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WAMJ

World Asian Medical Journal

Inspirational Asian Healthcare Leader

YOUNGMEE JEE,MD,PhD

Commissioner of Korea Disease Control and Prevention Agency

SPECIAL REPORT

Gastric Cancer Disparity discussed at 25th New York Health Forum

BIOPHARMA REPORT

Biotech Trends to Watch: Reflecting on the First Half of 2024

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From the Publisher

Chul S. Hyun, MD, PhD, MPH
Publisher
President, Center for Viral Hepatitis
Chairman, New York Health Forum
Founder, Stomach Cancer Task Force

Dear Friends,

As we continue to strive for excellence in medical journalism, I am thrilled to share some significant milestones and exciting updates in this issue of the World Asian Medical Journal (WAMJ).

First, I am proud to report on the remarkable success of the Stomach Cancer Task Force's (SCTF) inaugural Congressional forum, held on May 7th. This landmark event was a resounding success, drawing attention from key stakeholders, including policymakers, healthcare professionals, and community leaders. The forum provided a crucial platform for discussing the pressing issue of health disparities related to gastric cancer in the United States. The insights and collaborations that emerged from this forum have set the stage for meaningful progress in our fight against this deadly disease. Building on this momentum, I am pleased to announce that SCTF's second Congressional forum is scheduled to take place on February 11, 2025. We anticipate this event to be equally impactful, continuing to drive the conversation forward and bringing us closer to our goal of eliminating health disparities in gastric cancer care.

In this issue, we are also honored to feature an exclusive interview with Dr. Youngmee Jee, the Director of the Korea Disease Control and Prevention Agency (KDCA). Dr. Jee's leadership at KDCA has been nothing short of extraordinary, particularly in the realms of COVID-19 response, viral hepatitis management, and broader public health initiatives. Her efforts have set a global benchmark for public health excellence, and we are delighted to highlight her achievements and insights. The work of KDCA under Dr. Jee's guidance serves as an inspiring example of how dedicated leadership and a commitment to public health can make a profound difference.

As always, we remain committed to bringing you the latest developments, expert opinions, and valuable resources in the medical field. We hope you find this issue both informative and inspiring as we continue to advance our shared mission of improving healthcare for all.
Thank you for your continued support.

Sincerely,
Chul Hyun, MD, PhD, MPH

From the Editor-in-Chief

Joseph P. McMenamin, MD, JD, FCLM
Editor in Chief
EVP, W Medical Strategy Group
Partner, Christian & Barton, LLP

Welcome to the August issue. We think you will enjoy it.

Our lead article, as usual, is an interview with a prominent health professional of Asian birth or heritage. Despite her hectic schedule, Youngmee Jee, MD, PhD, commissioner of the Korean CDC, former Director, Center for Infectious Disease Research, Korea National Institute of Health, Korea CDC, and former chair, Korean Society of Infectious Disease, graciously permitted us to interview her. Trained at Seoul National University, the London School of Hygiene & Tropical Medicine, and the University of London, Dr. Jee is a virologist. She discusses her role and philosophy at Korean CDC, and her ambition to make her agency a world leader, including by developing an independent mRNA vaccine by 2027. Dr. Jee describes her extensive experience in combating epidemics and pandemics around the world, often as member of or in collaboration with numerous prestigious international organizations. Among these are the WHO, particularly its Western Pacific Region, the Institut Pasteur, the International Vaccine Institute, and the Strategic Advisory Group of Experts for Immunization (SAGE). In keeping with this emphasis, Dr. Jee relates how KDCA collaborates with UK Health Security Agency, the US CDC and NIH, Denmark's Statens Serum Institut, the National Institute of Infectious Diseases Japan, the National Institute of Hygiene and Epidemiology Vietnam, the Research Institute for Tropical Medicine, and other partners. She discusses her first-hand experience with hepatitis in hemophiliacs, norovirus among students, tuberculosis, HIV, MERS, Covid-19, and other scourges, and reflects on the lessons Covid has taught. We are confident you will find her story inspirational.

We also offer Grace Ham's Special Report on Gastric Cancer Disparity, as considered and discussed at the 25th New York Health Forum. Despite the Forum's name, this event, at which Members of Congress spoke, was held in Washington, DC, under the leadership our friend Chul Hyun, MD, PhD. Attendance was so robust that there was “standing room only” at the site.

Finally, this issue features a Biopharmaceutical Report from Andri Buvailo, Ph.D. Dr. Buvailo is the Co-Founder and Director of BiopharmaTrend, “where tech meets bio.” Dr. Buvailo's interests include the application of artificial intelligence to drug discovery and biotech, among other subjects. His report analyzes “Biotech Trends to Watch: Reflecting on the First Half of 2024.”

WAMJ Recap of the Last Issue

Cover Story

Kyung Ryul Lee
CEO of the SCL Group, a Specialist in Laboratory Medicine

Dr. Kyoung Ryul Lee, CEO of SCL Group, was motivated by a lifelong desire to aid underserved communities and enhance diagnostic accuracy, which led him to specialize in laboratory medicine despite its lesser visibility in the 1980s. His business philosophy centers on evidence-based medicine and error-free diagnostics, which guided the establishment and growth of SCL into a leading medical platform with global aspirations, including recent expansions into Mongolia, China, and Indonesia. As an influential figure in laboratory medicine, Dr. Lee emphasizes the importance of adapting to new advancements, such as AI integration and personalized medicine, while addressing challenges like data security. His commitment extends to Yonsei University, where he aims to foster diversity, increase development funds, and promote interdisciplinary education, reflecting his broader vision for advancing global healthcare and medical research.

Special Report I

Innovation and Equity discussed at 24th New York Health Forum

The 24th New York Health Forum, held on March 28, 2024, at the Korea Society in New York City, focused on healthcare innovation and equity. Organized by W Medical Strategy Group, the event featured influential figures including Jamie Metzl, who highlighted the transformative impact of technology on healthcare, emphasizing AI, genomics, and digital health. The forum's sessions, moderated by Sabina Lee, covered investment trends, technological advances, and cross-border collaborations, with panelists from various sectors providing insights on driving growth and innovation. The forum also honored Kyoung Ryul Lee with the inaugural Health Equity Award for his dedication to equal healthcare access. Presentations by Levi Waldron and Chul S. Hyun further explored data science and ethnic disparities in healthcare. The event concluded with a look at W Medical Strategy Group's decade-long achievements in fostering healthcare collaboration between Korea and the US, reinforcing its role as a key player in advancing global health and wellness.

Healthcare Industry Report

FemTech Supports Women in the Workforce

FemTech, a rapidly growing sector addressing women's health issues through technology, offers innovative solutions ranging from menstrual health and fertility to menopause and behavioral health. Coined by Ida Tin in 2016, FemTech's market is projected to exceed $108 billion by 2032, driven by rising employer interest and adoption. Employers are increasingly integrating FemTech solutions to support women's health, enhance recruitment and retention, and create more inclusive workplaces. Notable examples include smart tampons, lactation support, and fertility treatments. This trend aligns with a broader push for holistic benefits that address unique female health needs and support work-life integration, reflecting a shift towards valuing and supporting women in the workforce.

