



EN ESTE NÚMERO

VacCiencia es una publicación dirigida a investigadores y especialistas dedicados a la vacunología y temas afines, con el objetivo de serle útil.

Usted puede realizar sugerencias sobre los contenidos y de esa forma crear una retroalimentación que nos permita acercarnos más a sus necesidades de información.

- Noticias más recientes en la Web sobre vacunas.
- Artículos científicos más recientes de Medline sobre vacunas.
- Patentes más recientes en Patentscope sobre vacunas.
- Patentes más recientes en USPTO.

Noticias en la Web

Biological E, Jiangsu Recbio Technology tie up for HPV vaccine

Jul 1. China-based Jiangsu Recbio Technology Company has entered into a licensing cooperation agreement with Biological E (BE) for technology transfer of its Recombinant 9-valent HPV (HPV9) vaccine.

HPV is a group of over 200 known viruses, some of which are classified as high-risk due to their potential to cause cancer. The HPV9 vaccine is a recombinant vaccine designed to protect against nine types of Human Papillomavirus (HPV), including those responsible for cervical, vulvar, vaginal, anal, and oropharyngeal cancers, as well as genital warts.

As part of the agreement, Recbio will provide Hyderabad-based BE with Drug Substance (DS) and transfer technology to formulate, fill, and package vaccines. It will also include technology transfer for DS production at an appropriate time in the future.

Right to commercialise

The technology transfer process had already commenced. BE will receive the exclusive right to commercialise the vaccine in India and participate in UNICEF & PAHO tenders in other markets.

Recbio has begun transferring the necessary technical knowledge, materials, and expertise to BE to produce the HPV9 vaccine and will continue to support in clinical development and regulatory approvals. BE will begin large-scale manufacturing of the HPV9 vaccine once the technology transfer is completed.

“We are delighted to collaborate with Biological E. This cooperation is another significant progress for Recbio in expanding into international markets., We will work together with our Indian partner to accelerate the launch process of the HPV9 vaccine in India, and jointly make greater contributions to global public health,” Liu Yong, Founder, Chairman and CEO, Recbio said in a release on Monday.

Mahima Datla, Managing Director, BE said: “We are pleased to partner with Recbio to bring the HPV9 vaccine to India and other countries. This collaboration aligns with our commitment to improving global health by making essential vaccines more accessible and affordable as well as to promote a lasting legacy of innovation and stewardship.”

In 2019 alone, HPV was linked to an estimated 620,000 cancer cases in women and 70,000 in men. Recbio’s core product, REC603, is for people ranging from 9 to 45 years old and is currently in the crucial Phase III clinical trials in China.

Fuente: THE HINDU BUSINESS LINE. Disponible en <https://n9.cl/ab4tg>



HPV is a group of over 200 known viruses, some of which are classified as high-risk due to their potential to cause cancer |

Photo Credit: iStockphoto

Vacunarán en Uruguay contra enfermedad meningocócica

1 jul. La campaña comenzará a partir de la segunda quincena de julio e incluirá dos vacunas: la antimeningocócica B de Bexsero y la de los serogrupos ACWXY de MenFive.

El MSP explicó que en el caso de Bexsero se aplicará la primera dosis a todos los lactantes nacidos a partir de mayo de 2025, al cumplir dos meses de edad.

La segunda dosis será a los cuatro meses, y una de refuerzo se aplicará a los 15 meses de nacido.

La de MenFive (serogrupos ACWXY) se dará a infantes que cumplen 12 meses de edad a partir de julio de 2025.

Será dosis única, sin necesidad de refuerzo en la infancia, salvo que existan situaciones especiales identificadas por el médico tratante, indicó el MSP.

En los adolescentes se administrará una dosis única de la vacuna en quienes cumplan 11 años a partir de julio de 2025.

La meningitis meningocócica es una enfermedad grave causada por la bacteria *Neisseria meningitidis*, que puede provocar meningitis y sepsis. La vacunación en Uruguay es gratuita.

Fuente: Prensa Latina. Disponible en <https://n9.cl/lwv8l>

“El Ministerio de Salud Pública (MSP) de Uruguay incorporará la vacunación contra la enfermedad meningocócica a su esquema de inmunización”

Vaccine Industry Overview

Jul 1. The vaccine industry has witnessed significant growth and transformation over the past few decades, driven by advances in technology, changing global health needs, and the increasing importance of preventive healthcare. The global vaccine market is a complex and multifaceted industry that involves various stakeholders, including pharmaceutical companies, biotech firms, research institutions, and governments.

Overview of the Global Vaccine Market

The global vaccine market was valued at approximately USD 40 billion in 2020 and is expected to reach USD 60 billion by 2025, growing at a compound annual growth rate (CAGR) of 8.5% during the forecast period 1. The market is driven by factors such as the increasing prevalence of infectious diseases, growing awareness about vaccination, and government initiatives to promote immunization.

Key Drivers and Challenges in Vaccine Development

The vaccine development process is driven by several factors, including:

- ◆ Growing demand for vaccines due to the increasing prevalence of infectious diseases.
- ◆ Advances in vaccine technology, such as mRNA and DNA vaccines.
- ◆ Government initiatives and funding for vaccine research and development.
- ◆ Increasing awareness about the importance of vaccination.

However, vaccine development also faces several challenges, including:

- ◆ High development costs and regulatory hurdles.
- ◆ Complexity of vaccine manufacturing and quality control.
- ◆ Limited access to vaccines in developing countries.
- ◆ Vaccine hesitancy and misinformation.

Importance of Vaccine Technology in Public Health

Vaccine technology plays a critical role in public health by providing effective and safe vaccines that prevent infectious diseases. Vaccines have been instrumental in controlling and eliminating several diseases, such as smallpox and polio, and have significantly reduced the burden of diseases such as measles, mumps, and rubella.

The importance of vaccine technology can be seen in the following:

- ◆ Prevention of infectious diseases: Vaccines have been effective in preventing infectious diseases and reducing the risk of outbreaks.
- ◆ Reduction in mortality rates: Vaccines have significantly reduced mortality rates due to infectious diseases, particularly among children and vulnerable populations.
- ◆ Herd immunity: Vaccines help achieve herd immunity, which protects individuals who are not vaccinated or are immunocompromised.

Trends in Vaccine Technology

The vaccine industry is witnessing significant advances in technology, driven by the need for more effective and safer vaccines. Some of the emerging trends in vaccine technology include:

Advances in mRNA and DNA Vaccine Technology

mRNA and DNA vaccines are emerging as promising technologies for vaccine development. These vaccines use genetic material to instruct cells to produce specific proteins, which trigger an immune response.

The advantages of mRNA and DNA vaccines include:

- ◆ Rapid development and production: mRNA and DNA vaccines can be developed and produced quickly, making them ideal for responding to emerging infectious diseases.
- ◆ Flexibility: mRNA and DNA vaccines can be easily adapted to different diseases and pathogens.
- ◆ Improved safety: mRNA and DNA vaccines do not use live or attenuated pathogens, reducing the risk of vaccine-related complications.

Several mRNA and DNA vaccines are in development, including vaccines against COVID-19, influenza, and cancer.

Emerging Trends in Vaccine Adjuvants and Delivery Systems

Vaccine adjuvants and delivery systems are critical components of vaccine development. Adjuvants enhance the immune response to vaccines, while delivery systems ensure that vaccines are delivered effectively to the target population.

Some emerging trends in vaccine adjuvants and delivery systems include:

- ◆ Use of novel adjuvants: Researchers are exploring the use of novel adjuvants, such as nanoparticles and toll-like receptor agonists, to enhance the immune response to vaccines.
- ◆ Development of microneedle patches: Microneedle patches are being developed as a painless and efficient delivery system for vaccines.
- ◆ Use of nanoparticles: Nanoparticles are being used to deliver vaccines and enhance the immune response.

Personalized Vaccines and Their Potential Applications

Personalized vaccines are being developed to tailor vaccine responses to individual needs. These vaccines use genetic information and other biomarkers to create customized vaccines that are more effective and safer.

