How Russian Fake News Defied a Ban

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FEATURES



The new science of nutrition promises customized dietary recommendations designed to keep you healthy and ward off disease. *by* ADAM PIORE

26 The World's Best Hospitals 2023

Newsweek and global research and data firm Statista team up for the fifth year to find the most highly ranked institutions around the globe.

STEADY During a time of pandemic and enormous global uncertainty, leading hospitals kept attracting great people and providing the best results for patients.

COVER Photograph by Getty



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Fate of \$400 Billion

People rally in front of the U.S. Supreme Court on February 27 to show support for the Biden administration's student debt relief plan to wipe out some \$400 billion in student debt for 26 million borrowers. The following day, the Court heard arguments about the plan's constitutionality. Questions from the court's conservative justices indicated that they may see the case as an unlawful overreach of executive power. The Court is due to rule by the end of June.

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InFocus







EAST PALESTINE, OHIO

Safety Test

Collecting water samples on February 25 from Leslie Run creek near the site of the February 3 train derailment that caused a toxic chemical spill leading to fears about long-term health consequences. Misinformation and politicization have clouded the month-long investigation into the incident. Wastewater from the train is now being transported to Texas for disposal.

MICHAEL SWENSEN



TEMPI VALLEY, GREECE

Head On

Emergency crews search for wreckage on March 1 after a train carrying hundreds of passengers collided with a freight train on the same track. The deaths and injuries rose to at least 57 and 85, respectively, in what was Greece's worst-ever crash. Immediately after the tragedy, the Greek transport minister resigned and mass protests burst out against Greece's railway company.

Image: State S



BRUSSELS

Gone Kids

Teddy bears and toys representing the 16,000 children Ukrainian officials say have been abducted and deported to Russia are seen during an event organized by Avaaz NGO and Ukrainian refugees on February 23. The Ukrainian government says only about 307 of the children have been returned. Officials also say they have confirmed more than 460 children have been killed and more than 920 wounded in the fighting.

ICOLAS MAETERLINCK

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MISINFORMATION MONITOR

How Russian Fake News Stays on YouTube

Propaganda justifying the Ukraine war proliferated on the platform despite a ban on Russian state-funded media

by

EVA

MAITLAND,

MADELINE

ROACHE

and

SOPHIA TEWA

"WE HEAR THAT WE STARTED THE WAR IN DONbas, Ukraine—No." Russian President Vladimir Putin says grimly to the camera, flanked by the colors of the Russian flag. "It was unleashed by the collective West, which organized and supported the unconstitutional armed coup in Ukraine in 2014, and then encouraged and justified genocide on the people of Donbas."

This clip—in which Putin advances blatant misinformation about the origins of the war that he, in fact, started—appears at the beginning of a pol-

ished, 30-minute documentary on You-Tube channel iEarlGrey, which according to Russian state media, is run by independent journalist Mike Jones. The channel's logo is embedded in the video, but Jones is not its creator. The film was produced by Russian propaganda outlet RT and was first published on its documentary website, RTD.RT.com, a fact NewsGuard easily confirmed by comparing iEarlGrey's You-Tube upload to the branded RT documentary on RTD.RT.com. On YouTube, iEarlGrey's republished RT film racked up 43,000 views in three months and contains no RT branding, nor any warning that the content is Russian propaganda.

Since Russia invaded Ukraine on February 24, 2022, RT's documentary site, RTD.RT.com, has published 50 films that advance disinformation about the war, a rate of about one a week. These documentaries are available for free on RTD's web-

site—and, as NewsGuard discovered, on YouTube—in Russian and English, with some available in French and Spanish.

In March 2022, YouTube banned Russian state-funded media from its platform globally, proceeding to block channels belonging to RT. Despite this policy, News-Guard found more than 250 uploads of RT's documentaries about the war in

MISINFORMATION MONITOR

Periscope

Ukraine across more than 100 You-Tube channels, with over a half-million views combined. Approximately 200 uploads of RT films clearly displayed the RTD logo, while 50 of the videos had their connection to RT removed, presumably in an attempt to avoid detection by YouTube.

The films repeat egregious falsehoods about Ukraine, including that Ukraine's Maidan political revolution in 2014 was a "Western-backed coup," that Ukrainian authorities committed "genocide" of Russian-speakers in Donbas and that "Nazism" is rampant in Ukrainian politics and society. (These claims, and more than 100 others, have been debunked by NewsGuard on its Russia-Ukraine Disinformation Tracker.)

The films use harrowing footage to advance pro-Russian false claims about the war. For example, the opening sequence of one RT-produced documentary, Operation Ukraine: Crime without Punishment, history of crimes against Donbas civilians, that NewsGuard found on YouTube, shows the aftermath of two missile strikes in civilian areas in eastern Ukraine in March and April 2022. The film, posted on YouTube by ex-U.S. cop turned pro-Russia conspiracy theorist John Mark Dougan, uses footage of civilian casualties and an interview with a grief-stricken widow to blame Ukraine for killing the civilians, citing as evidence a widely debunked claim that a serial number filmed on a Tochka-U missile proves that the Ukrainian army was to blame for one of the attacks. At one point, the film cuts to a political analyst who states, "Such a provocation is multilayered. The Third Reich used it, too." As of February 2023, the film had garnered 19,000 views on Dougan's channel.

Several so-called documentaries

advance other known Kremlin propaganda tropes, such as that sanctions on Russia are the result of Western "Russophobia" and that the sanctions have had little impact on Russia, while devastating European economies.

Asked for comment, YouTube did not challenge NewsGuard's findings. In a February 20, 2023, email to NewsGuard, a YouTube spokesperson said, "Since the devastating war in Ukraine began, our teams have quickly restricted and removed

In March 2022 YouTube banned Russian statefunded media from its platform globally.

harmful content, and our systems have connected people to high quality information from authoritative sources. We've removed more than 9,000 channels and more than 85,000 videos related to the war for violating our Community Guidelines. Additionally, we blocked YouTube channels associated with Russian state-funded news channels globally, resulting in more than 800 channels and more than 4 million videos blocked. Our teams continue to closely monitor the ongoing war and are ready to take further action."

After NewsGuard published its report, YouTube removed most of the 250 videos identified by News-Guard and terminated several of the channels.

From Games to Propaganda

NewsGuard found the most-viewed English-language RT propaganda

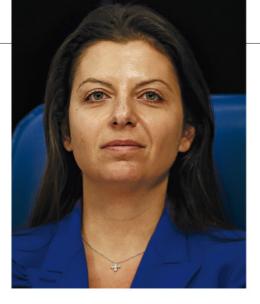


FROM LEFT: YURI KADOBNOV/AFP/GETTY; SEFA KARACAN/ANADOLU AGENCY/GETTY

films appeared on iEarlGrey, the channel run by Mike Jones, a British former YouTube gamer living in St. Petersburg, Russia, according to his Twitter profile. Prior to March 2022, the channel primarily focused on producing content related to online gaming. But shortly after Russia invaded Ukraine, Jones pivoted to Russian propaganda, publishing videos with titles such as "Mother claims 'There was no airstrike,'" in which Jones repeated widely debunked Kremlin claims that the March 2022 airstrike on a maternity hospital in Mariupol was staged. The video violates YouTube's policy prohibiting content denying, minimizing or trivializing well-documented violent events. Following NewsGuard's report, YouTube removed the video for violating its hate speech policy."

NewsGuard analysts based in the U.S. and U.K. found dozens of





SPREADING LIES Above: RT editor-in-chief Margarita Simonyan has talked openly of beating YouTube's ban. Opposite: An RT control room in Moscow.

pro-Russian propaganda videos on iEarlGrey's YouTube channel featured Google-enabled programmatic ads from household brands, including Expedia and home insurance provider Urban Jungle, nonprofits such as Doctors Without Borders and organizations such as the United Nations Refugee Agency, which has provided humanitarian assistance in Ukraine since the start of the war. Ice Station Europe, an RT-produced documentary promoting the claim that the "anti-Russian sanctions" have pointlessly devastated European economies since "there are no alternatives to Russian supplies [of gas]" was one of the dozens of videos monetized on iEarlGrey's YouTube channel.

More recently, monetized videos on his channel show Jones apparently filming in Russian-occupied Lugansk and Donetsk in eastern Ukraine. NewsGuard found that these videos featured programmatic ads from Sandy Hook Promise, a nonprofit founded by parents who lost children during the 2012 Newtown school shooting; International Rescue Committee, a humanitarian crisis relief organization whose work includes providing emergency assistance to Ukrainian refugees; insurance company Liberty Mutual and Spectrum, a U.S.-based internet and cell phone service provider, among others. (While dozens of pro-Russian propaganda videos were monetized on iEarlGrey, the vast majority of RT propaganda films NewsGuard found across YouTube did not feature programmatic advertising.)

With Jones' help, the Russian propaganda films have garnered tens of thousands of views on YouTube. For example, the RT documentary *Fast Forward to Fascism*, which repeats the false narrative that Ukraine has systematically targeted ethnic Russians in eastern Ukraine and juxtaposes scenes of 1940s Nazi Germany with modern-day Ukraine, has drawn approximately 50,000 views since Jones posted it on his channel in November 2022.

After NewsGuard contacted YouTube for comment about this video, YouTube removed iEarlGrey's upload of *Fast Forward to Fascism* as well as 17 other uploads of the film on anonymous channels that News-Guard identified.

YouTube did not address News-Guard's inquiries about why iEarl-Grey is permitted to continue posting Russian propaganda on YouTube, or why those videos are allowed to generate ad revenue.

iEarlGrey also did not respond to two February 2023 emails from NewsGuard, inquiring about the channel's promotion of Kremlin propaganda and RT documentaries, and its relationship with RT.

NewsGuard found that other channels followed similar trajectories to iEarlGrey. Anonymously run channel EVENT2BABI NEWS previously published French-language R&B music videos, but in August 2022 it switched to boosting pro-Russian propaganda, including full-length RT documentaries translated into French. It has

Periscope

42,000 subscribers. One upload, titled *Wagner PMC, Contract with the Motherland*, about the work of Russia's brutal private military contractor Wagner, has garnered 133,000 views in the two months since it was uploaded. This video's success appears to have been aided by approximately 20 accounts that shared its URL on Twitter, enabling it to reach well beyond the channel's audience, NewsGuard found.

Flying Under YouTube's Radar

Not all channels promoting RT films on YouTube were as prominent as iEarlGrey or EVENT2BABI NEWS. NewGuard discovered over 80 anonymous channels spreading pro-Russian propaganda about the war. With small subscriber bases and low view counts per video, these channels appear able to avoid moderation by YouTube, despite uploading multiple RT news clips every day. Although they appear insignificant individually, they collectively have a powerful cumulative effect.

For example, NewsGuard found that the RT film *Donbass: I'm Alive!* has been uploaded by some 40 different anonymously run YouTube channels, cumulatively reaching tens of thousands of viewers. The film claims in its closing sequence that "NATO is the reincarnation of the Wehrmacht and SS." (The Wehrmacht was the armed forces of Nazi Germany, while the SS was a Nazi paramilitary organization responsible for running concentration camps and executing opponents.)

YouTube removed the videos after NewsGuard flagged the uploads, but did not comment on how this content had been allowed to proliferate on the platform. Asked to comment about whether it only monitors accounts with significant followings, YouTube did not respond.

Along with the anonymously run accounts, NewsGuard found RT films on at least five channels with a small number of subscribers that are apparently run by the Russian government. With names like Russian House in Dar es Salaam, and Russian House in Athens, the channels are

MOSCOW CALLING Russian producers of pro-war misinformation have found numerous ways to evade attempts to block them.



purportedly run by Rossotrudnichestvo, the Russian Federal Agency for the Commonwealth of Independent States Affairs, Compatriots Living Abroad, and International Humanitarian Cooperation, a Russian government cultural-promotion agency. (Rossotrudnichestvo has been under EU sanctions since July 2022 for what the bloc described as spreading the "Kremlin's narratives, including historical revisionism.")

YouTube told NewsGuard that it removed some of the flagged content for circumventing the platform's restrictions of Russian state sponsored news channels. NewsGuard found that YouTube did remove uploads of RT documentaries from these channels, but did not take the channels themselves down.

RT's editor-in-chief, Margarita Simonyan has spoken openly about how the outlet uses unbranded channels to circumvent YouTube's ban. In April 2022 she told Russian state TV channel Russia-1, "Without using our brand, we open a channel on YouTube, it gets millions of views in a few days. After three days [YouTube's] intelligence services figure it out [...] and close it."

RT did not respond to News-Guard's inquiry about whether the Russian state media organization is behind the various accounts peddling these films. Still, News-Guard's findings show that despite YouTube's ban on Russian state media, this propaganda has found a way to thrive.

► Eva Maitland is a staff analyst, Madeline Roache is managing editor UK and Sophia Tewa is news verification analyst for NewGuard, which provides trust scores and ratings for more than 8,500 news and information websites. newsguardtech.com



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by Adam Piore



KNEW A GUY IN COLLEGE WHO COULD consume heaping bowls of ice cream without any discernable effect on his six-pack

abs. I've been wondering ever since why my body doesn't respond that way to my favorite dessert or, for that matter, if I'll ever find one that I won't regret the next day when I step on the scale. Recent advances in nutrition science now are edging closer to delivering on my dream of dessert with impunity—and a lot of other health benefits, besides.

It's long been obvious, to scientists and lay people alike, that each person responds differently to a given food or diet regimen. For years, scientists have

tried to figure out how to accommo date these idiosyncrasies in a way that improves health and avoids common ailments such as heart disease, obe sity and diabetes—and, for better or worse, helps people lose weight.

After years of trying to find genes that might account for individual differences, scientists have come to realize that genes alone cannot ex-

plain the human body's relationship to food in all its complexity. Diet and health involve genes and many other factors besides, including sleep, exercise, stress and other lifestyle matters. One of the biggest factors—perhaps the biggest—is the community of trillions of individual microorganisms that live in each person's gut, called the microbiome.

This news is good because, while you can't change your genes, you can cultivate healthy gut bacteria, change the timing of meals and adjust diet and lifestyle factors to optimize metabolic health.

It would also be a data nightmare, if it weren't for recent advances in artificial intelligence—in particular, a type of AI called machine learning, which can recognize patterns in mind-boggling amounts of data. AI can digest all the measurements required to assess the state of each individual's health and use them to generate helpful insights, including predictions about how food choices impact wellness and risk for disease.

The goal of this science is to arrive at a longpromised era of personalized nutrition, with potentially profound effects on human health. Last year, the U.S. National Institutes of Health announced plans to dole out more than \$170 million in research grants to speed the development of new algorithms that predict individual responses to food and dietary routines. The agency is gearing up to recruit and enroll 10,000 Americans in a study that will track their daily diets, feed some of them special diets selected by researchers, carefully track individual responses and then use some of these algorithms to analyze them. The study will take into account an individual's genetics, gut microbes and other lifestyle, biological, environmental or social factors, "to help each individual develop eating recommendations that improve overall health."

A bevy of startup companies are incorporating the results of recent studies into new health products.

"I HAD TO SUDDENLY STOP THINKING I WAS A **GENETICIST** ANYMORE AND CHANGE TO BEING MORE OF A **MICROBIOME** NUTRITIONIST."





HEALTH



They offer self-administered tests and machine-learning assessments of an individual's diet predilections and recommendations on how to adjust diet and lifestyle to stay healthy and fend off disease. But here's the rub: The interplay of diet and metabolism over many individuals in a population is so complex that scientists need much more data before they can take into account all aspects of human health. Some companies offer helpful advice, but it's not clear if it's always better than what you can get from your doctor during a routine checkup.

The new nutrition science comes not a moment too soon. Rates of diabetes, obesity and preventable diseases linked to metabolic disorders have reached unprecedented levels, and continue to rise. About 9 percent of Americans are already diabetic. An additional 33 percent of Americans are prediabetic, meaning their bodies are already profoundly dysregulated and can no longer properly control the amount of sugar circulating in the blood. Between 2017 and 2020, the prevalence of obesity (defined as a body mass of 30 or higher) increased from 30.5 percent to almost 42 percent—placing millions at

SHOCK TEST

Self-styled genetic epidemiologist Dr. Tim Spector (left) founded the firm Zoe, which sends test kits (top left) containing muffins (top right) designed to "challenge" the client's metabolism. far higher risk of developing metabolic syndrome.

Personalized nutrition, some say, is our best chance of getting those numbers down. Whether this new approach will be able to lift the U.S. out of its public health crisis is an open question.

Trillions of Gut Microbes

A FEW WEEKS AGO, I REQUESTED A KIT FROM A BOSton-based nutrition startup called Zoe that purports to measure the way my body responds to different foods and generate recommendations on how I might adjust my diet to suit my unique metabolic profile. A while later, I received a canary-yellow package a little bigger than a shoebox containing two packets of vanilla muffins, larded with enough fat and sugar to send a small animal into a hyperglycemic frenzy.

The purpose of the muffins is to "challenge" my metabolism, so Zoe's scientists and AI algorithms could compare my body's response to those of 70,000 other hopeful dieters who have previously undergone the testing. To measure this, along with my response to a host of additional

HEALTH

metabolic challenges and tests, the muffins came with an assortment of gadgets—a continuous-blood glucose monitor that looked like a giant thumbtack, an at-home blood test and an elaborate "stool collection kit" complete with disposable gloves and a tiny plastic spoon. After taking all these tests, the company promises to send a detailed report and action plan—along with an early preview of the future of health care.

The founder of Zoe is Dr. Tim Spector, a 64-year old "genetic epidemiologist" at Kings College London, and the author of several books on the science of nutrition. In 2017, a pair of internet entrepreneurs with machine learning backgrounds, Jonathan Wolf and George Hadjigeorgiou, heard him give a lecture at the National Geographic Society in London on nutrition. Afterwards, the two engineers buttonholed him with the idea of putting his words into action. The three formed Zoe soon after, emerging from "stealth mode" in 2020 after raising millions of dollars in venture capital. They launched a slick marketing campaign pegged to the publication of a pair of high-profile, peer-reveiwed papers in the prestigious scientific journal *Nature Medicine.*

If you'd asked Spector 20 years ago why different individuals respond in different ways to identical diets, he probably would have delivered a lecture on genetics. He had, after all, spent the previous 20 years building the U.K.'s largest registry of identical and fraternal twins so he could study how genes influence human health and disease. Originally trained as a rheumatologist, Spector's work included influential findings on how genetic variations might influence differences in the way individuals metabolized vitamin D, which plays a key role in the uptake of calcium, bone health and the severity of some forms of arthritis. Like most of his colleagues, he believed we were on the cusp of a revolution in personalized nutrition that would be powered by new genetic sequencing technologies. He has recruited 13,000 twins to participate in studies with the idea of making this revolution happen.

By the early 2010s, Spector's opinion—and that of many of his colleagues—had begun to change. He had fully sequenced the genomes (three billion bits of genetic data encoded in each individual's DNA) of about 3,500 twins in his registry. The results were disheartening. Many of the conditions that had produced promising initial data suggesting **ANATOMY OF HEALTH**

Genetic predisposition isn't the only factor that determines health. Sleep (below) is also important, as are the myriad bacteria that live in the gut (bottom right), says Eran Elinav (top right). they might be linked to specific genes using less precise genetics tests showed only modest genetics associations when analyzed with the better tools. For instance, the influence of genetics on the age at death, he recalls, was only about 25 percent. For heart disease it was roughly 30 percent. In the realm of nutrition-a growing area of personal interest to Spector who, in 2011, had suffered a minor stroke and resolved to change his diet—the influence was even harder to find. In rheumatoid arthritis, the disease in which his previous vitamin D research had generated so much optimism, genetics turned out to account for less than 15 percent of the risk. In obesity, he'd found a thousand associated genes. They explained, he says, less than 1 percent of the variation among individuals.

"It became quite obvious to me that we couldn't predict common diseases this way for most people," he says. "And that was also true for traits like nutrition, including differences in the way





Weizmann Institute of Science published a bombshell scientific paper in the journal Cell that called into question one of the most widely used tools in the field of nutrition—"the glycemic index," a rating system that measured the length of time it took for the human body to convert the natural carbohydrates in a given food into glucose and release it into the bloodstream. The index, based on readings collected and averaged from a small group of test subjects in the 1970s and early 1980s, had for decades been a central measure used to evaluate the nutritional qualities of food. Foods with a high glycemic index were thought to lead to unhealthy spikes in blood glucose levels, which, over time, were associated with a greater risk of developing diabetes and a whole host of other metabolic conditions.

The Weizmann scientists repeated the experiment on 800 healthy individuals and, armed with all the implements of modern science, did so in far greater depth and rigor. The team followed each individual for a week, recording blood sugar levels using a continuous glucose monitor every five minutes, eventually characterizing individualized

"EVENTUALLY WE WILL GET TO THE POINT WHERE CERTAIN DIETARY RECOMMENDATIONS AT THE INDIVIDUAL LEVEL WILL BE USEFUL, BUT WE'RE NOT THERE YET."

individuals metabolized fats and carbohydrates."

Luckily, there were promising new places to look. In the late aughts and early 2010s, Jeffrey Gordon, a fellow geneticist at Washington University in St. Louis, demonstrated that some obese individuals had abnormally low levels of certain kinds of gut bacteria compared to lean individuals, and that it was possible to reverse these ratios through diet. Inspired by this finding, Spector, like many of his colleagues, began to dabble in studies examining the gut microbiome, and its possible links to metabolic disorders and other diseases.

In 2015, another crucial piece of the puzzle fell into place. An Israeli research group at the

responses to a total of 46,898 meals.

The results were shocking. For one thing, the researchers demonstrated wide variability in individual responses to each of the meals, casting doubt on the utility of the widely used glycemic index. And they demonstrated a far more effective way to evaluate the nutritional qualities of food: by using a machine-learning algorithm to

find patterns in large amounts of nutrition data. Their algorithm was able to predict the glycemic response of different individuals to specific meals with far more accuracy than the glycemic index by analyzing individual response to previous meals, measurements of physical activity, the amount of fiber consumed over the previous 24 hours and the presence of 72 distinct kinds of bacteria in the gut.

The implications for human health and preventative medicine were potentially profound. Now there was a powerful way to measure a host of important metabolic processes in each individual and come up with ways of modifying them. The problem had a solution.

BEYOND FOOD

Stanford's Michael Snyder (center), works to improve his metabolic health with Jerzy and Aniela Gregorek.

"IF WE KNOW THAT CERTAIN FOODS SPIKE YOU AND OTHERS DON'T, WE CAN MAKE ACCURATE

HOW YOU WILL RESPOND EVEN WITHOUT NECESSARILY KNOWING

EAT SLL



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"There are 20,000 human genes that characterize who we are, which are of course extremely important but cannot be changed," says Eran Elinav, a Israeli gastroenterologist turned research scientist who was one of the senior authors on the paper. "You cannot change a gene that predisposes you to cancer. But the microbiome represents a hundred-fold more genes to our human body—close to 3 million genes on top of the 20,000 genes that are coming from the human side. And these genes are much more amenable to manipulation than the human genes. You can change it simply by changing the composition of the microbiome."

Burgeoning Crisis

THE FINDING HAD BIG IMPLICATIONS FOR PUBLIC health. The United States is currently in the grips of a crisis caused by surging rates of "metabolic syndrome," a cluster of conditions that occur when the systems the human body relies upon to transform food into the energy, and regulate the amount of glucose in the blood, begin to break down. The symptoms of metabolic syndrome include chronically high blood sugar, excess fat, high cholesterol and triglyceride levels and increased blood pressure. And it is associated with diseases such as heart disease, stroke, osteoporosis, certain types of cancer and type 2 diabetes.

Public health experts are optimistic that precision nutrition can help get the problem under control by minimizing unwanted blood glucose spikes and other factors associated with disease. Glucose comes from the carbohydrates we consume, which are broken down in the digestive system and released into the bloodstream. Though essential to powering the normal processes of the human body, too much glucose in the bloodstream for too long has been linked to unhealthy levels of chronic inflammation. When the human metabolic system is properly functioning, the amount of circulating glucose is carefully controlled by the release of a stew of different hormones involved in digestion, hunger and metabolism.

The body, however, can only process so much glucose at once. Too much glucose in the blood stream can kick off a self-perpetuating biochemical cascade that short-circuits the system. The muscles and the liver, which would normally absorb the glucose, reach their limit, causing glucose in the bloodstream to rise. The pancreas responds by flooding the bloodstream with more insulin, the signal that tells cells to absorb the glucose. In response, cells in the muscles and liver, which are normally primed to respond to insulin, become less sensitive to the signal, which means the pancreas must produce larger and larger amounts of insulin to get their attention.

Eventually, excess glucose causes chronic inflammation and interacts with free-floating proteins and fats to cause "glycation," a chemical reaction that damages these cells, stiffens blood vessel walls and leads to high blood pressure, diabetes and strokes. Without the ability to efficiently convert glucose

into the energy we need, we grow lethargic and fatigued. Even though our bloodstream is already awash in fuel, we grow hungry for more food. We eat more, move less and the downward spiral continues.