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Inspirational Asian Healthcare Leader

Youngmee Jee, MD, PhD

Commissioner of Korea Disease Control and Prevention Agency

1. Tell us how you decided to pursue a career in medicine. How did you choose your specialty?

Many people ask how I chose medicine. I enjoyed science subjects in high school days and I saw medicine as a way to continue exploring science. My high school teachers strongly recommended going to medical school and I followed their advice. After graduating from medical school, I started basic research at the US NIH and continued my research in the field of medical microbiology and virology in the UK. The subject of my PhD dissertation was "hepatitis B virus cellular receptor" a topic I chose because hepatitis B remains a significant issue in Korea and other Asian countries. After obtaining my PhD in hepatitis B virology, I joined the Korea NIH in the Division of Hepatitis and Enteric Viruses where I worked on surveillance and laboratory testing of poliovirus and enterovirus. This role allowed me to collaborate with the WHO's Expanded Program on Immunization (EPI) in the Western Pacific Regional Office (WPRO). My familiarity with WPRO EPI provided an opportunity for my transition to WPRO in Manila, where I spent eight years working with over 20 countries in the region. In May of this year, I had the pleasure to join the celebration of the 50th Anniversary of EPI during the 77th World Health Assembly in Geneva. As Commissioner of KDCA, I need to oversee all public health areas but the immunization program remains particularly special to me.

2. With over 30 years of experience, undoubtedly, you've encountered significant challenges throughout your career. Could you share some of the most formidable obstacles you've faced and how you navigated through them?

Reflecting on my public health career, I have faced several key decisions, such as moving to the WHO Western Pacific Regional Office in Manila in 2007, returning to Korea CDC in 2014 and applying to be the CEO of the Institut Pasteur Korea in 2020. I was fortunate to have the full support of my family in making those decisions.

During my first 10 years in Korea NIH (1997-2007) and 5 years in the Korea Disease Control and Prevention Agency ("KCDC") (2014-2019), I dealt with outbreaks including hepatitis A among hemophilia patients, norovirus among students, MERS in 2015 and hepatitis C in 2015-2016. These challenges strengthened our teamwork and our collaboration with experts in Korea and public health partners, including WHO.

As Commissioner since December 19, 2022, my greatest challenge has been transitioning daily life from the COVID-19 crisis in early 2023. KDCA efficiently managed this transition by collaborating with other ministries, expert groups and committees through the whole-of-government and whole-of-society approach established during COVID-19.

Each outbreak taught us valuable lessons to strengthen preparedness and response capacities for public health crises related to infectious diseases. Especially, our painful experience with the 2015 MERS outbreak in 2015 led to significant improvements in national preparedness and response infrastructure. During the COVID-19 outbreak, KCDC was transitioned to KDCA, strengthening implementation roles in disease control and prevention. I attribute our successes to teamwork, close collaboration with expert groups and data-driven decision making.

3. What are the guiding principles of KDCA, and what is your philosophy behind healthcare policymaking?

Since becoming Commissioner, I have always emphasized "Communication and Collaboration" as core KDCA values. I encouraged all members to engage with expert groups and stakeholders, listen, provide feedback and act proactively. I strive to communicate with KDCA members at all levels as well as key public health partners, scientific communities and media.

Various task force teams including ones for health zoonotic diseases and antimicrobial resistance, tuberculosis, viral hepatitis, HIV and clinical cohorts were formed to share progress and plans regularly.

Recognizing the importance of scientific evidence in public health policies, I created the Department of Science and Data Analysis under my direct leadership in June this year to produce evidence for policymaking. Scientific conferences and forums are also organized to generate timely evidence linking science to policy.

The importance of regional and global cooperation became evident during recent outbreaks such as MERS and COVID-19. As a leading Organization for Economic Cooperation and Development ("OECD") country in public health, the Korean government established the Global Health Security Coordination Office ("GHSCO") in December 2023 to share the responsibilities in health emergencies. GHSCO held its first core personnel training course for public health in June, inviting public health staff from the Association of Southeast Asian Nations("ASEAN") countries. This initiative aims to enhance public health capacities and prepare for emerging infectious diseases.

4. What are KDCA's key priorities in enhancing the infectious disease response system in South Korea vs. internationally? How do you assess the COVID-19 pandemic and its impact on public health? Any lessons from your experience of managing the pandemic?

After the MERS outbreak in 2015, Korea rebuilt itself the national system and infrastructure for emerging infectious disease response, establishing the emergency operation center, the laboratory diagnosis and analysis center, and the risk communication team.

In responding to new emerging infectious diseases, early detection is crucial to containing viruses and preventing community transmission through testing, tracing and treatment("3T"). This national system and infrastructure rebuilt after the MERS outbreak were instrumental during the early phase of the COVID 19 outbreak in 2020. In particular, the newly established Laboratory Diagnosis and Analysis Center immediately acted to set up the COVID-19 laboratory testing for both public and private sectors by early February 2020, well before WHO declared the COVID pandemic on March 11, 2020.

Korea's early testing efforts and actions minimized community transmission. Almost all COVID-19 cases occurred during the phase of the Omicron variants, which had a much lower mortality rate than the original strain after much of the population was vaccinated with COVID-19 vaccines. Until August 31, 2023, around 35 million cases and 35,000 deaths (0.1% mortality rate, one of the lowest in the world) were officially reported.

Transparency and communication were key to our COVID-19 response. The government provided daily briefings to the public.

The government introduced special entry procedures for travelers, avoiding a complete lockdown, and provided free testing, therapeutics, vaccines, hospitalization cost, sickness benefits and compensation for small businesses. A majority of health care services and program, including immunization, treatment of non-communicable diseases and various health surveys were not so affected.

Five key lessons from COVID-19 include: Strengthening international cooperation, prioritizing vulnerable populations, ensuring equitable access to response measures, maintaining healthcare capacity, and

Dr. Jee presents her keynote speech at the 1st World Health City Forum.

sustaining and scaling up investments. Establishing a collaborative network with WHO and regional collaboration mechanisms are essential for pandemic preparedness. Protecting vulnerable populations should be at the core of pandemic preparedness.

While international cooperation was crucial to bring the pandemic to an early end, the early stages of COVID-19 revealed nationalism-driven competition for vaccines and medical countermeasures. This underscores the need for a globally concerted response, ensuring more equitable access to vaccines, treatments, diagnostics, and other medical countermeasures.

Based on the lessons learned from COVID-19, KDCA established the National Pandemic Preparedness and Response Plan in May 2023 with three goals: securing essential medical countermeasures including vaccines and therapeutics within 100 or 200 days; strengthening and maintaining high-level response capacity for sustainable pandemic management (medical capacity to accommodate 1 million cases per day), and prioritizing vulnerable populations. In addition, we are also preparing for human infection with highly pathogenic avian influenza.