The potential applications of personalized vaccines include:

- ◆ Cancer treatment: Personalized cancer vaccines are being developed to target specific tumor antigens and enhance the immune response.
- ◆ Infectious diseases: Personalized vaccines can be developed to target specific pathogens and provide more effective protection.
- ◆ Autoimmune diseases: Personalized vaccines can be used to modulate the immune response and treat autoimmune diseases.

Key Players and Collaborations

The vaccine industry involves various stakeholders, including pharmaceutical companies, biotech firms, research institutions, and governments. Some of the key players in the vaccine industry include:

Major Pharmaceutical Companies in Vaccine Development

Major pharmaceutical companies play a significant role in vaccine development, with several companies having a strong portfolio of vaccines. Some of the major pharmaceutical companies involved in vaccine development include:

Company	Vaccine Portfolio
Pfizer	Pneumococcal conjugate vaccine, Meningococcal vaccine, COVID-19 vaccine
GlaxoSmithKline	Rotavirus vaccine, Human papillomavirus vaccine, Hepatitis A vaccine
Merck & Co.	Human papillomavirus vaccine, Hepatitis A vaccine, Varicella vaccine

Role of Biotech Firms and Research Institutions

Biotech firms and research institutions play a critical role in vaccine development, with many companies and institutions developing innovative vaccine technologies. Some of the key biotech firms involved in vaccine development include:

- ◆ Moderna Therapeutics: Developing mRNA vaccines against various diseases, including COVID-19 and influenza.
- ◆ Inovio Pharmaceuticals: Developing DNA vaccines against various diseases, including COVID-19 and cancer.
- ◆ Novavax: Developing protein-based vaccines against various diseases, including COVID-19 and influenza.

Research institutions, such as universities and government laboratories, also play a significant role in vaccine development, with many institutions conducting research on vaccine technologies and collaborating with industry partners.

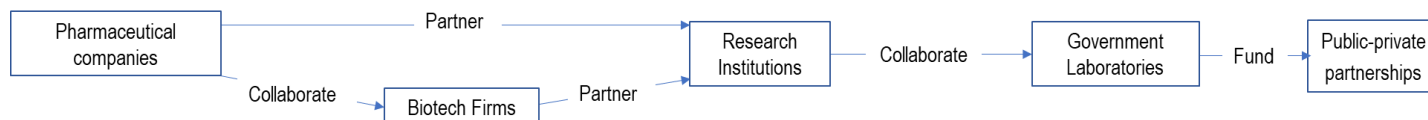
Collaborations and Partnerships in Vaccine Research and Development

Collaborations and partnerships are essential in vaccine research and development, with many companies and institutions partnering to develop new vaccines. Some examples of collaborations and partnerships in vaccine development include:

- ◆ Public-private partnerships: Governments and pharmaceutical companies are partnering to develop and distribute vaccines, particularly in response to emerging infectious diseases.

- ◆ Industry collaborations: Pharmaceutical companies are collaborating with biotech firms and research institutions to develop new vaccine technologies.
- ◆ Global health initiatives: Global health initiatives, such as the Global Vaccine Alliance (GAVI), are working to improve access to vaccines in developing countries.

The following flowchart illustrates the collaborations and partnerships in vaccine research and development:



Conclusion

The vaccine industry is a complex and multifaceted industry that involves various stakeholders, including pharmaceutical companies, biotech firms, research institutions, and governments. The industry is driven by advances in technology, changing global health needs, and the increasing importance of preventive healthcare. Emerging trends in vaccine technology, such as mRNA and DNA vaccines, are expected to play a significant role in shaping the future of vaccine development.

Fuente: Number Analytics. Disponible en <https://n9.cl/erave>

Dengue vaccine a step closer? India's first phase 3 trial hits 50% enrolment mark, early data shows no safety concerns

Jul 3. India has reached the 50 per cent enrolment mark in its first phase III clinical trial for the indigenous tetravalent dengue vaccine, DengiAll, with over 7,000 participants randomised across 20 trial sites. Initial results show no safety concerns for the one-shot vaccine to fight the mosquito-borne viral disease, according to researchers.

Developed by Panacea Biotec Limited under a licensing agreement with the National Institutes of Health (NIH), the primary US federal agency for biomedical research, DengiAll targets all four dengue virus subtypes and has shown promising results in earlier clinical trials.

The study, coordinated by the Indian Council of Medical Research (ICMR), seeks to recruit 10,355 volunteers aged between 18 and 60, with follow-ups extending for two years post-vaccination. Participants will receive either the vaccine or a placebo. The trial has been approved by the Drug Controller General of India and aims to conclude enrolment by October.

What is the dengue vaccine DengiAll about?

DengiAll has a weakened form of all four dengue virus subtypes and has the same virus composition as the vaccine developed by NIH, except for the inactive ingredients. The NIH also evaluated the vaccine in the US and the results were found to be promising in the early-stage clinical studies. A Phase I and II clinical trial conducted in India revealed a balanced and robust immune response across all four dengue virus types. The vaccine was also found to be safe and well-tolerated.

A robust trial

Multiple ICMR institutes are involved in the study to evaluate the efficacy, immunogenicity and safety of DengiAll. The ICMR-National Institute of Translational Virology (NITVAR) and AIDS Research (formerly ICMR-NARI) is responsible for overall trial coordination.

Dr Sheela Godbole, director, ICMR-NITVAR and national principal investigator of the trial, told The Indian

Express that the follow-up will be completed in the last quarter of 2027.

According to Dr Abhijit Kadam, national co-principal investigator, healthy adults in the 18-60 year age group are being screened and randomised to receive either the dengue vaccine or a placebo (2:1). “They will be followed up for two years,” he said.

How will the vaccine help?

Dr Suchit Kamble, principal investigator for the NITVAR clinical trial site, explains that the vaccine would help in prevention of a disease that has no treatment. “Some of the infections could result in severe manifestations like bleeding and sudden drop in blood flow and may threaten the life of the patient,” he said.

Where are the trial sites?

The 20 trial sites are located in the following cities: Chennai, Pune (with two sites), Mysuru, Hyderabad, Puducherry, Kochi, Jodhpur, Ranchi, Kolkata, Aligarh, Patna, Rohtak, Ludhiana, Bengaluru, New Delhi, Bhubaneswar, Rishikesh, Guwahati, and Faridabad. The research teams at these sites come from well-known medical institutions, including three affiliated with ICMR.

What's India's dengue load?

Dengue fever is one of the top 10 threats to global health, according to the World Health Organisation (WHO). India accounts for a large fraction of global dengue cases and the disease is endemic (regularly occurring within an area or community) in certain regions.

Data from the National Centre for Vector Borne Diseases Control, Ministry of Health and Family Welfare, shows that till March this year, around 12,043 dengue cases were reported, while 2.3 lakh cases and 297 deaths were reported in 2024.

Fuente: The Indian Express. Disponible en <https://n9.cl/b4ms8>

Pandemic speed: How rapid-response science saves lives

Jul 3. CEPI's leaders explain how speed, scale and access are essential to the 100 Days Mission which aims to accelerate the development of pandemic-busting vaccines.

CEPI's leaders explain how speed, scale and access are essential to the 100 Days Mission which aims to accelerate the development of pandemic-busting vaccines.

CEPI stepped up quickly when a novel coronavirus emerged in China in late 2019 and became one of the first organisations to begin funding the development of vaccines. Within a few months.

It had built one of the largest development portfolios of COVID-19 vaccines, seven of which have been licensed for international or domestic use.

When Stephane Bancel, chief executive of the now well-known pharmaceutical firm Moderna, emailed CEPI on the evening of January 20, 2020, it was to ask for a million-dollar, potentially pandemic-busting decision.



“Even though the novel coronavirus hadn't been around long enough even to earn its own name, Moderna's scientists had already been hard at work on a totally new mRNA-based rapid response vaccine construct they thought might be able to protect against it.”

