DEATH, DISRUPTED

BY ALEXANDRA SIFFERLIN

THE TITANS OF THE TECH INDUSTRY ARE KNOWN for their confidence that they can solve any problem—even, as it turns out, the one that’s defeated every other attempt so far. That’s why the most far-out strategies to cheat death are being tested in America’s playground for the young, deep-pocketed and brilliant: Silicon Valley.

Larry Ellison, the co-founder of Oracle, has given more than $330 million to research about aging and age-related diseases. Alphabet CEO and co-founder Larry Page launched Calico, a research company that targets ways to improve the human lifespan. Peter Thiel, co-founder of PayPal, has also invested millions in the cause, including over $7 million to the Methuselah Foundation, a non-profit focused on life-extension therapies.

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THE HACK: It may sound vampiresque, but 50 people in the U.S. have paid $8,000 for a transfusion of plasma from someone between the ages of 16 to 25. The study is run by Ambrosia, a company based in Monterey, Calif.

THE HYPE: The transfusions are based on the idea that two-liter injections of blood from the young may confer longevity benefits. Now, in the first known human clinical trial of its kind, Ambrosia is enlisting people willing to pay the hefty price to give it a shot. Ambrosia’s founder, Jesse Karmazin, who has a medical degree but is not a licensed physician, says that after the transfusions, his team looks for changes in the recipient’s blood, including markers of inflammation, cholesterol and neuron growth. “When we are young, we produce a lot of factors that are important for cellular health,” he says. “As we get older, we don’t produce enough of these factors. Young blood gives your body a break to repair and regenerate itself.”

THE DEBATE: Scientists are roundly critical of this study, in large part because of the way it has been designed: there’s no control group, it’s costly to participate in, and the people enrolled don’t share key characteristics that make them appropriate candidates to be looked at side by side.

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THE BOTTOM LINE: Blood-based therapies for longevity could still be in our future, but the science isn’t there yet. “Donor blood can save lives, but using it to rejuvenate oneself is counterproductive,” says Irina.
THE HACK: Biohackers in Silicon Valley and beyond have long experimented with the idea that fistfuls of supplements, taken in just the right combination, may be the antidote to aging. Now, scientists and businesspeople are experimenting with the idea that just one or two pills, taken daily, may also get the job done.

THE DEBATE: Genome sequencing can indeed pinpoint genetic risk for some cancers and other diseases. And microbiome profiles—which look at the makeup of bacteria in the gut—can provide clues about the presence of some chronic diseases. Changes in cholesterol and blood sugar can also signal illness, though that kind of blood work is routinely tested by primary-care physicians. About 400 people ages 30 to 95 have had the physical so far, and the test has identified significant medical problems in 40% of them, according to Venter, who says they’ve found cancer, aneurysms and heart disease in several people without symptoms.

Still, it raises questions among its skeptics about whether or not patients can actually use most (or any) of the data they receive. It also highlights some doctors’ concerns about the negative consequences of over-screening, where there is always a risk for false positive results. “When healthy people undergo scanning, it can backfire,” says Dr. Eric Topol, director of the Scripps Translational Science Institute, who has studied data-driven medicine. “It can find abnormalities and lead to more tests and procedures, many of them unnecessary. It can cause harm, not to mention anxiety and expense.”

This isn’t news to Venter. “The criticism people throw out is ‘How dare you screen healthy people?’” he says. “My response is, ‘How do you know they’re healthy?’ We are finding pretty good evidence that many are not.” Topol says a rigorous study of the program by independent researchers could help settle the score. “If validated for benefit in this way,” Topol says, “my outlook would be more positive.”

THE BOTTOM LINE: Venter acknowledges that while costs may come down, the battery of tests is so far too expensive to be realistic for most. Whether it adds years to a person’s life is also an open question. For now, looking into the crystal ball requires a whole lot of money—and a comfort with uncertainty.
**THE HACK:** These supplements, called nootropics or sometimes “smart drugs,” promise to sharpen your thinking and enhance mental abilities. Many common nootropic ingredients—including the sleep-enhancing hormone melatonin, energy-boosting B vitamins as well as caffeine—are already present in the foods and pills that people consume on a daily basis.

**THE DEBATE:** The ingredients in nootropic supplements have a “generally recognized as safe,” or GRAS, designation from the FDA, and some of them have been studied for their cognitive-enhancing effects. But the unique combinations in the pills themselves haven’t been proven to heighten people’s mental capacity. Nootrobox says it is currently conducting clinical trials of its products. The FDA is notoriously hands-off when it comes to the regulation of dietary supplements. In the U.S., vitamins are not required to undergo rigorous testing for effectiveness or safety before they’re sold.

Many doctors are also skeptical that they make a difference in mental performance. “There’s probably a lot of placebo effect,” says Kimberly Urban, a post-doctoral research fellow at the Children’s Hospital of Philadelphia who has studied the effects of nootropics on the brain. “I think people should use some caution, especially young people.” She adds that while these supplements may in fact be safe, there’s no scientific research to prove it.

**THE BOTTOM LINE:** Many nootropics on the market are probably less sugary and lower in caffeine than most energy drinks, which often contain similar ingredients to those in the pills. Still, the notion that they make people sharper is largely unproven. So until independent clinical trials prove otherwise, it’s buyer beware.

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**HIGH-TECH Fasting DIETS**

**THE HACK:** Calorie restriction—the practice of consuming nothing but water for a day at a time or drastically slashing calories a few days per week—has been popular for decades among energy bars, plant-based snacks, vegetable soups and algae-oil supplements that add up to a total of 700 to 1,100 calories a day. A five-day kit that must be ordered by a doctor costs $299.

**THE DEBATE:** Studies do show that calorie-restricted diets are linked to longer life expectancy. It’s not clear why, exactly, but some scientists suspect that stressing the body kicks it into a temporary mode that leads to the creation of healthy new cells. Other research suggests that a very-low-calorie diet may make the body more responsive to cancer treatment and can slow the progression of multiple sclerosis.

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**THE BOTTOM LINE:** Occasional calorie restriction does appear to have health benefits, but how much comes from weight loss and how much comes from healthy cell changes needs to be further explored. Widely agreed upon is that any version of a fasting diet should be done under a physician’s supervision.