The COVID-19 crisis taught us that no country is safe until all countries are prepared. On the last day of the 77th World Health Assembly 2024, all member states agreed on the International Health Regulation (IHR) amendment affirming our shared responsibilities for global health emergencies. This historic IHR amendment will take effect in one year and all member states should be prepared to implement it.

5. You've mentioned KDCA's goal of developing an independent mRNA vaccine by 2027. Give us an overview of the mRNA vaccine development process currently underway and its potential global impact.

Dr. Jee support clinical trials at SK Bioscience Research Institute.

Securing an mRNA vaccine platform is a critical pillar of our national pandemic preparedness and response plan. KDCA is preparing a national mRNA vaccine project to support up to phase 3 clinical trials to develop our own COVID-19 mRNA vaccine by 2028. In the first half of 2024, KDCA closely communicated with industry partners to understand the current level of mRNA vaccine technology in Korea. We aim to finalize the mRNA vaccine project plan in the second half of 2024 and hope to initiate it within 2024.

With government support, Japan developed 3 mRNA vaccines during COVID-19 through the Strategic Center of Biomedical Advanced Vaccine Research and Development for Preparedness and Response ("SCARDA"). China also developed its own mRNA vaccine. Securing mRNA vaccine platform would be is essential not only for COVID-19 and other infectious diseases but also for cancer treatment and beyond.

Globally, many countries including those in the Global South are working to build their own manufacturing capabilities. The Korean government has supported low-and middle-inocme countries ("LMICs") in building manufacturing capacity for vaccines and medicines since 2022.

Once we successfully develop our own mRNA vaccines by 2028, Korea will be better positioned to support LMICs's mRNA production, contributing to global public health.

6. Do you have plans to scale KDCA research and policies beyond South Korea? Explain your vision for strengthening global collaborations.

KDCA's core function is to create and analyze scientific data to inform policies. I recently established the Department of Science and Data to focus on linking data to policies. We collaborate closely with the UK Health Security Agency and the US CDC on disease modelling and surveillance. We send experts to WHO HQ, WPRO and US CDC in health emergencies. We are also working on designating WHO collaborating centers for health emergencies and NCD surveillance.

Within KDCA, Korea NIH specializes in public health research and strengthening collaborations with US NIH, Denmark's Statens Serum Institut, the National Institute of Infectious Diseases ("NIID") Japan, the National Institute of Hygiene and Epidemiology ("NIHE") Vietnam, the Research Institute fo Tropical Meidicine ("RITM") Philippines and WHO through joint research and establishing research hubs. Korea NIH hosts one WHO Collaborating Center for One Health antimicobial resistance ("AMR") research, supporting AMR capacity building in the region including Mongolia.
Through our leadership in WHO-led international healthcare governance, we strive to boost collaboration across fields and sectors to improve global health, respond to pandemics and create a One Health ecosystem.

7. How is South Korea working with the World Health Organization (WHO) to eliminate viral hepatitis?

Korea is exemplary in controlling hepatitis B with the introduction of universal hepatitis B vaccination in 1995 and the prevention of mother-to-infant transmission program in 2002. WHO Western Pacific Region validated Korea for hepatitis B elimination in 2008 based on HBsAg seroprevalence data. For controlling and eliminating hepatitis C, a pilot study of temporarily including hepatitis C antibody testing in the National Health Screening for 56 year-olds was conducted in 2020.

To eliminate viral hepatitis B & C, KDCA announced the 1st National Strategic Plan for Viral Hepatitis B and C in 2023. This plan focuses on establishing a comprehensive hepatitis management system throughout all stages (prevention-diagnosis-treatment), consisting of four core strategies to be implemented over the next five years to eradicate viral hepatitis in Korea. This plan also covers how we can address high risk groups in collaboration with other ministries and agencies.

Based on a hepatitis C ("HCV") pilot study conducted in 2020, Korea will introduce hepatitis C antibody testing in the National Health Screening for the 56 year-old population within this year. KDCA is working closely with the WHO Western Pacific Region to eliminate viral hepatitis by 2030. As an advisory committee member of regional validation on elimination of mother-to-child transmission of HIV, hepatitis B and syphilis in the Western Pacific Region, I provide support to other member states in the region.

During a UN high level organized by the Coalition for Global Hepatitis Elimniation in September 2023, I participated in a side event of UN Group of Friends to Eliminate Viral Hepatitis. I attended to reaffirm Korea's commitment to accelerating the effort to fight viral hepatitis by collaborating with WHOm, other global health partners, and other member states to eliminate viral hepatitis by 2030.

8. How would you like to see the Agency grow and evolve in the future?

KDCA is Korea's central public health agency specializing in scientific evidence-based public health management and healthcare research and development(R&D). We are committed to generating robust evidence and implementing evidence-based policies to protect people from infectious diseases

Dr. Jee presents at a meeting of Central Disaster and Safety Countermeasures Control Headquarters

and various health threats including climate change, and to reduce the national disease burden of chronic diseases. This year, we launched a big data platform to integrate infectious disease information, share that information with the public, and facilitate related research.

I believe Korea now has responsibilities to support the Global South. One of my primary goals during my service at KDCA is to actively engage and lead a global health agenda, including pandemic preparedness and a response plan, and fighting antimicrobial resistance, viral hepatitis and tuberculosis.

During the COVID-19 pandemic, Korea was recognized as one of the most successful countries in managing the crisis. Over the past few years, KDCA has increasingly communicated and collaborated to share our experience with other countries including the UK, Singapore, Mongolia, Laos, Philippines, and Vietnam as well as global health partners such as WHO, UNICEF, Global Fund, Gavi, Unitaids, Africa CDC, ASEAN, the Asian Development Bank and the US CDC. KDCA is leading some Official Development Assistance ("ODA") projects to strengthen public health capacities in Laos and Mongolia and collaborating with ASEAN and the Africa CDC. KDCA will continue to increase Official Development Assistance ("ODA") activities through the operation of the Global Health Security Coordination Office ("GHSCO").

One of GHSCO's priorities is communicating with Global Health Security Agenda (GHSA) member states to identify public health areas needing improvement using 19 evaluation tools from WHO's Joint External Evaluation (JEE). GHSCO completed its

first pilot project, a core personnel training course for public health officers from 4 ASEAN counties on July 1. Based on feedback from the participants, GHSCO will offer other need-based intensive core personnel training courses to enhance public health capacities and make full efforts to facilitate collaborative endeavors on infectious diseases to promote global health.

I hope that KDCA will evolve into a globally recognized health agency that actively collaborates with countries of the Global South in partnership with international organization and major global health partners.

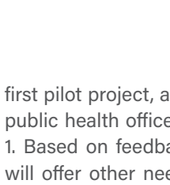
9. What are some of the merits of pursuing a career in public health? Why is it important to expand and nurture the next generation of healthcare practitioners in the public sector?