This process has already played out in millions of people. An estimated 43 percent of Americans are already diabetic or prediabetic, which means

their metabolisms are profoundly dysregulated and can no longer properly regulate the levels of sugar in their blood. Two out of three Americans are overweight, placing them at risk of developing the disorder. The medical cost of obesity in the U.S. tops \$173 million a year.

"Glucose control causes diabetes and diabetes rates have skyrocketed in recent years," says Michael Snyder, chair of genetics and director of genomics and personalized medicine at Stanford University and the former director of the Yale Center for Genomics and Proteomics. "It's far more prevalent as an endemic than COVID was a pandemic. So getting glucose under control is a big, big deal."

Research that has emerged since the Weizmann paper suggests that glucose control is only one of many areas that could be modulated with a better understanding of the factors that influence individual responses to different foods. Other research suggests the microbiome and other factors can influence our ability to absorb specific nutrients, metabolize fats and a wide array of other factors. Over the last decade, researchers have identified scores of specific species of gut bacteria, studied and characterized their impact and published the results in top peer-reviewed scientific journals. They've also demonstrated that these bacteria can help break food down in the intestines and transform them into nutrients, chemical messengers and other beneficial metabolites that the body on its own would be far less likely to absorb.

They have also discovered "bad" microbes that produce unwanted byproducts detrimental to metabolic health. Some of these, research suggests, can have a profound impact on essential metabolic processes. Recently, for instance, researchers at Emory University identified an "obesity-promoting" chemical produced by intestinal bacteria called "delta-valerobetaine" that seems to interfere with the

"DIABETES RATES HAVE SKYROCKETED IN RECENT YEARS. SO GETTING GLUCOSE UNDER

CONTROL IS A BIG, BIG DEAL."





TOP RIGHT: KSENIYA OVCHINNIKOVA/GETTY; JUSTIN PAGET/GETTY; UTE GRABOWSKY/GETTY

FROM -



liver's capacity to oxidize fatty acids and burn fat during periods of fasting. Obese individuals, with BMIs above 30, the researchers found, had levels of delta-valerobetaine in their blood that were about 40 percent higher than others. Perhaps most significantly, the research suggested a specific nutrient often found in animal products like red meat, and available as a dietary supplement, might help counteract the effect.

Startup Fever

THIS RESEARCH HAS SPAWNED SCORES OF CONSUMer products from companies hoping to capitalize on the excitement. (These include a company cofounded by Elinav and some of his collaborators on the *Cell* paper, known as DayTwo.) Over the last decade, the number of firms offering personalized nutritional testing and advice has grown from less than 20 to almost 700 today, according to Mariette Abrahams, the CEO and founder of the consulting firm Qina, which tracks the "personalized nutrition

PERSONAL TOUCH

Research has spawned many startups offering personalized, Al-based advice on nutrition, including recipes (top), lifestyle coaching (left, top) and glucose monitoring (left). industry," which is estimated to top \$8 billion.

The depth and relevance of the testing offered by these companies varies widely, as does the usefulness of the information they provide. Some rely on detailed questionaries, or data collected by sleep and activity trackers. Others collect and analyze blood, urine, hair and stool samples and then feed the results into proprietary AI algorithms that spit out dietary and lifestyle advice and recommendations. Some still rely on outdated genetic tests that likely do not have much utility.

Since Zoe's testing is based on techniques it used to produce the data cited in studies it published in highly respected journal Nature Medicine, it is considered by scientists in the field to be among the more credible of the bunch (though plenty of researchers have questioned whether the field has matured enough to justify the cost of paying for the products). It offers consumers a toned-down version of the protocols used in a pair of scientific studies, known as the PREDICT and PREDICT 2, done in collaboration with academics at Harvard, Stanford and a wide array of other institutions. The studies, published in *Nature Medicine* in 2019 and 2020, used machine learning to analyze genetic, microbiome and blood samples collected from 1,000 twins and unrelated healthy adults as they consumed a series of identical meals-including the muffins I received in my yellow box. It factored in data about sleep, exercise, stress and other environmental factors. Then it teased out the relative influence each of these factors had on individual differences.

Like others before it, the study, considered one of the most comprehensive examinations to date of individualized responses to food, found wide variations in the way its participants responded to the meals. But the most headline-worthy takeaway particularly given Spector's pedigree—was that the vast majority of these differences were due to modifiable non-genetic factors, such as the microbiome or lifestyle choices.

"We found a 10- to 15-fold difference in blood sugar and fat levels for individuals fed the same meal at the same time," Spector tells *Newsweek*. "But less than 30 percent of the variation in glucose spikes was due to your genes. For fat, that number was less than 5 percent. That's when we really threw genes out the window. I had to suddenly stop thinking I was a geneticist anymore and changed to being

HEALTH

HEALTH

more of a microbiome nutritionist."

Snyder, whose firm, January AI, sells its own consumer tests, says that his company's proprietary artificial intelligence algorithms have been trained on the reactions of different individuals to a wide array of different foods and that these reactions are highly predictive of how these individuals will respond to other kinds of foods with similar macronutrient profiles. Thus, after collecting data on the way an individual responds to just four daysworth of meals by tracking glucose levels with a blood sugar monitor, Snyder says, his company's algorithm is capable of making accurate predictions about the way that an individual will respond to most other foods.

"If we know that certain foods spike you and others don't, we can make accurate predictions about how you will respond even without necessarily knowing and understanding all the underlying causes," he says. "We have a 32 million food database. I'm not saying it's perfect, but it's pretty good. "

With this knowledge, Snyder notes, it may be possible to minimize sugar spikes in the bloodstream. That might be done by substituting some foods, or by first eating other foods that interact with one's individual metabolism in ways that are likely to help suppress those spikes, attenuating the effects of foods likely to cause big spikes—like that ice cream I'm hoping to consume with impunity.



LETTUCE BE

Below: Eric Topol is skeptical that Al-based personal nutrition is ready for prime time. "No one has yet cracked the case," he says. Right: agricultural researchers examine crop plants.

Missing Pieces

WHETHER COMMERCIAL PRODUCTS LIKE ZOE, JANuary AI and others offer enough benefit to justify their costs remains a matter of some debate. None have gone through the rigorous testing required to win FDA approval, meaning the agency has determined the benefits of the product outweigh the known and potential risks.

Spector's Zoe, Elinav's DayTwo, and Snyder's January AI are based on peer-reviewed research produced by recognized leaders in the emerging field of personalized nutrition. On the plus side, their services offer interesting insights on how specific foods affect blood sugar. Although most American diabetics already know all about continuous glucose monitors, their use by non-diabetics only emerged over the last five years, says Snyder.

The science behind microbiome analysis is promising. Zoe tests for the presence of 15 "good" microbes and 15 "bad" ones and recommends a series of specific foods to boost the good ones and suppress the bad ones. They claim their own research has found that those who use their products have more energy, are less hungry, sleep better and have an easier time maintaining a healthy weight.

Coaching is another benefit. After a \$300 testing program that includes wearing a blood glucose monitor for two weeks and analysis of stool, Zoe offers access to the firm's searchable food database,

"THERE ARE 20,000 HUMAN GENES THAT EXTREMELY IMPORTANT BUT

which uses an AI algorithm to assign scores to individual foods based on the way a client's blood sugar and fat levels responded to the muffin test and other tests. It costs an additional \$30 per month.

For those who already avoid processed foods and eat a Mediterranean diet, however, it's not clear that commercial tests offer enough useful information to be worth paying for.

Like any computer program, algorithms are only as good the available data. A great deal remains to be learned about precisely what factors contribute to individual differences in metabolism, scientists say, beyond what commercial testing offers. For CLOCKWISE FROM LEFT: NEILSON BARNARD/GETTY;



how an individual's immune systems interacts with the microbiome and the food we eat.

"Eventually we will get to the point where certain dietary recommendations at the individual level will be useful, but we're not there yet," says Eric Topol, director and founder of Scripps Research Translational Institute. "There's a lot of promise here. But it's complicated and there's a lot of layers of data and no one has yet cracked the case. No one has yet done the multimodal AI to understand how all these interact."

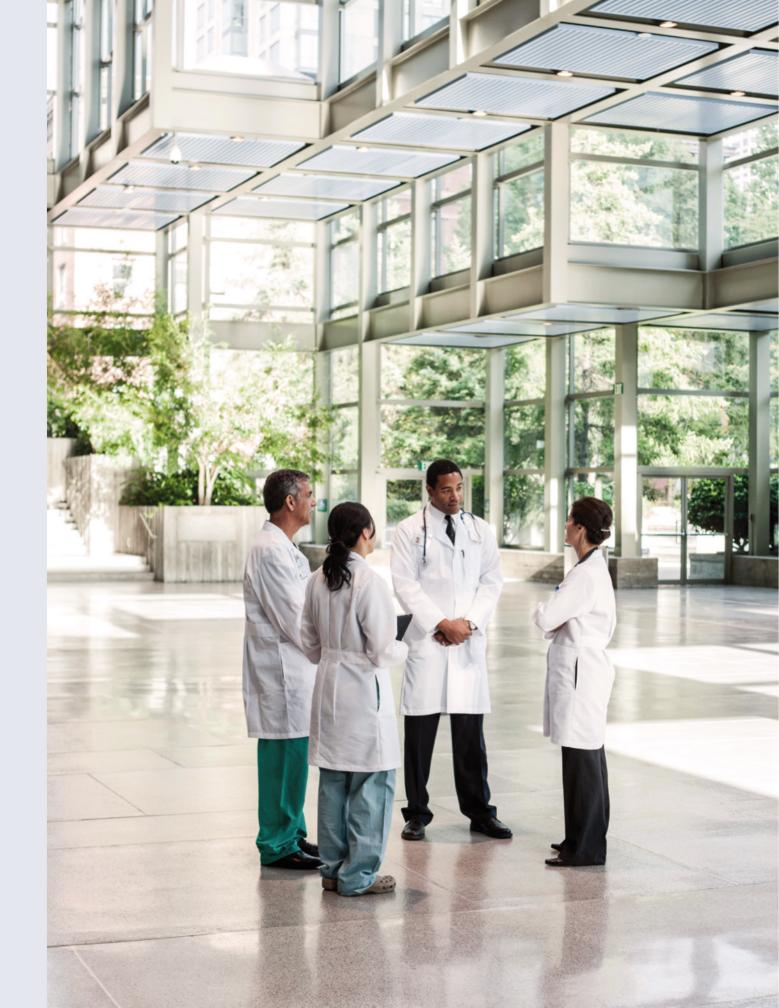
Based on its current trajectory, the science will likely continue to improve. Evidence is growing, for instance, that the unique characteristics of each person's immune system, shaped by past exposures to pathogens, plays a role in metabolic differences. In one recent experiment, Synder and his colleagues found the consumption of an Ensure shake, a leading nutrition drink that includes protein, vitamins and minerals, caused an anti-inflammatory response in some individuals (which is good) and a pro-inflammatory response in others (which is usually not good). In another recent study, Snyder showed that some types of fiber lowered the cholesterol of some individuals and helped them metabolize glucose, while in others those same fibers caused inflammation, the release of a specific liver enzymes, bloating and flatulence. The results suggest that, in some

CHARACTERIZE WHO WE ARE, WHICH ARE OF COURSE CANNOT BE CHANGED. BUT THE MICROBIOME ... [IS] MUCH MORE AMENABLE TO MANIPULATION."

all the variables that scientists have some understanding of—such as genetics, the microbiome, sleep and exercise patterns—a dizzying number of other variables interact in ways scientists are only beginning to understand. These include the effects of age, menopause, the precise composition of food, previous meals, stress, meal timing, overall fiber intake and overnight fasting.

Scientists are only beginning to figure out the microbiome. Many more gut microbes remain to be discovered—and the number of those deemed to be important has increased since the original PREDICT study. Scientists also know little about cases, one-size-fits-all nutritional guidelines could lead some people to adopt diets that are not good for them.

Inspired by Snyder, I consumed several pints of Ben and Jerry's ice cream under a variety of different conditions, and discovered that eating certain high-fiber foods prior to stuffing my face with ice cream seemed to attenuate my blood sugar spikes. Still, even if I got my metabolism working to perfection, 1000 calories of ice cream is still a lot to handle. It seems unlikely I'll ever find a way to eat ice cream while rocking washboard abs. But I'm optimistic about what I might learn.



This year's expanded ranking of more than 2,300 **PREMIER DESTINATIONS** for medical care throughout the U.S. and around the globe

THE WORLD'S BEST HOSPITALS

HESE ARE CHALLENGING TIMES for hospitals. COVID-19 put unprecedented stress on health systems, as have inflation and global financial uncertainty. Around the world, leading hospitals are dealing with rising

costs, aging populations and an exhausted workforce. Among the hallmarks of great hospitals, however, are not just first-class care, first-class research and first-class innovation. The very best institutions also share another quality: consistency. The world's best hospitals consistently attract the best people and provide the best outcomes for patients as well as the most important new therapies and research. Few can do all those things year in and year out. The best belong to a very exclusive club.

To recognize them, *Newsweek* and global data firm Statista are proud to introduce our fifth annual listing of the World's Best Hospitals 2023. This year, we have ranked over 2,300 hospitals in 28 countries, including one that is new to our list, Taiwan. For the first time, we have ranked all top 250 global hospitals. We have also listed the best hospitals by country; the online version of each country list includes a listing of top specialty hospitals.

We have also made other changes. This year we have added an important new pillar to our scoring model: For the first time, hospitals were surveyed regarding their PROMs implementation status. PROMs (Patient-Reported Outcome Measures) are defined as standardized, validated questionnaires completed by patients to measure their perception of their functional well-being and quality of life. The World's Best Hospitals 2023 also includes new hospital quality metrics, most notably data from the Israeli National Program for Quality Indicators (INPQ) for Israel and the Danish Clinical Quality Program for Denmark. And we have added new accreditations for Thailand and Taiwan to the scoring model (For more details on the ranking criteria, see Methodology.)

The goal of this study is to provide a data-based comparison of hospital reputation and performance across countries. We hope this will be useful to patients and families seeking the best care for themselves and loved ones, as well as to hospitals as they benchmark themselves against their peers.

▶ Nancy Cooper, Global Editor in Chief



METHODOLOGY

THE WORLD'S BEST HOSPITALS 2023

ranking lists the best hospitals in 28 countries: Australia, Austria, Belgium, Brazil, Canada, Colombia, Denmark, Finland, France, Germany, India, Israel, Italy, Japan, Mexico, Netherlands, Norway, Saudi Arabia, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan, Thailand, United Arab Emirates, United Kingdom and U.S. The countries were selected based on multiple comparability factors, such as standard of living/ life expectancy, population size, number of hospitals and data availability.

A global board of renowned medical experts supports the continuous development of the methodology. The lists are based on four data sources:

1 _ Online Survey Over 80,0000 medical experts (doctors, hospital managers, health care professionals) in 28 countries were invited to participate in an online survey. Participants were asked to recommend hospitals in their own country as well as in other countries. Recommendations for own employer/hospital were not allowed.

2 _ Patient Satisfaction Results from patient experience surveys. Publicly available data from existing patient surveys was used to analyze patient experience. Patient surveys are typically conducted by insurance companies among patients after hospitalization. Examples of survey topics include general satisfaction with the hospital, recommendation of hospital and satisfaction with medical care.

3 _ Hospital Quality Metrics e.g., data on quality of treatment and hygiene measures. Quality metrics from a variety of public sources were collected for most countries. Quality metrics differ between countries. Examples of included data are data on quality of care for specific treatments, data on hygiene measures and patient safety and data on number of patients per doctors and per nurse.

4 _ PROMs Implementation Survey For the first time, a PROMs implementation score has been included in the scoring model of the World's Best Hospitals project. PROMs are defined as standardized, validated questionnaires completed by patients to measure their perception of their functional well-being and quality of life. In the fall and winter of 2022, *Newsweek* and Statista reached out to hospitals and conducted a survey about the implementation and use of PROMs. Scores were calculated for each hospital in each of four categories and weighted: Peer recommendation (49 percent national, 5 percent international): patient experience (14.5 percent), hospital quality metrics (29 percent), PROMs implementation (2.5 percent).

Every hospital in each country is rated by a score. Scores are only comparable between hospitals in the same country, because different sources for patient experience and medical key performance indicators were examined in each country. Since it was not possible to harmonize this data, cross-country comparisons of the scores are not possible (a score of 90 in country A doesn't necessarily mean that this hospital is better than a hospital with a score of 87 in country B).

The number of hospitals awarded in each country varies based on the number of hospitals and data availability in the respective country. The U.S. had the most hospitals awarded with 414, while Israel and Singapore were represented with 10 hospitals each. In total, more than 2,300 hospitals were ranked for this fifth edition of the ranking.

The top global hospitals were determined by the number of international recommendations received in the survey and their national rank. The global list does not include specialized hospitals.

The rankings are comprised exclusively of hospitals eligible regarding the scope described here. The ranking is the result of an elaborate process which, due to the interval of data-collection and analysis, is a reflection of the last calendar year. Furthermore, events preceding or following the period January 1, 2022, to December 31, 2022, and/or pertaining to individual persons affiliated/associated with the facilities were not included in the metrics. As such, the results of this ranking should not be used as the sole source of information for future deliberations.

ANDRIY ONUFRIYENKO/GETTY

The information in this ranking should be considered in conjunction with other available information about hospitals or, if possible, accompanied by a visit to a facility. The quality of hospitals not included in the rankings is not disputed. The full rankings and methodology are available at *newsweek.com/wbh-2023*

THE EXPERTS

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David W. Bates, M.D. BRIGHAM AND WOMEN'S HOSPITAL, BOSTON

Chief of the division of general internal medicine and primary care at Brigham and Women's Hospital. He is an expert on patient safety and using information technology to improve care. Bates is a Professor of Medicine at Harvard Medical School and a Professor of Health Policy and Management at the Harvard School of Public Health. He directs the Center for Patient Safety Research and Practice at Brigham and Women's and served previously as external program lead for research in the WHO's Global Alliance for Patient Safety.

Jens Deerberg-Wittram, M.D. ROMED KLINIKEN, ROSENHEIM. GERMANY

CEO and president of RoMed, a German nonprofit health system. Deerberg-Wittram is the founding president of the International Consortium for Health Outcomes Measurement and lectures regularly on value-based health care. He has worked as a health care strategy consultant, served as the CEO of a German for-profit hospital and taught at Harvard Business School.

Gary S. Kaplan, M.D. VIRGINIA MASON FRANCISCAN HEALTH. SEATTLE

► CEO Emeritus of the Virginia Mason Health System and Virginia Mason Franciscan Health. Kaplan has been a long-time practicing internist and an expert on patient safety. He is also chair of the Institute for Healthcare Improvement's Lucian Leape Institute, which focuses on patient safety, and a founding member of Health CEOs for Health Reform and has served as chair of the IHI's board of directors.

Gregory Katz, Pharm.D., Ph.D. UNIVERSITY OF PARIS SCHOOL OF MEDICINE, FRANCE

Professor at the University of Paris School of Medicine. Katz holds the Chair of Innovation & Value in Health. He is also president of PromTime, a health data science company specializing in PROMs and valuebased health care, commissioned by the French Ministry of Health to incentivize practitioners on highvalue care. He has served as director of research and innovation at leading private hospital groups in Europe.

Christoph A. Meier, M.D. UNIVERSITY HOSPITAL, ZÜRICH AND UNIVERSITY OF GENEVA

► Director, Department of Internal Medicine at University Hospital Zürich. Meier is a practicing internist and serves on several boards, including Swiss Federal Quality Commission. He has served as chief medical officer and deputy CEO of the University Hospital Basel where he implemented principles of value-based health care.

Eyal Zimlichman, M.D. SHEBA MEDICAL CENTER,

RAMAT GAN, ISRAEL

► Deputy director general, chief transformation officer and chief innovation officer at Sheba Medical Center. Zimlichman is the founder and director of the ARC innovation program, a global program that leads digital transformation efforts in health care. He is also the co-chairman of the Future of Health (FOH) global think-tank initiative. He is a founding member of the International Academy of Quality and Safety in Health Care and an International Expert at the International Society of Quality in Healthcare (ISQua).



statista 🖌



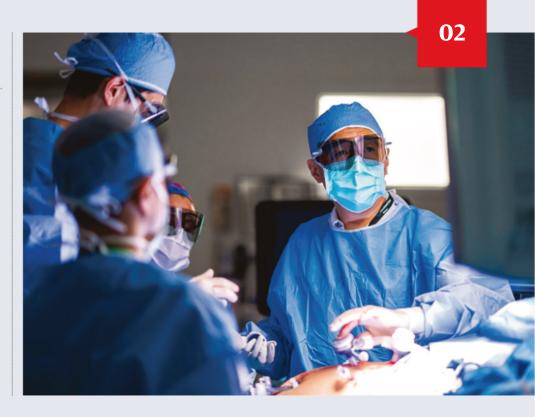
Mayo Clinic ROCHESTER, MINNESOTA

Possibly the best-known name in American medicine, the Mayo Clinic was founded in 1889 by a group of Minnesota physicians led by brothers William and Charles Mayo. The Clinic, which employees 73,000 people, now has campuses at its home in Rochester, Minnesota, as well as Scottsdale and Phoenix, Arizona, and Jacksonville, Florida. The Mayo Clinic Health System has dozens of locations in several states. Every year the Mayo Clinic sees more than 1.4 million patients with serious or complex illnesses from the U.S. and 140 countries. Last year, it invested more than \$500 million annually in research. A renowned transplant center, the Mayo Clinic is also highly regarded for expertise in several specialty areas, particularly diabetes and endocrinology, gastroenterology, geriatrics and gynecology. > mayoclinic.org

Cleveland Clinic

CLEVELAND, OHIO

The Cleveland Clinic was founded in 1921 and now encompasses 21 hospitals with 6,496 beds (including a 394-bed hospital in Abu Dhabi and an outpatient location in London) and more than 226 outpatient locations in the U.S. and internationally. It has more than 5,500 physicians and scientists and 14,700 registered nurses. Cleveland Clinic was one of the first academic medical centers in the U.S. to offer COVID-19 diagnostic testing. Highly rated in several specialties, Cleveland Clinic has been a longtime leader in cardiology and heart surgery. Last year it performed 1,050 transplants, including heart, kidney, liver, intestine and lungs. **• my.clevelandclinic.org**



03



Massachusetts General Hospital BOSTON, MASSACHUSETTS

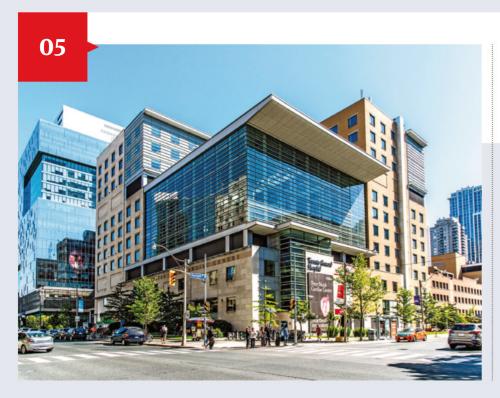
The first and largest teaching hospital of Harvard Medical School, Massachusetts General was founded in Boston in 1811, making it the oldest and largest hospital in New England and the third oldest in the U.S. Today it is part of Mass General Brigham, a hospital and physician network with Boston's Brigham and Women's Hospital. Massachusetts General has more than 1,000 beds and employs more than 19,000 people. It is known for research in a range of fields and has the largest hospital-based research program in the U.S., with more than \$1 billion in research operations.

massgeneral.org

The Johns Hopkins Hospital BALTIMORE, MARYLAND

The Johns Hopkins Hospital was founded in 1889 with a \$7 million grant from Baltimore banker and philanthropist Johns Hopkins. Since then, it has had a central role in the history and development of American medical education. Today, the hospital has more than 2,400 full-time attending physicians, more than 1,100 beds, admits more than 40,000 patients and has more than 87,000 emergency room visits. Johns Hopkins Coronavirus Resource Center's comprehensive global dashboard, launched in 2020 and scheduled to be shut down this March, was one of the first global maps to track COVID-19 cases and deaths. > hopkinsmedicine.org





Toronto General -University Health Network TORONTO, CANADA

Toronto General is the flagship of the University Health Network, which also includes Toronto Western Hospital, the Princess Margaret Cancer Centre, Toronto Rehabilitation Institute and The Michener Institute of Education. It was founded in 1819 and now has over 400 beds. TGH is one of the world's leading transplant centers. The first single lung transplant was performed here in 1983, and the first double lung transplant was done at TGH three years later. ► uhn.ca/OurHospitals/TGH