Bancel, who had just arrived at the World Economic Forum in Davos in the Swiss Alps and had been closely watching the novel coronavirus that was starting to spread from Wuhan in China, was eager to push ahead with a scientific development he thought could become a world first and help protect against this worrying outbreak.

Even though the novel coronavirus hadn't been around long enough even to earn its own name, Moderna's scientists had already been hard at work on a totally new mRNA-based rapid response vaccine construct they thought might be able to protect against it. But they needed money—fast—to get clinical development of the experimental vaccine off the ground.

"We were anxious to get moving," Bancel recalled afterwards. "We had known about the virus since between Christmas (2019) and New Year (2020), but without the genetic information we could do nothing. But then came a moment that we could start moving."

For CEPI's pandemic-watchers, it was a no-brainer. CEPI's CEO Dr Richard Hatchett took just seven minutes to respond positively to Bancel's email. And with catalytic funding of just under \$1 million from CEPI, Moderna was able to get going on making its first test batches of experimental coronavirus vaccines.

"Starting early is the name of the game, because you can never make up for lost time," says CEPI's Executive Director of Preparedness and Response Dr Nicole Lurie. "We (at CEPI) had a deep appreciation of the need not just to move science fast, but to move money fast, and the need to be deadly serious about it."

The seven-minute decision to fund Moderna was swiftly followed by two more lightning-fast CEPI investments—one with the American biotech company Inovio and the other with a team of vaccinologists at the University of Queensland in Australia.

This meant that by January 23, 2020 when just 581 cases of infection with SARS-CoV-2 had been confirmed worldwide, CEPI had already kick-started three vital investments into potential defences against it.

And it didn't stop there. In the months that followed, CEPI built one of the world's largest and most diverse COVID-19 vaccine portfolios, based on the principles of speed, scale and access.

"We had a deep appreciation of the need not just to move science fast, but to move money fast, and the need to be deadly serious about it."

... Dr Nicole Lurie



Fuente: Gavi. Disponible en <https://n9.cl/klit2>

Breaking Down Pneumococcal Conjugate vs Polysaccharide Vaccines

July 3. Five FDA-approved pneumococcal vaccines are currently available, including 4 conjugate vaccines (PCV13, PCV15, PCV20, PCV21) and 1 polysaccharide vaccine (PPSV23). Conjugate vaccines provide T-cell-dependent immune responses with superior immunologic memory, making them effective in pediatric populations and preferred for most adult vaccinations. PPSV23, developed in the 1980s, produces T-cell-independent responses with limited memory and requires revaccination in immunocompromised patients every 5 years.

PCV20 and PCV21 represent the newest generation of pneumococcal vaccines, with distinct advantages and coverage patterns. PCV20 covers 20 serotypes and was the first conjugate vaccine approved for adult use without requiring follow-up PPSV23 vaccination.

PCV21 offers broader serotype coverage with approximately 85% coverage of invasive disease in adults 65 years and older compared with 54% coverage by PCV20, representing a 30% improvement in theoretical protection against invasive pneumococcal disease.

Geographic considerations influence vaccine selection, as PCV20 provides coverage for serotype 4, which is not included in PCV21 but remains prevalent in certain populations and regions, including Alaska, New Mexico, and Oregon. Patients at higher risk for serotype 4 disease include those younger than 65 years with alcohol use disorder, lung disease, smoking history, homelessness, or injection drug use. Health care providers must consider these epidemiologic factors when selecting between PCV20 and PCV21 to optimize protection for individual patients and communities.

Fuente: Pharmacy Times. Disponible en <https://n9.cl/jjae10>

Así es la nueva variante 'Frankenstein' del coronavirus: se cuadriplica en menos de un mes y puede ser la más contagiosa

4 jul. La Organización Mundial de la Salud (OMS), ha notificado que esta variante de COVID-19, denominada como 'Stratus' se encuentra “bajo vigilancia”.

En el Reino Unido, ya han notificado de una nueva variante de coronavirus: se denomina 'Stratus', y los expertos aclaran que podría provocar nuevas olas de infecciones. La nueva variante del coronavirus ha ido cogiendo presencia en la sociedad británica, pasando de ser el 10% de los casos al 40% en junio, convirtiéndose en la cepa



dominante en el país, según notifican los datos de la Agencia de Seguridad Sanitaria del Reino Unido.

A esta nueva variante de COVID-19 se le conoce como 'Frankenstein', ya que al parecer, esta proviene de un caso de una persona que se infectó con dos cepas, la XFG y su derivada, la XFG.3.

Lawrence Young, virólogo de la Universidad de Warwick, ha afirmado que “dado que la inmunidad está bajando en la población, debido a una disminución en la aceptación de la vacuna de refuerzo de primavera y la reducción de las infecciones por COVID-19 en los últimos meses, más personas serán susceptibles a la infección con XFG y XFG.3”.

Por ello, el virólogo informa de que esto podría traer consigo “una nueva ola de infección, pero el alcance de esta ola es difícil de predecir”, según recoge el Daily Mail.

No obstante, el experto ha detallado que no hay evidencia de que Stratus pueda generar una enfermedad más grave y que recibir la vacuna contra COVID-19 puede ofrecer protección contra enfermedades graves y hospitalización. A su vez, esta nueva variante está “bajo vigilancia” según la OMS.

Otra “variante bajo vigilancia”

Esta noticia llega después de que la OMS notificase, el pasado mes de mayo, como “bajo vigilancia” a la variante NB.1.8.1, proveniente de la XDV.1.5.1. Sus primeros casos fueron detectados en enero de este año.

“No es una cepa más transmisible, por los datos que se tienen. Tampoco es una cepa más grave y no hace un escape inmunitario significativo a las vacunas. Por eso, la OMS la ha calificado como una variante de bajo

riesgo”, afirma Susana Monge, responsable del sistema de vigilancia de infecciones respiratorias agudas en España (SIVIRA) del Centro Nacional de Epidemiología - ISCIII en declaraciones recogidas por Newtral.

En lo que respecta a España, se han detectado un 3'2% de los casos en el mes de mayo. Un dato inferior con respecto a Europa, que tiene una tasa que se eleva al 7'6%, según datos de GISAID proporcionados al medio citado.

Fuente: Antena3. Disponible en <https://n9.cl/2izr6o>

La vacuna de nueva generación para prevenir la peligrosa enfermedad meningocócica ya está disponible en Vietnam

4 jul. El 4 de julio, el Sistema de Vacunación VNVC lanzó y administró oficialmente la vacuna antimeningocócica de nueva generación MenACYW. La vacuna es producida por Sanofi Pharmaceutical Company (Francia) en su planta de EE. UU.

Prevención de bacterias que causan enfermedades

Las vacunas ayudan a prevenir las bacterias que causan muchas enfermedades peligrosas, como la meningitis y la sepsis, especialmente aquellas que pueden causar infecciones fulminantes que pueden matar a niños y adultos en cuestión de horas.

A diferencia de la vacuna meningocócica anterior, que limitaba la edad de vacunación a los 55 años, la vacuna MenACYW está indicada para niños a partir de los 12 meses y adultos sin límite de edad, y se espera que se amplíe a niños a partir de las 6 semanas en un futuro próximo.

De esta forma, se ha vacunado contra la enfermedad meningocócica a adultos de 56 años o más, contribuyendo a protegerlos frente a esta peligrosa enfermedad con mayor tasa de mortalidad entre niños, adolescentes y ancianos.

La vacuna MenACYW aplica una tecnología innovadora que utiliza proteína conjugada del toxoide tetánico (TT) con una estructura molecular moderna, lo que ayuda a estimular una respuesta inmune fuerte y sostenible, al tiempo que reduce la tasa de personas sanas portadoras del virus, contribuyendo a romper la cadena de transmisión en la comunidad.

La vacuna ayuda a prevenir los cuatro serotipos patógenos más comunes: A, C, Y y W-135, que causan enfermedades peligrosas como meningitis y sepsis, causando más de 135.000 muertes cada año en todo el mundo.