Among many paths in public health, being a KDCA member can provide exceptional opportunities to shape and implement national policies while working closely with international organizations including WHO. KDCA members are deeply involved in creating science-based evidence and developing health policies addressing infectious diseases, chronic diseases and various health threats at the national level.

As a KCDC member, I collaborated with the WHO Western Pacific Region to establish AFP surveillance, laboratory testing and analysis for polio in Korea with the aim of achieving global polio eradication from 1997 to 2007. My experience with networking and collaborating with local public health institutes was invaluable for my work in the Expanded Program on Immunization in the WHO Western Pacific region where coordinating and collaborating with member states is a major responsibility.

I hope many young healthcare practitioners will be inspired to shape and implement health policies that impact healthcare practice. KDCA offers numerous opportunities to become public health experts and to make a significant contribution to public health.

Through our leadership in WHO-led international healthcare governance, we strive to boost collaboration across fields and sectors to improve global health, respond to pandemics and create a One Health ecosystem.



Youngmee Jee, MD, PhD
Commissioner of Korea Disease Control and Prevention Agency

Youngmee Jee, MD, PhD is Special Representative for Health Diplomacy, Korea Foundation and a Visiting Professor at the Graduate School of Public Administration, Seoul National University. Dr Jee has broad experience in collaborating with WHO and international public health partners. Currently, she is a member of the WHO International Health Regulation Emergency Committee on COVID-19 and of the WHO Scientific Advisory Group for the Blueprint on Research and Development Preparedness for Epidemics. From 2014 to 2019, she served as Director-General of the Center for Infectious Disease Research of the Korea Centers for Disease Control and headed the KNIH as Acting Director between January and October 2019. During the MERS-CoV outbreak in 2015, Dr. Jee was a member of the WHO-Korea Joint Mission on MERS-CoV Outbreak in the Republic of Korea, and in 2017 was assigned the role of the National Lead for the WHO IHR Joint External Evaluation (JEE) of the Republic of Korea's Public Health Emergency Preparedness and Response. She received a President Medal of Distinguished Service in 2017. She has served as a member of various national and international advisory committees, including the WHO Strategic Advisory Group of Experts (SAGE) on Immunization and is currently a member of WHO SAGE Measles Rubella Working Group and of Hepatitis B Expert Resource Panel in the WHO Western Pacific Region. During 2007-2014, Dr Jee worked for the Expanded Programme on Immunization in the WHO Western Pacific Region. She received her M.D. from Seoul National University Medical School (1986), a Diploma in Medical Microbiology (1988) and her Ph.D. in Virology from the University of London (1997).

SPECIAL REPORT

Gastric Cancer Disparity discussed at 25th New York Health Forum

BIOPHARMA REPORT

Biotech Trends to Watch: Reflecting on the First Half of 2024

SPECIAL REPORT I

Gastric Cancer Disparity discussed at 25th New York Health Forum

BY **GRACE HAM**

On May 7th, 2024, the 25th conference of the New York Health Forum brought together advocates across the nation to address a pressing and severely overlooked issue in healthcare: the disparity and inequity of gastric cancer care in the United States. With representatives from patient advocates, physicians, and policymakers converging at the Capitol Building in Washington DC, this historic event united voices from various fields to spotlight and tackle the inequities that bar the diagnosis and treatment of gastric cancer among racial and ethnic minorities. Organized by the W Medical Strategy Group and the New York Health Forum, the event showcased powerful testimonies, illuminating presentations, and endorsements from Congress Members Young Kim (R-CA), Andy Kim (D-NJ), and Wiley Nickel (D-NC). The forum attendees were also met with a special visit from Congresswoman Young Kim, the representative for California's 40th District, who expressed her support for increasing access to screening and early detection within high-risk populations.

Beginning the day of conversation, Dr. Joseph McMenamin, an experienced health law attorney and former emergency physician, welcomed attendees to the Capitol and kickstarted the series of speaker sessions by introducing Dr. Chul Hyun, Chairman of the New York Health Forum and President of the Stomach Cancer Task Force, to deliver a few remarks. As a leading figure in spearheading a national initiative to address this pressing issue, Dr. Hyun spoke about the disproportionate rates of stomach cancer cases that occur among Asian and Hispanic Americans, with an incidence gap as much as 14.5 times higher in Korean Americans than non-Hispanic Whites. The five-year survival rate of stomach cancer in the United States remains dismally low at 33% and exhibits a significantly lower level of funding for stomach cancer research. Despite clear research depicting alarming statistics and cost-effective preventative methods, there remains no structured system in the United States to screen stomach cancer in high-risk populations. Expounding on this disparity, Dr. Hyun expressed the forum's intent to urge policymakers to make national change and develop methods to implement screening guidelines for stomach cancer in high-risk populations.

The first presentation of the day began with Dr. John Marshall, the Physician Executive Director of MedStar Washington DC, who spoke about his research on the "Impact of Precision Medicine on Gastric Cancer." Dr. Marshall is an avid advocate and globally recognized expert in new drug development for gastrointestinal cancer, contributing to his immense expertise in precision medicine. By making cancer care more accessible for the global community and optimizing therapeutic decisions, Dr. Marshall has expressed his hope for future biomarker discovery and improvements in technology, including using artificial intelligence learning to drive innovation and growth for cancer treatment.

With a focus on equipping advocates with resources and impactful stories, the second speaker session highlighted the efforts of the 2nd Stomach Cancer Patient Empowerment Summit hosted by Hope for Stomach Cancer that took place over the previous two days in Arlington, VA. With a special partnership between the Stomach Cancer Task Force and Hope for Stomach Cancer, the summit was met with immense success in bringing together a passionate group of patients, patient advocates, and researchers, including a representative team from the National Cancer Institute, to provide education and awareness to patients and caregivers. The enlightening conversations that took place during the summit carried on to the forum with a special speaker session from Aki Smith, the Founder and Director of Hope for Stomach Cancer, and Dr. Mahathi Vojjala, a gastric cancer stage 2 survivor and epidemiologist. Through the speaker session, Aki Smith shared her experience of caring for her father, a Stage IV gastric cancer survivor, and her own experience with battling an H. pylori infection. Dr. Vojjala combined her personal experience and academic expertise to evoke powerful emotions with her touching and insightful story that described her brave and extensive fight with the diagnosis and treatment of Stage II gastric cancer. She spoke about the barriers to screening for H. pylori and the urgency for establishing national guidelines to advocate for those who have suffered like she has experienced. Aki and Dr. Vojjala's personal and inspirational presentations combined with the learnings from the patient empowerment summit served as a large step in advancing the mission of the Stomach Cancer Task Force in developing stomach cancer campaigns across the nation. As the SCTF continues these collaborations and participation in advocacy and awareness programs, national guidelines to address this disparity will soon become a reality.