Karolinska University Hospital

SOLNA, SWEDEN

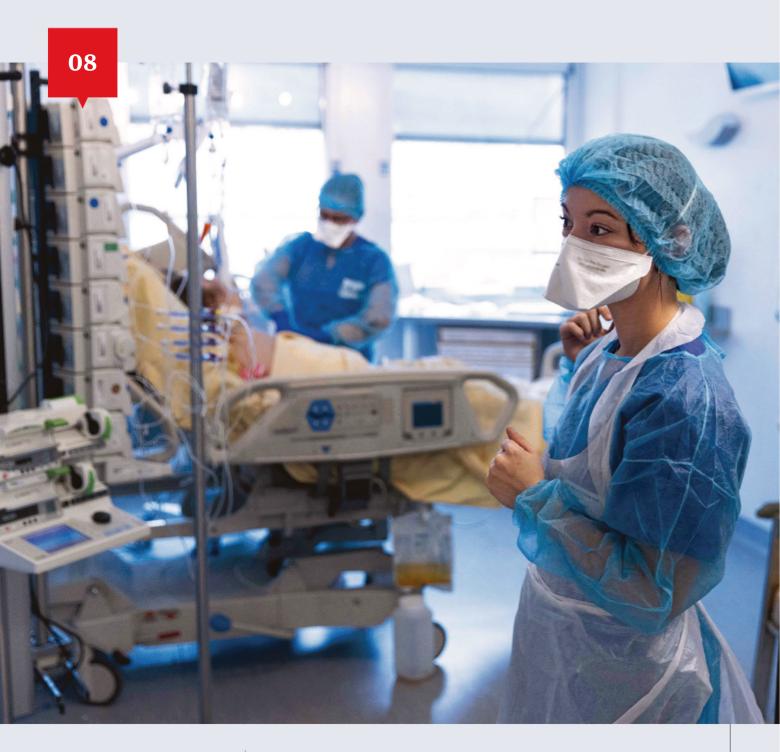
For the fourth year in a row, Karolinska is rated among Newsweek's top 10, moving up from the number 8 spot last year. The hospital has the lowest mortality figure in the country for TAVI aortic valve intervention. In 2022, it invested in a plan to become the country's first "queue-free" university hospital, reducing wait times to less than 90 days for surgeries and 30 days for new visits by adding simplified scheduling and elective surgeries on Saturdays to help cut the backlog. An investment in advanced technology, including AI; cutting-edge ALS research; minimally invasive, robot-assisted techniques for upper abdominal surgeries and a new wellness center to promote staff well-being all contribute to its current successes. **karolinska.se/en/karolinska-university-hospital**





Charité -Universitätsmedizin Berlin Berlin, Germany

Founded over 300 years ago, Charité is still at the forefront of cutting-edge medicine. As part of its "Strategy 2030— Rethinking Health," the hospital is enhancing its use of digitalization and telemedicine. It has been recognized for coordinating pandemic relief, with its researchers publishing close to 700 scientific publications on COVID-19 during the first two years of the pandemic. It has opened a post-COVID syndrome treatment center and coordinated an Academic Research Network of 36 university hospitals and begun a long-term strategic collaboration with the WHO to predict, prevent, detect, respond to and prepare for new global health emergencies. The last year brought two new centers as well: the German Center for Mental Health and the German Center for Child and Adolescent Health. ► **charite.de**



AP-HP - Hôpital Universitaire Pitié Salpêtrière PARIS, FRANCE

This public health hospital, made up of 90 buildings and 77 services grouped into 10 centers, is renowned for cancer care. It takes care of one third of all cancer patients in Île-de-France, with more than 150 open therapeutic trials for its patients. In January 2023, it also opened a new pediatric outpatient surgical unit to care for approximately 3,000 children annually, with features designed specifically for kids, making them the hero of their own tablet game during their treatment. **> pitiesalpetriere.aphp.fr**

Singapore **General Hospital** SINGAPORE

Moving back into the top 10 this year, Singapore General is a top-tier research and teaching hospital, and over the pandemic has pivoted from wholly in-person training to gamification and simulation to enhance its education methods. About one quarter of all the acute hospital beds in the country's public sector are at SGH, and its new Emergency Medicine building is expected to open in 2023 with a focus on bringing care to the patient while minimizing transfers, as well as stations designed to handle mass-casualty decontamination. > sgh.com.sg



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UCLA Health -**Ronald Reagan Medical Center** LOS ANGELES, CALIFORNIA

UCLA is a leader in developing new cancer treatments, is a national leader annually in the number of solid organ transplants and is a pioneer in the field of brain mapping. The medical center's architecture was designed by I.M. Pei and Associates to prioritize the whole patient, providing a comfortable stay combined with state-of-the-art integration of medical equipment. A newly announced, \$20 million gift will fund a new center focused on the microbiome and its effect on health. > uclahealth.org/reagan/

- **11** Sheba Medical Center RAMAT GAN, ISRAEL
- 12 Universitätsspital Zürich ZÜRICH, SWITZERLAND
- 13 Universitätsklinikum Heidelberg HEIDELBERG, GERMANY
- 14 Centre Hospitalier Universitaire Vaudois LAUSANNE, SWITZERLAND
- **15 Universitätsspital Basel** BASEL, SWITZERLAND
- 16 Stanford Health Care-Stanford Hospital STANFORD, CA, USA
- **17 The University** of Tokyo Hospital TOKYO, JAPAN
- 18 Brigham and Women's Hospital BOSTON, USA
- 19 AP-HP–Hôpital Européen Georges Pompidou PARIS, FRANCE
- 20 Klinikum rechts der Isar der Technischen Universität München MUNICH, GERMANY
- 21 Northwestern Memorial Hospital CHICAGO, USA
- 22 Sunnybrook Health Sciences Centre TORONTO, CANADA
- 23 The Mount Sinai Hospital NEW YORK CITY, USA
- 24 Aarhus Universitetshospital AARHUS, DENMARK
- 25 New York-Presbyterian Hospital-Columbia and Cornell NEW YORK CITY, USA
- 26 Mount Sinai Hospital TORONTO, CANADA
- 27 Rigshospitalet– København KØBENHAVN, DENMARK
- 28 St. Luke's International Hospital TOKYO, JAPAN
- 29 Asan Medical Center SEOUL, SOUTH KOREA

- 30 Allgemeines Krankenhaus der Stadt Wien – Medizinischer Universitätscampus WIEN, AUSTRIA
- 31 LMU Klinikum MUNICH, GERMANY
- 32 Medizinische Hochschule Hannover HANNOVER, GERMANY
- 33 University of Michigan Hospitals – Michigan Medicine ANN ARBOR, ML USA
- 34 Hospital Israelita Albert Einstein SAO PAULO, BRAZIL
- 35 Cedars-Sinai Medical Center LOS ANGELES, USA
- 36 Amsterdam UMC AMSTERDAM, THE NETHERLANDS

37

Oslo Universitetssykehus

39 Helsinki University Hospital HELSINKI, FINLAND

ROME, ITALY

- 40 Samsung Medical Center SEOUL, SOUTH KOREA
- 41 CHU Lille Hôpital Claude-Huriez LILLE, FRANCE
- 42 St Thomas' Hospital LONDON, UNITED KINGDOM
- 43 Universitätsklinikum Hamburg-Eppendorf HAMBURG, GERMANY
- 44 UCSF Medical Center SAN FRANCISCO, USA
- 45 Duke University Hospital DURHAM, NC, USA
- 46 UMC Utrecht UTRECHT, THE NETHERLANDS
- 47 Kameda Medical Center KAMOGAWA, JAPAN
- 48 UZ Leuven LEUVEN/PELLENBERG, BELGIUM
- 49 Seoul National University Hospital SEOUL, SOUTH KOREA

- 50 Hospital of the University of Pennsylvania – Penn Presbyterian PHILADELPHIA, USA
- 51 NYU Langone Hospitals NEW YORK CITY, USA
- 52 Mayo Clinic Jacksonville JACKSONVILLE, FL, USA
- 53 Hospital Universitario La Paz MADRID, SPAIN
- 54 Rush University Medical Center CHICAGO, USA
- 55 North York General Hospital TORONTO, CANADA
- 56 Turku University Hospital TURKU, FINLAND
- 57 University College Hospital LONDON, UNITED KINGDOM
- 58 Landeskrankenhaus Universitätskliniken Innsbruck INNSBRUCK, AUSTRIA
- 59 CHU Bordeaux Groupe hospitalier Pellegrin BORDEAUX, FRANCE
- 60 Grande Ospedale Metropolitano Niguarda MILAN, ITALY
- 61 Erasmus MC ROTTERDAM, THE NETHERLANDS
- 62 Hospital Clínic de Barcelona BARCELONA, SPAIN
- 63 Tampere University Hospital TAMPERE, FINLAND
- 64 Ospedale San Raffaele – Gruppo San Donato MILANO, ITALY
- 65 Policlinico Sant'Orsola-Malpighi BOLOGNA, ITALY
- 66 Royal Prince Alfred Hospital CAMPERDOWN, AUSTRALIA
- 67 Severance Hospital Yonsei University SEOUL, SOUTH KOREA
- 68 Kyushu University Hospital FUKUOKA, JAPAN
- 69 Tel-Aviv Sourasky Medical Center TEL AVIV, ISRAEL



- 70 Uniklinik Köln COLOGNE, GERMANY
- 71 Radboud UMC NIJMEGEN, THE NETHERLANDS
- 72 Hospital Universitario 12 de Octubre MADRID, SPAIN
- 73 Center Hospital of the National Center for Global Health and Medicine TOKYO, JAPAN
- 74 Leids Universitair Medisch Centrum LEIDEN, THE NETHERLANDS
- 75 Klinik Hirslanden Zürich ZÜRICH, SWITZERLAND
- 76 Universitätsklinikum Freiburg FREIBURG, GERMANY



- 77 Les Hôpitaux Universitaires de Genève (HUG) – Cluse-Roseraie GENEVA, SWITZERLAND
- 78 Mayo Clinic Phoenix PHOENIX, USA
- 79 Landeskrankenhaus Universitätsklinikum Graz GRAZ, AUSTRIA
- 80 Addenbrooke's CAMBRIDGE, UNITED KINGDOM
- 81 Houston Methodist Hospital HOUSTON, USA
- 82 UCLA Health Santa Monica Medical Center SANTA MONICA, CA, USA
- 83 Hospital Universitari Vall d'Hebron BARCELONA, SPAIN

- 84 Sahlgrenska Universitetssjukhuset GÖTEBORG, SWEDEN
- 85 Akademiska Sjukhuset UPPSALA, SWEDEN
- 86 Hôpital Paris Saint-Joseph PARIS, FRANCE
- 87 Universitätsklinikum Essen ESSEN, GERMANY
- 88 Universitätsklinikum Tübingen TÜBINGEN, GERMANY
- 89 Istituto Clinico Humanitas ROZZANO, ITALY
- 90 Hospital General Universitario Gregorio Marañón MADRID, SPAIN

- 91 The Catholic University Of Korea – Seoul St. Mary's Hospital SEOUL, SOUTH KOREA
- 92 Odense Universitetshospital ODENSE, DENMARK
- 93 Seoul National University – Bundang Hospital SEONGNAM CITY, SOUTH KOREA
- 94 Universitätsklinikum Erlangen ERLANGEN, GERMANY
- 95 Beth Israel Deaconess Medical Center BOSTON, USA
- 96 National University Hospital SINGAPORE, SINGAPORE
- 97 Clinica Universidad de Navarra PAMPLONA, SPAIN
- 98 The Alfred MELBOURNE, AUSTRALIA
- 99 Centre hospitalier de l'Université de Montréal MONTREAL, CANADA
- 100 Universitätsklinikum Carl Gustav Carus Dresden DRESDEN, GERMANY
- 101 Ospedale Policlinico San Matteo PAVIA, ITALY
- 102 Aalborg Universitetshospital AALBORG, DENMARK
- 103 Azienda Ospedaliera di Padova PADOVA, ITALY
- **104 Hospital Sirio Libanes** SAO PAULO, BRAZIL
- 105 Mount Elizabeth Hospital–Orchard SINGAPORE, SINGAPORE
- 106 University of Chicago Medical Center CHICAGO, USA
- **107 Polyclinique Santé** Atlantique SAINT-HERBLAIN, FRANCE
- **108 Keio University Hospital** TOKYO, JAPAN
- 109 Vanderbilt University Medical Center NASHVILLE, TN, USA

- 110 University of Wisconsin Hospitals MADISON, WI, USA
- 111 UC San Diego Health– Jacobs Medical Center LA JOLLA, CA, USA
- 112 Kyoto University Hospital KYOTO, JAPAN
- 113 University of Washington Medical Center SEATTLE, USA
- 114 Landeskrankenhaus Salzburg-Universitätsklinikum der PMU SALZBURG, AUSTRIA
- 115 Hospital Moinhos de Vento PORTO ALEGRE, BRAZIL
- 116 Montreal General Hospital–McGill University Health Centre MONTREAL, CANADA
- **117 St. Antonius** NIEUWEGEIN, THE NETHERLANDS
- **118 Nagoya University Hospital** NAGOYA, JAPAN
- 119 Ajou University Hospital SUWON CITY, SOUTH KOREA
- 120 Ospedale Borgo Trento VERONA, ITALY
- 121 AP-HM–Hôpital de la Timone MARSEILLE, FRANCE
- 122 All India Institute of Medical Sciences–Delhi NEW DELHI, INDIA
- 123 UZ Gent GENT, BELGIUM
- 124 CHU Toulouse– Hôpital Purpan TOULOUSE, FRANCE
- 125 Jewish General Hospital MONTREAL, CANADA
- 126 VCH–Vancouver General Hospital VANCOUVER, CANADA
- 127 Hospices Civils de Lyon–Hôpital Lyon Sud PIERRE BENITE, FRANCE

128 Universitair Medisch **Centrum Groningen** GRONINGEN, THE NETHERLANDS

- **129** Universitätsklinikum Bonn BONN, GERMANY
- 130 Tan Tock Seng Hospital SINGAPORE, SINGAPORE

131 Universitätsklinikum Düsseldorf DÜSSELDORF, GERMANY

132 University of **Colorado** Hospital AURORA, CO, USA

133 Gangnam Severance Hospital-Yonsei University SEOUL. SOUTH KOREA

134 Ospedale Papa Giovanni XXIII BERGAMO, ITALY

135 Gleneagles Hospital SINGAPORE, SINGAPORE

136 Guy's Hospital LONDON, UNITED KINGDOM

137 Claraspital BASEL, SWITZERLAND

138 Maastricht UMC+ MAASTRICHT, THE NETHERLANDS

139 Hirslanden Klinik Aarau AARAU, SWITZERLAND

140 Kangbuk Samsung Hospital SEOUL, SOUTH KOREA

141 St. Olavs Hospital TRONDHEIM, NORWAY

142 The Catholic University Of Korea-Yeouido St. Mary's Hospital SEOUL, SOUTH KOREA

143 University Hospitals **Cleveland Medical Center** CLEVELAND, USA

144 Korea University-**Anam Hospital** SEOUL, SOUTH KOREA

145 Universitätsmedizin der Johannes Gutenberg-. Universität Mainz MAINZ, GERMANY

146 Hôpital Erasme–ULB ANDERLECHT/LAEKEN/ WOLUWE-SAINT-LAMBERT, BELGIUM

147 John Radcliffe Hospital OXFORD, UNITED KINGDOM

148 Universitätsklinikum Würzburg WÜRZBURG, GERMANY

149 Presidio Ospedaliero Molinette-Â.O.U. Città della Salute e della Scienza TURIN, ITALY

150 Royal North Shore Hospital ST LEONARDS, AUSTRALIA

151 IRCCS Arcispedale Santa Maria Nuova REGGIO NELL'EMILIA, ITALY

152 Hospital Universitario Ramón y Cajal MADRID, SPAIN

153 Haukeland Universitetssykehus BERGEN, NORWAY

154 St. Bartholomew's Hospital LONDON, UNITED KINGDOM

155 Lindenhofspital Bern BERN, SWITZERLAND

156 Ordensklinikum Linz Elisabethinen LINZ, AUSTRIA

157 Hôpital Louis Pradel **BRON, FRANCE**

158 University of California-**Davis Medical Center** SACRAMENTO CA USA

159 Skånes Universitetssjukhus-Lund LUND, SWEDEN

160 AP-HM-Hôpital Nord MARSEILLE, FRANCE

161 AP-HP–Hôpital Cochin PARIS, FRANCE

162 Fundación Valle Del Lili CALI, COLOMBIA

- 163 Medanta The Medicity GURUGRAM, INDIA
- 164 Yale New Haven Hospital NEW HAVEN, CT, USA

165 Kuopio University Hospital KUOPIO, FINLAND

166 University of Utah Hospital SALT LAKE CITY, USA

167 Universitätsklinikum Ulm ULM, GERMANY

168 Kurashiki Central Hospital KURASHIKI, JAPAN

169 Barnes-Jewish Hospital ST. LOUIS, MO, USA

170 Universitetssykehuset Nord-Norge TROMSØ, NORWAY

171 Kepler Universitätsklinikum LINZ, AUSTRIA

172 Universitätsklinikum Münster MÜNSTER, GERMANY

173 Unity Health Toronto-St. Michael's Hospital TORONTO, CANADA

174 Emory University Hospital ATLANTA, USA

175 Toranomon Hospital TOKYO, JAPAN

176 Universitetssjukhuset Linköping LINKÖPING, SWEDEN

177 Hospital Alemão **Oswaldo Cruz** SAO PAULO, BRAZIL

178 Rabin Medical Center PETAH TIKVA, ISRAEL

179 Clinique Pasteur TOULOUSE, FRANCE

180 Hospices Civils de Lyon-**Hôpital Edouard Herriot** LYON, FRANCE

181 Juntendo University Hospital TOKYO, JAPAN

182 Bumrungrad **International Hospital** BANGKOK, THAILAND

183 Universitätsklinikum Leipzig LEIPZIG, GERMANY

184 Scripps Memorial Hospital La Jolla LA JOLLA, CA, USA





Newsweek

- 204 Universitätsmedizin Göttingen GÖTTINGEN, GERMANY
- 205 Hospital Universitario y Politécnico la Fe VALENCIA, SPAIN
- 206 Clinique Générale-Beaulieu GENÈVE, SWITZERLAND
- 207 Royal Brisbane & Women's Hospital HERSTON, AUSTRALIA

208 St Vincent's Hospital-Fitzrov FITZROY, AUSTRALIA

209 Diakonhjemmet Sykehus OSLO. NORWAY

- 210 Hospital das Clínicas da Faculdade de Medicina da Universidade de São Paulo (HCFMUSP) SAO PAULO, BRAZIL
- 211 Hospital Universitario Fundación Jiménez Díaz MADRID, SPAIN

212 Kobe City Medical Center **General** Hospital KOBE, JAPAN

213 Universitätsklinikum Jena JENA, GERMANY

214 CHU Grenoble-Site Nord LA TRONCHE, FRANCE

215 Presidio Ospedaliero Spedali Civili di Brescia BRESCIA, ITALY

216 Hospital Clínico San Carlos MADRID, SPAIN

217 Keck Hospital of USC LOS ANGELES, USA

- **218** Inselspital Bern BERN, SWITZERLAND
- **219** Freeman Hospital NEWCASTLE UPON TYNE, UNITED KINGDOM
- 220 Hospital Universitario Virgen del Rocío SEVILLE. SPAIN
- 221 Amsterdam UMC–Vumc AMSTERDAM, THE NETHERLANDS
- 222 The Jikei University Hospital TOKYO, JAPAN

- 223 Torrance Memorial Medical Center TORRANCE, CA, USA
- 224 Gold Coast University Hospital SOUTHPORT, AUSTRALIA

225 Tufts Medical Center BOSTON USA

226 Universitätsklinikum Regensburg REGENSBURG, GERMANY

227 University of Virginia Medical Center CHARLOTTESVILLE, VA, USA

228 Catharina Ziekenhuis EINDHOVEN. THE NETHERLANDS

229 KyungHee University Medical Center SEOUL, SOUTH KOREA

230 Hospital Universitario Puerta de Hierro MAJADAHONDA, SPAIN

- 231 The Royal Victoria Infirmary NEWCASTLE UPON TYNE, UNITED KINGDOM
- 232 OHSU Hospital PORTLAND, OR, USA
- 233 Konkuk University Medical Center SEOUL, SOUTH KOREA
- 234 Krankenhaus der Barmherzigen Schwestern Wien WIEN, AUSTRIA
- 235 Hospital Médica Sur CIUDAD DE MÉXICO, MEXICO
- 236 Chelsea and Westminster Hospital LONDON, UNITED KINGDOM

237 Azienda Ospedaliero Universitaria Careggi FLORENCE, ITALY

238 Oueen Elizabeth **Hospital Birmingham** BIRMINGHAM, UNITED KINGDOM

- **239** UT Southwestern Medical Center DALLAS, USA
- 240 Robert-Bosch-Krankenhaus STUTTGART, GERMANY

241 King's College Hospital LONDON, UNITED KINGDOM

242 Kyorin University Hospital MITAKA, JAPAN

- 243 Daegu Catholic **University Medical Center** DAEGU METROPOLITAN CITY, SOUTH KOREA
- 244 Cleveland Clinic–Florida WESTON, FL, USA
- 245 Hospital Universitario Marqués de Valdecilla SANTANDER, SPAIN

246 Yokohama Municipal **Citizen's Hospital** YOKOHAMA, JAPAN

- 247 Chungnam National University Hospital DAEJEON, SOUTH KOREA
- 248 Centro Médico ABC **Campus Santa Fe** CIUDAD DE MÉXICO, MEXICO
- 249 National Taiwan **University Hospital** TAIPEI CITY, TAIWAN
- 250 Apollo Hospital-Chennai CHENNAI, INDIA

FROM LEFT:

185 Hospital Santa

Catarina Paulista

SAO PAULO, BRAZIL

186 AP-HP-Hôpital Bichat-

KANSAS CITY, KS, USA

Hospital-Parkville

PARKVILLE, AUSTRALIA

189 Uniklinik RWTH Aachen

AACHEN, GERMANY

190 Japanese Red Cross

Medical Center

University Hospital

SEOUL, SOUTH KOREA

192 Inha University Hospital

CITY, SOUTH KOREA

OULU, FINLAND

UMEÅ, SWEDEN

Medical Center

195 Virginia Mason

SEATTLE. USA

OSAKA, JAPAN

Frankfurt

198 Österreichische

WIEN AUSTRIA

ABU DHABI, UAB

WOLUWE-SAINT-

201 Cleveland Clinic

Hospital

LAMBERT, BELGIUM

Fairview Hospital

CLEVELAND. USA

202 Hokkaido University

HOKKAIDO, JAPAN

Medical Center

202 Ewha Womans University

SEOUL, SOUTH KOREA

200 Cliniques

197 Universitätsklinikum

194 Norrlands

193 Oulu University Hospital

Universitetssjukhus

196 Osaka University Hospital

FRANKFURT AM MAIN, GERMANY

Gesundheitskasse-Mein

Hanusch-Krankenhaus

199 Cleveland Clinic Abu Dhabi

Universitaires St. -Luc

INCHEON METROPOLITAN

TOKYO, JAPAN

190 Chung-Ang

Claude-Bernard

PARIS, FRANCE

188 Royal Melbourne

187 University of Kansas Hospital



THE BEST BY COUNTRY

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The leading hospitals in 16 countries around the world. The number of institutions varies by country and rankings are not comparable between different countries (the top hospital in country A is not necessarily superior to the number 2 hospital in country B).