Las personas con enfermedad meningocócica pueden morir en cuestión de horas.

En Vietnam, solo en los primeros seis meses de 2025, se registraron decenas de casos, incluidas dos muertes por meningococo. En junio de 2025, el Instituto Pasteur de Ciudad Ho Chi Minh advirtió sobre el riesgo de un brote de meningococo en la región sur.

La bacteria meningocócica suele residir en la zona de la garganta y se transmite por las vías respiratorias. En la comunidad, entre el 5 % y el 25 % de las personas portadoras de la bacteria no presentan síntomas, pero



aun así propagan el patógeno, lo que la convierte en una fuente de infección difícil de controlar.

La Dra. Bach Thi Chinh, directora médica del Sistema de Vacunación VNVC, comentó: «La investigación y el desarrollo de vacunas antimeningocócicas de nueva generación por parte de fabricantes como Sanofi, con tecnología de vanguardia para ampliar el espectro de protección, aumentar la eficacia, hacerlas más seguras y adecuadas para todas las edades, es un gran logro de la tecnología médica que contribuye a la protección eficaz de la salud pública».

En la ceremonia de lanzamiento, el Dr. Kuharaj Mahenthiran, director médico de Sanofi Vaccines Vietnam, afirmó que la enfermedad meningocócica es una enfermedad inquietante que puede causar que personas sanas se encuentren en estado crítico en cuestión de horas. Incluso con un tratamiento oportuno, entre el 10% y el 15% de los pacientes pueden fallecer.

La vacuna antimeningocócica de nueva generación, MenACYW, ha sido aprobada en más de 70 países y se ha implementado en casi 40 desde 2021. Con una amplia indicación de edad y una sólida base de investigación, esta vacuna desempeñará un papel clave y representará un gran avance en la protección de la población vietnamita contra la enfermedad meningocócica, enfatizó el Sr. Kuharaj Mahenthiran.

Según el Dr. Chinh, las vacunas meningocócicas no tienen inmunidad cruzada, por lo que las personas deberían recibir una combinación de vacunas para prevenir completamente los cinco serotipos meningocócicos que causan la enfermedad.

Dependiendo del historial vacunal, situación epidemiológica, edad y necesidades, etc., el médico prescribirá la vacuna y pauta vacunal adecuada para conseguir una protección óptima.

"La actualización continua de las vacunas de nueva generación líderes a nivel mundial, seguras, eficaces y de alta calidad reafirma el compromiso de VNVC de brindar al pueblo vietnamita acceso a soluciones médicas avanzadas a la altura de los estándares internacionales.

"Esta es una acción práctica hacia el objetivo de la OMS de reducir en un 70% las muertes y en un 50% los casos de meningitis bacteriana para 2030", enfatizó el Dr. Chinh.

Fuente: VIETNAM.VN. Disponible en <https://n9.cl/dk8pv>

La encrucijada de Pasteur: la decisión que marcó la historia de las vacunas y salvó a un niño de la rabia y un terrible destino

6 jul. El chico, Joseph Meister, de nueve años, había empezado a morir. Y el médico que podía salvarlo estaba un poco aterrado. Además, el médico no era médico, era químico. Pero, como diría muchos años más tarde Henri Mondor, uno de sus colegas que lo admiraba y, además, era escritor, "Louis Pasteur no fue médico ni cirujano, pero nadie ha hecho tanto como él en favor de la medicina y la cirugía".

Sin embargo, ese 6 de julio de 1885, hace ciento cuarenta años, frente al chico Meister, Pasteur dudaba: lo atenazaba una enorme angustia

moral porque tenía que pasar por encima de sus propias convicciones y de los rígidos conceptos médicos de la época: tenía que experimentar con un ser humano vivo, un chiquillo de nueve años que había llegado de Alsacia, lastimado porque un perro lo había mordido, pero todavía alegre y tranquilo sin sospechar el terrible destino que se cernía sobre su corta vida.

Días antes, en su pueblo natal -había nacido en Meissengott, que hoy se llama Maisongoutte, el 21 de

"El 6 de julio de 1885, Louis Pasteur enfrentó un dilema ético sin precedentes: aplicar por primera vez su vacuna experimental contra la rabia en un ser humano. El destinatario era Joseph Meister, un niño de nueve años atacado por un perro infectado. El resultado marcó un hito en la medicina y el inicio de la inmunización moderna."

febrero de 1876- Joseph había apartado, o había intentado defenderse con un palo de un perro que, pasado de juguetón, se le había echado encima con furia inusitada: el chico blandió el palo y el perro, con decidida ferocidad, lo mordió varias veces en la pierna, el muslo y el brazo. No era un perro agresivo, sólo estaba desesperado porque el virus de la rabia le cerraba la garganta y no podía ni comer, ni beber agua. Cuando el perrito murió, el chico Meister también empezó a morir: en apenas una decena de días le esperaba una muerte horrible e inevitable. Sólo Pasteur, y sólo tal vez, nada era seguro, podía salvarle la vida.

Y Pasteur dudaba ahora si debía aplicar o no su vacuna contra la rabia, en estado experimental y probada hasta ese momento sólo en animales, en ese chico que ignoraba su terrible final inminente. Experimentar en seres humanos sin tener la certeza de la efectividad de un medicamento o de una vacuna, iba contra los principios de Pasteur y del resto de la comunidad científica. Además, si alguien sabía que Pasteur no era médico era el propio Pasteur. Si su vacuna fracasaba, todo su prestigio, todos sus logros, acaso toda su obra científica quedaría marcada para siempre ya no sólo por ese fracaso, sino por haber hundido en el fango uno de los mandatos morales básicos de la medicina y de la investigación científica. Al mismo tiempo, si no intentaba salvar la vida del chico Meister, lo enviaba a una muerte espantosa.

Algún lejano recuerdo de infancia también agitaba la memoria de Pasteur. Uno de sus principales biógrafos, René Dubos, evoca que el químico que debía ejercer ahora como médico, no había olvidado jamás el terror que le produjo un lobo rabioso que había atacado a hombres y a animales en la región de Jura, no lejos de la casa paterna de Pasteur, que nació en Dole, en la región de Borgoña, el 27 de diciembre de 1822. El chico Pasteur, casi a la misma edad que el chico Meister, había visto cómo cauterizaban la herida de una de las víctimas del lobo con un hierro al rojo vivo, aplicado sin miramientos en la herrería cercana a la casa paterna de Pasteur. Algunas de las víctimas del lobo habían sucumbido a la hidrofobia entre horribles sufrimientos, y la región entera recordó siempre con pavor el caso del lobo rabioso.

Dubos sostiene que no fue sólo ese recuerdo de infancia el que decidió a Pasteur a luchar contra la hidrofobia. La elección de ese mal como objeto de sus estudios inmunológicos presentaba un desafío para Pasteur. La rabia no era un drama en Francia, apenas provocaba la muerte de un par de centenares de personas; por otro lado, las experiencias en Alemania y Australia decían que una política sanitaria destinada al control animal y a medidas que dispusieran una cuarentena efectiva en el caso de un brote, disminuían los casos y los riesgos. Pero casi no existían indicios sobre el origen y desarrollo de la hidrofobia; los experimentos eran laboriosos y caros, y la lucha contra esa enfermedad mortal no daba resultados.

Es probable que existiera también otra razón para que Pasteur se volcara a la lucha contra la rabia. Dice Dubos: “La rabia se había apoderado desde antiguo de la imaginación popular y era el símbolo del terror y del misterio. Por lo tanto, estaba bien configurada para satisfacer las ansias de Pasteur por los problemas románticos”.

En 1882, tres años antes de que el chico Meister, que no sabía que iba a morir, se topara con Pasteur, que dudaba si debía salvarle la vida, el científico había ingresado en la Academia Francesa de Letras. Renan, premonitorio, se había encargado del discurso de bienvenida: “Lo que le preocupa a usted hoy es la rabia. Usted la vencerá y la humanidad le deberá su liberación de esta horrible enfermedad y también de una triste anomalía: me refiero a la falta de confianza que no podemos evitar mezclar cuando acariciamos al animal en el que vemos la más amable benevolencia de la naturaleza”.

