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Economic Forecast: Where biotech goes next after a banner year

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For our annual Economic Forecast, we asked our reporters and other industry experts to weigh in on how Biden, Covid and other factors will affect their industries in 2021. Click here to read insights from Paul Hastings of Nkarta Therapeutics.



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Covid-19 has driven a mass influx of capital and interest in companies tackling the disease, as well as the larger biotech industry.

THREE THINGS TO WATCH IN 2021

The year of the vaccine

If all goes as planned, Covid vaccines from Pfizer/BioNTech and Moderna will reach hundreds of millions of people globally.

And more vaccines are on the way. Vaxart Inc. of South San Francisco expects to share data in early 2021 from an early-stage trial of its potential oral vaccine. What's more, Redwood City's Meissa Vaccines Inc. plans to start a Phase I trial in early 2021 with its live-attenuated vaccine — taking the Covid-causing virus and engineering out or reducing its virulence — that could be delivered once through the nose.

Meanwhile, Vir Biotechnology Inc. expects to take its antibody drug, partnered with GlaxoSmithKline plc, into a late-stage trial as a prophylactic, which could be used to prevent Covid even after the virus enters the body. The same drug is in a late-stage trial now as an early treatment for Covid, and the National Institutes of Health is starting a Phase III study of the drug as a treatment for more-severe Covid patients.

Biotech's space race

Even with some 13 million square feet recently opened, under construction or on drawing boards, it's just not enough for the biotech industry in the Bay Area.

The new space is not just new structures. From San Francisco to Alameda and South San Francisco to Palo Alto, landlords hit by their tenants' work-from-home policies during the Covid pandemic are looking to convert their space from offices to labs.

Biotech companies looking for space say their search remains tight and competitive as rents approach \$70 per square foot. But it remains to be seen if developers can move quickly enough to satisfy the demand from large biopharma companies as well as mid-sized companies and startups fueled by record amounts of capital.

'Synbio' grows in the East Bay

The synthetic biology revolution may not be televised, but it is taking shape in the East Bay.

Zymergen Inc., which is using "synbio" to develop everything from film for foldable electronics to safe, affordable, sustainably produced insect repellent, is currently converting the former home of Chiron Corp. in Emeryville into a nearly 300,000-square-foot headquarters for the 800-person company.

Synthetic biotech sits at the junction of biology and engineering, redesigning and fabricating novel biological components for new

uses.

The field is changing the way we grow food, produce consumer electronics and develop medicine. Synbio companies are heavily focused on accelerating development timelines — cutting the time it takes to discover and test drugs, for example — but they also promise to change processes to use fewer chemicals and resources and reduce reliance on intensive animal farming.

Certainly, that's taking place around the Bay Area. Case in point: Redwood City-based Impossible Foods Inc.'s insertion of genes that encode for a soy protein into a species of yeast, which is carefully curated to spin out the company's "fake meat."

Synbio's roots were planted at UC Berkeley, Lawrence Berkeley National Laboratory and Amyris Inc., the Emeryville company that pivoted from synthetic fuel alternatives to cosmetics, sugar substitutes and more.

That expertise is helping to birth a new generation of startups.

Take Octant Inc. The company landed a \$30 million venture capital round early in 2020 to combine synthetic biology, synthetic chemistry, genomics and computer science to engineer cells to tell researchers what potential drugs work best against a combination of cell receptors in common diseases. Today, traditional drug makers generally focus on a single target of a disease.

By the end of the year, the company also helped partner Ginkgo Bioworks Inc. find a 22,000-square-foot site in Emeryville to handle Covid-19 and other diagnostic testing.

The culture of the East Bay is more conducive to the type of risk taking inherent in synbio, said Sri Kosuri, a UCLA professor who founded the company with a former executive at Google Inc. and Dropbox inc.

"The synthetic biology community in Emeryville is really strong. That was a big lure for us," he said. "It's a much different feel than in South San Francisco, maybe because we're younger, more idealistic. It just feels very exciting."

THE BIDEN EFFECT

Even for an industry adept at playing both sides of the political aisle, a Biden White House may bring a welcomed level of consistency. But biotech may not like what it gets.