FRANCE

- 1 AP-HP–Hôpital Universitaire Pitié Salpêtrière PARIS
- 2 AP-HP–Hôpital Européen Georges Pompidou PARIS
- 3 CHU Lille–Hôpital Claude-Huriez LILLE
- 4 CHU Bordeaux–Groupe hospitalier Pellegrin BORDEAUX
- 5 Hôpital Paris Saint-Joseph
 PARIS
- 6 Polyclinique Santé Atlantique SAINT-HERBLAIN

- 7 AP-HM–Hôpital de la Timone MARSEILLE
- 8 CHU Toulouse– Hôpital Purpan TOULOUSE
- 9 Hospices Civils de Lyon– Hôpital Lyon Sud PIERRE BENITE
- 10 Hôpital Louis Pradel BRON

GERMANY

- 1 Charité– Universitätsmedizin Berlin BERLIN
- 2 Universitätsklinikum Heidelberg HEIDELBERG



- 3 Klinikum rechts der Isar der Technischen Universität München MUNICH
- 4 LMU Klinikum MUNICH
- 5 Medizinische Hochschule Hannover HANNOVER
- 6 Universitätsklinikum Hamburg-Eppendorf HAMBURG
- 7 Uniklinik Köln COLOGNE
- 8 Universitätsklinikum Freiburg FREIBURG
- 9 Universitätsklinikum Essen ESSEN
- 10 Universitätsklinikum Tübingen TÜBINGEN

ITALY

- 1 Policlinico Universitario A. Gemelli ROME
- 2 Grande Ospedale Metropolitano Niguarda MILAN
- 3 Ospedale San Raffaele– Gruppo San Donato MILAN
- 4 Policlinico Sant'Orsola-Malpighi BOLOGNA
- 5 Istituto Clinico Humanitas ROZZANO
- 6 Ospedale Policlinico San Matteo
- 7 Azienda Ospedaliera di Padova PADUA
- 8 Ospedale Borgo Trento VERONA
- 9 Ospedale Papa Giovanni XXIII BERGAMO
- 10 Presidio Ospedaliero Molinette-A.O.U. Città della Salute e della Scienza TURIN

JAPAN

- 1 The University of Tokyo Hospital TOKYO
- 2 St. Luke's International Hospital TOKYO
- 3 Kameda Medical Center KAMOGAWA
- 4 Kyushu University Hospital FUKUOKA
- 5 Center Hospital of the National Center for Global Health and Medicine TOKYO
- Keio University Hospital
 TOKYO
- 7 Kyoto University Hospital KYOTO
- 8 Nagoya University Hospital NAGOYA
- 9 Kurashiki Central Hospital KURASHIKI
- **10 Toranomon Hospital** TOKYO

SOUTH KOREA

- 1 Asan Medical Center SEOUL
- 2 Samsung Medical Center SEOUL
- 3 Seoul National University Hospital SEOUL
- 4 Severance Hospital– Yonsei University SEOUL
- 5 The Catholic University Of Korea–Seoul St. Mary's Hospital SEOUL
- 6 Seoul National University-Bundang Hospital SEONGNAM CITY
- 7 Ajou University Hospital SUWON CITY
- 8 Gangnam Severance Hospital-Yonsei University SEOUL
- 9 Kangbuk Samsung Hospital SEOUL

2023

* * * * * WORLD'S

BEST HOSPITALS



- 10 The Catholic University of Korea-Yeouido St. Mary's Hospital SEOUL
- UNITED KINGDOM
- 1 St Thomas' Hospital LONDON
- 2 University College Hospital LONDON
- 3 Addenbrooke's CAMBRIDGE
- 4 Guy's Hospital LONDON
- 5 John Radcliffe Hospital OXFORD
- 6 St. Bartholomew's Hospital LONDON
- 7 Freeman Hospital NEWCASTLE UPON TYNE
- 8 The Royal Victoria Infirmary NEWCASTLE UPON TYNE
- 9 Chelsea and Westminster Hospital LONDON

10 Queen Elizabeth Hospital Birmingham BIRMINGHAM

AUSTRALIA

- 1 Royal Prince Alfred Hospital CAMPERDOWN
- 2 The Alfred MELBOURNE
- 3 Royal North Shore Hospital ST LEONARDS
- 4 Royal Melbourne Hospital–Parkville PARKVILLE
- 5 Royal Brisbane & Women's Hospital HERSTON

AUSTRIA

- 1 Allgemeines Krankenhaus der Stadt Wien-Medizinischer Universitätscampus WIEN
- 2 Landeskrankenhaus Universitätskliniken Innsbruck INNSBRUCK

- 3 Landeskrankenhaus– Universitätsklinikum Graz GRAZ
- 4 Landeskrankenhaus Salzburg-Universitätsklinikum der PMU SALZBURG
- 5 Ordensklinikum Linz Elisabethinen LINZ

BRAZIL

- 1 Hospital Israelita Albert Einstein SAO PAULO
- 2 Hospital Sirio Libanes SAO PAULO
- 3 Hospital Moinhos de Vento PORTO ALEGRE
- 4 Hospital Alemão Oswaldo Cruz SAO PAULO
- 5 Hospital Santa Catarina Paulista SAO PAULO

CANADA

- 1 Toronto General University Health Network TORONTO
- 2 Sunnybrook Health Sciences Centre TORONTO
- 3 Mount Sinai Hospital TORONTO
- 4 North York General Hospital TORONTO
- 5 Centre hospitalier de l'Université de Montréal MONTREAL

INDIA

- 1 All India Institute of Medical Sciences–Delhi NEW DELHI
- 2 Medanta The Medicity GURUGRAM
- 3 Apollo Hospital–Chennai CHENNAI
- 4 The Christian Medical College VELLORE
- 5 PGIMER–Postgraduate Institute of Medical Education and Research CHANDIGARH

MEXICO

- 1 Hospital Médica Sur CIUDAD DE MÉXICO
- 2 Centro Médico ABC Campus Santa Fe CIUDAD DE MÉXICO
- 3 IMSS-Centro Médico Nacional Siglo XXI CIUDAD DE MÉXICO
- 4 Centro Médico ABC Campus Observatorio CIUDAD DE MÉXICO
- 5 IMSS-Centro Medico Nacional La Raza CIUDAD DE MÉXICO

SPAIN

- 1 Hospital Universitario La Paz MADRID
- 2 Hospital Clínic de Barcelona BARCELONA
- 3 Hospital Universitario 12 de Octubre MADRID





- 4 Hospital Universitari Vall d'Hebron BARCELONA
- 5 Hospital General Universitario Gregorio Marañón MADRID

SWEDEN

- 1 Karolinska Universitetssjukhuset SOLNA
- 2 Sahlgrenska Universitetssjukhuset GÖTEBORG
- 3 Akademiska Sjukhuset UPPSALA
- 4 Skånes Universitetssjukhus– Lund LUND
- 5 Universitetssjukhuset Linköping LINKÖPING

SWITZERLAND

- 1 Universitätsspital Zürich ZÜRICH
- 2 Centre Hospitalier Universitaire Vaudois LAUSANNE
- 3 Universitätsspital Basel BASEL
- 4 Klinik Hirslanden Zürich ZÜRICH

Les Hôpitaux Universitaires de Genève (HUG)–Cluse-Roseraie GENEVA

TAIWAN

5

- 1 National Taiwan University Hospital TAIPEL CITY
- 2 Taipei Veterans General Hospital TAIPEI CITY
- 3 Kaohsiung Chang Gung Memorial Hospital KAOHSIUNG CITY
- 4 National Cheng Kung University Hospital TAINAN CITY
- 5 China Medical University Hospital TAICHUNG CITY

UNITED ARAB EMIRATES

- 1 Cleveland Clinic Abu Dhabi ABU DHABI
- 2 Rashid Hospital DUBAI
- 3 American Hospital Dubai DUBAI
- 4 Mediclinic City Hospital
- 5 Aster Hospital, Mankhool DUBAI

AMERICA'S BEST

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Newsweek

These are the 414 leading hospitals around the U.S. for 2023, listed here in alphabetical order.

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- 1 Mayo Clinic–Rochester ROCHESTER, MN
- 2 Cleveland Clinic CLEVELAND
- 3 Massachusetts General Hospital BOSTON
- 4 The Johns Hopkins Hospital BALTIMORE
- 5 UCLA Health–Ronald Reagan Medical Center LOS ANGELES
- 6 Stanford Health Care-Stanford Hospital STANFORD, CA
- 7 Brigham And Women's Hospital BOSTON
- 8 Northwestern Memorial Hospital CHICAGO
- 9 The Mount Sinai Hospital NEW YORK CITY
- 10 New York-Presbyterian Hospital-Columbia and Cornell NEW YORK CITY
- 11 University of Michigan Hospitals–Michigan Medicine ANN ARBOR, MI
- 12 Cedars-Sinai Medical Center LOS ANGELES
- **13 UCSF Medical Center** SAN FRANCISCO
- 14 Duke University Hospital DURHAM, NC
- 15 Hospital of the University of Pennsylvania–Penn Presbyterian PHILADELPHIA

16	NYU Langone Hospitals	
	NEW YORK CITY	

- 17 Mayo Clinic–Jacksonville JACKSONVILLE, FL
- 18 Rush University Medical Center CHICAGO
- **19 Mayo Clinic–Phoenix** PHOENIX
- 20 Houston Methodist Hospital HOUSTON
- 21 UCLA Health–Santa Monica Medical Center SANTA MONICA, CA
- 22 Beth Israel Deaconess Medical Center BOSTON
- 23 University of Chicago Medical Center CHICAGO
- 24 Vanderbilt University Medical Center NASHVILLE, TN
- 25 University of Wisconsin Hospitals MADISON, WI
- 26 UC San Diego Health– Jacobs Medical Center LA JOLLA, CA
- 27 University of Washington Medical Center SEATTLE
- 28 University of Colorado Hospital AURORA, CO
- 29 University Hospitals Cleveland Medical Center CLEVELAND
- 30 University of California–Davis Medical Center SACRAMENTO, CA

- 31 Yale New Haven Hospital NEW HAVEN, CT
- 32 University of Utah Hospital SALT LAKE CITY
- 33 Barnes-Jewish Hospital ST. LOUIS
- 34 Emory University Hospital ATLANTA
- 35 Scripps Memorial Hospital La Jolla LA JOLLA, CA
- 36 University of Kansas Hospital KANSAS CITY, KS

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- 37 Virginia Mason Medical Center SEATTLE
- 38 Cleveland Clinic Fairview Hospital CLEVELAND
- **39 Keck Hospital of USC** LOS ANGELES
- 40 Torrance Memorial Medical Center TORRANCE, CA
- 41 Tufts Medical Center BOSTON

42 University of Virginia Medical Center CHARLOTTESVILLE, VA 43 OHSU Hospital

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- PORTLAND, OR 44 UT Southwestern Medical Center DALLAS
- 45 Cleveland Clinic –Florida WESTON, FL
- 46 Morristown Medical Center MORRISTOWN, NJ
 - 47 Baylor University Medical Center DALLAS
- 48 Baylor St. Luke's Medical Center HOUSTON
- 49 Johns Hopkins Bayview Medical Center BALTIMORE
- 50 UAB Hospital BIRMINGHAM, AL
- 51 Brigham and Women's Faulkner Hospital BOSTON

- 52 Mercy Hospital St. Louis ST. LOUIS
- 53 CentraCare–St. Cloud Hospital SAINT CLOUD, MN
- 54 Jefferson Health-Thomas Jefferson University Hospitals PHILADELPHIA
- 55 Sanford USD Medical Center SIOUX FALLS, SD

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- 56 Providence St. Vincent Medical Center PORTLAND, OR
- 57 Hackensack University Medical Center HACKENSACK, NJ
- 58 UPMC Presbyterian & Shadyside PITTSBURGH
- 59 St. Luke's Hospital of Kansas City KANSAS CITY, MO
- 60 M Health Fairview University of Minnesota Medical Center-West Bank East MINNEAPOLIS

- 61 Nebraska Medicine– Nebraska Medical Center OMAHA, NE
- 62 Northwestern Medicine Central DuPage Hospital WINFIELD, IL
- 63 St. Luke's Regional Medical Center BOISE, ID
- 64 Penn State Health-Milton S. Hershey Medical Center HERSHEY, PA
- 65 Ohio State University– Wexner Medical Center COLUMBUS, OH
- 66 VCU Medical Center RICHMOND, VA
- 67 Memorial Hermann-Texas Medical Center HOUSTON
- 68 Medical City Dallas Hospital DALLAS
- 69 Loyola University Medical Center MAYWOOD, IL
- 70 Mayo Clinic–Health System In Eau Claire EAU CLAIRE, WI
- 71 UnityPoint Health-Meriter MADISON, WI
- 72 Inova Fairfax Hospital FALLS CHURCH, VA
- 73 Christ Hospital CINCINNATI
- 74 Froedtert Hospital and the Medical College of Wisconsin MILWAUKEE
- 75 Indiana University Health West Hospital AVON, IN
- 76 Penn Medicine Chester County Hospital WEST CHESTER, PA
- 77 University of Maryland Medical Center BALTIMORE
- 78 Sharp Memorial Hospital SAN DIEGO
- 79 UNC REX Hospital RALEIGH, NC



- **Umass Memorial** 80 Medical Center WORCESTER, MA
- 81 ChristianaCare NEWARK, DE
- **Henry Ford Hospital** 82 DETROIT
- **Atrium Health Carolinas** 83 Medical Center CHARLOTTE, NC
- **Tampa General Hospital** 84 TAMPA, FL
- Newton-Wellesley Hospital 85 NEWTON, MA

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- St. Joseph Mercy Chelsea 86 CHELSEA, MI
- **Cleveland Clinic** 87 **Akron General** AKRON, OH
- Intermountain 88 Medical Center MURRAY, UT
- 89 University of North **Carolina** Hospitals CHAPEL HILL, NC
- **Maine Medical** 90 Center PORTLAND, ME
- Advocate Good 91 Samaritan Hospital DOWNERS GROVE, IL
- MemorialCare Long 92 **Beach Medical Center** LONG BEACH, CA
- Luminis Health Anne 93 **Arundel Medical Center** ANNAPOLIS, MD
- Indiana University 94 Health-North Hospital CARMEL, IN
- **El Camino Hospital** 95 MOUNTAIN VIEW, CA
- Aurora St. Luke's 96 Medical Center MILWAUKEE
- **Emory Saint Joseph's** 97 Hospital ATLANTA
- 98 University of Iowa **Hospitals** and Clinics IOWA CITY, IA
- 99 The Moses H. Cone **Memorial Hospital** GREENSBORO, NC

- 100 Inova Alexandria Hospital ALEXANDRIA, VA
- **101** Roper Hospital CHARLESTON, SC **102** Advocate Lutheran
- **General Hospital** PARK RIDGE, IL
- **103** Reading Hospital READING, PA
- **104** Abbott Northwestern Hospital MINNEAPOLIS
- 105 Queen's Medical Center HONOLULU

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- **106** CarolinaEast Medical Center NEW BERN, NC
- 107 Miami Valley Hospital DAYTON, OH
- **108** UC Irvine Medical Center . ORANGE, CA
- **109** Mills-Peninsula **Medical Center** BURLINGAME, CA
- 110 Cleveland Clinic-Hillcrest Hospital MAYFIELD HEIGHTS, OH
- 111 Lahey Hospital and **Medical Center**

- **112** Swedish Medical Center SEATTLE
- 113 Santa Barbara **Cottage Hospital** SANTA BARBARA, CA
- 114 University of Kentucky-Albert B. Chandler Hospital LEXINGTON, KY
- **115** Dartmouth-Hitchcock Medical Center LEBANON, NH
- 116 St. Luke's Hospital Bethlehem BETHLEHEM, PA

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- 117 Strong Memorial Hospital-University of Rochester ROCHESTER, NY
- **118** ProMedica Toledo Hospital TOLEDO, OH
- **119** Boone Hospital Center COLUMBIA MO
- 120 Sharp Chula Vista **Medical Center** CHULA VISTA, CA
- 121 Valley Hospital RIDGEWOOD, NJ
- **122** Doylestown Hospital DOYLESTOWN, PA



124 Providence Mission -Hospital MISSION VIEJO, CA **125** Providence St. Jude . Medical Center FULLERTON, CA 126 Bon Secours St. Francis Hospital CHARLESTON, SC **127** Saint Joseph Medical Center TOWSON, MD **128** MedStar Georgetown . **University Hospital** WASHINGTON, D.C. **129** Parker Adventist . Hospital PARKER, CO **130** North Shore University . Hospital MANHASSET, NY **131** Kaiser Permanente Santa **Clara Medical Center** SANTA CLARA, CA 132 Baylor Scott & White **Medical Center** TEMPLE, TX **133** Silver Cross Hospital . NEW LENOX, IL 134 Memorial Hermann-**Memorial City Medical Center** HOUSTON 135 University of Cincinnati Medical Center CINCINNATI **136** MUSC Health-University Medical Center CHARLESTON, SC **137** Regions Hospital SAINT PAUL, MN **138** Porter Adventist Hospital DENVER **139** Baylor Scott & White . **Medical Center-Plano** PLANO, TX 140 St. Lukes Hospital CHESTERFIELD, MO **141** Providence Portland . Medical Center PORTLAND, OR **142** UCHealth Poudre . Valley Hospital FORT COLLINS, CO

143 Edward Hospital NAPERVILLE, IL

- 144 EvergreenHealth Medical Center KIRKLAND, WA
- 145 Beaumont Hospital ROYAL OAK, MI
- 146 Sarasota Memorial Hospital SARASOTA, FL
- 147 Blanchard Valley Hospital FINDLAY, OH
- 148 Saratoga Hospital SARATOGA SPRINGS, NY
- 149 St. Joseph's Hospital– BayCare TAMPA, FL

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- 150 Indiana University Health Medical Center
- 151 Kaiser Permanente Woodland Hills Medical Center WOODLAND HILLS, CA
- 152 Hoag Memorial Hospital Presbyterian NEWPORT BEACH, CA
- **153 Lancaster General Hospital** LANCASTER, PA
- **154 Palomar Medical Center** ESCONDIDO, CA
- 155 Legacy Salmon Creek Medical Center VANCOUVER, WA
- **156 Duke Regional Hospital** DURHAM, NC
- 157 John Muir Health–Walnut Creek Medical Center WALNUT CREEK, CA
- 158 Northern Light Mercy Hospital PORTLAND, ME
- 159 Sparrow Hospital LANSING, MI
- **160 Virginia Hospital Center** ARLINGTON, VA
- 161 California Pacific Medical Center SAN FRANCISCO
- 162 The Jewish Hospital– Mercy Health CINCINNATI
- 163 St. David's Medical Center AUSTIN, TX



164 St. Francis Hospital
 & Medical Center
 HARTFORD, CT

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* * * * * WORLD'S BEST HOSPITALS 2023

- 165 Providence Little Company of Mary Medical Center Torrance TORRANCE, CA
- **166 Beaumont Hospital– Grosse Pointe** GROSSE POINTE, MI
- 167 Overlook Medical Center SUMMIT, NJ
- **168 Lankenau Medical Center** WYNNEWOOD, PA
- 169 United Regional Health Care System WICHITA FALLS, TX
- 170 Avera McKennan Hospital and University Health Center SIOUX FALLS, SD
- 171 Utah Valley Hospital PROVO, UT
- 172 Baptist Health Baptist Hospital MIAMI
- **173 Huntington Memorial** Hospital PASADENA, CA
- **174** Scripps Green Hospital LA JOLLA, CA

- 175 Health One The Medical Center of Aurora AURORA, CO
- **176 Morton Plant Hospital** CLEARWATER, FL
- 177 John Muir Medical Center–Concord Campus CONCORD, CA
- 178 Evanston Hospital EVANSTON, IL

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- 179 Baptist Medical Center-Beaches JACKSONVILLE BEACH, FL
- 180 Firsthealth Moore Regional Hospital PINEHURST, NC
- 181 Henrico Doctors' Hospital RICHMOND, VA
- 182 Park Nicollet Methodist Hospital SAINT LOUIS PARK, MN
- 183 Adventhealth Orlando ORLANDO, FL
- **184 Sky Ridge Medical Center** LONE TREE, CO
- **185 Main Line Hospital– Paoli Hospital** PAOLI, PA

- **186 Good Samaritan Medical Center** LAFAYETTE, CO
- 187 Northwestern Medicine Lake Forest Hospital LAKE FOREST, IL
- **188 Mission Hospital** ASHEVILLE, NC
- 189 Wentworth-Douglass Hospital DOVER. NH
- **190 Mercy St. Anne Hospital** TOLEDO, OH
- 191 Henry Ford West Bloomfield Hospital WEST BLOOMFIELD, MI
- **192 Pennsylvania Hospital** PHILADELPHIA
- 193 Mayo Clinic Health System–Albert Lea and Austin ALBERT LEA, MN
- **194 Saint Francis Hospital** TULSA, OK
- 195 M Health Fairview Ridges Hospital BURNSVILLE, MN
- **196 M Health Fairview** Southdale Hospital EDINA, MN

- 197 Mayo Clinic Health System–Franciscan Healthcare LA CROSSE, WI
- **198 Kaiser Permanente** Zion Medical Center SAN DIEGO
- 199 St. Mary's Regional Medical Center ENID, OK
- 200 Texas Health Harris Methodist Hospital Southwest Fort Worth FORT WORTH, TX
- 201 Newark Beth Israel Medical Center NEWARK, NJ
- 202 Griffin Hospital DERBY, CT
- 203 St. Vincent Healthcare BILLINGS, MT
- 204 Northwestern Medicine-Delnor Hospital GENEVA, IL
- 205 Memorial Hospital SOUTH BEND, IN
- 206 UnityPoint Health-St. Luke's Hospital CEDAR RAPIDS, IA
- 207 Beaumont Hospital–Troy TROY, MI
- 208 Kaiser Permanente Los Angeles Medical Center LOS ANGELES
- 209 Aurora Baycare Medical Center GREEN BAY, WI
- 210 Community Memorial Hospital MENOMONEE FALLS, WI

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- 211 St. Vincent Indianapolis Hospital INDIANAPOLIS
- 212 UCHealth–Medical Center of The Rockies LOVELAND, CO
- **213** Community Hospital of the Monterey Peninsula MONTEREY, CA
- 214 Willis Knighton Medical Center SHREVEPORT, LA
- 215 Cape Canaveral Hospital COCOA BEACH, FL



- 216 Straub Clinic And Hospital
 HONOLULU
- 217 SSM Health–St. Mary's Hospital Jefferson City JEFFERSON CITY, MO
- 218 Salem Hospital SALEM, OR
- 219 Pali Momi Medical Center AIEA. HI
- 220 Logan Regional Hospital LOGAN, UT
- 221 Inova Fair Oaks Hospital FAIRFAX, VA

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- 222 Baylor Scott & White Medical Center–Round Rock ROUND ROCK, TX
- 223 Banner University Medical Center Tucson TUCSON, AZ

- 224 Emory Johns Creek Hospital JOHNS CREEK, GA
- 225 Holland Hospital HOLLAND, MI

- 226 St. Joseph Medical Center BLOOMINGTON, IL
- 227 St. Elizabeth Edgewood Hospital EDGEWOOD, KY
- 228 Main Line Health-Bryn Mawr Hospital BRYN MAWR, PA
- 229 Brookings Hospital BROOKINGS, SD
- **230 St. Francis Downtown** GREENVILLE, SC
- 231 Asante Rogue Regional Medical Center MEDFORD, OR
- 232 Presbyterian Hospital ALBUQUERQUE, NM 233 Sentara Norfolk **General Hospital** NORFOLK, VA 234 St. George Regional . **Hospital River Road** ST. GEORGE, UT 235 Fayette Medical Center FAYETTE, AL 236 Tulane Medical Center NEW ORLEANS 237 AMITA Adventist Medical **Center Hinsdale** HINSDALE, IL 238 Aurora Medical **Center Grafton** GRAFTON, WI 239 Community Hospital East INDIANAPOLIS



240 Mercy Iowa City IOWA CITY, IA

241 LDS Hospital SALT LAKE CITY

- 242 Inova Loudoun Hospital LEESBURG, VA
- 243 AdventHealth Shawnee Mission SHAWNEE MISSION, KS
- 244 Baptist Health Lexington LEXINGTON, KY
- 245 Sentara Williamsburg Regional Medical Center WILLIAMSBURG, VA
- 246 Geisinger Medical Center DANVILLE, PA
- 247 Christus Mother Frances-Hospital Tyler TYLER, TX

- 248 Stillwater Medical Center STILLWATER, OK
- 249 Elmhurst Hospital ELMHURST, IL

250 Mary Greeley Medical Center AMES, IA

251 Dignity Health– Sequoia Hospital REDWOOD CITY, CA

252 UT Southwestern Medical Center LAWTON, OK

253 Advocate Christ Medical Center OAK LAWN, IL

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254 Mclaren Northern Michigan PETOSKEY, MI

255 Wooster Community Hospital WOOSTER, OH

256 OhioHealth Riverside Methodist Hospital COLUMBUS, OH

257 Sutter Medical Center, Sacramento SACRAMENTO, CA

258 Northside Hospital Forsyth CUMMING, GA

259 The University of Texas Health Science Center at Tyler TYLER, TX

260 Barton Memorial Hospital SOUTH LAKE TAHOE, CA

261 Northwestern Medicine Mchenry Hospital MCHENRY, IL

262 Billings Clinic Hospital BILLINGS, MT

263 Holy Cross Health FORT LAUDERDALE, FL

264 Advocate Illinois Masonic Medical Center CHICAGO

265 Emory University Hospital Midtown ATLANTA

266 Pinnacle Health Hospitals • HARRISBURG, PA

267 WVU Medicine MORGANTOWN, WV

- 268 Fairbanks Memorial Hospital FAIRBANKS, AK
- 269 Bronson Methodist Hospital KALAMAZOO, MI
- 270 Missouri Baptist Medical Center TOWN AND COUNTRY, MO

271 Southcoast Hospital Group FALL RIVER, MA

- 272 Bellin Memorial Hospital GREEN BAY, WI
- 273 Ochsner Lafayette General Medical Center LAFAYETTE, LA
- 274 St. Luke's Magic Valley Medical Center TWIN FALLS, ID
- 275 Southwest Health Center–Platteville PLATTEVILLE, WI

276 MercyOne Dubuque Medical Center DUBUQUE, IA

277 UPMC Magee-Womens Hospital

- PITTSBURGH
 278 St. Clair Hospital
- PITTSBURGH
- 279 Sharp Coronado Hospital CORONADO, CA
- 280 Kaiser Permanente Moanalua Medical Center HONOLULU

281 Providence Medford Medical Center MEDFORD, OR

- 282 SSM Health St. Mary's Hospital–Madison MADISON, WI
- 283 East Alabama Medical Center OPELIKA, AL
- 284 Lake Region Healthcare Corporation FERGUS FALLS, MN
- **285** Atrium Health Lincoln LINCOLNTON, NC
- 286 Aurora Medical Center – Sheboygan County SHEBOYGAN, WI
- 287 Memorial Hospital And Health Care Center JASPER, IN

288 Catawba Valley Medical Center HICKORY, NC

- 289 Inova Mount Vernon Hospital ALEXANDRIA, VA
- 290 St. John's Health JACKSON, WY