Abundar en los logros científicos de Pasteur sería largo y acaso tedioso en estos momentos en los que el chico Meister, que no sabe que tiene los días contados, espera que el doctor Pasteur, que no es médico, decida su dilema moral de experimentar una vacuna contra la rabia en un ser humano.

Las vacunas, la inoculación en un ser humano de un agente infeccioso debilitado en forma artificial, había sido un hallazgo del británico Edward Jenner que estudió la viruela bovina, de allí el nombre vacuna. Estos conocimientos elementales resultan muy útiles en estos años. Pasteur siguió a Jenner y desarrolló una vacuna contra el carbunco, una enfermedad infecciosa mortal, causada por la bacteria "*Bacillus anthracis*", conocida como ántrax, que puede transmitirse a los seres humanos. En 1881 dividió un rebaño de ovejas en dos: a una mitad le inyectó la enfermedad y a la otra mitad la vacunó. La mitad con la enfermedad murió, pero la otra mitad no se contagió.

Con el virus de la rabia fue diferente porque Pasteur creó la vacuna a partir del propio virus causante de la enfermedad ya no atenuado de forma artificial, sino natural. Fue un descubrimiento dictado por el azar. En 1880, uno de sus ayudantes, Charles Chamberland, olvidó un cultivo de bacterias causantes del cólera aviar. Cuando regresó después de un par de semanas, notó que el cultivo se había debilitado. Pasteur inyectó ese virus débil en algunos pollos que padecieron unos síntomas leves y luego, cuando se los expuso al cólera, no enfermaron.

Así estudió Pasteur con la hidrofobia; experimentó en conejos y perros inoculando el virus en el sistema nervioso central de los animales: en el cerebro de los conejos, en concreto, el resultado era una mayor acción del virus y un acortamiento del período de incubación. A la muerte del animal, su médula espinal era suspendida en un ambiente seco y estéril, en el principio fue un frasco. Al cabo de unas semanas, la médula se hacía mucho menos virulenta.

La experiencia con perros demostró que cuando el animal recibía médula espinal infectada y desecada durante catorce días, y al día siguiente recibía una médula disecada durante trece días, y al día siguiente una de doce y así hasta el día uno, en la que recibía una médula "fresca" y virulenta, el animal no contraía la rabia y resistía la inoculación del virus en el cerebro, que en otras circunstancias hubiese sido mortal. En otras palabras, Pasteur había descubierto que en quince días de inyecciones diarias del virus, cada día menos atenuado y más peligroso, era posible alcanzar la inmunidad contra la rabia.

Aplicar el resultado de sus investigaciones era otra cosa, era una ruleta rusa que llevaba escrito un destino fatal. Si Pasteur estuvo a punto de decir que no, que no iba a experimentar con el chico Meister, cedió luego ante el embate de dos de sus colegas y amigos. Uno era el médico y filólogo Alfred Vulpian, que en 1856 había deducido la existencia de una sustancia en la médula suprarrenal que se vertía en la sangre, la noradrenalina y la adrenalina y junto con el neurólogo Jean-Marie Charcot había aportado estudios sobre la enfermedad de Parkinson y la esclerosis múltiple. El otro médico que apuntaló a Pasteur fue Jacques-Joseph Grancher, pionero en las investigaciones sobre tuberculosis, creador de medidas para luchar contra ese mal en los chicos y defensor del aislamiento y la antisepsia. Fue Grancher quien asumió la responsabilidad médica del caso Meister, mientras los dos amigos explicaban a Pasteur que el muchachito iba a contraer la rabia, y que su muerte sería inevitable y horrenda.

Así llegó ante Pasteur el chico Meister, con manos, piernas y muslos mordidos por aquel perro rabioso de Alsacia. ¿Qué sucedió después? Lo cuenta Dubos, el biógrafo de Pasteur: "El 7 de julio, sesenta horas después del accidente, se inyectó al muchacho con médula espinal atenuada por desecación durante catorce días. En las doce inoculaciones posteriores recibió el virus cada vez más fuerte hasta que el 16 de julio recibió una inoculación de médula virulenta extraída el día anterior del cuerpo de un conejo que había muerto después de la inoculación con virus fijo. Joseph Meister no presentó ningún síntoma y regresó sano a Alsacia.

Fuente: infobae. Disponible en <https://n9.cl/8koo1>

Need for Newer Vaccines – Emerging trends in the development of newer Vaccines and Vaccine schedules

Jul 6. For centuries, people have sought ways to protect themselves and others from harmful viruses or bacteria. The first attempts at immunization in the 18th century culminated in a true vaccine success story. Since then, the development of vaccines has been responsible for reducing, if not eliminating, diseases such as polio, tetanus and diphtheria.



Testing the vaccine

Next, the vaccine enters a clinical development stage, which is also called a clinical trial. To do this, researchers submit an Investigational New Drug (IND) application to FDA, which includes data from animal studies, information on manufacturing technology, and the quality of the vaccine. Vaccine quality is important because it affects how well it will work to provide long- and short-term protection against disease.

The clinical development stage is a three-phase process, which may include a fourth phase if the vaccine is approved by the FDA.

Phase 1

Small groups of people (20 to 100) receive the trial vaccine. During this phase, researchers gather information on how safe the vaccine is in people. This includes learning about and identifying side effects, and studying how well the vaccine works to cause an immune response.

Phase 2

The clinical trial expands to hundreds (100-300) of trial participants who have characteristics (such as age and physical health) similar to the intended recipients for the vaccine. They can also include groups of people from diverse backgrounds to ensure representation across different populations.

This phase provides additional safety information on side effects and risks, and more information on how well the vaccine works to cause an immune response.

Phase 3

The clinical trial expands to thousands (1,000–3,000) of people. In this phase, researchers confirm how well the vaccine works, monitor common and less common side effects, and collect information to support safe use in people.

Phase 4 (after FDA approval)

After the FDA approves (also known as "licenses") a vaccine for use in the general population, it might advance to an additional clinical trial phase with thousands of participants. Phase 4 is a formal, ongoing study to evaluate the new vaccine's safety and effectiveness over a longer period.

The field of vaccine development is experiencing rapid advancements, driven by new technologies, a deeper understanding of immunology, and the need to respond quickly to emerging global health threats. Here are some of the current and emerging trends:

Advanced Vaccine Platforms

RNA Vaccines: remains a major focus. Its adaptability allows for rapid development and modification to target new variants or diseases. Research is exploring self-amplifying and circular mRNA to increase efficacy and prolong immune responses, potentially requiring lower doses. mRNA is also being investigated for cancer immunotherapies and other therapeutics.

DNA Vaccines: While not yet approved for human use in many regions, DNA vaccines are under extensive research. They involve injecting genetically engineered DNA that prompts the body's cells to produce antigens, triggering an immune response. India has approved the first DNA vaccine for human use against COVID-19.

Viral Vector Vaccines: These vaccines use harmless viruses to deliver genetic material that codes for antigens, as seen in some Ebola and COVID-19 vaccines. They offer a diverse approach to expanding the vaccine development toolkit.

Recombinant Vaccines: These vaccines use genetic engineering to produce specific antigens in large quantities, which then trigger an immune response. This platform offers versatility and safety.

Virus-Like Particles (VLPs): These are self-assembling nanoparticles that mimic the structure of viruses but lack genetic material, making them non-infectious. They effectively present antigens to the immune system.

Innovative Delivery Systems

Microneedle Patches (MAPs): These patches contain tiny needles that painlessly deliver vaccines through the skin, potentially improving antigen uptake, reducing discomfort, and simplifying administration, especially in resource-limited settings.

Mucosal Vaccines (e.g., Nasal Sprays): Targeting the respiratory or gastrointestinal tracts, these vaccines aim to induce immune responses at the pathogen's entry points. Nasal sprays offer ease of administration and the potential for self-vaccination.

