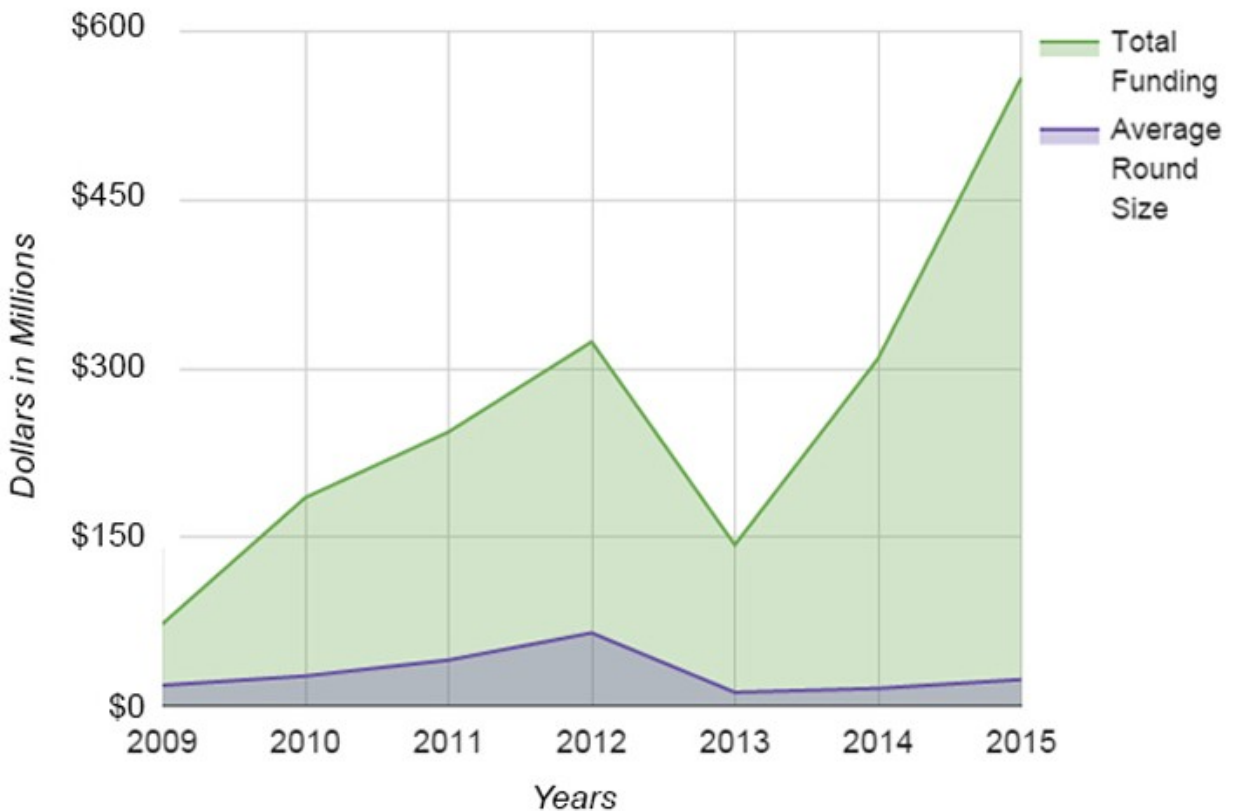


These Synthetic Biology Companies Have Raised Half a Billion Dollars in 2015

10/09/2015

2009-2015 Investment in Synthetic Biology Companies




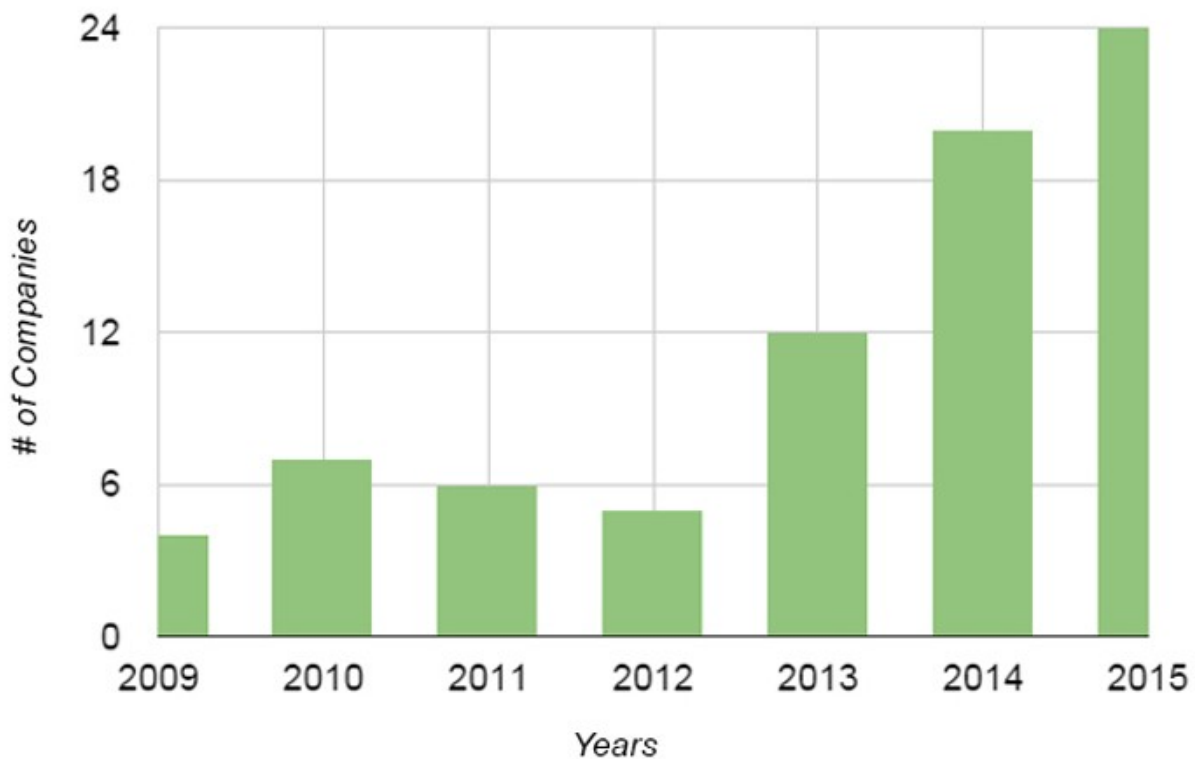
For many years scientists have been hailing the potential of synthetic biology to revolutionize almost every area of human life, encompassing several multi-billion dollar industries including the energy, chemical, agricultural, and medical sectors.

While the vision has always been clear, the science has struggled to deliver on its promises. Many early attempts to produce chemicals from sustainable bioreactors failed to be commercially viable due to their high production costs. That all seems to be changing as the pace of innovation in synthetic biology increases year after year, debuting game-changing discoveries like CRISPR and enhancing microbe development through the integration of advanced automation techniques. As such, companies are

beginning to show undeniable promise and even find tangible success in their ambitions. It hasn't taken investors long to respond to the first signs of this sea change.

As of September 2015, investment in new synthetic biology companies (many of which will be at [SynBioBeta San Francisco 2015](#)) has surpassed half a billion dollars: a sum greater than all synbio investment in 2013 and 2014 combined. While the average investment has decreased to around 23 million per company from 64 million in 2012, this year has witnessed, by numbers, the most total companies to be funded. Some investors include Y Combinator, Founders Fund, Google Ventures, Flagship Ventures, OS Fund, Data Collective, Sofinnova Partners, Fidelity Biosciences, Innovation Endeavors, Novartis, SOSventures, Bioeconomy Capital, Rainbow Seed Fund, Draper Fisher Jurvetson and Illumina.