As the last speaker of the forum, Dr. Mukyung Hong, a gastroenterologist from Fair Oaks Hospital, shared his

US Representative of Young Kim and Dr. Hyun deliver their speech at the 25th New York Health Forum

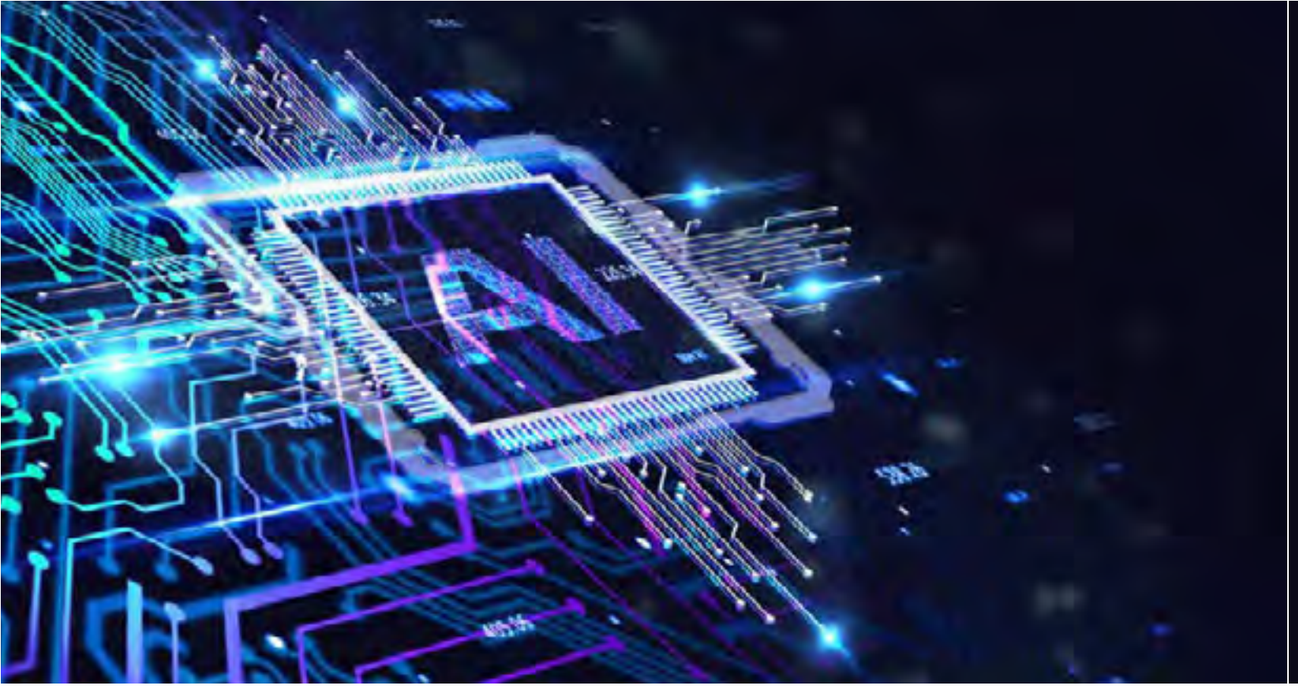
research on gastric cancer and his current practices as an attending physician in Virginia. By sharing shocking statistics of gastric cancer rates specifically for Korean Americans, Dr. Hong emphasized early screening for high-risk populations, which has led to his high-detection rates of stomach cancer among minority groups. Following his speaker session, collaborative discussions progressed as attendees expressed interest in further understanding his research and how to implement successful advocacy efforts. By having an open discussion, many patient and expert attendees further enriched the dialogue by fostering an insightful and fruitful conversation that touched on unique and all-encompassing perspectives.

By creating a meaningful space in the nation's capital to hold influential speaker sessions and collaborative discussions, the forum and the summit brought together those who share the journey of working towards a more equitable, patient-centered, and hopeful future for racial and ethnic minority groups who suffer from lack of guidelines and resources when battling gastric cancer. As the mission of these three days of advocacy and education continues to live on through further research and conversations, it is no doubt that leaders and advocates will continue to unite and advance the health and wellness for minority groups disproportionately affected by gastric cancer.

Grace Ham, MSc

Master of Science Graduate, Harvard Medical School

Grace received her Master of Science in Media, Medicine, and Health (SM-MMH) at the Harvard Medical School, specializing in multidisciplinary storytelling focused on health interventions. She created a short film that showcased the barriers to national screening for H. pylori and stomach cancer and the health disparity among minority groups in the United States. She also has experience with advocacy for Asian American health, and her main interests lie in bridging the gap in health disparities for ethnic minorities and increasing access to healthcare globally.



Biotech Trends to Watch: Reflecting on the First Half of 2024

BY **ANDRIL BUVAILO**

If we talk about tech advances in pharma and biotech, the year 2024 has been a blast so far!

Last December I compiled a list of 11 Biopharma Trends to Watch in 2024 and I must say, the actual industry developments in all these areas in the first half of 2024 exceeded my expectations. Both in terms of scientific breakthroughs, and in business activity and financing dynamics (except stock markets which are weird in bio space, as usual).

Now, I've decided to review where we stand with some of the trends from my Christmas list half a year later, but today I am mostly focusing on the new trends that I picked to expand the list. So, it would still be relevant to check 11 Biopharma Trends to Watch in 2024 for the complete picture.

2024 is increasingly looking like a potential record breaker when it comes to VC dealmaking, with only the top 50 funding rounds approaching $9 billion (data from a table published by Endpoints News).

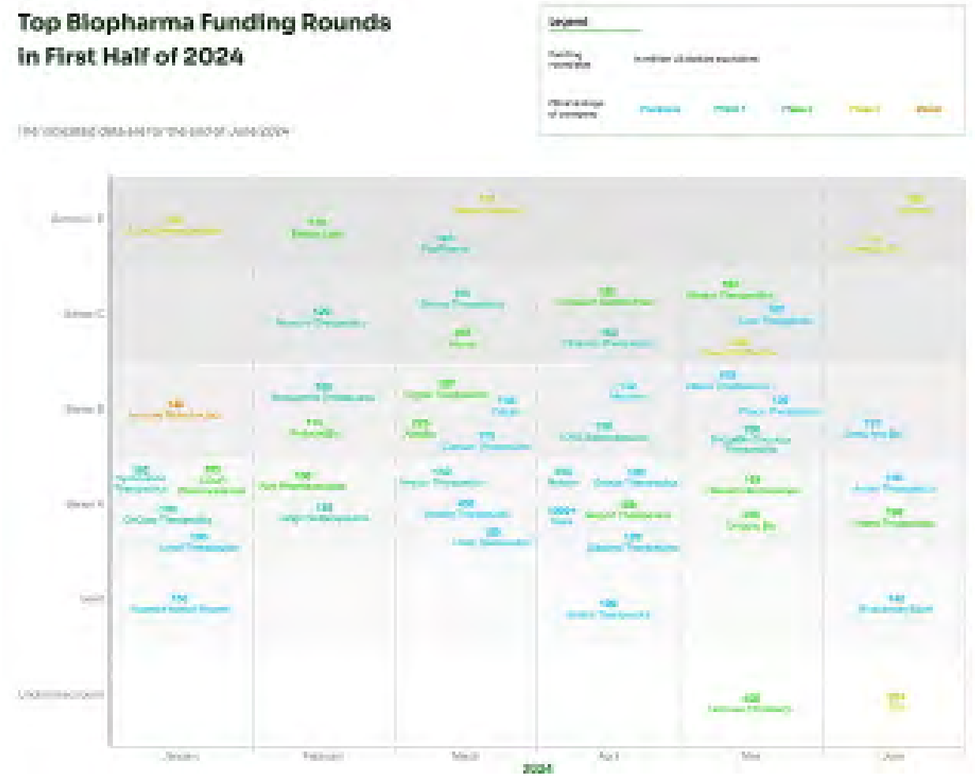
Organoid Intelligence

In February 2023, scientists founded a new field: "organoid intelligence" (OI), which I consider one of the potentially most impactful ideas in the biological sciences—for the better or worse.

