logan Thrasher Collins

I created this list to serve as a resource to help people learn about and keep track of key biotechnology companies. Some of these are emerging startups, some are established giants, and some provide useful services. Though this list is far from comprehensive, I have tried to cover as many of the key players as possible. It is also important to realize that this landscape is constantly changing, so some of the information on this list will eventually transition into antiquity (this current version was written over the course of 2021 and updated during the summer of 2022). I hope you enjoy delving into the exciting world of biotechnology!

Ablynx
Nanobodies as therapeutics and as laboratory reagents.

AgeX Therapeutics
Treating aging using stem cell therapies, induced tissue regeneration, related methods.

Allonnia
Engineering microorganisms and enzymes to degrade environmental pollutants.
Funded by the Ferment Consortium of Ginkgo Bioworks.

Alora
Engineering salt-tolerant rice via CRISPR for ocean agriculture to feed the world.
Formerly known as Agrisea.
Early stage: raised a $1.4M seed round as of September 2022.

Asimov
Developing computer aided design tools for synthetic biology, making host cell lines for viral vector and biologics manufacturing, constructing genetic parts database.
One of the co-founders is Christopher Voigt.
James Collins is on the scientific advisory board.

Beam Therapeutics
Developing base editor technologies towards therapeutic applications.

David Liu and Feng Zhang are among the co-founders.

Bioasis
Has developed a peptide called xB^3 that facilitates transcytosis across the blood-brain barrier.
Working towards applications in glioblastomas, brain metastases, and neurodegenerative diseases.

Biogen
Large pharmaceutical company focusing on developing treatments for neurological diseases.
Has made moves towards developing gene therapy pipelines for treating neurological diseases, though the company has experienced some setbacks in this space (i.e. failed clinical trials).

BioMarin Pharmaceutical
Enzyme replacement therapies for rare diseases.
During April 2021, announced a collaboration with the Allen Institute to develop AAV gene therapies for rare diseases of the brain.

Bionaut Labs
Microrobotics as a new paradigm for drug delivery.

BioViva
Developing gene therapies to treat aging, offers tests for determining biological age.
Elizabeth Parrish (the company's CEO) tested an experimental gene therapy on herself and reports positive results, though she did not intend for this information to go public.
George Church and Aubrey de Grey are on the scientific advisory board.
Anders Sandberg is the company's ethics advisor.

Capsida Biotherapeutics
Developing targeted AAV gene therapies for a variety of brain diseases.
Has made blood-brain barrier crossing AAVs that are liver untargeted and brain targeted.
Founded by Viviana Gradinaru.

Capsigen

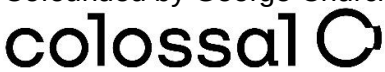
Engineering superior AAV gene therapy vectors through a proprietary method called Transcription-Dependent Directed Evolution (TRADE™).
Have developed greatly improved neurotrophic AAVs.
Entered into a partnership with Biogen during May of 2021 to develop AAV gene therapies that treat various brain and neuromuscular disorders.

CATALOG

Building a DNA-based platform for massive digital data storage and computation.

Colossal

Centered on moonshot projects that are using advanced CRISPR methods to bring back the Wooly Mammoth, the Thylacine (Tazmanian Tiger), and other extinct animals.
Aims to reintroduce lost biodiversity and thus repair ecosystems.
Will develop biomedical technologies such as artificial wombs in conjunction with its de-extinction research, providing additional benefits to humanity and acting as a way to bring in funding.
Cofounded by George Church, Ben Lamm, and Andrew Busey.



Cortical Labs

Developing hybrid bioelectronic devices which incorporate cultured biological neurons to perform computational tasks. These devices are power efficient, scalable, robust to physical damage, and have the potential for fluid adaptation to many different computational problems.

Creative Biolabs

Custom services for antibody engineering, membrane protein production and characterization, bioconjugation, gene therapy development, viral vector engineering, cell therapy development, molecular dynamics simulations, drug development consulting, and more.

Cultivarium
Developing molecular techniques, hardware platforms, and software tools to accelerate adoption of non-model microorganisms for biotechnology.
Cultivarium is a focused research organization (FRO), so it possesses a distinct funding approach and different goals compared to traditional startups. For more information, see this open access article describing FROs in Nature.

CULTIVARIUM

Dyno Therapeutics
Using deep learning to improve properties of AAV capsids as a platform technology for gene therapy.
George Church is one of the co-founders.

E11 Bio
Building moonshot technologies involving superior molecular barcoding, spatial -omics, and viral circuit tracing to help neuroscientists map the brain. Has a long-term goal of mapping brains at the one-hundred billion neuron scale.
E11 Bio is a focused research organization (FRO), so it possesses a distinct funding approach and different goals compared to traditional startups. For more information, see this open access article describing FROs in Nature.

Editas Medicine
CRISPR-based gene therapy.
George Church, David Liu, Jennifer Doudna, Feng Zhang, and J. Keith Joung are the co-founders.

