



BiologIC is the first company in the UK — and one of the first in Europe — to install Stratasys' new J826 3D Printer. Picture shows, from left: BiologIC co-founders Dr Colin Barker, Richard Vellacott and Nick Rollings

BiologIC Technologies' "Desktop Computer of Biology" Comes to Life with Stratasys J826 Prime 3D Printer

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BiologIC Technologies' entire business model and strategic goals are built around the unique advantages of Stratasys' full-colour, multi-material 3D printing. Without the J826 Prime, we wouldn't be moving ahead as a company as we wouldn't have a product.”

Richard Vellacott

Co-founder & CEO, BiologIC Technologies



Cambridge-based [BiologIC Technologies](#) is a pioneer in powerful Industry 4.0 digital architectures for radically different and highly integrated automation in synthetic biology — the field of science that involves redesigning organisms for useful purposes by engineering them to have new abilities.

Engineering biology is conventionally a complicated and expensive process, requiring large laboratories and highly skilled scientists mixing and moving liquids to different robots that undertake specific, sometimes repetitive tasks. BiologIC's aim is to significantly simplify and condense existing laboratory processes by creating a "Desktop Computer of Life Sciences," mirroring the way in which large mainframe computers eventually gave way to smaller, more efficient desktop PCs. Rather than processing information, BiologIC's products will process biology. Once developed, the company hopes this device will ultimately drive the next wave of biological innovation.

But the cost and time implications of bringing it to reality with a working prototype using traditional manufacturing was the stumbling block. After researching the options available to the company, BiologIC's three co-founders discovered that 3D printing could hold the key to unlocking their vision. Having tested a number of technologies, the team decided to invest in a full-color, multi-material [J826™ Prime 3D Printer](#) from Stratasys' local partner, [Tri-Tech](#).

On-demand biology using 3D printing

"Our 'lab-in-a-box' is based on the novel application of 3D printing in new miniaturised and highly integrated architectures, inspired by the long and successful history of semiconductor systems," said Nick Rollings, co-founder of BiologIC. "Our instrument could be used to create biology by design and on-demand, whether it's to treat patients on-site or make the latest biofuels."

The beating heart of BiologIC's technology proposition is a 3D printed "bio-processing unit" — produced entirely on the J826 Prime — which automates a number of complex biological processes using many different elements and materials. According to Rollings, this would be simply impossible to create using any traditional methods.

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We can now see our product being commercially scaled-up at least 100% faster than if we were using traditional manufacturing methods.”

Richard Vellacott

Co-founder & CEO, BiologIC Technologies

The multi-material 3D printing capabilities of the Stratasys J826 3D Printer enabled the creation of a highly accurate multi-domain system — this would be impossible to develop using any traditional methods





With its Stratasys J826 3D Printer, BiologIC can build and test cartridges, and show potential customers and investors its rapid development process in real time — something, it says, is unachievable with other traditional life science R&D processes

Multi-material for a multi-domain

The creative freedoms delivered by Stratasys' full-colour, multi-material 3D printing technology enables BiologIC to accelerate its design process with zero restrictions and enabled the team to achieve the complexity of the current design. For example, the ability to print in transparent [VeroUltra™Clear](#) material, with its glass-like clarity, is essential for visualization of the cartridge's inner workings so that scientists can confirm the biology is high-quality and performing as designed. Additionally, within the structure, the precision movement of fluids is key to controlling the biology. And the ability to print in flexible photopolymers like [Agilus30™](#), has allowed the company to add a level of functionality within its bio-processing unit that would have been otherwise impossible.

The design of the unit, around the size of a Rubik's Cube, currently combines four materials, but the team hopes to shortly utilize the full material potential of the J826 Prime.

It is not just the technological capabilities that have been essential to helping BiologIC realize their vision, but the business potential too.

According to Richard Vellacott, co-founder and CEO of BiologIC, 3D printing has enabled the team to turn the traditional life-sciences business model on its head.

Fast development and collaboration without the need for investment — a life sciences first

"Traditionally, technology companies have to raise a lot of capital from investors to fund a number of years of technology development in the belief that there will be a viable market for their product when it's ready to be commercialised," Vellacott explains.