Led by Dr. Thomas Hartung in the U.S., they are developing biocomputers using brain organoids—lab-grown tissues mimicking organ functions—from human stem cells.

These brain organoids, though not structurally identical to human brains, exhibit neuron-like functions and are envisioned to surpass the computational efficiency of supercomputers, offering novel approaches to pharmaceutical testing and insights into brain functioning.

The field confronts technological challenges like scaling up organoids and developing brain-computer interfaces for data exchange. It also confronts ethical considerations regarding the potential consciousness and rights of these organoids, necessitating a rigorous and inclusive ethical framework for development.



This year we have seen progress by a Swiss biotech startup FinalSpark, which introduced the world's first bioprocessor using 16 human brain organoids.

The platform utilizes four Multi-Electrode Arrays (MEAs) housing the living tissue – 3D cell masses of brain tissue (organoids). Each MEA holds four organoids, interfaced by eight electrodes for both stimulation and recording. Data is transferred via digital analog converters (Intan RHS 32 controller) with a 30kHz sampling frequency and a 16-bit resolution.

In 2023, researchers from Indiana University Bloomington connected their "Brainoware" architecture to an AI tool, and recently, scientists from Tianjin University in China have taken this a step further by creating a robot named MetaBOC with "organoid intelligence" (OI), capable of obstacle avoidance, tracking, and grasping.

The brain-computer interface on a chip technology uses in vitro cultured brain organoids coupled with electrode chips for information interaction through encoding, decoding, and stimulation-feedback, as described by Tianjin University's Ming Dong. Although brain-powered robots are still a far-future concept, these organoids could help individuals with neurological conditions by potentially being grafted onto living brain tissue to stimulate neuron growth.

The successes in the field of organoid intelligence are closely dependant on the technological advances in the most vulnerable part of the tech stack: brain computer interfaces, the next item on our list of trends.

Brain Computer Interfaces

Advances in brain computer interface (BCI) technologies are striking, and it is not just Neuralink! Although I would say, the progress of Neuralink is setting the pace for the entire field, with their plans to equip a second patient with the BCI device.

If you would like a high-level but very insightful intro into the field of invasive and non-invasive BCIs, watch my recent interview with Dr. Brian Jamieson, a former NASA engineer turned neuroscience innovator and the founder and CTO of Diagnostic Biochips, a US-based medical devices company: Ex-NASA Expert Unveils Everything You Need to Know About Brain-Computer Interfaces

Invasive BCI technology, led by companies like Neuralink and Blackrock Neurotech, involves surgically implanting electrodes into the brain to capture high-resolution neural signals, providing precise brain-device communication but facing challenges such as infection risks and surgical complexity.

On the other hand, non-invasive BCIs, developed by companies like Kernel, Neurable, BrainCo, Emotiv, and MindMaze, utilize external sensors like EEG and fNIRS to detect neural activity, offering safer and more accessible solutions albeit with lower signal resolution.

Interestingly, China is planning to create a Brain-Computer Interface (BCI) standardization technical committee under the Ministry of Industry and Information Technology (MIIT) to guide industrial standards and promote domestic innovation. This committee aims to develop a BCI standards roadmap and enhance the research and development of key technologies, bolstering China's BCI industry through policy support, financial investment, and the cultivation of domestic and foreign talent. So, are we witnessing the start of a new global tech race?

Gen AI' and Foundation Models are (Still) on the Rise

As I outlined in '11 Biopharma Trends to Watch in 2024', 2023 was a mixed year for AI in drug discovery. Some notable advancements, including generative AI-enabled successes by Insilico Medicine, were opposed by a number of clinical trial setbacks for AI-inspired drug candidates by other companies, a bit of a cold shower for the AI community.

You may want to check a detailed report by BiopharmaTrend, It's Been a Decade of AI in the Drug Discovery Race. What's Next?, if you want to go deeper into pipelines of various companies.

But in general, the media headlines of the first half of 2024 were mostly dominated by the topic of gen AI applications in protein design (e.g. antibodies), and by various companies trying to build large scale general-purpose models for biology, aka 'foundation models'.

Their scalability in terms of both model size and data volume enables them to capture intricate patterns and dependencies within the data. The pre-training phase of foundation models imparts them with a broad knowledge base, making them highly efficient in few-shot or zero-shot learning scenarios where minimal labeled data is available for specific tasks.

Such companies as Recursion Pharmaceuticals, Bioptimus, Deep Genomics, Ginkgo Bioworks, BioMap, Terray Therapeutics and many others are building foundation models for everything from omics to digital pathology. Read 14 Foundation Models for Biology Research and Chemistry for dive a little deeper.

Another major trend in the AI space is the increasing activity of 'big tech' companies, like NVIDIA, Google and others. The numbers of pharma and biotech partnerships with big tech are skyrocketing, while companies such as NVIDIA aim for becoming de facto providers of AI infrastructure for drug discovery and biotech: NVIDIA expands BioNeMo platform with new foundation models and microservices for AI-powered Drug Discovery

But we have to be cautious about gen AI, in general. There are known issues, and the future of this trend is vague due too enourmous costs needed to implement technology at scale. For instance, here is a quite surprising report by Goldman Sachs "Gen AI: Too Much Spend, Too Little Benefit?" which casts shadows on the overly excited market.

In Pursuite of Macrocyclic Peptides

Macrocyclic peptides are superior to small molecules and biologics because they effectively bridge the gap between these two drug classes by offering the high selectivity and potency typical of biologics, while also maintaining the cell permeability and oral bioavailability characteristic of small molecules.
The field of macrocycle drug discovery is rapidly advancing, propelled by cutting-edge technologies and innovative approaches from companies like Unnatural Products, Orbis Medicines, Circle Pharma, Insamo, Nimble Therapeutics and others.