Oral Vaccines: Research is focused on protecting vaccine ingredients in the harsh digestive environment to improve absorption and stability.

Needle-free Injection Systems: Technologies like high-pressure air jets or ultrasound waves are being explored to deliver vaccines through the skin without traditional needles.

Personalized Vaccines: Advances in AI and synthetic biology are enabling the design of tailored immunizations based on an individual's genetic and immune profile, potentially leading to improved efficacy and fewer side effects.

Clinical Trial Optimization: AI aids in selecting appropriate participants and real-time data monitoring to ensure safety and efficiency in clinical trials.

Novel Adjuvants

New adjuvant formulations are being developed to enhance the immune response to vaccine antigens, improve efficacy and safety, and allow for lower vaccine doses. Examples include Toll-like receptor (TLR) agonists, saponins, and cytokines.

Targeting Challenging Diseases and Conditions

Broadly Protective Vaccines: Research is focused on developing vaccines that offer broader protection against multiple strains or variants of a pathogen (e.g., universal flu vaccines, pan-coronavirus vaccines).

- Enhanced Speed and Efficiency of Development:

The goal of a "100 Days Mission" to develop and deploy new vaccines in response to emerging threats is driving innovations in platform technologies and manufacturing processes to ensure faster and more scalable solutions.

Adaptive clinical trial designs and parallel regulatory reviews are also being adopted to shorten development timelines.

Addressing Vaccine Hesitancy and Accessibility:

Beyond scientific innovation, there's a continued focus on improving vaccine accessibility, affordability, and distribution, especially in low and middle-income countries. This includes developing thermostable vaccines that do not require ultra-cold storage ("cold chain" problem) and simpler administration methods.

These trends collectively point towards a future of more effective, safer, and accessible vaccines, with the potential to address a wider range of infectious diseases and even non-communicable conditions like cancer.

Big focus on mRNA vaccines

Even though messenger RNA (mRNA) was first developed as early as the 1960s³, mRNA vaccines were only brought to the market for the first time in response to the COVID-19 pandemic. There are several reasons for the delayed product launch, so to speak, one being technical challenges that could only be overcome by sophisticated innovations. Those innovations, in turn, required several decades of research.

When the world was faced with the COVID outbreak in 2020, mRNA technology was made ready to be used in vaccines – and it has proven to be both safe and efficient. This has led to a rise of mRNA vaccines, with numerous manufacturers developing new products to protect against some respiratory viruses, including influenza.

The numerous advantages of mRNA vaccines and the recent success during the COVID-19 pandemic has propelled progress and innovation in this field. Vaccine manufacturing companies are heavily investigating new fields of applications for mRNA vaccines in an attempt to re-shape the way immunity is achieved –

Role of Artificial Intelligence (AI) and Big Data:

Accelerated Vaccine Design: AI and machine learning algorithms are increasingly used to analyze large datasets, identify potential vaccine targets (e.g., from genomic data), predict antigen structures and functions, and optimize vaccine formulations. This significantly reduces the time and cost associated with traditional methods

The Centers for Disease Control and Prevention (CDC) has released the 2025 immunization schedules. The most significant updates are related to COVID-19, meningococcal B, and *Haemophilus influenzae* type b vaccines.

The schedules incorporate policies approved over the past year and tweaks to improve clarity and readability. They have been endorsed by the AAP, which has published a policy statement detailing the updates.

"Both immunization schedules ... are designed to be a guide for health care providers to ensure individuals get all the vaccines they need when they need them,".

CDC publishes the Vaccination Schedule for 2025

The 2025 child and adolescent immunization schedules include the following updates.

COVID-19: The vaccine formula has been updated for 2024-'25. All individuals ages 6 months and older should receive at least one dose of the 2024-'25 vaccine, and additional COVID vaccine doses are recommended for children and adolescents who are immunocompromised. Updated notes state all doses should be from the same manufacturer for healthy children ages 6 months through 4 years and immunocompromised children and adolescents receiving their initial vaccine series.

Dengue: The schedule clarifies the vaccine is recommended only for certain populations in the age group.

Diphtheria, tetanus and acellular pertussis (DTaP): A note addresses the use of Td vaccine in children under 7 years with a contraindication to the pertussis component of DTaP.

***Haemophilus influenzae* type b (Hib):** Vaxelis is one of two preferred vaccines to protect American Indian/Alaska Native infants from Hib. The other preferred vaccine is PedvaxHIB.

Inactivated poliovirus: Clarifies an earlier recommendation that catch-up vaccination is recommended for 18-year-olds who are known or suspected to be unvaccinated or incompletely unvaccinated.

Influenza: Vaccines for 2024-'25 are trivalent. High-dose inactivated and adjuvanted inactivated influenza vaccines are acceptable options for 18-year-old solid organ transplant recipients who are receiving immunosuppressive medications with no preference over other age-appropriate inactivated or recombinant influenza vaccines.

Measles, mumps, rubella: A new note indicates children 12 months and older vaccinated with one dose should get a second dose at least four weeks after the first if they are going to travel internationally.

Measles, mumps, rubella, varicella: The vaccine is contraindicated in HIV-infected people.

Meningococcal B: Bexsero dosing has been changed to a two-dose series for healthy adolescents and a three-dose series for those at increased risk of disease. Patients who need rapid protection (such as during an outbreak) can choose a three-dose series.

Respiratory syncytial virus (RSV): Updated notes clarify that for infants born in October through March, the ideal timing of nirsevimab administration is during the birth hospitalization. In addition, infants born to people who received an RSV vaccine during a previous pregnancy should receive nirsevimab.

As the CDC updates policies throughout the year, addenda will be added to the online schedules.

The updated schedules come as reports show troubling trends in childhood vaccination. A recent CDC report showed kindergarten vaccination rates decreased last school year, as exemptions from school vaccine requirements reached another record high. Another CDC study showed vaccine coverage for children by 2 years of age was lower for those born during the COVID-19 pandemic than in previous years.

Fuente: LinkedIn. Disponible en <https://n9.cl/lkq0j>



mRNA vaccines make an elephant-sized advance

Jul 7. Messenger RNA vaccines aren't just saving human lives—they are protecting elephants as well. In 2024, Tess, an elephant at the Houston Zoo, became the first to receive an mRNA vaccine developed by Paul Ling and his team at Baylor College of Medicine, in partnership with the zoo, to combat elephant endotheliotropic herpesvirus (EEHV), a lethal disease for young elephants. Now, two Asian elephant calves at the Cincinnati Zoo may be the first proof that the vaccine works.

For years, vaccine development against the virus stalled because researchers lacked the necessary system to grow the virus in a lab, a step traditionally essential for vaccine development. But the success of COVID-19 mRNA vaccines, which don't require growing live viruses, gave new life to the possibility of an EEHV vaccine.

"The easiest, fastest way for us to get something on the ground was to generate the mRNA vaccine," Ling says.

The elephant vaccine closely resembles other mRNA vaccines made for humans. mRNA packed in lipid nanoparticles carries instructions for making glycoproteins, which train the immune system to recognize and fight the virus.

But large and structurally complex herpes viruses presented challenges for the development of the vaccine. While the predominant COVID-19 vaccines contain a single mRNA encoding glycoprotein, the EEHV needed to contain four mRNAs because the virus relies on multiple glycoproteins to infect cells. Previous studies from Ling's lab found that elephants naturally mount a strong immune response against these glycoproteins, making them promising candidates for a vaccine.

After testing the vaccine in mice, where they saw a strong T-cell response, the team faced their next challenge: How much vaccine do you give to an animal that can weigh over 500 kg? To figure it out, they turned to studies in which researchers had given mRNA vaccines to horses.

Once the researchers had determined the right formula and dose, they gave Tess the shot, and she showed no adverse reactions. Four months later at the Cincinnati Zoo, elephants Sanjay and Kabir received a dose as a preventative measure when it was discovered that they did not naturally carry antibodies against the virus. After another elephant at the zoo tested positive for EEHV, Sanjay and Kabir, who had shown early signs of infection, remained healthy, marking a milestone for the vaccine's effectiveness.