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- 291 St. Tammany Parish Hospital COVINGTON, LA
- 292 Bethesda North Hospital
- 293 Fulton County Health Center WAUSEON, OH
- 294 AMITA Health–Adventist Medical Center La Grange LA GRANGE, IL
- 295 Sentara Martha Jefferson Hospital CHARLOTTESVILLE, VA
- 296 Spectrum Health Butterworth Hospital GRAND RAPIDS, MI
- 297 Our Lady of the Lake Regional Medical Center BATON ROUGE, LA
- 298 Fairview Park Hospital DUBLIN, GA
- 299 Upmc Altoona ALTOONA, PA
- 300 University of Missouri Health Care COLUMBIA, MO
- **301 Anderson Hospital** MARYVILLE, IL
- 302 HSHS St. Vincent's Hospital GREEN BAY, WI
- **303 Eisenhower Health** RANCHO MIRAGE, CA
- 304 Advocate Sherman Hospital ELGIN, IL
- **305 Good Samaritan Hospital** CINCINNATI
- **306 Sentara Leigh Hospital** NORFOLK, VA
- **307 Duncan Regional Hospital** DUNCAN, OK
- 308 Trinity Health Ann Arbor Hospital ANN ARBOR, MI

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309 Lakewood Health System STAPLES, MN

- 310 Orlando Health Regional Medical Center ORLANDO, FL
- 311 Mount Auburn Hospital CAMBRIDGE, MA
- 312 Gundersen Lutheran Medical Center LA CROSSE, WI
- 313 Kadlec Regional Medical Center RICHLAND. WA
- **314 Saint Anne's Hospital** FALL RIVER, MA
- **315** Providence Saint John's Health Center SANTA MONICA, CA
- 316 MedStar Union Memorial Hospital BALTIMORE
- 317 Englewood Hospital And Medical Center ENGLEWOOD, NJ
- 318 MedStar Good Samaritan Hospital BALTIMORE

319 Dignity Health-Northridge Hospital Medical Center NORTHRIDGE, CA

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320 Huntington Hospital HUNTINGTON, NY 321 Mercy Hospital

COON RAPIDS, MN

- 322 St. David's North Austin Medical Center AUSTIN, TX
- 323 Adventhealth Wesley Chapel WESLEY CHAPEL, FL
- 324 Mercy Health–West Hospital CINCINNATI
- 325 ProHealth–Waukesha Memorial Hospital WAUKESHA, WI
- **326** St. Mary Medical Center Inc. HOBART, IN
- 327 Middleburg Heights Medical Center MIDDLEBURG HEIGHTS, OH
- 328 University Hospital (Stony Brook) STONY BROOK, NY



- 329 Cleveland Clinic Avon Hospital AVON, OH
- 330 Mease Countryside Hospital SAFETY HARBOR, FL

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- 331 Mount Sinai Morningside NEW YORK CITY
- 332 Saint Luke's East Hospital LEES SUMMIT, MO
- 333 Mercy Regional Medical Center VILLE PLATTE, LA
- **334 Winchester Hospital** WINCHESTER, MA
- **335 UH Ahuja Medical Center** BEACHWOOD, OH
- 336 Houston Methodist Willowbrook Hospital HOUSTON
- 337 Bryan Medical Center LINCOLN, NE
- 338 Atrium Health Wake Forest Baptist Medical Center WINSTON-SALEM, NC
- 339 Cuyuna Regional Medical Center CROSBY, MN
- 340 MercyOne Des Moines Medical Center DES MOINES, IA
- 341 Boston Medical Center BOSTON
- 342 Adventist Health Castle KAILUA, HI
- 343 Mount Nittany Medical Center STATE COLLEGE, PA
- 344 White Plains Hospital Center WHITE PLAINS, NY
- 345 Wesley Medical Center WICHITA, KS
- 346 Saint Joseph Hospital DENVER
- 347 Geisinger Wyoming Valley Medical Center WILKES-BARRE, PA
- 348 Evangelical Community Hospital LEWISBURG, PA

- 349 Kettering Health Miamisburg MIAMISBURG, OH
- 350 St. Mary Medical Center, Langhorne LANGHORNE, PA

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- 351 Baylor Scott & White Medical Center – Waxahachie WAXAHACHIE, TX
- 352 Avera Queen of Peace Hospital MITCHELL, SD
- 353 Ochsner Medical Center NEW ORLEANS
- 354 UF Health Shands Hospital GAINESVILLE, FL
- 355 Providence St. Mary Medical Center WALLA WALLA, WA
- **356 Upmc Horizon** GREENVILLE, PA
- 357 Williamson Medical Center FRANKLIN, TN
- 358 UNC Health Johnston SMITHFIELD, NC
- **359 Thibodaux Regional** Health System THIBODAUX, LA
- 360 University Medical Center, Lubbock LUBBOCK, TX
- **361 Perham Health Clinic** PERHAM, MN
- 362 Mercy Hospital Springfield SPRINGFIELD, MO
- 363 Health One–Rose Medical Center DENVER
- 364 Ascension Seton Medical Center Austin AUSTIN, TX
- 365 Lehigh Valley Hospital– Cedar Crest ALLENTOWN, PA
- 366 Ochsner University Hospital & Clinics LAFAYETTE, LA
- 367 Overlake Hospital Medical Center BELLEVUE, WA

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OSPITAL 2023

Newsweek

APPLETON, WI

GILBERT, AZ

Hospital

411 HSHS St. Joseph's

410 Dignity Health–Mercy

CHIPPEWA FALLS, WI

412 Rhode Island Hospital

PROVIDENCE, RI

413 Norman Regional

NORMAN, OK

414 Portsmouth Regional

PORTSMOUTH, NH

Hospital

Hospital

Gilbert Medical Center

- 368 HonorHealth–Scottsdale **Thompson Peak** Medical Center SCOTTSDALE, AZ
- 369 Denver Health **Medical Center** DENVER
- 370 North Shore **Medical Center** SALEM, MA
- 371 Aspirus Wausau Hospital WAUSAU, WI
- **372** Northside Hospital ATLANTA
- **373** Grant Medical Center COLUMBUS, OH
- **374** Lawrence Memorial Hospital LAWRENCE, KS
- **375** Mountain View Hospital PAYSON, UT
- 376 Texas Health Presbyterian **Hospital Dallas** DALLAS
- 377 Jefferson Abington Hospital ABINGTON, PA
- 378 Ochsner Medical Center -Baton Rouge BATON ROUGE, LA
- 379 Centura Health-**Penrose St. Francis Health Services** COLORADO SPRINGS, CO
- **380** Houston Methodist . **The Woodlands Hospital** THE WOODLANDS, TX
- 381 Truman Medical **Center Lakewood** KANSAS CITY, MO
- 382 MaineGeneral **Medical Center** AUGUSTA, ME
- 383 Temple University Hospital PHILADELPHIA
- **384** Banner University **Medical Center Phoenix** PHOENIX
- 385 Beth Israel Deaconess Hospital-Plymouth PLYMOUTH, MA
- 386 Meadowview Regional **Medical Center** MAYSVILLE, KY

87 MedStar Washington Hospital Center WASHINGTON, D.C.	398 Piedmont Athens Regional Medical Center ATHENS, GA	407 St. Catherine Hospital EAST CHICAGO, IN
Sutter Roseville Medical Center ROSEVILLE, CA	399 John Dempsey Hospital • FARMINGTON, CT	408 Guadalupe Regional Medical Center SEGUIN, TX
39 Integris Southwest	400 WellSpan York Hospital • YORK, PA	409 Thedacare Regional Medical Center–Appleton

Medical Center OKLAHOMA CITY

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390 Baton Rouge General Medical Center BATON ROUGE, LA

391 Central Texas Medical Center SAN MARCOS, TX

392 Banner Desert Medical Center MESA, AZ

393 St. Vincents Medical Center-Clay County MIDDLEBURG, FL

- 394 Lifespan–Newport Hospital NEWPORT, RI
- **395** UCHealth Memorial **Hospital Central** COLORADO SPRINGS, CO
- 396 Ascension St. Vincent **Carmel Hospital** CARMEL, IN
- **397** Novant Health Forsyth Medical Center WINSTON-SALEM, NC

- **401** HSHS Sacred Heart Hospital - Eau Claire EAU CLAIRE, WI
- 402 Mercy Health-St. Rita's Medical Center LIMA, OH
- **403** Hartford Hospital HARTFORD, CT

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- **404** Community Hospital South INDIANAPOLIS
- 405 Centracare Health-Monticello MONTICELLO, MN
- 406 Monmouth Medical Center LONG BRANCH, NJ

STATISTA

Publishes worldwide established rankings and company listings with high-profile media partners. This research and analysis service is based on the success of Statista.com. The leading data and business intelligence portal provides statistics, business relevant data and various market and consumer studies/surveys.

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GETTY FROM LEFT: SEKSAN MONGKHONKHAMSAO/GETTY;

STAR-M: pioneering innovation in woodworking drill bits



Manufacturing with passion is the name of the game at STAR-M, a Japanese drill bit maker that's celebrating its centenary in 2023.



"We try to deliver whatever our customers need, even when they only ask for one product or large quantities. Our mission is to give shape to what our customers want."

Tokiko Kobayashi, President, STAR-M Corporation

A company in its centenary year, STAR-M Corporation is a market-leading Japanese specialist in the design and production of woodworking drill bits. Based in Miki City, Hyogo Prefecture, the firm is guided by its commitment to *monozukuri* – Japan's pursuit of perfection in manufacturing – as it creates high-quality, cuttingedge products that are sold in over 30 countries worldwide.

"Japanese manufacturers employ creativity, and the kaizen philosophy of continual improvement, in every product they manufacture," STAR-M president Tokiko Kobayashi says. "At the same time, we listen to our customers' voices to determine what they want. Put all these things together, and that's what Japanese monozukuri is about. I believe that by manufacturing with passion, the final product will be strikingly different. It's a philosophy that our employees uphold - they dis-



STAR-M INT. LTD. "WoodOwl"



Core cutting process



Polishing process



play a passion for the individual products they manufacture."

In addition to turning 100 in 2023, STAR-M is celebrating the 20th anniversary of its U.S. affiliate company, STAR-M International. Located in Lombard, Illinois, it sells the WoodOwl brand of drill bits created specifically for American customers. "We currently have a 70% market share in Japan. Upon achieving that significant domestic market percentage, we looked for potential targets and decided to challenge ourselves in the U.S. market," explains Ms. Kobayashi.

"U.S. clients' specifications greatly vary from those of Japan. We only had single-spiral products in the beginning, but we sought to tailor our products to meet the needs of our clients, so we produced drill bits with double and triple spirals. One of our drills which is often used in America works very well for the wooden pylons that support their electrical wires. Our clients have also said that with our Tri-Cut triple-spiral drill bits, which are regularly used in the construction of two-by-four houses, they are able to bore highly accurate holes through the wood."

STAR-M's successful adaptation to American clients' requirements owes much to rigorous R&D efforts. "We perform several tests, using the actual power tools they use," Ms. Kobayashi explains. "We do a lot of trial-and-error testing to adjust the design and model to bring about the perfect hole in varying types of woods. And our testing to find out the best drill-bit design for our customers is not limited to the U.S. It's our philosophy throughout STAR-M Corporation. We try to deliver whatever our customers need, even when they only ask for one product or large quantities. Our mission is to give shape to what our customers want."

STAR-M's comprehensive, continuous R&D processes also ensure that the firm's drill bits keep pace with the evolution of the power tools and wood types available to their customers. "They are constantly changing, especially recently, so we have to keep updating our products to respond to the advanced types of power tools and wood material variations," Ms. Kobayashi notes. "Our ability to constantly update our products comes from the deep knowledge and experience we have cultivated over the past 100 years."

This commitment to constant progress goes hand in hand with the message that STAR-M's special new logo, created to commemorate the company's centenary, seeks to convey. "The design is based on the image of infinity, which means that drilling has no limits," Ms. Kobayashi says. "And the slogan '100 years and counting' speaks to our dedication to never, ever stop challenging ourselves."



Sanwa Metal: unceasing quality that makes the difference

When it comes to grease nipples – which are an essential part of mechanical systems – Sanwa Metal Industry is a supplier that clients can rely on. The company has built and kept a top share in the Japanese market through its efforts to maintain reliability and reasonable pricing.



"We want to increase the ratio of foreign companies that have been placing orders with us."

Yoshimori Kitayama, President, Sanwa Metal Industry Co., Ltd.

Sanwa Metal Industry is a market-leading Japanese specialist in the production and sale of grease nipples – a small but crucial product that allows lubricant to be fed into machinery.





SD nozzles

"We have seen customers shift their supply chain and give preference to cheaper manufacturers in China, before coming back to us," says Sanwa Metal's president, Yoshimori Kitayama. "Japanese companies have always been able to provide sustainable and reliable guality."

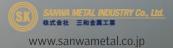
Although it opened an overseas factory in Thailand in 2012, the manufacturer remains chiefly a supplier to Japanese customers: just over 90% of the orders it receives are from domestic companies.



However, building on the growing success it has enjoyed in Indonesia in recent years, Sanwa Metal is out to increase its portfolio of international clients. Grease nipples and related products

"Indonesia is a very important market for us, and we have seen an explosion of interest not just there, but also from neighboring countries such as Singapore and Malaysia. The Southeast Asian market is very important to us, so we have been building our brand in these countries.

"My son, Muneyuki Kitayama, is responsible for foreign market exposure, and he is trying to increase the ratio of foreign companies that are placing orders with us."



Naniwa Whetstone a cut above the rest

Naniwa invites professional chefs and home cooks alike to discover the unmatched quality of its whetstone knife sharpening tools.

As any good professional or home chef knows, the key to finely prepared food is a finely sharpened kitchen knife.

The kitchen knife is undoubtedly a chef's best friend – an essential tool that must be sharpened regularly to ensure top performance. For kitchen samurais aspiring for the best, only



New designs for summer 2023

the Japanese-made Naniwa Whetstone sharpening tools will do.

Made to the highest Japanese quality standards, offering sophisticated design and unmatched reliability, Naniwa Whetstone sharpening tools promise to enhance your cutting skills, cooking performance and creativity in the



Naniwa standard stone series

kitchen. What's more, Naniwa has more than 80 years of experience in creating the perfect sharpening tools for industrial, restaurant and home use, and the quality borne from this experience can be seen and felt in each of the company's products.

"Sushi is, of course, the most famous Japanese cuisine," says Naniwa president Nobuhiro Sadakane. "You must have a very sharp knife to make the best and tastiest sushi, and whetstones are required in order to maintain the sharpness of the knife. We have been in this business for over 80 years, so we have a wide range of products, focusing only on whetstones, and a wide variety of materials, which is the culmination of our technologies and knowledge."

When it comes to knife sharpening, Naniwa stresses that a 15-degree angle is the critical angle when using whetstone. "We named the 15-degree angle as the 'Perfect Angle'," adds Mr. Sadakane. "All



"My goal is to be number one in the world for whetstones."

Nobuhiro Sadakane, President, Naniwa Abrasive Mfg. Co., Ltd.

our product packaging has been updated and includes sharpening guidelines on the packaging. These changes to the packaging also make it easier for the customer to choose the right product."

With its products the longstanding preferred choice of sushi chefs across Japan, Naniwa now aims to take its Japanese-crafted whetstone sharpening tools to chefs and home cooks throughout the world.



www.naniwa-abrasive.com

Takamisawa Cybernetics aims to take its machinery global



"Takamisawa Cybernetics' corporate philosophy is to be a company that creates machines that are indispensable to the world."

Kazuo Takamisawa, President and Representative Director, Takamisawa Cybernetics Co., Ltd.

Established in 1969, Takamisawa Cybernetics is a leading manufacturer of automatic ticket vending machines, automatic platform doors and turnstiles used in train stations across Japan. The Japanese firm also supplies mechatronics systems designed to handle tickets, bills, coins and cards, as well as specific system machines designed for applications such as disaster prevention, measurement equipment, security



gates and bicycle parking lots.

Today, Takamisawa Cybernetics is developing new innovations for a cashless society and a post-pandemic world.

Coin handling while also conmachine

tinuing to spread its cash and coin-based machinerv to overseas markets such as China and Southeast Asia.

The coronavirus pandemic has no doubt accelerated the global shift to a cashless society. In Denmark and Sweden, almost 80% of all payments are now cashless, but countries like Japan, Italy and Spain have been much slower to adopt. With this in mind, Takamisawa Cybernetics president Kazuo If you have ever used Japan's famous train network, then you are probably familiar with the technology of Takamisawa Cybernetics.

Takamisawa believes that supplying coin-handling systems will continue to be an important part of the business for the company, even in China, where demand for coinbased machinery remains high is about 20-30%. When you go a little bit deeper, 70% of that cashless element is credit cards. One element we have introduced is our turnstile equipped for VISA touch card payments, which was



despite the fact that the Chinese market is now mainly cashless.

"I do believe that cashless is something that is going to continue to expand here in Japan, but I also think that in order for us to be completely cashless it will take time. I think there needs to be a balance struck between having both options. So, therefore, there will be a need for advancements in technology for both elements," he says.

'Currently what is most important when it comes to really supporting a cashless society is to ensure that the machines we have installed, such as the automatic ticket vending machines and security systems, are equipped for cashless transactions. I think that the closest way we have been



Automatic ticket gate (VISA)

able to provide our support for that is through the credit card payment system. The percentage of cashless payments in Japan born out of a collaboration with the railway companies."

Having cemented its reputation in Japan, Takamisawa Cybernetics took its industry-leading technology to China, where it has sold around 22,000 units to date. "The reason our coin systems were installed in 2010

TAKAMISAI

Automatic ticket

and became such a huge hit in China comes down to a number of different reasons," explains Mr. Takamisawa. "One is the high level our systems have in terms of counterfeit detection. Second is the ability to insert a number of different denominations of coins at one time, which is very different from the old system of one coin at a time. Finally, it is possible to recycle the money you put in and receive it back as change. I think this is our company's strength; the ability to really pursue the greatest technoloay when it comes to our products

and to continually improve upon our technologies. We are a company that takes pride in our ability to constantly improve our technology and evolve."

This ability to constantly evolve its technology has seen Takamisawa Cybernetics develop new



Security gate (Good Design Award)

solutions, such as its touch-free security gates using sensor-based technology. "Our strategy in that market is to ensure that we have a variety of different products, diversify the machines, and put efforts into making designs that look aesthetically pleasing," adds Mr. Takamisawa. "Many security gates have the same shape at the entrance and exit. We customized this according to the design of the building itself, and produced a security gate with different stylish shapes for the entrance and exit. For that reason, we have been highly appraised and one of our gates won a Good Design Award."

Moving forward, the company's strategy is to take the business model that has been so success-

ful in China and move it to Southeast Asia as a whole, while developing new partnerships with local firms. "As far as Takamisawa Cybernetics' evolution in the future, developing business overseas is what we are really looking to do," says Mr. Takamisawa. "That isn't limited to coin-handling systems, and we are really excited to build partnerships with local companies overseas. We really want to understand the needs of local markets and the

vending machine best way to achieve that is through local partnerships."





Providing the world's most advanced mesh technology



By combining existing technologies with unique new discoveries and techniques, NBC is developing new meshes enabling functions unimaginable with conventional mesh solutions.



"Our target is to become a material company contributing to the improvement of the environment as well as the welfare of human beings."

Tetsuya Kaji,

President, NBC Meshtec Inc.

Originally founded in 1934, NBC Meshtec is committed to manufac-

turing products that contribute to sustainable objectives in order to protect the global environment and create a prosperous society. Company president Tetsuya Kaji elaborates.



Weaving machine for high performance mesh

"Our corporate philosophy involves maintaining the quality and trust gained by providing services that are needed by customers, while adapting to what we call society and streamlining our communities."

The advanced mesh technology offered by NBC Meshtec opens up a number of fields.

"For example, our mesh for acoustic products, it can help with the expansion of 5G and 6G markets," explains Mr. Kaji. "Then there are solar panels and hydrogen-related technologies and products for a decarbonized and hydrogen society, and ion-exchange membranes for wastewater treatment and other applications to strengthen environmental protection initiatives."



Solar farm

While growth is expected in the automotive industry, much is also being done for the medical sector.



EV charging station

"Antiviral and antibacterial products from our Cufitec® product range aid in hygiene goals," he says.

With thoughts to the future, Mr. Kaji is focused on profitability, investment and improving the lives of everyone.

"I am confident that our chosen path is the right one, and will benefit the company, our employees, our customers and the planet. When I retire, it will be very satisfying if I can say that NBC Meshtec made a significant contribution to society."



Innovative resin products supporting critical industries

Pelnox's extensive product line is utilized by over 1,000 global firms in diverse fields, from electronics to auto-parts, sports equipment, and daily essentials.

Founded in 1970, Pelnox has leveraged its proprietary technology and know-how for extraordinary growth as a formulator of resin compounds and tailored products.



Power semiconductor modules and automotive devices

In a conversation with company president Yoshihiro Motoki, the company leader points to the strength of the Japanese chemical industry. "The most advanced area is its capability to provide photoresist for semiconductors. Japanese companies dominate with 90% of



Next-generation components

the global market share because they can mass-produce high-purity products with fine synthesis and filtration technology."

The miniaturization trend in electronics has led to a demand for advanced functional chemicals for products such as LCDs, solar cells. OLEDs, and EVs.

"For us, the more types of raw materials we can use, the more we can demonstrate our compounding and mixing technologies," Mr. Motoki explains. "The insulating materials business has potential for developing new products, while the company is also entering new markets, such as binder materials for CFRP used in rockets."

The shift to electric vehicles is a great opportunity due to the increased number of electronic control unit circuits they need.



Binders for CFRP used in rockets

"Our strength is our ability to provide heat resistant and heat dissipating materials, functioning in extreme temperature environ-



"We have witnessed extraordinary growth as a formulator of resin products tailored to meet the demands of our loyal customers."

Yoshihiro Motoki, President, Pelnox, Ltd.

ments where our resins don't crack. We are collaborating with major semiconductor module manufacturers to develop resins for use in nextgeneration semiconductors for EVs."

Growth and profit are clearly part of Pelnox's objective but as Mr. Motoki says: "The passion of our employees to challenge themselves is what matters most."



Sanwa Kako to focus on environmental initiatives

High-mix, low-volume production and flexibility are key strengths Sanwa Kako utilizes to add value to its products.



Head office building

One of the first companies to start manufacturing polyethylene foam, Sanwa Kako was established in 1965 and can call on more than a half century of industry experience.

Among its few thousand different products, perhaps the most famous is SUNPELCA, a chemi-

"If companies elsewhere are interested in our technology, we see potential in providing it in a joint venture."

Norio Yoshida, President. SANWA KAKO CO., LTD.

cally cross-linked extra-thick cell foam that has many applications in the civil engineering, construction and IT industries.

However, the chemical sector is changing, and with the Japanese

government aiming for total carbon neutrality by 2050, company President Norio Yoshida is look-

ing at ways to



reduce the burden his company places on the environment.

"Our goal," he states, "is a reduction of oil used in production by 80%." Meanwhile, the company is taking several additional steps.

Kickboard

"The first is the thermal recycling of foam that goes to waste, creating a more sustainable energy cycle," Mr. Yoshida continues.



Joint mat

"At the same time we are trying to introduce the 3Rs (Reduce, Reuse, Recycle) and we have created recycled resin pellets, with these pellets making up 50% of 3R products."

Looking to the future, Sanwa Kako sees high growth potential in both the automotive industry and disaster prevention, and is hoping to build on its existing presence in Vietnam by moving into neighboring countries such as Thailand and Malaysia.

As for Mr. Yoshida, his goals are a little closer to home. "Yearly profit is important, of course, but equally important is raising the next generation so that we can create valuable human resources and a base for sustainable company operations."



Sasano looking to bridge gaps in a variety of industries

As a trading firm, Sasano Max is looking to provide quality service and products to its arowing clientele.



With non-ferrous metal materials and products, Sasano Max has worked with many different companies across a wide range of industries since its establishment in 1947.

"Our role is to support manufacturing firms so that they can focus on elevating their product

levels," says company president Takihei Sasano.

And while the com-Processed pany continues pipe for heat to focus on the exchangers semiconductor and automotive industries, with Japan's aging and declining

population, Mr. Sasano sees great potential in the field of mobility.

"We, as a trading firm, want to understand and predict market needs, and act as a pioneer in finding solutions by working together with institutions which carry out research and development."

With an established presence in China, Thailand and the U.S.A., meanwhile, Sasano Max is also looking to open additional operational bases in countries such as Mexico and India.

Elsewhere, Mr. Sasano makes no secret of his desire to diversify

> the group's supply chain so that it can expand its channels of procurement, with the company having been affected in recent years not only by Covid-19 but also by the increase in cus-



"We want to offer and provide the best-matching solution to our clients, and be able to supply the service at a cheaper cost in an efficient way."

Takihei Sasano, President, Sasano Max Company Limited

toms taxes levied on Chinese products by the Trump administration.

That, along with his goal to increase the percentage of processed parts and component sales to 50%, could add "unique value" to the company and ensure it is trusted and relied upon by clients for many years to come.



Coloring the world

Using its unique technologies, Sumika Color is bringing its solutions to new markets.



"We have the expertise to improve the performance of plastic materials."

Toshiro Kojima, President, Sumika Color Co., Ltd.