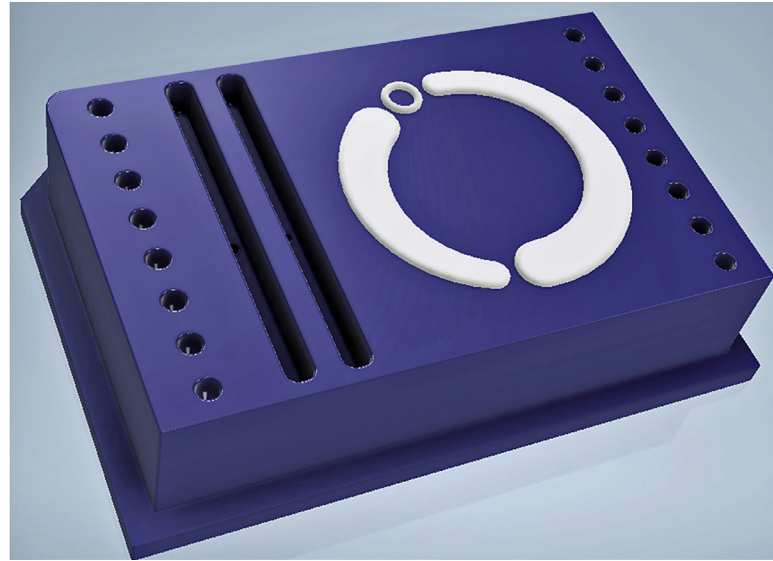
"However, the J826 Prime has allowed us to collaborate directly with innovative customers from day one to physically demonstrate and co-develop product concepts to ensure they fit their needs, avoiding the need for us to have to raise investment," he adds. "This, we believe, has never previously been achieved with other traditional life science technology R&D processes. And even though our technology development is still in the early phase, the J826 Prime enables our digital business model to deliver exponential growth."

For BiologIC, the expectation is for a product that will be scaled commercially within two years, as opposed to five to 10 years using conventional manufacturing methods — an improvement in efficiency in excess of 100 percent. The breadth of product range being fabricated using the very same J826 Prime platform also includes a broad range of applications both in life sciences and beyond. This level of flexibility has led directly to an early adopter program with other high-science and biology companies, resulting in faster innovation and greater success overall.

Having almost completed the R&D process, the company is confident that the business model can completely exploit the key benefits of 3D printing, namely manufacturing such cartridges on-demand at a price point and significant scale that benefits many customers and society as a whole.

BiologIC is not only using its J826 Prime for working prototypes during the R&D process, but also with its fundamental ability to enable design ingenuity, especially the creation of highly complex multi-material internal geometries. The solution will also be used to manufacture the final product.

“We need a technology that enables us to be lean and agile. Stratasys’ PolyJet™ 3D printing is the best in the game, and importantly the J826 Prime gives us access to this technology at a price point and physical size attractive for a start-up,” Vellacott adds.



From working prototypes through to manufacturing, BiologIC expects to start producing the final commercially available product before the end of 2021

“Without the J826 Prime, we wouldn’t be moving ahead as a company as we wouldn’t have a product; it’s as simple as that. This 3D printer is at the heart of everything we do and will be pivotal in enabling us to realize the next step in our journey — scaling-up the product for other applications and working with Stratasys to expand into manufacturing in 2021,” he concludes.

USA - Headquarters

7665 Commerce Way
Eden Prairie, MN 55344, USA
+1 952 937 3000

ISRAEL - Headquarters

1 Holtzman St., Science Park
PO Box 2496
Rehovot 76124, Israel
+972 74 745 4000

stratasys.com

ISO 9001:2015 Certified

EMEA

Airport Boulevard B 120
77836 Rheinmünster, Germany
+49 7229 7772 0

ASIA PACIFIC

7th Floor, C-BONS International Center
108 Wai Yip Street Kwun Tong Kowloon
Hong Kong, China
+ 852 3944 8888



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www.stratasys.com/contact-us/locations