Ling hopes that following this success, more juvenile elephants will begin to receive doses on a regular schedule to protect them before they enter the period of highest vulnerability to EEHV when the antibodies passed on by their mothers begin to wane. Once an elephant is naturally exposed to the virus and successfully mounts its own immune response, further vaccination may no longer be necessary, he explains.

In the meantime, the lab is also exploring a protein subunit vaccine against EEHV that would use important viral proteins to trigger an immune response.

"There's a lot of evidence in the vaccine field that using a combination of vaccine platforms can be more effective than a single one alone," Ling says.

Fuente: Chemical & Engineering News. Disponible en <https://n9.cl/afvnt>

China's first 9-valent HPV vaccine priced at just US\$70

Jul 10. China's first domestically developed 9-valent HPV vaccine has been priced at 499 yuan (\$70) per dose, offering people a new choice for HPV vaccination, according to Xinhua News Agency.

Following 18 years of effort, the domestically developed 9-valent HPV vaccine has demonstrated trial data comparable to that of imported ones. A study published in *The Lancet Infectious Diseases* in July 2023 indicates that the domestic and imported 9-valent HPV vaccines exhibit similar immune responses and safety profiles.



Preventing persistent HPV infection is the first line of defense against cervical cancer. Results from the Phase III clinical trial show that vaccination with the domestic 9-valent HPV vaccine effectively established a defense against cervical cancer caused by high-risk HPV types covered by the vaccine.

In 2020, the World Health Organization launched a global strategy to accelerate the elimination of cervical cancer. China subsequently issued its own plan for the years 2023-2030, listing HPV vaccination promotion as a primary objective.

To date, 70 to 80 percent of China's 300 million females aged 9 to 45 remain unvaccinated against HPV, according to Xinhua.

As the only HPV vaccine approved for a two-dose regimen in youths aged 9 to 17, it may improve vaccination compliance, increase coverage rates, and facilitate the timely establishment of immune protection.

Fuente: Asia News Network. Disponible en <https://n9.cl/29mlf>

Vaccines work: Data show real-world evidence of stable protection against HPV-related cervical cancer

Jul 10. Among the more than 100 types of human papillomavirus (HPV), at least 14 are considered as "high-risk" types which can cause (cervical) cancer. After breast cancer, cervical cancer is the most common cancer in Europe among women aged 15–44 years.

Before HPV vaccination among teenage girls started in Denmark, high-risk HPV was found in all cervical cancers. HPV types 16/18 accounted for around three quarters (74%) of cervical cancers. These two types are covered in the 4-valent HPV vaccine offered to girls since 2008 as well as the 9-valent vaccine, which has been in use in Denmark since November 2017.

One third (26%) of cervical cancers prior to the HPV immunization campaign were caused by high-risk types that are not covered by the 2- and 4-valent vaccine.

In their research article published in *Eurosurveillance*, a team led by Mette Hartmann Nonboe examined the HPV status of cervical samples over time among women (22–30 years) at the screening age for cervical cancer who were vaccinated as girls.

They tested up to three consecutive cervical cell samples per participant provided by the contributing pathology departments in Denmark for HPV.

In total, 17,252 women with at least one cervical cell sample were registered between 1 February 2017 and 29 February 2024. During the seven years of the randomized "Trial23" study (cervical cancer screening starts at age 23 in Denmark), 84% of women in the study had at least one cell sample taken. The authors compared HPV prevalence, persistence and incidence among vaccinated and unvaccinated women.

Strong indication of population immunity against high-risk HPV types 16 and 18

Based on the data gathered during the study period, HPV16/18 has been almost eliminated among vaccinated women in Denmark. The prevalence of these two types in the samples decreased to < 1% in 2021 from 15–17% before the vaccination of girls. In addition, the prevalence of types 16/18 in women who had not been vaccinated against HPV remained at 5%, which, according to the authors, "strongly indicates population immunity."

Despite the evidence of protection through vaccination, about one-third of women screened during the study period still had HPV infection with high-risk HPV types not covered by the offered vaccines—and new infections with these types were more frequent in vaccinated women than in unvaccinated women.

There was a low prevalence of HPV16/18 during the seven-year study period and women who have been vaccinated against HPV as girls are expected to have a considerably lower risk of cervical cancer compared with previous generations. Therefore, the authors also assessed whether the current cervical screening strategies in the country could be adjusted accordingly or even stopped entirely.

The study results showed a remaining high prevalence of high-risk HPV infections in women that are not covered by the HPV vaccines and that had been detected in both vaccinated and unvaccinated women during the study period.

At the same time, the authors noted a significantly higher incidence of non-vaccine high-risk HPV types among vaccinated women than in unvaccinated women.

Based on this, Nonboe and colleagues thus conclude that "less intensive screening seems reasonable until women vaccinated as girls with the 9-valent vaccine reach screening age, at which point screening should be reconsidered."