A chemical solutions company best known for developing its unique palletization technology, Sumika Color was established in 1950 and is an established international presence with bases in China, Taiwan, as well as Japan.

However, as the country faces well-documented demographic is-



New factory

sues, Sumika president Toshiro Kojima is focused on ensuring that the company continues to thrive.

"Going forward," he says, "it's important to look into talent from overseas markets. We also need to use more female workers. In factories, meanwhile, we have to promote digitization and automation using AI."

The latter in particular has the potential to appeal to a younger workforce, for whom the chemical industry has not always been synonymous with innovation.

Also on the agenda according to Mr. Kojima is a new business related to materials derived from biomass and plastics recycling. "Right now a lot of companies are targeting carbon neutrality," he states. "Biomass plastic is currently weaker and less durable than its petroleum-based counterpart, but we are looking at ways to improve those weaknesses using our technology. If we can achieve that, we can expect the consumption of non-petroleum plastic to increase."



Masterbatch

Given its lower barriers to entry, one potential application for biomass-based plastic is laptops, but in time, Mr. Kojima hopes to expand into the automotive industry, which still represents the company's dominant customer base.



Two-layer pellets

Looking to the future, Mr. Kojima is keen to enhance Sumika's presence in China, with increased capacity in the field of research and development, and a focus on lowering its environmental impact.

With TSMC, the largest manufacturer of semiconductors, currently based in Taiwan, there is potential for Sumika to diversify operations into the semiconductor industry, while the prospect of a technological license agreement with Tah Kong Chemical Industrial Corporation may also present opportunities in neighboring Vietnam.

It is a development that may prove vital in restoring Japan's competitive edge in a chemical industry that accounts for 10% of the country's GDP.



Special steel: the backbone of Japan's monozukuri might

"It is said that special steel gives rise to Japanese industries, and we see this as key," says NSSI president Yoichiro Nakagawa.



Head office in Tsukiji, Tokyo

Established in 1924, NAKAGAWA SPECIAL STEEL INC. (NSSI) has been supporting Japan's industrial development as a reputed trader of special steel for almost a century. With a long-established network of partner companies and a long-standing, stable supply chain, today the company provides the special steel to support the growth of new industries and technologies both in Japan and beyond.

Speaking about NSSI's role as a trading firm within the Japanese manufacturing ecosystem, president Yoichiro Nakagawa stresses the importance of QCD – quality, cost, delivery. "Of course, steel manufacturers conduct QCD, but we complement and enhance it. It can be said that this is the value of NSSI." Steel produced by steel manufacturers is delivered to clients in the automobile, construction machinery, and industrial equipment industries through multiple supply chains made up of companies engaged in secondary processing, tertiary processing, parts, and assembly.



Tennoz Central Tower in Tennoz Isle, Tokyo

"Special steel trading companies such as NSSI have entered these long and complicated supply chains next to steel manufacturers, with the specialized trading companies grasping the QCD required by customers and being able to provide supply-chain SMEs with details or even make adjustments of various requirements to satisfy final users' QCD needs. As a result, we believe that good supply chains where trading companies such as ours are located lead to good manufacturing and excellent *monozukuri* (manufacturing craftsmanship)."

As a very basic material, special steel has applications in various new industries, including electric vehicles, renewable energy, and 5Grelated products. "We are going into those markets and many of our customers are also focusing their attention on these markets moving forward," adds Mr. Nakagawa.



Founder of NSSI (second from left) Looking to the future and

Looking to the future and beyond its imminent 100th an-

niversary, NSSI – which is also engaged in warehousing, steel processing and the urban development real estate business– aims to strengthen its global presence,



Factory in Chonburi City, Thailand

particularly in the U.S., Mexico, India and Southeast Asia, where it has already played a notable role in supporting industrial development. "In Southeast Asia since there are existing supply chains of special steel including those built by NSSI for automotive industries, there is space for growth and improvement for our company."

NSSI NAKAGAWA SPECIAL STEEL INC. www.nssiglb.com

Bubble time for that sparkling shine

As Japan's oldest vehicle washing machine manufacturer, JCW knows a thing or two about removing grime to really make vehicles shine.



Bus wash (Kuala Lumpur)

A vehicle can be transformed by the sparkle from a wash, and that goes from the smallest car to a full-length train. Japanese firm JCW Nihon Sharyou Senjouki has been providing sparkling cleanliness through its washing machines for vehicles since 1957 and continues to expand its reach.

The Japanese firm designed, manufactured, and sold the first

"Our company's credo is to always surprise our customers and to bring them happiness."

Naohiro Masuda, President & CEO, JCW Co., Ltd.

automobile washing machine in Japan and has remained at the forefront of the industry ever since. Company president Naohiro Masuda says JCW focuses on the client's objectives when developing new tech-

nology. This is seen in its development of solutions suitable for the extreme temperatures of Japan's Hokkaido island, where



machines have to be able to function at -30° C.

JCW's environmental credentials are strong, with a system that recycles 100% of the water used in washing trains for railway companies. This type of innovation

> has enabled the company to expand into India, where it is working on the country's high-speed train system through its base in New Delhi.



Bearing cleaning (Tokyo)

JCW has also established a base in Indonesia, which – much like India – is in the process of developing its infrastructure for transportation. As such, the company is on the lookout for similarly-minded companies with local knowledge to partner with. As JCW approaches its 70th anniversary, Mr. Masuda hopes the company will develop into a global leader of not only washing machines, but overall washing technology.



The go-to partner for aerospace manufacturers

High-speed rail cleaning (Taiwan)



"Our three core activities are to procure items, to manufacture items, and to introduce new machines to the Japanese market."

Tadaaki Nakaji, President, Nakano Aviation Co., Ltd.

A firm with a track record of providing customers with optimum solutions, Nakano Aviation is a specialist Japanese importer and exporter of parts, materials and equipment for aerospace manufacturers.

Founded in 1990, the Nagoyabased trading company chiefly acts as a bridge between Japanese clients and overseas supA Japanese trading company specializing in importing aerospace products, Nakano Aviation offers expertise that makes its clients' lives a whole lot easier.

pliers, with a focus on imports from the United States. Indeed, Nakano's key relationship with the U.S. led it to establish an office in California shortly after launching.



Master schedule

Nakano offers its clients a comprehensive service that goes beyond simply supplying products, says President Tadaaki Nakaji. "The role of the trading company isn't just procurement," he explains. "We also need to propose the best and most efficient use of the procured items to our customers.

"For the client, it's not as easy as just purchasing the raw materials and then producing products. You need to know how to use



the products you purchase. You may also need to learn about the installation and set-up of those products. When working directly with suppliers, you need to take care of all this – but if you use a trading company, it can take care of those processes for you."

Working for contractors to companies such as Boeing, Nakano also oversees the production of aerospace parts manufactured by subcontractors, who are known in the industry as 'backshops'. The firm manages the manufacturing process – from planning, to execution, to QA – and its trusted partners produce the items.



Machining

"We procure the materials," Mr. Nakaji says, "and if we also take care of the backshops, it's so much easier for our clients."



Pioneering the future with technology and trust

MetalTech continues to provide customers with high-quality products by utilizing its unique technology, with this year marking the 100th anniversary of its founding.



Thai MetalTech Co., Ltd. (Thailand)

With a century of experience, MetaITech is one of Japan's leading manufacturers responsible for the design and manufacture of automotive parts with quality production at its core. The company's president, Ryuichi Yajima, understands the core strengths and challenges across the domestic industry, and how his organization can best contribute, driven from a positive work environment where everyone feels valued and respected.

"The basis of manufacturing lies in people," he says. "We are working together to create products of better quality and solve problems. There is unwavering trust and harmony.

"We provide our employees with a better working environment and must show our employees a more attractive way of doing work, giving them a broader perspective and helping them feel a sense of achievement." This sense of purpose and fulfillment in one's work is key to the president's vision.



Hot stamping press in Okayama plant

"In reality, if they are motivated and have the ability to make proposals, our company will let them take on challenges."

Regarding overseas workers, MetalTech has close links to Thailand, where the company has subsidiaries.

"Our trainees from Thailand enhance their skills and become certified in Japan. Then they can



Material heat process

work in Thailand, and get involved in quality assurance, engineering and even management."

As with a number of industries, the switch to EVs and next-generation vehicles is having an impact on MetalTech, and the company sees this as an opportunity to meet the changing demands of the market.

"We have introduced new technologies, such as a hot stamping press to produce high-strength steel for lighter bodies, an ultrasonic measuring instrument to check the strength and quality of welding, and inspection automation, to achieve stable high quality."



"Our important mission is to manufacture products with equipment that can ensure quality that exceeds the expectations of our customers and to provide them at a reasonable price."

Ryuichi Yajima, President, MetalTech Co., Ltd.

"Though it will not be easy, we aspire to achieve things that are beyond what we are doing now," Mr. Yajima concludes.



Pursuing a circular society through automobile recycling

With over five decades' experience and accumulated data to match, Kaiho Industry is seeking to establish alliances in order to boost car recycling worldwide.

Used engine warehouse

A company that is focused on recycling and reusing auto parts, Kaiho Industry is an established international name which has developed an enviable network of alliances since its founding in 1969.



Recycling education program

Known domestically for introducing the Japan Reuse Standard (JRS), a five-level assessment to check the quality of used engines, Kaiho has also been behind initiatives such as the RUM alliance and Recycling Education Center.

More recently, its Kaiho Recyclers Alliance (KRA) system, which encompasses some 88 companies domestically, has helped facilitate the smooth transaction of used cars. KRA was created to provide



greater transparency in domestic and overseas recycling services, as well as knowledge and training on recycling itself.

Recycling used car parts can be problematic, particularly in an in-

ternational context. As company president Takayuki Kondo explains: "The same Toyota Corolla model might require different parts "Right now our goal is to make used car transactions more transparent and fairer at both ends."

Takayuki Kondo, President, Kaiho Industry Co., Ltd.

depending on whether it was manufactured in, say, Japan or Thailand."

Kaiho, however, knows right away what is needed by the buyer, thanks to a digital database that ensures it can provide its service

> to the international market.

Having recently scooped the Forbes Small Giant Award, Mr. Kondo makes no secret of what drives him. "My biggest goal," he says, "is to create a world that is cosmopolitan, which means that people are inhabitants of the earth, not a specific country or nation. The earth is an entity that is not owned by anyone."



Technical training for Malaysian government officers

How will he achieve his goal? By continuing to emphasize that giving to others is far more powerful than focusing on personal gain.



Toyo Trading: the young company with a big future

While only 12 years since its establishment, Toyo Trading is bringing the 'Made in Japan' brand to overseas markets.



Industrial machinery parts

Established in 2011, Toyo Trading has been demonstrating its knowhow in conventional rubber products, providing overseas manufacturing, while striving to reshape some conventional perceptions.

"There are three things we insist on in our operations to maintain our high level of quality," explains company president Yoshie Yumoto. "Clear communication, a hands-on approach, and on-site inspection tours for our clients.

"As we've seen companies from all over the world expand into China, there has been a marked improvement in the level of expertise there and in the quality of Chinese products."

"It is important for us to continuously make efforts for improvement and develop new products with added value."

Yoshie Yumoto, President. Toyo Trading Co., Ltd.

With an objective to export that recognized 'Made in Japan' caliber, Ms. Yumoto focuses on the company's advantages. "Our greatest strength is providing high-quality products in small lots and in a short time. We ship using our consolidation scheme which serves as a one-stop shop for multiple cus-

tomers. Despite recent price rises in raw material and transportation costs, we minimize the knock-on impact to remain competitive with no drop in quality.



"We are working on the development of new products with environmental issues in mind, linked to Japan's carbon neutrality goals," the president says. "We plan to exhibit various items at the IPF and aim to build new partnerships to target new markets together."

By the time we reach the company's 20th anniversary, Ms. Yumoto is confident that Toyo will have flour-Auxiliary ished as it conparts for home tributes even appliances more to society.



Home appliance parts

"We've already grown as a developer and manufacturer of key functional components that support automobiles, which are indispensable to our daily lives, as well as industrial machinery, rolling stock, ships, and home appliances," she says. "What we want to do now is to enter a new field, the EV automobile industry, and expand our production bases in Southeast Asia. With our broader client base, we want to take care of each customer and grow further."

TOYO TRADING https://toyotrading.co.jp

The plating experts guided by a firm commitment to sustainability

A company that looks bevond the short term, OM Sangyo boasts state-ofthe-art surface-treatment technologies that can respond to the needs of a host of industries.



Partial plating on glass

The OM Group has an 80-year history and is divided into three main business segments: first, manufacturing and sales of automotive parts; second, manufacturing and sales of office products (OA floors. free access floors, etc.) and welfare equipment, as well as metal and plastic 3D printer-based manufacturing; and third, surface treatment (mainly metal plating). OM Sangyo is responsible for the surface treatment business of the group.



OM Sangyo is engaged in "functional plating," which imparts or enhances functions such as heat resistance, wear resistance, and electrical conductivity. The company is also taking on the challenge of enabling plating on materials that are

difficult to plate, such as ceramics, carbon, and glass.

The company is committed to continuous technological improvement - a drive that led it to establish

"We focus on the sustainable growth of our employees and technology, and securing the continuity of the business."

Keitaro Namba, President, OM Sangyo Co., Ltd.

its Surface Finishing Institute, a dedicated R&D facility, in 2013.

"We can move forward as long as we keep pursuing innovation," says President Keitaro Namba.

Having opened a Thai subsidiary in 2015, OM Sangyo is also eyeing advance-

ment in the form of international growth.

However, Mr. Namba stresses that OM Sangvo's pursuit of progress is centered on the long-term devel-



R&D in new technologies for surface treatment

opment of the company and its workforce, rather than chasing short-term gains: "We focus on the sustainable growth of our employees and technology, and securing the continuity of the business.

"We want our employees to be happy and enjoy working with us. We've helped some to obtain PhDs. This doesn't directly contribute to enhancing our technology, but it's a good motivator. We want to be a company where both people and technology can grow sustainably."



www.oms.co.jp/en

Support for employees to

obtain PhDs

A multi-functional trading firm shaped by over 100 years of experience



"We coordinate and work closely with our customers, providing the engineering services and sales for their casting products."

Soichiro Kusano, President & CEO, Kusano Co., Ltd.

Kusano is a trading company that specializes in foundry raw materials, but its range of services has expanded during its 109-year history. "We used to just sell raw materials, but we now coordinate Specializing in iron and steel, Kusano not only offers raw materials for the casting industry, but continues to expand its business to meet the demands of its diverse customers.

and work closely with our customers," says President and CEO Soichiro Kusano. "We offer them engineering services along with



Casting product

machinery sales to ensure optimum efficiency, as well as focusing on coordinating the sales of our customer's casting products."

Continuing to evolve its product portfolio is part of Kusano's mid-term strategy, which has several goals. "The first is to develop human resources for the next 100 years," Mr. Kusano reveals. "The second is to focus on niche products. They're important: it's hard to compete with bigger companies on mainstream products. The third is aggressive investment. We're looking at M&As in transportation and engineering. We also want to focus on steel scrap given it's in demand and aligns with the goal of carbon neutrality."



Market map

A firm committed to the U.N.'s Sustainable Development Goals, Kusano has a major role to play in a greener future. "Many companies understand they need to make changes, but don't know how. Trading companies are key to assisting them,



by advising them Rice resin file on which sectors and markets are best for their business."

Kusano's mid-term plan also includes strengthening its presence abroad, where it has Chinese, Indonesian and Vietnamese subsidiaries. "We're focused on Asia, which has growing markets due to its growing population," Mr. Kusano says.



The next generation of filter paper products



"Our company excels at high performance and making multi-layer papers."

Satoru Azumi, President, Azumi Filter Paper Co., Ltd.

Founded just over a century ago in 1919, Azumi Filter specializes in the manufacture of filter With many high-quality products used in a range of industries, Azumi Filter is ensuring that filter paper is being taken to the next level.



paper, as well as other filter products and functional papers.

A major sector Azumi works with is the automobile industry, which accounts for 30% of its business – but the company is keen to avoid becoming overdependent on a single field, says president Satoru Azumi: "The automobile industry continues to be an important sector for us, but we should not fully rely on it, and our slogan for the past ten years has been that we should commit to other industries."

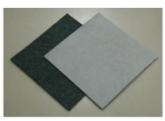
For example, the Covid-19 pandemic has led Azumi to make inroads into the medical sector.

"Our filter paper has been used in Covid test kits," Mr. Azumi reveals. "Especially in places



Heat and moisture exchanger (HME)

where there have been shortages of medical resources such as ventilators, the pandemic demonstrated Japanese society's overreliance on imports. We now realize that we need to build a solid supply chain to produce these products at home.



Two-layer filter paper

We will start the production and sales of ventilator filters soon."

Around 30% of Azumi's sales are international – and as Japan's aging population declines, continued global expansion is a chief way for the company to counteract a fall in domestic demand, Mr. Azumi says. "Europe and Asia have the most potential for us," he notes.



www.azumi-filter.co.jp/en

Culture

HIGH, LOW + EVERYTHING IN BETWEEN

UNCHARTED

Iconic Settings, as Seen in Oscar Winners

your Weekly Adventure fueled

Some of the world's most heralded movies have been set at iconic locations, from museums to military institutions to UNESCO World Heritage Sites and beyond. The locations, along with the actors, help make the scenes they're featured in a treasured part of Hollywood history. Each of the films here has been part of award history, with at least one—and as many as 11—Academy Awards to its name. —EILEEN FALKENBERG-HULL AND NICOLE WAKELIN

Ten Million Plus Years in the Making Nick Kroll on the Influence of Mel Brooks and History of the World > P.88

Indiana Jones and the Last Crusade (1989)

In the third installment of the Indiana Jones franchise (which has won seven Oscars across the series), Al-Khazneh doubles as a temple that houses the Holy Grail. In reality, it's one of the most elaborate temples in Petra, but its interior is a small, simple stone room rather than a booby-trapped layer. Shots of the make-believe interior were filmed at Elstree Studios in London. (See #07 on following spread)

61

Culture

02

Good Will Hunting (1997) UNIVERSITY OF TORONTO, TORONTO

The nine-time Oscar-nominated (and winner of two) film was set in Boston. Some of it was filmed in Beantown, but much of it was actually filmed in Canada. Instead of wandering the halls of MIT, what you actually saw was the University of Toronto. Campus buildings such as Whitney Hall were used throughout the movie for both exterior and interior shots, including the lecture halls.

Les Miserables (2012) OLD ROYAL NAVAL COLLEGE. **GREENWICH, ENGLAND**

The story is set in France, but much of the filming was done in England. Various locations were used as the streets of Paris with moviegoers none the wiser. The barricade scenes—some of the three-time Oscar-winning film's most dramatic moments-were filmed at Old Royal Naval College.





Once Upon a Time in Hollywood (2019) THE MUSSO & FRANK **GRILL, LOS ANGELES**

01

Quentin Tarantino's latest movie and winner of two Oscars recalls some of the most iconic Hollywood hotspots of the late 1960s. In one scene, Leonardo DiCaprio's character Rick Dalton meets with characters Cliff Booth (Brad Pitt) and Marvin Schwarz (Al Pacino) at The Musso & Frank Grill. The restaurant is older than most Old Hollywood movies, having been around since 1919. To this day, it retains its old-school style and service.

Rocky (1976) PHILADELPHIA MUSEUM OF **ART, PHILADELPHIA**

Set in the City of Brotherly Love, Rocky won three Academy Awards, including Best Picture. In one of the most famous scenes from the film, the title character, played by Sylvester Stallone, runs up a set of steps and throws his hands in the air in triumph. These famous steps lead to the Philadelphia Museum of Art's east entrance. It's also the location of the iconic statue that was created for Rocky III.

The Motorcycle Diaries (2004) MACHU PICCHU, PERU

04

The historic 15th century Incan citadel is a UNESCO World Heritage Site and considered one of the New Seven Wonders of the World. It's among the places visited by the duo of motorcyclists during The Motorcycle Diaries (Oscar winner for music) as they traversed South America, and a point of significance for the main character who is moved by the beauty of the site.





06 Ben Hur (1959) JAFFA GATE, JERUSALEM

With 11 Oscars, *Ben Hur* is tied for the record for most wins. Though it was filmed entirely on sound stages at Cinecittá in Rome, most of the locations in the movie—widely regarded as one of the best ever made—are able to be seen in real life. This includes the Jaffa Gate, one of the entries to the Old City of Jerusalem. It was restored and cleaned in 2010.

GETTY

RICHARD NOWITZ/GETTY; 08: WOLFGANG KAEHLER/GETTY; 09: GETTY; CHRISTOPHE D. YVOIRE/SYGMA/GETTY; 10: PARK HYATT TOKYO; 11: ALEX LIVESEY/FIFA/GETTY;

06:

07 Indiana Jones and the Last Crusade (1989) AL-KHAZNEH, PETRA, JORDAN (See previous spread)



08 Out of Africa (1985) THE KAREN BLIXEN MUSEUM, KAREN, KENYA

The movie tells the story of Karen Blixen, a Dane who moved to Africa to start a coffee plantation and whose story was chronicled in the memoir that inspired this beloved film, which won seven Academy Awards. The museum contains some of Blixen's original furniture and sits on the land that was once her plantation. It also features props from the Meryl Streep and Robert Redford movie.

09

The Last Emperor (1987) FORBIDDEN CITY, BEIJING

The Forbidden City, with its elaborate gardens and numerous temples, features prominently in this ninetime Oscar winner. The film tells the story of Puyi, the last Emperor of China, who was born 500 years after the city's construction from 1406 to 1420. It was the first Western feature film granted permission by the People's Republic of China to film at the site.

Lost in Translation (2003) PARK HYATT HOTEL, TOKYO

This romantic comedy—and Oscar winner for Best Original Screenplay—was filmed at temples, shrines and even country clubs throughout the city. One of the most notable locations in the film is the Park Hyatt Hotel. Here, the two main characters, played by Bill Murray and Scarlett Johansson, meet for the first time. Head up to the bar on the 52nd floor to sip a drink where the pair met and enjoy a beautiful view of Tokyo.





The Lord of the Rings (2001–2003) MATAMATA, NEW ZEALAND

A visit to New Zealand is a must for fans of J.R.R. Tolkien. Locations throughout the country were used for filming both *The Lord of the Rings* and *The Hobbit* (2012-2014) movies (with 17 Oscar wins and 37 nominations between them). At the top of the locations list is Matamata, which served as Hobbiton. The set is now open as an attraction to explore and even offers meals at The Green Dragon Inn.

Culture

PARENTING

'l'm Sorry I Chased You With a Booger'

Lessons on the right way to teach kids to apologize—and grown-ups, too

Apologies are fundamental to a civilized society. Yet so many of us get them so wrong when we try to say "sorry"—or don't even apologize at all. But why? Why is it so hard to apologize? And to do it well? SorryWatch.com founders Marjorie Ingall and Susan McCarthy have been tracking and analyzing good and bad apologies for the last decade, and in their entertaining new book Sorry, Sorry, Sorry (Gallery Books), they unwind the baggage behind bad apologies and share the secrets of how to make a good one. In this excerpt from their book, they delve into teaching kids to apologize well—with lessons that apply to people of all ages.

APOLOGIES FROM LITTLE KIDS can be so charming, touching, and funny, and SorryWatch adores their apology notes.

Take Riley here:

dear ciara I'm sorry I chased you with a booger on my finger i put it here so you can get me back love Riley.

This is an excellent apol-

ogy. Riley uses the word "sorry," apologizes to Ciara rather than to the public or a third party and makes amends by providing a payback opportunity. Notice how Riley did not write "dear ms johnson I regret if I

disturbed the class love Riley." There's no "if." Riley knows the booger chasing was wrong and does not pretend it wasn't. And Riley saved that booger for Ciara. Now *that's* restitution. We like to think that Ciara will not get Riley back with the booger, because she's better than that. But she clearly has permission.

Here is another excellent apology, this one from a young fellow named Jack.

This Ben and Jerry's card is for the People who cleaned up the throwup of a kid on Friday the 28th. I don't know their names but I thank them

> alot and I'm sorry again for throwing up. And hope you

by enjoy MARJORIE From J INGALL kid the and next tu SUSAN Aga MCCARTHY

throwing up. And hope you enjoy your Ice cream. From Jack. AKA the kid that puked right next to the bathroom Again, the kid in ques-

tion states precisely what he's apologizing for (he's

sorry for his puke, not for "the puke that occurred," or for "the regrettable vomnado situation"). He shows he understands the impact (someone had to clean up his mouthpoop) and he tries to make amends. It's particularly lovely that Jack wants to atone for something he clearly couldn't help;



the location of the hurl indicates that in all probability he was heading for the bathroom and didn't quite make it.

Does it matter if Jack's parents rather than Jack paid for the Ben & Jerry's card or told Jack to write the letter? It does not. Jack wrote the letter. The letter is clearly in Jack's own words. Applause for Jack's parents for handling this perfectly. Parents understand that vomit happens. It is not a joy, but it is a price we pay for

беттү



regurgitation situation occurred at Powell's Books in Portland, Oregon, and that the apology arrived via U.S. mail in an envelope addressed to "Attention Barf Cleaners." (Sorry-Watch is good at forensic apology work.) Bravo for Jack, bravo for the good humor shown by the Powell's employee who shared this online, and bravo for whatever role Jack's parents played in this saga.