Drug industry CEOs and advocates have long complained that their segment of the health care industry has been a scapegoat for systemic problems around pricing. Some have pushed for Congress to take a deep look at all parts of the industry, including hospital systems, prescription benefit managers, insurers and government policy; they say a focus on drug makers alone would drive away investors who fund innovations — like cell therapy and messenger RNA central to Moderna Inc.'s Covid vaccine — and ultimately drive costs higher.

With Xavier Becerra — the current California attorney general and Biden's pick to head Health and Human Services — they may get someone who has comprehensive understanding of health care. But they may not like Becerra's 360-degree view.

Drug pricing will remain a dicey issue. Where Trump wallpapered over a populist issue with gift cards for seniors and a "most favored nation" model for a few dozen drugs, Becerra has championed more systemic change.

Becerra targeted how drug companies get doctors to prescribe their drugs and pushed hard against Sutter Health, eventually driving the company to settle over its monopoly-like pricing policies in California.

Becerra signed on with other attorneys general this summer to demand that the federal government exercise its rights under patent law that would allow drug makers to scale up production of

the Covid-fighting drug remdesivir. That drug is sold by Foster City-based Gilead Sciences Inc. at an average cost of \$3.120 for a course of treatment.

So-called march-in rights, which have never been used, allow the government to tap the patent rights it has for inventions developed with taxpayer funding.

THE COVID EFFECT

While other sectors have suffered enormously, the pandemic was a proving ground for biotech and a stress test for the larger health care system.

Within 11 months, life sciences companies translated the genetic sequence of the novel coronavirus that causes Covid into two early vaccines and scores of drugs and diagnostics to treat and test for Covid. That includes Gilead's remdesivir and Emeryville startup Lucira Health's emergency use authorization from the FDA for the first at-home Covid self test.

Those results may give the drug-making industry clout in D.C. and in state capitals as it takes on meaty issues like drug pricing.

The pandemic also seemed to highlight to investors that drug makers could do good and do well. Record amounts of venture capital and initial public offerings — some two dozen Bay Area life sciences IPOs alone — have poured billions of dollars into young and maturing companies. Also, special purpose acquisition companies, known as SPACs or blank-check companies, have emerged as a popular vehicle for collecting capital and taking companies public.

At the same time, Covid has exposed a health care system that is at capacity for intensive care unit beds to care for the sickest of the sick Covid patients. Many hospitals in Covid hotspots, at one point or another, stopped elective surgeries to prevent the spread of the virus.

"Can't wait to disintermediate this whole broken healthcare system," Robert Nelsen, a managing director at ARCH Venture Partners, tweeted in December. "Misaligned incentives, lack of data, hospital monopolies, centralized, reactive care, low impact drugs sucking the money from high impact drugs. The innovation wave can save us, but will take a fight."

THE WAVES OF COVID-19, VISUALIZED

Daily numbers of hospitalized confirmed Covid patients in the nine-county Bay Area, March 29 through Dec. 15



QUOTABLE

"The world is awash in cheap capital and people who don't know what they're doing. But the fundamentals of this field right now are so strong: The underlying science of biology is just exploding. This is the golden age of biotechnology. I compare it with 100 years ago, with electrical and mechanical engineering going to the moon or flying across the ocean. There's a nonlinear exploding of tech and biotech, and a convergence of technologies like DNA sequencing and computers, that is driving the field from less descriptive to more predictable.

"Five years ago, it would take three years to develop a vaccine for Covid, if we ever got there. Now there are two companies that did it in less than a year, one with a technology that never had been used to develop a vaccine before.

— **Dr. Sean Harper, founding managing director, Westlake Village BioPartners**

"The macro environment is full of uncertainty and disruption — how we work, homeschooling. It's taken much more flexibility, and people are more comfortable and realistic about what they can do.

"We've worked around the macro environment: We slowed down, figured out where everyone is and what they could do. It's a tremendous amount of work and stressful on people. But bringing this drug to patients is more important during Covid. People are committed."

— **Dr. Lynn Seely, CEO, Myovant Sciences, as the company neared FDA approval of its prostate cancer pill relugolix**

"We have our first product on the market (2021), a growing pipeline with a second product. We'll have a couple partnerships that expand beyond (the company's) three verticals. We've spent the last six to seven years building the technology and platform and

building the pipeline, and now we're stitching that together in an operating business."

— **Josh Hoffman, CEO, Zymergen Inc.**

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