Some further reading: The Rise of Cyclic Peptides: Bridging the Gap in Modern Medicine

A Booming Weight-Loss Drug Discovery Landscape at a Glance

In 1986, Danish scientist Jens Juul Holst discovered that the gut hormone GLP-1 stimulates insulin and suppresses appetite. This research led to the development of two blockbuster weight-loss drugs: Wegovy by Novo Nordisk and Zepbound by Eli Lilly, now prescribed to millions as obesity affects 1 in 8 people globally.

Since Wegovy's 2021 launch and Zepbound's approval five months ago, Novo Nordisk and Eli Lilly are leading the next generation of weight-loss drugs, targeting a market projected to reach $150bn by 2030. Currently, 232 anti-obesity drugs are in development, with the most advanced utilizing GLP-1 combined with other hormones.

Novo Nordisk and Eli Lilly, who initially received approval for GLP-1 treatments for diabetes in 2005 and 2010, respectively, are now advancing five new weight-loss drugs in phase 3 trials. Novo Nordisk's CagriSema, targeting over 20% weight loss, and Eli Lilly's retatrutide, showing a 24% weight reduction in early trials, are notable candidates.
Novo Nordisk is also developing amycretin, a promising pill combining GLP-1 and amylin. Analysts like Emily Field from Barclays note these companies continually set higher standards.

Read an overview of this space in our recent newsletter: A Booming Weight-Loss Drug Discovery Landscape at a Glance

A Bang Year for Cell and Gene Therapies

2024 is on track to be a notable year for cell and gene therapy approvals with 6 therapies having scored the approvals since the beginning of the year till now (July).

The FDA has recently approved ELEVIDYS, a gene therapy developed by Sarepta Therapeutics, for Duchenne Muscular Dystrophy (DMD) patients aged 4 and older. This approval marks a significant milestone in the treatment of DMD.

In April, Pfizer has received FDA approval for Beqvez, a hemophilia B gene therapy, and will charge $3.5 million per dose, matching the price of CSL and uniQure's Hemgenix. The treatment aims to reduce the need for frequent and costly intravenous transfusions, offering significant potential long-term healthcare savings. Pfizer will also offer a warranty program to provide financial protections against efficacy failure.

Earlier in March, U.S. FDA approved Bristol Myers Squibb's Breyanzi ® as the first and only CAR T cell therapy for adults with relapsed or refractory chronic lymphocytic leukemia (CLL) or small lymphocytic lymphoma (SLL).

FDA also approved BMS and J&J CAR-T Cell Therapies for the Earlier Treatment of Multiple Myeloma, and so on (write in the comments if you want me cover this topic in more details).

Looking ahead, 7 more approvals are anticipated within the next six months. This indicates a period of rapid advancement in the cell and gene therapy field. Regulatory approval does not immediately translate into therapies accessible to patients.

It is important to note that regulatory approval is only the initial step. Following approval, several key processes must be addressed, including patient logistics, new medical coverage policies, logistics for treatment delivery, development of new treatment protocols etc.

Radiopharmaceuticals are a Growing Category (with Challenges)

Drug makers have developed some radiopharmaceuticals over the past several decades. Most of them did not reach commercial goals and were eventually shelved.

But the market for radiopharmaceuticals is on the rise now. There are now more than 70 radiopharmaceutical startups in the U.S. alone, approaching a critical mass.

Amidst the growing trend, the radiopharmaceutical sector faces significant supply chain difficulties, with limited global suppliers for Ac225. This has led to heightened demand and competition for securing isotope supplies.

A Growing Race to Change Status Quo in the Lucrative NGS Market

The next-generation sequencing (NGS) industry is entering an exciting phase, marked by a surge of innovations and competitive dynamics. Over the past three years, several companies have introduced groundbreaking sequencing technologies, challenging the long-standing dominance of Illumina. As we move through 2024, it will be fascinating to see how customers respond to these emerging alternatives.

For instance, Element Biosciences has raised over $277 million in a Series D funding round to further develop and commercialize its DNA sequencing and multi-omics technologies.

The new capital will support the expansion of Element Biosciences' global customer base and the advancement of its technological offerings. Central to these efforts is the AVITI™ benchtop DNA sequencer, which has been rapidly adopted since its release. Additionally, the company plans to launch AVITI24™, an instrument designed to integrate sequencing with cyto-profiling. This technology allows for the simultaneous examination of DNA, RNA, proteins, phosphoproteins, and cell structure within single cells, offering researchers comprehensive insights into biological systems.

PacBio, another major player, introduced the Onso benchtop short-read sequencing platform in October 2022. Recently, PacBio launched the HiFi Prep Kit 96 and HiFi Plex Prep Kit 96, which streamline long-read sequencing workflows, reduce costs by 40%, and cut preparation time by 60%. These kits support running 1,536 samples in a single Revio run. PacBio's revenue for 2023 surged by 56% to $200.521 million, though the company still reported a net loss of $306.735 million.

Singular Genomics, a relative newcomer, rolled out the G4 Sequencing Platform in late 2021 and recently upgraded it to the G4X™ Spatial Sequencer. This high-throughput platform supports simultaneous direct RNA sequencing, targeted transcriptomics, proteomics, and fluorescent analysis from formalin-fixed, paraffin-embedded tissues. The new F4 Flow Cell aims to double the sequencer's run output, providing 600 million to 800 million paired reads per flow cell.

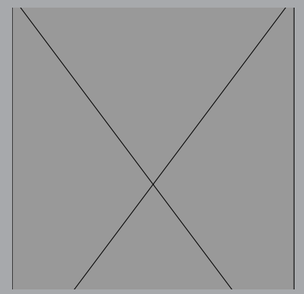
MGI Tech, through its U.S. subsidiary Complete Genomics, has also made headlines. Eurofins Genomics ordered MGI's DNBSEQ-T20×2 (T20) ultra-high throughput sequencer, which is designed to reduce sequencing costs to below $100 per genome. MGI Tech ended 2023 with a net loss of RMB 597.1 million, influenced by China's sluggish economy.

Oxford Nanopore Technologies introduced the PromethION 2 Integrated (P2i) device, facilitating real-time base calling and post-run analysis within the device itself. The company has achieved a record median simplex single molecule accuracy of Q28 (99.8%). Despite a net loss of £154.5 million in 2023, Oxford Nanopore saw underlying revenue grow by 39%, reaching £149.7 million.

Thermo Fisher Scientific continues to innovate within the NGS market under the Ion Torrent brand. The company launched new tools for preimplantation genetic testing-aneuploidy (PGT-A) and cancer testing. Thermo Fisher's sequencing business, part of its Life Sciences Solutions segment, generated $9.977 billion of the company's $42.86 billion revenue in 2023.

Ultima Genomics has introduced the UG 100 system, featuring an ultra-high-throughput sequencing architecture with an open silicon wafer and 24/7 run automation. The UG 100 aims to break the $100 genome barrier, offering high accuracy for various applications, including somatic and rare event detection. Ultima raised approximately $600 million upon emerging from stealth in 2022.