How to Do It Right

How do you become the kind of parent, grandparent or guardian who raises a Riley or a Jack? How can you help create a culture that values good apologies?

When we teach kids to apologize, we need to remember that apologizing is an act that is not intrinsically fun. If you don't remember that, the kid will probably remind you. Isolate the act of apology from bad things. Keep it separate from lectures and punishment, and praise the child for doing it, even if you had to drag it out of them. Truthfully tell them that they've now done something many adults are too . . . immature, or whatever . . . to do. Tell them apologies are acts of strength, because they are. Tell them you understand how difficult this is, because you do. (Later, you can perhaps share a story of your own

life on this earth. It can happen anywhere. (Disneyland and Walt Disney World used to use "protein spill" as code for "vomit or other bodily fluid requiring cleanup"; the current term is supposedly "Code V." You're welcome.) Cleaning up vomit is never fun, especially when the vomit did not come from your child, so a gift card is a nice gesture and an apology is essential. Through diligent research, SorryWatch has learned that Jack's

"If kids grow up around people who apologize when appropriate, apologizing won't seem like some mysterious torture you dreamed up BECAUSE YOU'RE MEAN AND YOU HATE THEM."" ¥

Six Apology Steps for Kids

1 _ Say "I'm sorry" or "I apologize." Luckily, little kids don't usually have the vocabulary to futz around with dodges like "What a pity that happened to Bodger's teddy bear. Sad!" And they should apologize to the person who was hurt or upset.

2_For what they did. Specifically, "for calling you a big sucky liar," not "for calling you names."

3_Acknowledge the effect. "Barbie's never going to get those heels on again."

4 _ Explain why they did it. Optional. This may be hard for kids, who sometimes have no idea why they do things. Still: "I thought it would be funny if it was raining fruit punch, and I didn't realize you'd get sticky and have to take a bath and change your clothes." Just be sure, as your kids get older, that they understand the difference between an explanation and an excuse. It's often better to avoid the former if the kid tends to start sliding into the latter.

5_Tell the person harmed Why they're safe now. Aka "I'll never do it again."

6 - How will you make it up to them? "I'm going to help sew Bodger's legs back on." "You can have my Barbie." "Here's the booger. Feel free to chase me with it."

BOOKS

Culture

difficulties apologizing. Back when you were a child yourself and clung to "Kenny did it" or, um, last week, when you rolled your eyes during the staff meeting. Because Jordan's comment was really, really stupid. But you should have kept the eye roll on the inside of your brain, not on the outside of your face. Because Jordan saw it and called you on it, after which you should not have said, "I did not," when you absolutely, totally did. And you should have privately apologized to Jordan after the meeting instead of avoiding Jordan for days.)

And just as with bad apologies, examples are powerful. You need to walk the walk yourself. Let your kid see and hear you apologize to them, to your spouse, to the waitress, to the friend you interrupted midstory, to the cat when you tripped over him, to Kenny. If kids grow up around people who apologize when appropriate, apologizing won't seem like some mysterious torture you dreamed up BECAUSE YOU'RE MEAN AND YOU HATE THEM.

I'm Just a Soul Whose Intentions Are Good

Kids often have a very hard time understanding that "I didn't MEAN to!" isn't a free pass. They still have to apologize for breaking the window, stepping on someone's hand, or spilling the entire container of homemade mango kombucha—in the living room, where IT'S NOT EVEN SUP-POSED TO BE. They may also have to put their birthday money toward fixing the window and learn how to clean up kombucha in the living room.

Kids often need reassurance that adults understand that they didn't intend those things to happen. But the things *did* happen. And the kids still have to do their best to make things right again. is brave and heroic; we're overcoming our fundamental, self-preserving instincts when we do it. What are some words that should never be in an apology?

There are many! Our book contains several Bad Apology Bingo cards full of them! But in general, avoid words that avoid claiming ownership of an act of wrongdoing. In particular, steer clear of "sorry if," "sorry but" and "sorry you." (Sorry if anyone's feelings were hurt. Sorry but I had good reasons for doing what I did. Sorry you don't understand my sense of humor.) "Obviously" also tends to provoke people, because anything "obvious" doesn't need to be pointed out...and you DO need to point out that you screwed up if you're going to apologize well for it.

There have been lots of apologies in the news lately. From Southwest Airlines' CEO for the 15,000 can-

immobile balls of self-doubt. When we're confronted with evidence that we did something hurtful—when we experience the cognitive dissonance of "I know I'm a good person, but I've done a bad thing" our first response is to reframe the

Marjorie Ingall &Susan McCarthy

BY MEREDITH WOLF SCHIZER

Q_Why do people find it so

Marjorie and Susan _ Our brains

designed to see ourselves as

we make our way in the world;

we have to see ourselves as the

keeps us from curling into tiny,

hero of our own story; that's what

are wired to make it difficult. We're

basically good, because that's how

difficult to apologize?

situation. If I did wrong, I was provoked! There were extenuating circumstances! It wasn't *that* bad! We have to overcome our own instincts and inclinations if we're going to say "I'm sorry" in the strongest, sincerest way. You can't apologize well if you won't take responsibility. That's why we say apologizing well



celed flights over the winter holidays: "Please also hear that I'm truly sorry," along with 25,000 frequent flyer points; from Representative George Santos, who lied about his resume: "I've said I was sorry many times. I've behaved as if I'm

sorry...I am sorry"; and from the Chinese foreign ministry, which "regrets the unintended entry" of a spy balloon into U.S. airspace. Are those good apologies? Southwest's apology wasn't that bad. Good apologies involve actions as well as words, and Southwest offered reparations, a very important



part of a good apology. The company apologized directly to customers, privately and publicly, and tried to take responsibility and make things right. Unfortunately, though, part of a good apology is making sure you won't repeat the offense...and it sounds like Southwest's business model—which involves using a point-to-point

flight system that's different from many other airlines' hub-and-spoke systems—means the problem of cascading cancellations could recur.

As for George Santos...look, apologies aren't a panacea. They can't

fix something irrevocably broken. And it certainly seems as though Santos has left such a vast trail of falsehoods, broken promises and shady activities, no apology could come off as sincere. Also, there's a reason the word "already" is a Bad Apology Bingo word. When you tell someone that you've already apologized, you're not being humble or vulnerable. The effect is, "Ugh, you're STILL asking this of me?!" Plus, what does "I've behaved as if I'm sorry" actually mean? I've

as if I'm sorry" actually mean? I've put on an abashed expression? No one is criticizing his acting; folks are criticizing his actions.



izing his acting; zing his actions. The Chinese foreign ministry's use of "regret" is certainly...regrettable. Whether you're a government, a company or a kid, "regret" isn't synonymous with "apology." Regret takes no ownership. Regret is about the speaker's feelings; apology is

about another person's feelings. As of this writing, China hasn't taken any responsibility, claiming that the balloon's presence in American airspace was "unintended" and that it was a civilian craft being used for meteorology research—not a spy craft. China used the term "force majeure," which literally means an

Sorry, Sorry THE CASE FOR DOD APOLOGIES MANDARE INCALL IN SUBMINICALL IN

LIFE LESSONS Parents need to model good apologies and also to teach that an apology is still necessary, even if their child didn't mean to do something wrong.

accident without any associated liability. That's no apology at all.

When shouldn't you apologize?

Don't apologize if you're genuinely not sorry. You'll apologize badly, and a bad apology is almost invariably worse than no apology. (But do get a reality check from a trusted friend about whether you should, in fact, be sorry.) Don't apologize if you simply can't do it without defensiveness or minimizing; again, you'll do more harm than good. Don't apologize if it would hurt the other person. If, for instance, they've made it abundantly clear they never want to hear from you again...sorry, you'll just have to sit with the discomfort of losing that relationship. Don't apologize if you can't do it without insisting that the other person take a share of the blame. Again, good apologies are brave acts, because you don't get to demand anything in return. Which also means you don't get to ask for forgiveness—forgiveness is a gift to be granted, and it's rude to ask for a gift. (You can, however, say, "I hope one day you'll be able to forgive me.") There may one day be a conversation in which you request that the other person apologize to you, but that day is not today. Don't apologize if you've already said you were sorry numerous times (and you've confirmed with your trusted friend that you apologized well!), yet the other person still won't stop demanding more apologies. You've done all you can do. 🛽

PARENTING

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It's as if there were two offenses: breaking the window, and planning to break the window. Kids who didn't plan to break the window focus on the fact that they didn't plan to break it, and not the fact that they did break it. It's especially upsetting for kids who were trying to do good things show another kid how to hit a fungo, demonstrate a new dance move, cheer a sibling up on a rainy day with an impromptu picnic (in the living room, where kombucha is NEVER supposed to be).

You know, maybe it's not that it's harder for kids to understand that "I didn't mean to" doesn't get you out of jail free. Maybe it's just that adults have more sophisticated ways of saying, "I didn't mean to." Like saying, "My remarks were taken out of context!" "It was not my intent to offend anyone!" "My friends know I'm not homophobic!" "My comedy is being censored by social justice warriors!" (To quote the kid in the vintage Partnership for a Drug-Free America ad, "I learned it by watching you!")

'Do You Have Prince Albert in a Can?'

When teaching kids to apologize, there may need to be more emphasis on understanding why an apology is called for, because kids are young and they don't know everything yet. In our lives, we learn things at different rates. Apology lessons have to be age-appropriate, and they shouldn't assume kids already know things they have no way of knowing. It's the parents' job to make the why something is wrong clear to them.

Here is an example of a British child whose parents did that, and the fact that they did is clear in the kid's apology. (The British child pranked 999, which is the emergency services number in the UK. Prank calls are very tempting, even if kids today do not understand why Prince Albert was in the can or why they should let him out.) To ever it concers I pressed 999 and I am

so so sorry. Why I should not press 999 only if it's an emensey.

 Because you will get a fine
 You will get really told off by the people on the phone
 It could stop someone
 else that needs help

I so sorry and I under stand how serius it was, I promise that I will never ever do it again. I am very, very sorry.

We don't know whether the East Midlands Ambulance Service responded to the child or whether they merely tweeted the letter. (Ah, social media.) Apologies should not be about getting caught and dutifully muttering, "I'm sorry." It's on parents to explain why the thing the kid is apologizing for was wrong, how the kid's actions affected others and how we want society to function. Yes, that's important.

But remember, no one has to forgive. Teach your kid not to follow up an apology with "We're good, right?" They have to be gracious if they've wronged someone, but the other kid is under no obligation to accept their apology and shouldn't be asked to do so. If your kid is on the receiving end of an apology, ask them not

"Whether you're a government, a company or a kid, 'regret' isn't synonymous with 'apology."

whether they were wronged but whether they think the apology was sincere. If the other kid screwed up but is willing to own that fact, teaching your kid to hang on to resentments isn't doing them any favors. When Jordan left his backpack in the aisle after being told that backpacks do not belong in the aisle, and your kid trips and Jordan apologizes and actually seems to understand that leaving the backpack in the aisle was wrong and caused pain, your kid should be encouraged to accept the apology and move on.

Teaching your kid to recognize gaslighting, on the other hand, is a valuable skill to take into adulthood. When Jordan deliberately tripped your kid and then said, "Sorry but it was an accident and I thought you saw my leg sticking out and you should really be more careful," your kid is under no obligation to accept that apology.

Maybe start with teaching your kid to say, "Thank you for the apology." And no more. Those words don't mean "I forgive you." And if the other kid is a cretin, encourage your kid to stay away if possible and expand their friend circle. Mean girls and jerky boys often make themselves known very early on.

We All Thank You

Teaching children how to apologize well and how to accept apologies gracefully contributes to children's overall happiness and sense of security and helps make the world better. We hope your children—and ours—become good people and that goodness emanates from them all their days.

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The New Era of Life Sciences

Lead Writer Ignacio Louzan

Sorina Dumitru, Irina Negoita, Silvia Sambugaro, Lewis Hart, Konstantin Tumanov, Flavia Negoescu

he new era of life sciences has already begun. The global pharmaceutical market is expected to reach over \$1.5 trillion by the end of 2023, as cuttingedge technologies are transforming the way we understand and treat diseases, and new medicines offer hope for millions where previously there was none. From the decoding of the human genome and the advent of precision medicine, to the search for cures for Alzheimer's and cancer, the

integration of technology in healthcare within the life sciences field has spurred remarkable progress in recent years. However, the industry also faces several regulatory and reputational challenges, notably due to the high prices of life-saving treatments and policy changes that some claim will hamper innovation. At the same time, the Covid-19 pandemic has served as a turning point for the way the public perceives the sector. Pharmaceutical companies have stepped up to the plate to develop life-saving vaccines and treatments at a rate that has been nothing short of a marvel, showing that when the industry puts its focus on public health the results can be impressive. In this special report, we present the culmination of diligent research: the result of comprehensive interviews with a distinguished cohort of decision-makers who shape the future of the industry. Our interviewees consist of North America's leading CEOs, association leaders, and government officials. Amidst the many transformative developments, there is no doubt that the impact of these innovations and policies will be significant, shaping the way we all live our lives.

In This Report...



ALBERT BOURLA CEO, PFIZER

We are living through a scientific renaissance – fueled by advancements in biology and technology. The years ahead will have a dramatic impact on human health.



PIERREECONOMY & INNOVATIONFITZGIBBONMINISTER OF QUEBEC

If we correlate the national health system database with the immense power of AI, we have the potential to develop some strong, and even revolutionary solutions.



LEONARD SCHLEIFER CEO, REGENERON Prices are higher in the U.S. because payers have been willing to pay the price of innovation; this is the reason we have certain medicines at all in the first place.



STEPHEN UBL PRESIDENT & CEO, PhRMA Changing or altering people's genes to cure them used to be the stuff of science fiction, but we are making it a reality.

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(Center for Breakthrough Medicines)

2022 was a record year for cell and gene therapy approvals, and 2023 is set to surpass it by five times. CBM partners with clients to streamline production and optimize capital deployment to allow innovators to focus on research while we deliver expertise and capacity.

From DNA to Data

The life sciences industry is shifting ever more from one-size-fits-all treatments to individual, tailor made cures. This is made possible through the science of genomics, one of the most exciting and rapidly advancing fields in the life sciences. In brief, within the genome all genetic information that plays a dominant role in determining the traits and characteristics of an organism are encoded: the recipe for all life itself. In the past 30 years, unprecedented advances in DNA sequencing technologies have made it possible to analyze vast amounts of genetic data. These insights into the underlying mechanisms of disease through genomics have revealed new avenues for the development of personalized treatments.



Today it is possible to sequence entire genomes at a much faster pace and lower costs more than ever before, thanks to the efforts of innovators such as Illumina. Its CEO, Francis deSouza, tells us that "it cost \$3 billion and thirteen years to sequence the first single human genome in 1990. When we introduced our first sequencer in 2007, the price was around \$150,000, and between then and 2023 we brought the price down to \$200 - which means we have lowered our prices by 99.9%." The benefits of such advancements are manifold, impacting areas ranging from gut health to rare diseases and, according to deSouza, even information science: "There is even research being done today about how we could use DNA as a storage medium for artificial data, given that it is much more efficient than current hard-disks." 🖸

Why is microbiota worth reading about?

Stay informed about microbiota **Deepen your knowledge** Pass it on to your patients



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An online international hub of knowledge dedicated to microbiota



Pushing Boundaries



DEBBIE HART PRESIDENT & CEO, BioNJ What is quite astonishing is the fact that people now live on average 10 years longer than they did in 1989, and the global pharmaceutical industry invested \$200 billion in R&D in 2020, which is an unprecedented amount.



PAMELA FRALICK | PRESIDENT, INNOVATIVE MEDICINES CANADA (IMC)

Canada is a nation of settlers, along with our Indigenous populations. As a result, we're able to conduct clinical trials on a broad, diverse population, especially in larger cities like Montreal, Toronto, and Vancouver, which is extremely attractive for the innovative pharmaceutical industry.



KEREN HARUVI SNIR PRESIDENT, SANDOZ U.S. According to our studies, by 2025, 1.2 million additional patients could get access to biologics just by virtue of the fact that we will have a greater volume of biosimilars available.



JOE PANETTA

PRESIDENT & CEO, BIOCOM CALIFORNIA We believe opportunity exists for collaboration between California-based companies and other markets. Biocom California has an office in Tokyo, and we plan to support our members who wish to expand to Asia and Europe.



RENE RUSSO

We believe that cancer treatment can be revolutionized through medicine that effectively tricks tumors into activating their own treatment, while protecting the patient's healthy tissue, organs, and cells.

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DR. FRANK BEDU-ADDO CEO PDS Biotech



Immunotherapies such as our Versamune® platform products that can activate large quantities of tumor-attacking killer T-cells, and also our novel tumor-targeting cytokine are key advancements in cancer treatment. We're excited to advance our lead candidate into a Phase 3 global registrational trial later this year.

Precision Medicine & Cancer Immunotherapies

These advances and cost reductions in genomics have paved the way for the development of precision medicine: treatments tailored to the unique genetic profile of patients. VP of Genomic Health at 23andMe, Noura Abul-Husn, states that "the push of people seeking genetic information on their own is a driving force behind personalized medicine," something unimaginable only 20 years ago when the first project to sequence the human genome was finally completed. Unlike traditional approaches, as Sadik Kassim, CTO of Genomic Medicines at Danaher tells us, personalized medicine helps to "identify the mutations that could cause diseases, and intervene with maximum precision and swiftness to correct or modify the genetic cause." This opens doors for medical professionals to design treatments that are more effective and less toxic.

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Precision medicine is already having an impact on the treatment of cancer. Olga Potapova, Founder and CEO of Cureline, claims that "targeted therapy is a revolutionary success for the industry - it prolongs life and improves its quality by paying attention not only to the illness, but also to the patient." Life Sciences Washington's CEO and President, Marc Cummings, highlights these advancements while also warning about costs: "Looking ahead, I think we will see dramatic changes in cancer survival rates. It is inspiring to witness that we already have the tools to develop the next generation of therapies, but we need to bring costs down as personalized cancer treatments are often very expensive."

Alongside immunotherapy, precision medicine is one of the greatest promises in the future of the field. Through immunotherapy, researchers have been unlocking the secrets of the immune system and discovering new ways to harness its power to fight against cancer. These therapies have shown remarkable efficacy in shrinking tumors and improving survival rates in patients who have not responded to traditional chemotherapy. CytomX's CEO, Sean McCarthy, says checkpoint inhibitors - a type of immunotherapy -"were discovered by blocking a protein called CTLA-4, which leads to the immune system being re-awakened to see the cancer and attack it. This is the amazing advance that transformed oncology research and subsequently helped many thousands of patients around the world." It is precisely by virtue of these advancements that biotechs like PDS could develop Versamune, a promising T-cell activating platform. The company's early clinical trials showed that "of 29 patients who, historically, had a median survival of only three to four months to live, we managed to extend this period to 21 months, with a response rate of 63% in the group of patients who received the most effective doses from the current reported standard of less than 10%," said Frank Bedu-Addo, CEO. 🖸





What we realized is plaques and tangles were not necessarily the toxic agent causing neuronal death. What we did learn is that they are both *inflammatory*.

biovie



People Centered Science

- BioVie is focused on reducing TNF-stimulated inflammation.
- We are developing innovative therapies for Alzheimer's and Parkinson's Diseases.
- Phase 3 Alzheimer's results expected 2H23.



CRISPR: The End of Genetic Disease?

Another revolutionary development in the field of genetics, CRISPR allows the DNA of living organisms to be edited with unparalleled accuracy and ease. With this breakthrough in-hand, humanity can realistically aspire to cure genetic diseases, create more resilient crops, and even design new organisms with custom properties. In the words of Trevor Martin, the CEO of Mammoth Biosciences, "what makes CRISPR really exciting is that it allows us to move from treating diseases to curing them. Rather than receiving treatment for the rest of your life you can access this one-time, potentially curative therapy that goes to the root cause of the disease."

CRISPR works by utilizing a molecule called RNA - which may sound familiar from the Covid-19 pandemic - that acts like a guiding system to direct a special enzyme to specific locations within the DNA, which allows one to remove, add or replace genetic material with almost absolute precision. "The rise of genomic and especially CRISPR technology completely shifted the paradigm in pharma; barriers were crossed and a new pool of opportunity developed," says John Leonard, President and CEO of Intellia. Martin even claims that CRISPR's presence implies a philosophical transformation: "We can make changes to our DNA rather than shooting in the dark and hoping that the molecule will affect the gene. If you cure one disease it makes it easier to tackle others, because you have already figured out delivery, dosage, etc., and all you are doing is switching up the guide RNA, a very reproducible and effective method. It simply changes the game of how we do drug development. There are 4,000 genetic diseases that we could target through our work." CRISPR might also open new avenues of treatment for autoimmune diseases. These maladies are one of the biggest challenges in medicine due to their complex and multifaceted nature, and it is precisely by editing the genes that trigger the immune system to attack its own cells that CRISPR can revolutionize the way we understand and treat autoimmune conditions.



Biotechnology is just a great big word that means hope.

The technology and infrastructure needed to make this a reality is still in its early days, however. Audrey Greenberg from the Center for Breakthrough Medicines enthusiastically tells us that "we are only in the early days of CRISPR technology, gene editing and allogeneic cell therapy - and they are already producing incredible results," but Greenberg also highlights that "these innovations still remain extremely expensive." Amongst other challenges, science has limited expertise in genomic analysis - we do not know what every specific gene 'does' yet - and difficulties in integrating these vast amounts of data into clinical decision-making. Additionally, some have voiced reasonable concerns apropos of how genetic data will be handled in terms of privacy and security. Yet, the exponential rate at which these technologies are advancing, make them the potential basis for a revolution that could save countless lives.



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GIOVANNI CAFORIO CEO, BRISTOL MYERS SQUIBB

Precision medicine is definitely one of the highlights of today's biotech market. If in the past cardiovascular treatments were addressed to a large number of patients, today our drug Camzyos can address genetic cardiomyopathy in a deeply individualized way.



MORITZ HARTMANN

GLOBAL HEAD INFORMATION SOLUTIONS, ROCHE Since the early 2000's we have been focusing on precision

medicine as we have seen how the rise of genomics drove the emergence of therapies that pre-identify if patients can benefit from a certain treatment.

 DeiCene

 Case

 Case

 Case

 DeiGene.com

 DeiGene.com

Alzheimer's: Approaching a Cure

As conspicuous as the rise of genomics is in the life sciences, it is certainly not the only area where innovation seems to have reached an inflection point. In recent years, the scientific community has made great strides in unraveling the mysteries of age-related neurodegenerative diseases, including Alzheimer's and Parkinson's, which jointly affect more than 60 million people worldwide. Martin Tolar, CEO, Alzheon says that "up until last year, all Alzheimer's research has been unsuccessful, with the cost of failures over the past decade reaching tens of billions of dollars." However, new breakthroughs in research are bringing hope to those affected. Advances in genetics have provided a deeper understanding of the complex risk factors that contribute to these conditions, while developments of new drugs are offering new pathways for treatment.



Eli Lilly is targeting plaque with its drug Donanemab, which according to their CEO, David Ricks, "is a super high affinity molecule that gets rid of plaque in the human brain at a very rapid rate, which we think is the negative agent causing the trouble." Ricks also remains convinced that the study is particularly promising. BioVie, on the other hand, is one of the smaller biotechs exploring untrodden roads in relation to Alzheimer's. Its CEO, Cuong Do, tells us that not long ago "we realized plaques and tangles were not necessarily the toxic agent causing neuronal death. What we did learn is that they are both inflammatory." This means that chronic inflammation may play a significant role in the development and progression of the disease. BioVie is exploring anti-inflammatory treatments as a potential way to slow or stop the progression of Alzheimer's, and its candidate awaits FDA approval. Cuong Do also claims that inflammation is "the root of many other evils", as it "leads to the hyper-methylation of our DNA and hence an acceleration of the aging process." His advice if we are to avoid it? "Exercise better, eat better, and be careful about the environment you put yourself in."

The Macro Reality of Microbiota

Several studies are now suggesting that the gut microbiome, a collection of over 100 trillion microbes that reside in the digestive tract, is more important than we ever imagined, and potentially interwoven with many of the ailments discussed in this article. The microbiome has been shown to have a profound impact on a wide range of physiological processes, from digestion to immune function and mental health. French company Biocodex was one of



CHRISTOPHER MOLLOY | PHD, CHANCELLOR EMERITUS, RUTGERS UNIVERSITY

The study of the human microbiome and potential implications of microbiome disturbances will be a crucially important area of research in the coming decades.

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the first to intuit that something of great relevance was hiding in our bacteria; "founded back in mid-50's, our founders have always felt that gut health held far more than meets the eye" says CEO Nicolas Coudurier. Marie-Emmanuelle Le Guern, VP Research & Development , tells us that "recent data have provided compelling evidence that the gut microbiota of patients with Parkinson's, depressive disorders or autism spectrum disorders (ASD) show a different composition compared to healthy people." According to Le Guern, "It seems that the "western modern diet" is an example of perturbation that leads to minor microbiota alteration." Other agents pointed at lately have been the abuse of antibiotics, which data suggest kills some of the gut's beneficial bacteria as mentioned by the Biocodex Microbiota Institute.



