

GE to boost yields with Synpromics' synthetic promoters

GE Healthcare and Scottish synthetic biology firm Synpromics partnered to develop a new library of synthetic promoters for GE's biologics manufacturing. Synpromics CEO David Venables said in January that the privately held, Edinburgh-based company's promoters should enable GE to boost processing yields for GE's biomanufacturing clients. Synpromics will receive an undisclosed up-front fee as part of the deal, which calls for it to develop custom-built promoters using its PromPT synthetic DNA design platform. The firm claims that deploying its platform improves on the conventional viral or gene-specific promoters on which the biopharma industry relies. GE Healthcare will employ Synpromics' platform on its Chinese hamster ovary (CHO)-cell-based expression system to produce difficult-to-manufacture proteins for use as therapeutics. GE is the latest and largest partner that Synpromics has announced related to its line of synthetic promoters. In December, it divulged an expanded agreement with Menlo Park, California-based Adverum Biotechnologies to develop promoters for treating eye diseases. That same month, it said it would lend its technology and expertise to Sartorius Stedim Cellca, a leading producer of CHO-expression-system-derived biopharmaceuticals in Göttingen, Germany. Other announced clients include the gene therapy companies Amsterdam-based uniQure and Alachua, Florida-based AGTC.

“I identified long ago that it was a race to the bottom based on screwy economics...I am perfectly happy to be wrong about that hypothesis, but the data seem to be bearing it out.” Rob Carlson Managing Director of Bioeconomy Capital, comments on the demise of DNA synthesis posterchild Gen9, which was swallowed by Ginkgo Bioworks in January. (*Boston Globe*, 20 January, 2017)

“Usually you come to San Francisco for this meeting [JP Morgan Healthcare Conference] and there is lots of chatter about potential deals, and you aren't seeing that. Everything is on hold until we find out what the government intends to do—and it seems to change every day.” Mario Molina, CEO of Molina Healthcare, comments on the uncertainty brought on by the arrival of the new US president. (*Bloomberg Markets*, 12 January 2017)

a new company it is willing to tap its investors for resources to drive such projects. “What we are proposing to do is not something I could raise using traditional research funding mechanisms (e.g., foundations and NIH).” She adds that, on the user interface side, in addition to the app, “I like what they are doing with their smart robots—that's a good delivery system for those less screen inclined.”

Being in China is also a major perk. China is investing heavily in research and healthcare and incentivizing opportunities to increase domestic spending so as to reduce its reliance on exports. “iCarbonX can tap into talent and resources from China in a way that US companies cannot,” says Au. “And in the world of computational science and technology, this is a big advantage. I see iCX as being able to maximally capitalize on their unique positioning.”

Snyder does suspect that laxer regulations on interactions with patients in China will give Wang's alliance room to breathe that US competitors lack. “This space is highly regulated in the US. It is difficult to get permission even in a research context to return participants' information back to them,” he says.

Natkin agrees that having its center of gravity in China will be strategically important. “China is looking to foster the development of local champions,” he says. What's more, over the past few years, China has tightened restrictions on the export of human genetic resources, and as a result, foreign rivals attempting to gain traction in China “will face a variety of obstacles making it difficult to compete effectively in the China market,” says Natkin. In China, there is still a large ‘gray area’ between what is considered a diagnostic, which requires drug agency approval, and what is just health advice. “We will find out,” says Wang.

But the alliance, which will also be operating in the US, will still have to deal with regulations there. Wang says, however, that PatientsLikeMe has learned from the US Food and Drug Administration's clamp-down on consumer genetics testing company

23andMe, of Mountain View, California, for diagnosing patients without having validated the tests, and has learned to stay out of the FDA's crosshairs.

In attempting to integrate data from US patients, such as those on PatientsLikeMe, and from Chinese individuals to raise numbers, the alliance will also have to face the stricter Chinese restrictions. Can individuals post their own data online or in social media? Do the restrictions apply to proteomic data as well as genetic? “These are good questions. Regulations are a moving target and we need to understand,” Wang says.

In the meantime, Wang will be setting up a Chinese version of each of the seven companies in the alliance. He also has two pilot projects. In one, 100 people will pay RMB10 million (\$1,440,000) over ten years for a package that includes life insurance, health

insurance and medical insurance along with the whole range of tests and tools that the alliance has to offer. In the other,

1,000 people will be allowed to purchase one time ‘check-ups’ at pricing platforms ranging from free to RMB99,999 (\$14,500)—and varying by the number of tests (immune system measurement, proteomics of different tissues, etc.) and varying degrees of information for each of those tests (for example, different number of proteins measured).

“The initiative is exciting and cutting edge, and there is no doubt that it will produce very interesting and cool data,” says Jing Ma, a cancer epidemiologist at Harvard. But the alliance seem to lack sufficient ties with the medical community to evaluate health and disease outcomes, Ma adds. The iCarbonX platform might also prove too time-consuming and expensive for people who are not sick to use.

Wang acknowledges the uncertainties—in the science, in the regulations and in peoples' reactions toward technology—and wants to tackle them head on. “That's the beauty of it—the challenge and opportunity,” he says.

David Cyranoski *Shanghai*

I will try everything and go with whatever works.

Correction

In the January 2016 issue, the article “Gut microbiome profiling tests propelled by customer demand” incorrectly stated that uBiome's SmartGut test costs \$89. Instead, that should have said that the price depends on the insurer, as this is a doctor-ordered, insurance-reimbursable clinical lab test, and that the uBiome Gut Explorer kit, which is available to the public online, costs \$89.