Eikon Therapeutics
Superior drug discovery platform which leverages high-throughput automated super-resolution microscopy for tracking single protein movements in living cells.
Eric Betzig is one of the advisors.

Emerald Cloud Lab
Remote automated laboratory as a service for researchers.
Has a large array of automated equipment for synthetic biology and genetic engineering, physical and biophysical chemistry, structural biology, biochemistry, analytical chemistry, etc.
Provides a software interface for users to instruct the automated equipment.

GATTAquant
DNA origami imaging probes, fluorescence microscopy reagents.
First commercial application of DNA origami.

GenScript
Services in artificial DNA synthesis, synthetic biology, antibodies, cell therapies, enzyme engineering, etc.

Ginkgo Bioworks
Synthetic biology, biomanufacturing, microorganism design, enzyme engineering, etc.
Acquired Gen9 in 2017.

HelixNano
Developing an mRNA-based SARS-CoV-2 vaccine which might protect from all possible variants of the virus.
Pivoted from original plan of developing cancer vaccines using the same technology.
Co-founded by Hannu Rajaniemi, who is also a successful science fiction author.
George Church is an advisor.

Immunai
Combining multi-omic single cell profiling technologies and machine learning to comprehensively map the immune system and thereby enable greatly improved immunotherapies as well as accelerate clinical trials and avoid costly failures.

Impossible Foods
Uses synthetic biology and biochemical engineering to develop plant-based substitutes for meat products.
Their signature product is the Impossible Burger. They also make a product which mimics sausages.
One notable strategy employed by Impossible Foods is production of leghemoglobin in yeast. This compound gives a meaty flavor when added to their food products. They also add other plant-based compounds to mimic the fats found in animal meat.

IMPOSSIBLE™

Intellia Therapeutics
Developing therapies which employ CRISPR gene editing technology.
Has conducted some successful clinical trials using CRISPR gene therapy to treat transthyretin amyloidosis (as of February 2022, this is not yet FDA approved though).
Also working on CRISPR therapeutics for engineering T cells towards targeting acute myeloid leukemia.
Partnered with Regeneron, Novartis, and others.
Jennifer Doudna was one of the co-founders.

Intellia
THERAPEUTICS

Kernel
Neurotechnology, noninvasive brain-computer interfaces, invasive neural prostheses.
Some noninvasive products anticipated to be released during 2021.
Founded by Bryan Johnson who personally invested $54 million.
Raised an additional $53 million from outside investors.
Early goal is to help treat brain disease, has ambitions to enable human enhancement.

kernel

Laronde
Developing therapies which utilize circular RNAs (Laronde calls these “endless RNAs”) as expression vehicles for proteins. Such circular RNAs are much more stable and less immunogenic than linear RNAs.

laronde

Ligandal
Peptide nanoparticles for targeted CRISPR-Cas gene therapy delivery, immunotherapy, hematological gene therapy, aging treatments.

Founded by Andre Watson.

LyGenesis
Allogenic cell therapy that uses host lymph nodes as bioereactors to grow ectopic replacement organs.
Has developed a method for generating ectopic livers via patient lymph nodes that is in early clinical trials as of September 2022.

Mammoth Biosciences
CRISPR-based diagnostics.
Jennifer Doudna is one of the co-founders.

ManifoldBio
System for barcoding protein therapeutics to enable high-throughput design and testing in complex environments, machine learning to optimize drug design.
George Church is one of the co-founders.

Moderna
Biomedical technologies which utilize mRNA inside of lipid nanoparticles; application areas include drug discovery, drug development, and vaccines.
Major player in COVID-19 pandemic since it was one of the first companies which developed and distributed SARS-CoV-2 vaccines to the world.

Nautilus Biotechnology
Developing a high-throughput single-molecule proteomics platform which integrates many novel techniques to decipher protein networks and thereby help accelerate basic science, new therapeutics, and new diagnostics.

NAUTILUS™
BIOTECHNOLOGY

Neurable
Developing a non-invasive brain-computer interface based on headphones that use electroencephalography to record brain signals, allowing people to control devices like phones with their minds.
As of September 2022, the company appears fairly far along in its product development process and is likely to release their headphones within a year or so.

neurable

Neuralink
High-bandwidth brain-machine interfaces, surgical robots which implant the interfaces in a manner resembling a sewing machine.
Early goal is to help treat brain disease, has ambitions to enable human enhancement.
Founded by Elon Musk and others, highly publicized by Elon Musk.
Has done testing on rats, pigs, monkeys, and other animals as of April 2021.

NEURALINK

Openwater
Portable medical imaging technologies which employ novel optoelectronics, lasers, and holographic systems.
Wearable imaging technologies which could be 1,000x cheaper than MRI and achieve similar or better results.
Has speculated that their technology might eventually allow telepathic communication.

OPENWATER

Organovo
3D tissue bioprinting for *in vivo* clinical applications, *in vitro* tissue models for disease modeling and toxicology.
Long-term goal is to print entire human organs for transplants.

organovo®

Oxford Nanopore Technologies
Portable nanopore sequencing devices, high-throughput desktop nanopore sequencing devices, sample preparation kits.
The company states that they have the first and only nanopore DNA and RNA sequencing platform as of May 2021.