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Innovation in Rare Diseases

Rare diseases in the U.S. are defined as conditions which affect less than 200,000 people. Despite their name, 1 in 10 U.S. citizens suffers from one of the 8,000 rare diseases. Recently, with the support of the FDA, researchers and pharmaceutical companies have been able to bring innovative treatments to the market that have given hope and relief to patients who previously had limited options. "Rare disease innovation has been the success story of the last two or three decades," says William H. Lewis, Chair & CEO of Insmed.



Nowadays, more and more companies are doing research in this field. Acasti is a specialty pharma whose strength lies in reformulating already marketed drugs. Its President and CEO, Jan D'Alvise, claims "they will have two drugs ready to move into Phase 3 in 2023, and a third drug which is a topical spray used for a pain indication for a disease called postherpetic neuralgia (the single largest cause of suicide in people over the age of 70 just due to the severe pain it causes) going into Phase 2." Another small biotech, PTC Therapeutics, is already successfully commercializing a drug that targets Duchenne muscular dystrophy, "the first approved gene therapy in the world directly injected into the brain and the first approved oral treatment for spinal muscular atrophy developed from PTC's Splicing platform," explained CEO Stuart Peltz. The 25-year-old company attributed its success to innovation, adding that "in this day and age, you definitely do not want to make the best horse and buggy when we have flying cars."

Partnering for Success: Tech & Contract Outsourcing

The convergence of the tech and life sciences industries has been a story of unlikely but transformative collaboration. What once was a relationship characterized by little more than the implementation of basic software solutions in healthcare facilities has now blossomed into a far-reaching partnership, whereby data management, AI, and cloud computing are utilized to address some of the most pressing challenges in healthcare. "Digital medicine has reached a tipping point: algorithms, software programs, and phone apps have proliferated, and now make medical decisions for patients themselves," says Stephen Perry, CEO of Kymanox.

The advent of AI, as recently encapsulated by ChatGPT, made many of us realize its mysterious power. Beyond chat boxes, however, AI is to play a vital role in drug discovery. As Sean McClain, the CEO and Founder of Absci, tells us "the industry is still trying to wrap their head around AI and how it can be applied to drug discovery and development to ultimately increase success rates and get medicines to patients faster." One example of AI's application in the field comes from the Canadian biotech AbCellera. Its CEO and co-founder, Carl Hansen, shares that they "have spent the last decade working to build an engine that can bring new antibody medicines to the clinic with greater speed and probability of success." Simultaneously, IT giants like Microsoft are using their expertise in AI to "work with Adaptive Biotechnologies to develop a machine learning technology that can separate all the T-cells from a blood sample, analyze the DNA and produce a printout with information about every disease that your body is coping with", as Peter Lee, the Corporate VP, says. 📀



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• At the same time, as the pharmaceutical industry continues to evolve and become more specialized, Contract Development and Manufacturing Organizations (CDMOs) are emerging as a crucial component in the drug development and production process. CDMOs offer a range of services, from early stage research and development to commercial scale production, allowing pharmaceutical companies to outsource specific aspects of their operations. Pierre-Alain Ruffieux, the CEO of Lonza Group, says that his company "brings the technical expertise on the manufacturing process, offers manufacturing facilities, and brings the regulatory expertise required on the quality side". One of the global giants to join the CDMO industry in the last decades is Samsung Biologics. Its CEO, John Rim, tells us that "the aging population and the continued growth and income in technology advancements led Samsung to invest in the life sciences industry and, as a result, in 2011 founded Samsung Biologics." Samsung's bet seems to have paid off and it is now growing at an outstanding pace, doubling its revenue from 2021 to around \$1.9 billion. The limit of the potential to be unlocked here remains uncertain. IT has helped make supply chains more efficient. In the words of Mandar Paralkar from SAP: "Covid-19 proved that supply chain networks have to be resilient. Regulatory agencies around the world protect their

The Race to Find a Cure



STEPHANIE VEYRUN-MANETTI CANADA COUNTRY LEAD, SANOFI

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KEVIN FITZGERALD CSO, ALNYLAM PHARMACEUTICALS If you have a disease where something is being produced too much, imagine an overflowing sink. You can either keep mopping the floor, which is what antibodies do, or you can turn down the faucet and let the drain catch up – what RNAi therapeutics do.



WILLIAM LEWIS CHAIR & CEO, INSMED

Rare disease innovation has been the success story of the last two or three decades since the Orphan Drug Act aligned the FDA with the companies that were trying to develop therapies in this space.

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citizens by requiring serialization documentation of ingredients to ensure pharmaceutical products follow local regulations. All this additional paperwork increases the burden on the industry, not just when it comes to source transparency, but also for the IT systems that have to be ready to support traceability." Jeffrey Simmons, GEO of animal health company Elanco, voices excitement and hope in view of their collaboration with the IT industry, which will help them have a wider reach: "With 69 years of history, we are at a point at which we have a network that reaches the world's pets and animals.April 2023 will be a milestone as we roll out our new SAP system that can reach into over 100 countries. Elanco will be the bridge to the world's animals." From improving drug development and manufacturing, to AI and efficient supply chain, the IT industry and CDMO industries are now at the forefront of progress in the life sciences.





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DAVID RICKS CEO, ELI LILLY

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STEPHEN BRADY CEO, TEMPEST THERAPEUTICS Capital markets have been volatile, and fundraising is more difficult. Companies with commercialization rights

to programs have the potential optionality to combine business development and financings.



JEFF CAMBRA CEO, SpinaFX MEDICAL Many of the venture capitalists (VCs), private investors and family offices that we are speaking with right now are very reserved and more selective than what we have seen in the past.

The High Price of Innovation

The pharmaceutical industry has long been a source of controversy, with a public perception that is often marked by suspicion prior to the Covid-19 pandemic, according to Gallup polls only the federal government was held in worse regard than pharma. From concerns over skyrocketing drug prices to accusations of putting profits before patients, the industry's reputation has faced numerous challenges. Admittedly, the world of pharma is not without its shortcomings; the occasional opportunism of some players to prioritize profits does exist - one needs only to remember the Sovaldi scandal in 2013, when Gilead's revolutionary cure for Hepatitis-C was priced at \$84,000 upon release, making the Californian giant double its revenue from \$11 billion to \$25 billion. It is also true that when observing some of the basic facts around the pharma industry in the U.S., one will inevitably find some conspicuous figures. First example: the U.S. spends more on prescription drugs per capita than any other country in the world, with an average cost of \$1.443 per person in 2019. Second example: prices have increased dramatically over the past decade, with some drugs seeing price hikes of over 500%.

When talking about costs and prices, it is necessary to recall some core facts that are often forgotten. Developing new drugs is a complex and expensive endeavor for pharmaceutical companies, each new development estimated at around \$2.6 billion. The process typically involves much investment risk and years of research and testing, including pre-clinical trials, clinical trials, and FDA approvals. Furthermore, the U.S. has a unique pricing ecosystem that involves insurance companies and other intermediaries (Pharmacy Benefit Managers, or PBMs) that double the price of most medications.





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S This means that, on average, pharma companies get 50 cents out of every dollar. But before unraveling the complexity of the nation's entire healthcare systems, some in the industry are trying to find ingenious ways to lower costs. One example is that of BeiGene, a global company aiming for this objective through their clinical trials : "up to 90% of the total cost of developing a medicine is tied up in the upfront clinical trial phase, and most clinical trials are run in wealthy countries and thus are not highly inclusive. But if more companies would run global clinical trials, as BeiGene does, we could as an industry reduce the time to enroll and conduct trials, reducing costs overall," says CEO John Oyler.

On the flip side, Michael Laranjo, Otsuka Canada Pharmaceuticals' CEO, talks about all the money that the life sciences save further down the line: "the truth is that some drugs help keep patients out of hospitals." In other words, these drugs reduce the costs for both the system and patients by preventing complications. Ocugen's CEO Shankar Musunuri, mirrors this attitude, claiming that "accessibility is also critically important" and that "it is not good enough to bring breakthrough gene therapies to market if patients cannot afford them. We need to be diligent in pricing if we want the most vulnerable populations to have access to treatment."

It is true that much of the cornucopia of innovations North America has experienced in the past decades is linked to the existence of a potential financial reward, which in turn is linked to 'free' prices. Joe Panetta from Biocom California argues for this point: "The U.S. has a very different economic model in relation to healthcare than the rest of the world (...) Here we have an incentive-based, open market system for healthcare and for the development of drugs. This has historically served as an advantage for the industry, fueling the development and commercialization of the most cutting-edge medical technologies and therapies the world has ever seen, alongside a free market providing open access."

In other words, the industry develops because investors inject capital confident that they will enjoy returns - and these only arrive in a free market. If the market was to be more strictly regulated, costs would be lower for patients, but many fear that innovation would stagnate - a fear that might reify with the recent passing of the Inflation Reduction Act in the U.S.



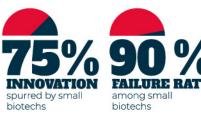
Approximately one-third of the global 50 million people with epilepsy do not respond to their medication and have uncontrolled seizure activity.

Inflation Reduction Act (IRA): The Donkey in the Room

The IRA has the potential to drastically alter the landscape of the biopharmaceutical industry. Its aim: to reduce the rate of inflation in pharmaceuticals by implementing price control measures and promoting transparency, making prescription drugs more affordable for consumers. While some proponents argue that cost control will bring much-needed relief to consumers, others - such as Mike Guerra, President and CEO of California Life Sciences, warn that the consequences could be dire: "We must be very clear on just how severe the ripple effects of the IRA, in its current form, can be. New research published by EU based Vital Transformation counts among the consequences hundreds of thousands of job losses as project funding diminishes, while VC companies are adopting a wait-and-see attitude. Also, if such drug pricing provisions had been in place, only six out of 110 therapies approved over the past decade would have made it to patients due to the limitations on research funding and partnerships." Thus, the IRA has brought a seismic shift to the pharmaceutical industry.







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The Financial Turmoil of Biotechs

Biotech startups were responsible for 75% of innovations in recent years; also, 90% of them fail. With the markets in turmoil and investors becoming increasingly risk-averse, securing funding has become a monumental task for young companies operating in the field. In the words of Christopher Schaber, CEO of Soligenix, "over the last two years the investment climate has been difficult due, in large part, to the broader global market conditions. As you would imagine, this has not translated well for smaller, earlier stage biotech companies, where both development risk and capital need is higher. Coupled with the length of the drug development process that can take 10-15 years in order to achieve potential success, it can make for even harsher times." It seems like the once-plentiful streams of capital have all but dried up, leaving many promising ventures struggling to stay afloat. A more dramatic example is that of M6P, a small startup with remarkable science that holds a strong promise to treat lysosomal storage disorders (LSDs) through enzyme replacement therapies. Hung Do and Cuong Do, M6P's leadership team, tell us that "unfortunately, at the moment, the entire biotech investing market, especially for preclinical companies, is frozen, so we are now relying on existing shareholders to keep the development going." Despite hardship, the biotech community has remained steadfast in their pursuit of medical innovation. Companies like Soligenix and M6P continue working against the tide, with a rich pipeline that promises much.

Now more than ever, it seems that collaborations and acquisitions between big pharma and biotechs are crucial in keeping the wheels spinning. Merck's spin-off Organon is poised to change the landscape of women's health. Its CEO, Kevin Ali, tells us that despite their being "a young company with a 2021 IPO" they "have completed 8 deals in the past 18 months, and are rapidly growing."



MARK GOLDBERG MD, CHAIRMAN & CEO, ALLUCENT

Small and mid-sized biotechs are responsible for as much as 75% to 80% of the new developments in our industry. The programs they're working on are often so new that new regulatory pathways need to be explored.

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• They are offering products such as the Jada device which addresses postpartum hemorrhage or abnormal bleeding in childbirth at a "90% plus efficacy rate and acts in under three minutes." This is a big leap in an industry that has been underfunded and deprioritized in the past, treated as a niche, but as Duchesnay CEO Eric Gervais points out, "the four billion women in the world are not a niche percentage."

Innovation hubs such as the Pennsylvania Biotechnology Center also bear good news, showing that the industry still stands strong in Pennsylvania, where "the last six years generated more than \$7.3 billion worth of economic impact." This is a testament to the resilience and innovation of the industry, as well as the vital role that biotechnology plays - and will play - in our society. Sekar Kathiresan is the CEO of Massachusetts based Verve Therapeutics, a company that fights heart disease through fascinating novel techniques such as gene editing, claims his company "has raised about \$800 million in capital across three private rounds and two public financings. Since inception, Verve has spent about \$250 million, so we have a significant amount (about \$550 million) still left at our disposal to continue the development of this medicine.



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PacBio intends to create a paradigm shift demonstrating that our technologies deliver better resolution, with competitive economics, at scale. "Perhaps the clearest sign that there is trust in the sector comes from companies such as EY, whose "pharma sector is currently the fastest growing sector at EY globally," as Pamela Spence, Global Head Sciences leader, assures. Despite challenges such as funding cuts and regulatory hurdles, biotechnology companies and the life sciences in general continue to make significant strides, bringing cutting-edge technologies to market and making a real difference in the lives of patients.

From Tragedy to Action: the Power of Personal Stories

On interviewing many of the leaders in North America's life sciences industry, one thing was particularly unexpected: many of the people we talked with were driven primarily by personal stories. Experiences of illness and loss serve as a powerful impetus for many. In our encounters, this was most commonly observed in the rare diseases sector.



WALTER KORZ COO, WEX PHARMACEUTICALS Opioids have been around since the early 1800s, and they are still what we always use for severe pain for patients post-surgery. They are useful and necessary, but not in all painful conditions.

John F. Crowley, Executive Chairman of Amicus Therapeutics, is a father of two children born with Pompe disease, which is a rare genetic disorder. Faced with the devastating reality that there was no cure for his children's condition, Crowley refused to give up hope. He quit his corporate job and, with unwavering determination, set out on a mission to find a cure. Soon after entering the world of biopharma, Crowley founded Amicus. Today, his work at Amicus has had a direct impact on his children's lives and many others with Pompe disease. "At the end of the day" Crowley tells us "biotechnology is just a great big word that means hope."

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On a different, deeply personal note, Travere's CEO Eric Dube tells us "Coming out as gay at the worst point during the AIDS epidemic in the '90s, I saw how little society, the government, and healthcare providers valued the lives of the men who were dying (...) In my career, I use my position to advocate for the health of all communities: to give a voice to patients who might feel like they lack access to the necessary medical care." Dube went on to found Travere, which specializes in rare diseases. Their products help thousands of Americans with rare diseases live better lives. Another noteworthy example, this time outside the field of rare diseases, is Branislav Vajdic, CEO and Founder of HeartBeam. Vajdic tells us about his main motivation: "My father was a physician, and one day at home he started feeling some tightness in his chest. He took this for indigestion, but it turned out to be a fatal heart attack - potentially one that could have been non-lethal, had it been addressed in time. This experience shook me, and harnessing all my knowledge of technology I asked the question: is there any technology out there that can help detect a heart attack?" Since then, Vajdic has devoted his efforts to developing a new generation of cardiovascular devices, the ingenious AimiGo, which has the potential to dramatically reduce the risk of a heart attack fatality by monitoring heart function with a credit-card size device.

From a debilitating medical condition to stories of uphill battles and shocking experiences where everything seems to crumble, these experiences serve as a driving force behind the development of new and innovative solutions, aiming to prevent similar suffering in the future. Reflecting upon the testimonies of these leaders, we are reminded that progress is not limited to scientific advancement, but also emanates from the spirit of those fighting with unwavering resolve.

As we embark on this new era of life sciences, both hope and challenges lie ahead - reminiscent of every revolution in human history. At what price, in what context, and what will be the impact of the medical breakthroughs discussed in this report on our lives? Only time can tell. We navigate a complex landscape where different forces cohabit, and it sometimes seems hard to see through it at all - especially when talking about an industry that raises many passionate and often opposing opinions. Undeniable are the stories, innovations and efforts of those who believe in the industry and improve the lives of patients every day.





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Talking Points

Guardian

"IT'S A SILENT WAR THAT SOCIETY DOESN'T SEE."

-Brazilian environmental officer Felipe Finger on illegal mining in rainforests

THE WALL STREET JOURNAL.

"If the input data is biased, then the output can amplify such biases."

-COMPUTER SCIENTIST TIMNIT GEBRU ON AI

"We do a much

better job when

we are better

represented both genders: male

and female.

-CHRISTINE LAGARDE, PRESIDENT

OF THE EUROPEAN CENTRAL BANK

THE NEW YORKER

"One of the great advantages of being Asian, and borderline well known, is that people tend to think you look like just another Asian."

-ACTOR RANDALL PARK

Hollijwood

"I'M TIRED OF HIDING. I WANT MY LIFE BACK."

> —Evgeniya Chernyshova, a once anonymous Harvey Weinstein accuser

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EVGENIYA CHERNYSHOVA

"Obviously I can't be everyone's best friend, because I don't have the time."

—Actor Jenny Slate

BUSINESS INSIDER

"I ALSO WANT TO BE SEEN AS A PERSON, AND NOT A COMMODITY, NOT SOMETHING FOR PEOPLE TO LIKE, USE AND THROW AWAY."

—Marissa Ross, *Bon Appétit's* former wine editor

RANDALL PARK

TIMNIT GEBRU



THEATER Bob Fosse's Dancin' Comes Home

The iconic choreographer's singular 1978 show gets its first Broadway revival IN 1978, WAYNE CILENTO, THEN A rising young Broadway performer, got the chance to try to impress Bob Fosse. Fosse, who died in 1987, was at the time a firmly established legend, best known for his distinctive jazzy choreography for musicals like *The Pajama Game*, *Damn Yankees, Sweet Charity* and *Chicago*. In a 40-year career, he won nine Tony Awards, three Primetime Emmy Awards and an Academy Award for directing the film version of *Cabaret*.

by LAUREN GIELLA

"People are gonna want to dance and that's such a beautiful language that we all understand."

"I was in *The Act* with Liza Minnelli," Cilento says. "We were rehearsing on one end of the hall and Bob was at the other end doing pre-production." Fosse was working on a new show called *Dancin*' and although it had already been cast, Cilento managed to secure an audition with Fosse and his muse and lead dancer, Ann Reinking.

"They started teaching me stuff and he danced with us, and I had a ball," Cilento remembers. "He looked at me and he shook my hand and he said, 'Thank you very much. I appreciate you coming in." Cilento says he left thinking that was as close as he'd ever getting to being in a Fosse show, but nonetheless "flying with excitement."

On the opening night of *The Act*, though, Cilento thought he was going to faint when he spotted Fosse in a center orchestra seat. At a party after the premiere, Fosse told him, "I want you in the show." Cilento stayed with *The Act* at night while joining *Dancin*' rehearsals during the day.

"It was number after number after number in all different styles," he said. "Bob at the time was free and he wanted to experiment with dancers. It was like a breath of fresh air." The show was not a play, but not quite a traditional musical, either. It was

GENERATIONS Opposite: Jacob Guzman and Mattie Love in *Dancin*.' Right: The show's choreographer Bob Fosse in his office in 1974. really Fosse's personal love letter to his art, a unique multi-act combination of music, dance and sketches that is a tribute to and celebration of dance.

Cilento was in nearly every number and when the show opened, he earned a Tony Award nomination for Best Performance by a Featured Actor in a Musical. Fosse himself scored a Tony for choreography

This March 19, *Dancin'* is coming back to Broadway at the Music Box Theatre and Cilento is returning with it, this time as its director. "I think people that are interested in dance or not [will] get a lot out of this," he says, adding this "feel-good" show is "just joy."

A Show by Dancers, For Dancers

With Broadway currently almost "saturated" with revivals, Cilento says he wanted to update *Dancin*' to "make it relevant for today." He admits that at first, he wasn't sure how a 45-year-old show would work for 2023 audiences. "My question to myself was, 'What would Bob do if he was doing *Dancin*' today?" He was so ahead of the curve and with technology and his experience from filmmaking.... How would he approach *Dancin*?"

The original production was structured like a burlesque show with dancers going on and off stage as an announcer presented each new number. Cilento says, "That stylistic way is not going to work today.... I think it needs to move like a film." So Cilento drew from Fosse's film experience and put the show on a soundstage, which, he says, opens the possibility of the story to "go anywhere."

At its core, though, *Dancin'* remains a show by dancers, for dancers.

Cast member Yani Marin says dancers don't usually get to be the leads in shows. They are put in the ensemble and pushed to the back where they are not engaging with the plot or the main cast "as a whole person telling a story." Not so with *Dancin*', she says. Without a definitive plot line, dancers are the primary focus.

"I feel really lucky that the features that have been assigned to me allow



Culture

me to express myself," she says, adding that learning and experiencing Fosse has brought her "joy to a level I had forgotten existed." And having an original cast member on the team made learning choreography easier for the dancers.

Marin, known for her role in the original Broadway cast of the 2009 *West Side Story* revival, says Cilento understands the Fosse choreography "on a whole other level." She says, "There's something there that you can't teach. It's just this feel, this essence"

Dancer Nando Morland says, "He's such a passionate, excited person that is experienced in the show, is experienced with Bob. His experience as a dancer in that time and in the show is so evident in the way that he moves and it's so fun to watch him demonstrate."

Morland, who was in the 2020 Broadway revival of *West Side Story* and the national tour of *Fiddler on the Roof,* says he has longbeen inspired by the "funk and contortion" of Fosse's style. "There's so much musicality and spunk in his style and in his language that it always felt really exciting and really a little bit like home," Morland says.

Second Chances

The show is not just a revival of a Broadway hit, but for some of the cast a personal revival.

Marin says she had retired from dancing before being cast. "I had stopped dancing pretty much and I've been transitioning heavily into more acting for TV and film." During the pandemic, she says, like many other performers she fell into a "really depressive state." But as she

"My question to myself was, 'What would Bob do if he was doing Dancin' today?""



went through the audition process, she began "experiencing joy again."

Morland also took a detour from performing during the pandemic. After *West Side Story* in early 2020, he moved to Denver to work as a substitute teacher.

He says, "I did take a break from dancing, so coming back, it was super exciting to have my first dance job back in the city and my first dance experience be *Dancin'*. Like literally dancing."

Morland says a revival should be about honoring history while giving the show new life. "I think what makes a good revival is a balance of upholding tradition and then also totally throwing tradition in the trash," he says. While the show is built on the foundation of Fosse's choreography, Morland says it also celebrates individual dancers with collaborations in the dialogue and acting to represent the current moment. He says, "We're not playing different characters. We are ourselves in the show."

"We're going to try to honor this choreography but because you're in a body that exists right now, in this time...the influence of your own life and your own experience will move through that formula in a way that gives a completely new life," Morland adds.

"I just feel like people are gonna want to dance and that's such a beautiful language that we all understand," Marin says. "It's like when you see someone smile, that's contagious."

► Lauren Giella is a NEWSWEEK national reporter based in New York. Follow her on Twitter @LaurenGiella

"PLAYING OURSELVES" Left to right: Dancin' cast members Kolton Krouse, Ida Saki, Khori Michelle Petinaud, Jacob Guzman and Yani Marin.

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Culture

PARTING SHOT

Nick Kroll

IF YOU'RE GOING TO ADD ON TO THE LEGACY OF A CLASSIC MEL BROOKS film, you've got to do it with a parade of superstars (and, of course, the blessing of Brooks himself). That's exactly what Nick Kroll has done with Hulu's *History of the World: Part II* (March 6). "You can expect an insane cast." We're talking Wanda Sykes, Taika Waititi, Jay Ellis and Sarah Silverman, among others. "Our goal was to continue to be provocative, but not necessarily preachy and political." And even if they aren't political, Kroll says Brooks' target in his work "has almost always been those in power, and how they are largely dumb and greedy." Part of the reason why Brooks, Kroll and the other producers wanted to do this was to expand on the diverse set of voices and stories that need to be told from history. "There's just so many interesting stories that we all sort of take for granted." And there's even something for fans of Brooks' other films. "We really try to pay homage...you're going to hear jokes from *The Producers*, from *Young Frankenstein*, from *Spaceballs*, like little Easter eggs and callbacks."

"We are taking a fresh look at history from so many different perspectives."



Why do you think now is a good time for *History of the World: Part II?*

In general, culturally, we are taking a fresh look at history from so many different perspectives. Obviously, Mel was doing that 40 years ago, and he's really been doing it throughout his career.

Jay Ellis is a perfect Jesus.

He is a perfect Jesus. Jay Ellis is hot. I guess when you're that attractive, you can be that kind. He's just lovely, and for him it was fun because it's all these different versions of Jesus. He's just so versatile.

How did all these stars get involved?

So much [of comedy is] about relationships and between Wanda and myself, we have a lot of relationships. Also, just Mel Brooks; his name just brings in so many people.

What influence has Mel Brooks had on you as a comedian?

There's just nobody more important to me in forming my comedy sensibility. He manages to always have these very funny visual jokes but then also just incredibly precise, funny writing.

What are you eager to do next?

I've been so fortunate throughout my career. I want to keep acting and making animation obviously, but I really am excited about building a [production] company that helps others produce and make film and television. —H. Alan Scott

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