The sequencing industry also includes key providers of workflow solutions. **Agilent Technologies** focuses on sample preparation chemistries and quality control for NGS samples, with its genomics business valued at $500 million. **QIAGEN**'s Genomics/NGS business grew by 6% in 2023, reaching $239 million. **Roche**, investing significantly in sequencing, saw its Diagnostics Division generate CHF 14.1 billion ($16.1 billion) in revenue last



Andri Buvailo, Ph.D.

Co-Founder, Director, BiopharmaTrend

Andrii Buvailo is a pharmaceutical industry analyst and writer, focusing on emerging companies (startups), technologies and trends in drug discovery, and R&D outsourcing. He received a master's degree in Inorganic Chemistry and a PhD in Physical Chemistry from Kyiv National Taras Shevchenko University. His articles were published on Forbes.com, and market research reports were referenced by some of the leading life science organizations. He also participated in numerous scientific projects in Ukraine, Belgium, Germany, and the United States (DAAD, Horizon 2020, NATO, CRDF grants), and published in high-impact research journals.

Conference Alert

North America

American Psychological Association Annual Convention

August 8 - 10, 2024 | Washington, D.C.

Website: https://convention.apa.org/

The APA Annual Convention is the largest gathering of psychologists and mental health professionals, drawing over 12,000 attendees annually. This event provides a platform for learning about the latest psychological research, innovative practices, and important advocacy issues. It includes keynote addresses, symposiums, poster sessions, and workshops.

RSNA Annual Meeting

December 1 - 5, 2024 | McCormick Place, Chicago, Illinois

Website: https://www.rsna.org/annual-meeting

The Radiological Society of North America (RSNA) Annual Meeting is a premier event for the medical imaging community. It attracts over 50,000 professionals from around the world to share and discover the latest advancements in radiology. The event features extensive educational programming, technical exhibitions, and networking opportunities.

Europe

European Society of Cardiology Congress

August 30 - September 2, 2024 | London, United Kingdom

Website: https://www.escardio.org/Congresses-%26-Events/ESC-Congress

The ESC Congress is the world's largest cardiovascular event, gathering over 35,000 cardiology professionals. The congress presents the latest scientific breakthroughs and provides comprehensive educational sessions, including hands-on tutorials, case-based learning, and state-of-the-art reviews.

European Society for Medical Oncology Congress

September 13 - 17, 2024 | Madrid, Spain

Website: https://www.esmo.org/meetings/esmo-congress-2024

The ESMO Congress is a key event for oncology professionals, offering a global platform for discussing the latest advancements in cancer treatment and research. Attendees can participate in scientific sessions, poster presentations, and networking events to exchange ideas and foster collaborations.

Asia

Asia Pacific Dental Congress

May 2 - 5, 2024 | Taipei, Taiwan

Website: https://www.45thapdc-2024.org.tw/index

The APDC brings together dental professionals from across the Asia-Pacific region to share knowledge and advancements in dental practice. The congress features keynote speeches, workshops, and exhibitions, providing a comprehensive overview of the latest dental technologies and research.

Asia Pacific Stroke Conference

September 25 - 28, 2024 | Adelaide, Australia

Website: https://www.apsc2024.org/

The Asia Pacific Stroke Conference is a premier event dedicated to the study and treatment of stroke. The conference offers a platform for healthcare professionals, researchers, and policy makers to discuss the latest research, clinical practices, and strategies for stroke prevention and management.

Latest Healthcare Indusry News

MAY 2024 - JULY 2024

1. **BioNTech Begins Clinical Trials for Pan-Coronavirus Vaccine**
   BioNTech announced the initiation of phase 1 clinical trials for a pan-coronavirus vaccine, aimed at providing protection against current and future coronavirus variants. The vaccine candidate, BNT164, utilizes mRNA technology to target multiple coronavirus proteins. Initial trial results are expected by the end of 2024, with potential for rapid advancement to phase 2 if successful.

2. **Moderna's mRNA Flu Vaccine Receives FDA Approval**
   Moderna's mRNA-based influenza vaccine, Flumira, has received FDA approval for adults. Flumira is the first mRNA flu vaccine to reach the market, designed to offer broader and more effective protection against multiple flu strains. Clinical trials showed a 65% higher efficacy compared to traditional flu vaccines. Moderna plans to distribute Flumira in the U.S. in time for the 2024-2025 flu season.

3. **Amgen Acquires Horizon Therapeutics for $27.8 Billion**
   Amgen has finalized a $27.8 billion acquisition of Horizon Therapeutics, bolstering its rare disease portfolio. Horizon's lead products, Tepezza for thyroid eye disease and Krystexxa for chronic gout, are key drivers for this acquisition. Amgen expects the deal to enhance its position in immunology and inflammation, with plans for global expansion of Horizon's products.

4. **GlaxoSmithKline's New Antibiotic Gets EMA Approval**
   GlaxoSmithKline's new antibiotic, Zivlura, has received approval from the European Medicines Agency (EMA) for treating multidrug-resistant bacterial infections. Zivlura targets a broad spectrum of gram-positive and gram-negative bacteria, including MRSA and Pseudomonas aeruginosa. The approval is based on positive results from phase 3 trials showing superior efficacy compared to existing treatments.

5. **Samsung Biologics Expands Manufacturing Facility in South Korea**
   Samsung Biologics announced the completion of its fourth biomanufacturing plant in Incheon, South Korea. The new facility doubles Samsung's production capacity, making it one of the largest biomanufacturing sites globally. This expansion is aimed at meeting the increasing demand for biologics, including monoclonal antibodies and cell and gene
   therapies.

Announcing the Inaugural Issue of NexusHealth Magazine

We are thrilled to announce the forthcoming inaugural issue of **NexusHealth Magazine**, marking an exciting transition from the World Asian Medical Journal (WAMJ) to a new, dynamic platform designed to cater to the needs of young medical professionals around the globe.

VISION

NexusHealth Magazine aims to be the premier global platform for medical students, residents, and early-career physicians to connect, learn, and collaborate. Our vision is to foster a community where future healthcare leaders can share knowledge, inspire one another, and contribute to shaping the future of medicine.

SCOPE

Global Medical Insights
Networking and Collaboration
Educational Resources
Global Health Perspectives
Lifestyle and Wellness
Opinion and Commentary

AIMS

Foster international Collaboration
Promote Knowledge Sharing
Support Professional Development
Enhance Health and Wellness
Cultivate a Global Perspective
Promote Mentor-Mentee relationships

NexusHealth Magazine is poised to become an indispensable resource for the next generation of healthcare leaders. We invite you to join us on this exciting journey as we continue to evolve and expand our mission to serve and empower young medical professionals worldwide.

Stay tuned for the release of our inaugural issue, and be a part of a global community dedicated to advancing healthcare and making a difference in the world.

MEDICAL KOREA
Where Your Health Begins Anew

We live in a time of uncertainties.
Don't leave your healthcare to chance.
Let Medical Korea be your guide to a new world of healing.

MEDICAL KOREA

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Ministry of Health and Welfare

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