Oxford NANOPORE Technologies

Oxitec
Genetically modified male insects which curb the reproduction of populations of their species in the wild, acting as a precise and environmentally friendly way of controlling dangerous pests that spread disease or destroy crops.
After years of battles with activists and regulatory bodies, the company will release 750 million genetically modified mosquitos in the Florida Keys (the first time this has been done in the U.S.) with the goal of reducing rates of illnesses such as yellow fever and dengue.

Panacea Longevity
Enhancing longevity and health using a fasting-mimetic metabolite supplementation.
Early stage as of May 2021.

Prime Medicine
Developing CRISPR Prime editing technology as a novel therapeutic modality.
David Liu and Andrew Anzalone are co-founders.

Proteinea
Mass-produced insect larvae as an affordable way of manufacturing recombinant proteins.
Early stage as of May 2021.

Repair Biotechnologies
Developing a cholesterol degrading platform therapy which can reverse atherosclerosis.
The CEO, who is known as Reason, is outspoken about the need to combat aging.
Has preclinical proof-of-concept as of May 2021.

Resilience
New manufacturing platforms to service partners for development and scaling of gene therapies, cell therapies, vaccines, protein therapies, and more.
Received $800 million in funding during 2020.

RESILIENCE

Sherlock Biosciences
CRISPR-based diagnostics.
Feng Zhang is one of the co-founders.

Sherlock BIOSCIENCES

Somalogic
Proteomics platform called SomaScan for protein biomarker discovery which aids researchers in the development of new diagnostics.
SomaScan is an aptamer-based platform which can simultaneously measure 7,000 protein biomarkers.
Founded by Larry Gold, who is the inventor of SELEX.

somalogic™

Strateos
Offers R&D services through remotely controlled automated laboratories.
Has extensive automated equipment for research in drug discovery, synthetic biology, imaging, cell and gene therapy, etc.

strateos

Synchron
Endovascular brain-computer interfaces as a minimally invasive approach for neural prosthetics, neuromodulation, and neurodiagnostics.
Has developed the strentrode, an endovascular electrode array that can record or stimulate neurons from within blood vessels.
As of September 2022, a technology called brain.io (that employs stentrodes) is in early clinical trials and gives paralyzed patients the ability to control digital devices.

synchron

Synthego
CRISPR genome engineering services, custom cell lines, custom screening libraries, CRISPR reagents and kits, aiding both academic researchers and clinical drug developers.

SYNTHEGO

Syzygy Plasmonics
Developing a photocatalytic reactor system which leverages a nanoparticle-based plasmonic photocatalyst. The photocatalyst consists of a larger light-harvesting plasmonic nanoparticle

decorated with smaller catalytic nanoparticles. Their first product will be a clean hydrogen fuel production system which does not rely on petroleum.
More of a chemical engineering company than a biotechnology company, but their technology may eventually have applications in biology.

SYZYGY PLASMONICS

Tilibit Nanosystems
Service which gives researchers predesigned and custom DNA origami nanostructures, including ones with chemical modifications.
Founded by Hendrik Dietz, who was CEO from 2012-2014. He is now a scientific advisor.

tilibit® nanosystems

Twist Bioscience
Artificial DNA synthesis services. Synthetic biology towards insulin manufacturing in yeast, scalable spider silk manufacturing, combating malaria, and DNA data storage.
Emily Leproust is a co-founder.

TWIST BIOSCIENCE

Vault Pharma
Protein vault nanocompartments as a drug delivery platform to treat cancers and other diseases, protein vaults as a vaccine platform.
Co-founded by Leonard Rome.

VAULTPHARMA

VectorBuilder
Services in vector cloning, virus packaging, library construction, cell lines, etc.

VectorBuilder

Verve Therapeutics
Developing CRISPR base editing therapies to turn off key genes (e.g. PCSK9 and ANGPTL3) involved in atherosclerotic plaque formation and thus to combat cardiovascular disease.
The delivery mechanism involves lipid nanoparticles carrying gRNA and mRNA encoding a base editor protein.
Has potential to save tens of millions of lives due to the status of heart disease as one of the most common causes of death.
Early clinical trials began in July 2022.

Zymergen
Synthetic biology, metabolic engineering, biomanufacturing of materials and compounds as a substitute for chemical engineering practices.

4D Molecular Therapeutics
Using high-throughput screening and recombination methods to develop novel AAV serotypes that evade immune responses and that target and transduce specific organs.
Clinical trials for several new AAV vectors that treat pulmonary, cardiac, and eye diseases are ongoing as of September 2022

10x Genomics
Spatial transcriptomics, genomics, proteomics, immune cell profiling, etc.
Acquired ReadCoor and Cartana in 2020.

64x Bio
High-throughput screening and computational design of new mammalian cell lines for manufacturing gene and cell therapies.
George Church and Pamela Silver are among the co-founders.