

## Embracing the promise of bioscience

When U.S. President Joe Biden welcomed his counterpart President Yoon Suk Yeol at the White House in the first state visit of a South Korean leader in more than a decade, the message could not have been clearer. “Ours is a future filled with unimaginable opportunities,” Biden said.

With news headlines understandably focusing on a new “Washington Declaration,” a set of new South Korean-U.S. steps aims to further deter North Korean aggression. The two leaders also heralded greater bilateral cooperation in the economic area, including an agreement to establish a dialogue for next-generation emerging and core technology pertaining to semiconductors, electric vehicle batteries, biotechnology, quantum science and other cutting-edge technologies, with the aim of promoting joint research and development and experts exchange.

The welcomed announcements also underscored to me the astonishing opportunities and promise of bioscience that continue for both our nations. Just a few weeks before Yoon’s visit, I read Milken Institute Chairman Michael Milken’s new book, *“Faster Cures: Accelerating the Future of Health.”* The memoir is a definitive account of the philanthropist’s lifetime of work to accelerate medical breakthroughs — and makes powerful reading for those also exploring the lessons and benefits of cooperation in the health sector.

Drawing from Milken’s book and his recent Wall Street Journal commentary piece, *“Another Medical Revolution Is Under Way,”* I found five key takeaways that offer up both lessons learned and reasons for optimism for all nations amid what too often seem like troubled, divided times:

First, the Triumph of Science. As recently as the 19th century, people suffered through gruesome surgeries without anesthesia and childbirth without antiseptic procedures and all manner of terrible infections. Fortunately, Milken notes, medicine has advanced from that dark past to the prospect of a bright future that will transform society in the years ahead.

Pessimists have often predicted that disease would bring pestilence and doom. Science met these challenges in the form of antibiotics, polio vaccines, statins, genome sequencing, immunotherapies, monoclonal antibodies, antiretroviral therapy, robotic surgery, powerful new diagnostic scans, focused ultrasound therapies, artificial intelligence, gene editing and mRNA vaccines.

One result of all this progress is worldwide life expectancy has more than doubled in less than 100 years. In large parts of Asia, the gains have been especially dramatic. South Korea’s remarkable economic and health progress, for example, is the envy of many nations.

There is also a remarkable economic benefit. In real, inflation-adjusted terms, the per-capita productivity of advanced economies is eight times that of the nineteenth-century average, Milken writes. And half of all economic growth over the past two centuries, he notes, is directly linked to progress in medical research and public health.

Second, Data is Paramount. The driving force behind this progress, according to Milken, is the astounding advance of our ability to produce, manipulate, store, retrieve and transmit data. Faster, cheaper, more-communicable data has revolutionized medical research.

No longer is a lone scientist working at a laboratory bench likely to produce medical breakthroughs. Science is now a team activity. The teamwork to produce a new therapy often involves the collaboration of experts in multiple countries. They might speak different languages, yet technology knits them together as a seamless creative unit. The benefits of continued U.S.-South Korean teamwork and cooperation in bioscience are numerous.

Third, Progress Requires Effective Strategies. It is not enough that researchers are smart and dedicated. Cohesive strategies underlie most medical and public health solutions. Milken's "*Faster Cures*" explains the plans that helped produce such advances as microbiome sequencing, non-invasive surgery, faster vaccine development, and drugs developed by harnessing artificial intelligence, machine learning and massive computational power.

Fourth, We Are Just Getting Started. The future looks incredibly exciting. We can envision gaining immunity from dozens of viruses with a single vaccine. And we can foresee editing genes to eliminate many birth defects, perhaps one day growing new organs from patients' own cells and even slowing the aging process. All these would have been considered science fiction only a few years ago.

Fifth, the Best Drug is Prevention. Despite all this progress and exciting future prospects, we must address a number of remaining challenges. The first of these is health equity. Those of us in the wealthier nations live years, often decades, longer than the average African, Latin American or South Asian.

Yet, even the regions that have made substantial longevity gains in recent decades still have remaining challenges. Even in the most developed nations, including the U.S. and Korea, too many people continue to destroy their health through neglect or abuse. It is great when medical science develops a new cure. It is even better when we can prevent disease from occurring in the first place. A focus on improving health also must not ignore mental health.

With thoughtful prevention, we will reap more benefits from the amazing revolution in life sciences. More than that, with the benefits increasingly clear of greater continued cooperation between the United States and South Korea — as well as with other nations — in areas that go beyond defense and economics to encompass health and bioscience, there is a reason for enduring optimism.

There is also reason to hope that faster cures and longer, more meaningful lives will be very much part of the "unimaginable opportunities" that the U.S. and South Korean presidents spoke of recently in April as springtime returned to Washington.



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