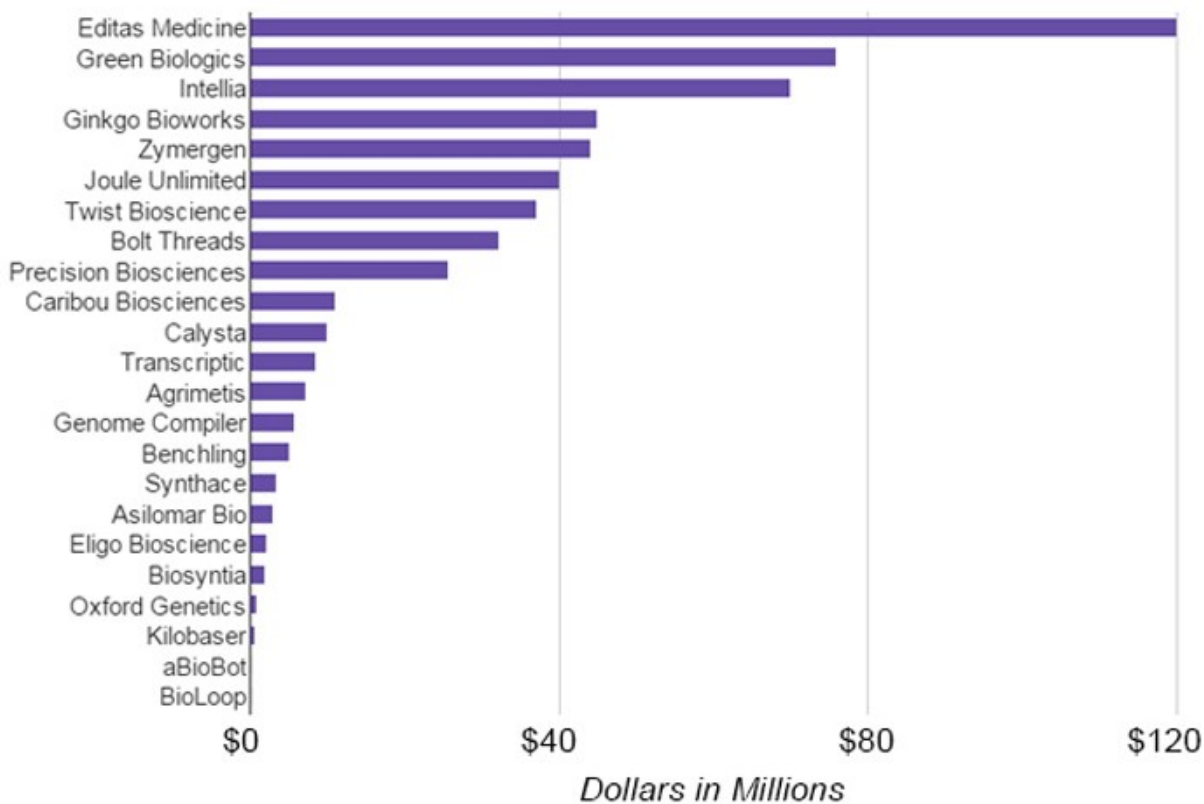
2009 - 2015 Synthetic Biology Companies Funded 



[Editas Medicine](#), a CRISPR-based genome engineering company, is leading the 2015 cadre with a \$120 million Series B funding round. Other genome engineering companies have also received multi-million

dollar funds this year including three CRISPR based companies, [Intellia Therapeutics](#), [Caribou Biosciences](#), [Eligo Bioscience](#), and one company, Precision Biosciences, that uses their own proprietary genome-editing system named ARCUS. While Editas, Caribou, and Precision are all chasing the seemingly endless applications of genome engineering (agricultural, therapeutic, industrial), Intellia seems poised to focus solely on therapeutics, and Eligo Biosciences is using CRISPR to engineer bacteriophages to serve as next-generation, species-specific antibiotics.

2015 Investment in Synthetic Biology Companies



The second biggest investment at \$76 million went to Green Biologics, a company that uses *Clostridium* to produce biofuels and other industrial chemicals from sustainable feedstocks. Green Biologics is just one player in an impressive group of companies that excel at organism engineering. Joule Unlimited uses bacteria to convert carbon dioxide into hydrocarbons and fuels while Calysta harnesses microbes to convert notoriously difficult-to-work-with methane into high-value industrial products. While these companies focus on engineering specific microbes for a specific purpose, other companies are developing efficient methods to create engineered microbes to order. With over \$100 million between them (this year), [Ginkgo Bioworks](#), [Zymergen](#), [Synthace](#), and [Biosyntia](#) are relying on

robotic automation, machine learning, novel software, and high-throughput screening to rapidly develop and optimize new strains to produce industrial chemicals and other bio-based products.

While these companies will most likely be fighting for big name clients, other companies are trying to make synthetic biology more accessible to everyone through automation and software. **Genome Compiler** and Benchling offer online software tools to organize and plan new synthetic biology projects. **Twist Bioscience**, with its new synthesis technology, promises to make DNA synthesis cheaper while Kilobaser is developing a benchtop synthesizer to bring the power of DNA synthesis to you. Meanwhile, **Transcriptic** aims to create a cloud-operated robotic lab so that you can run experiments from anywhere that has an internet connection, and aBioBot is trying to make those robots smarter and faster at their wet-lab job.

As these companies continue to pile up, the diverse potential of synthetic biology becomes indisputable. Companies like Agrimetis and Asilomar Bio are developing naturally derived compounds to help protect crops from weeds and parasites, while Clara Foods is trying to create vegan egg whites by producing all the constituents in yeast and then reconstituting the individual ingredients. Two companies, **Bolt Threads** (which raised a very impressive \$32.3 million for its synthetic spider silk technology) and BioLoop aim to engineer microbes to produce advanced textiles. It's been a monumental year for synthetic biology and the explosion in companies and technologies should only continue as we are ushered into a new era of the biologic industrial revolution.



John Cumbers

John is the founder of SynBioBeta, an activity hub for synthetic biology startup companies, industry and investors. John also leads the Planetary Sustainability Collaboratory at the NASA Ames Space Portal where he works on partnerships that bring new technologies to bear on sustainability challenges on Earth and in space.