Fuente: MedicalXpress. Disponible en <https://n9.cl/d8jgda>

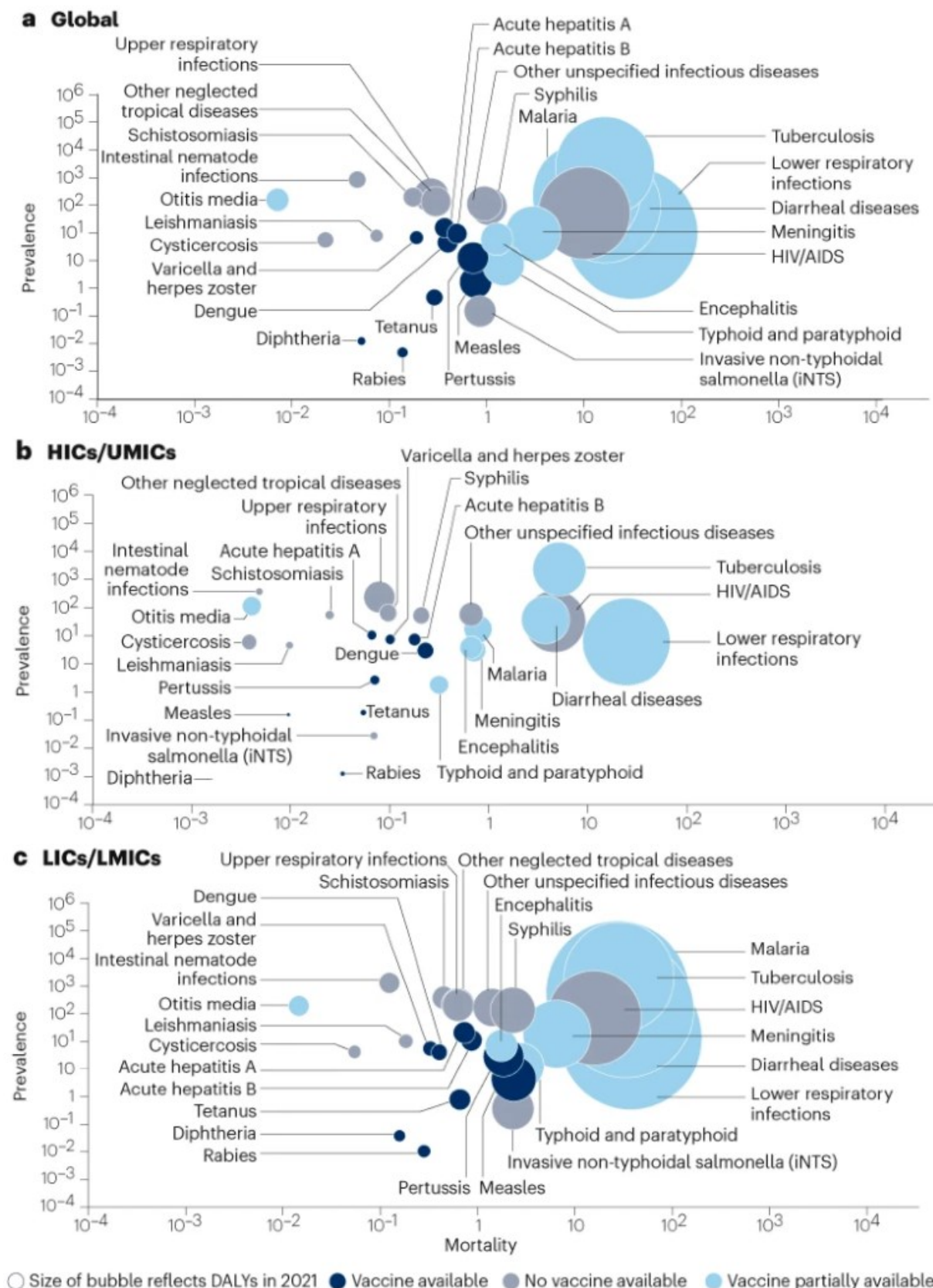
Unmet needs in vaccine development

Jul 10. Vaccines have been one of the most effective public health interventions in modern history, leading to the near eradication of diseases such as smallpox and polio and drastically reducing morbidity and mortality from other infectious diseases. In the past two decades, innovations in vaccine development have continued to increase these gains. For example, it has been estimated that vaccination prevented 37 million deaths across 98 low- and lower-middle-income countries (LICs/LMICs) from 2000 to 2019, and that the mortality rate could have been up to 45% higher without vaccines (Lancet 397, 398–408; 2021).

Despite these advances, unmet needs remain. This article examines the gap between infectious disease burden and vaccine availability, underscoring the role of vaccine innovation and proposing actions to advance equitable vaccine research and development.

Unmet needs in vaccine development

The World Health Organization estimates that three of the top ten causes of death worldwide in 2021 were from infectious diseases (COVID-19, lower respiratory infections, tuberculosis), despite some vaccines on the market. Of the top 30 infectious disease causes, the impact of diseases without available vaccines in 2021 in disability-adjusted life years (DALYs) was roughly 5 times higher in LICs/LMICs compared to upper-middle-income (UMICs) and high-income countries (HICs).

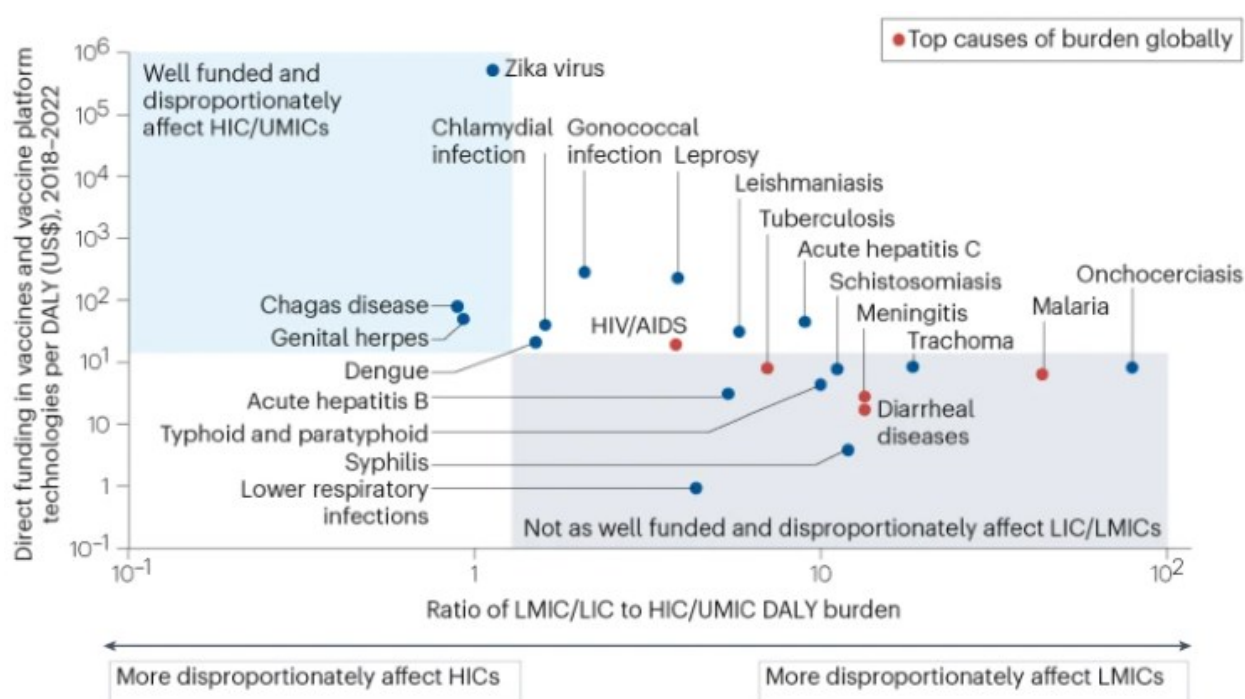


In the previous figure: Mortality, prevalence and burden of infectious diseases. **a–c**, The size of the bubbles in the panels show the top 30 infectious disease causes of burden based on disability-adjusted life years (DALYs; rate per 100,000 people) in 2021, with colour coding to illustrate the extent of vaccine availability globally (**a**), in high-income and upper-middle-income countries (**b**) and in lower-middle-income and low-income countries (**c**). See the Supplementary information for more detail on sources and definitions.

Infectious diseases with a substantial DALY burden can be classified into two categories: diseases for which vaccines exist but for which equitable access is lacking; and diseases for which no vaccines currently exist due to scientific, economic or logistical challenges.

Examples for the first category include first-dose coverage for measles, which, per WHO data, exceeds 90% in UMICs/HICs, but is only 66% in LICs and 84% in LMICs. Similar trends are observed for hepatitis B. Disparities in access to effective vaccines can stem from challenges related to local availability, healthcare facility readiness and vaccination intent. Other challenges sit further upstream in research and development — vaccines developed with limited regional representation in clinical trials are unlikely to account for regional differences in the dominant disease strain or population demographics, resulting in lower effectiveness. Through 2023, the total number of vaccines and infectious disease clinical trials conducted in LMICs/LICs was just 54% of those conducted in UMICs/HICs.

Examples in the second category include genital herpes, which has a comparatively greater burden in UMICs/HICs and relatively more funding (~US\$500) per DALY, while funding for onchocerciasis and typhoid, which are much more prevalent in LICs/LMICs, is only \$77 and \$40 in funding per DALY, respectively. Investment decisions for vaccine development are multifactorial and typically assess technical challenges and commercial potential. As such, R&D investments for vaccines against diseases without marketed products are not always focused on the diseases that drive the greatest global burden — a pattern we observed when comparing the funding per DALY versus the relative burden of disease across income groups.



In the previous figure: Historical vaccine R&D funding and relative disability-adjusted life years for country income groups. The y axis shows the direct R&D funding in vaccines between 2018–2022 per disability-adjusted life year (DALY) in 2021 in US\$, and the x axis shows the ratio of the DALY burden in high-income and upper-middle-income countries (HIC/UMIC) to that in lower-middle-income and low-income countries (LMIC/LIC). The top causes of infectious disease burden globally are shown in red. See the Supplementary information for more detail on sources and definitions.

Actions to address unmet needs

Equitable advances in vaccines are essential to prevent unequal health outcomes, which can destabilize global public health and global security. To close this innovation gap, stakeholders should consider four actions.

Increase investment in R&D for priority diseases with no available vaccines. Global R&D resources can be more intentionally directed towards diseases that lack (or lack effective or accessible) vaccines, especially those affecting LIC/LMICs. One priority target is schistosomiasis, with a high burden in LIC/LMICs and relatively limited funding (Fig. 2), potentially due to lower commercial viability in UMICs/HICs.

Mechanisms to address this gap could include raising awareness of funding disparity, incentivizing vaccine developers and focusing resources through cross-sector collaborations. Inspiration from broader development-partner-led initiatives include Gavi's Advanced Market Commitments; CEPI's \$3.5 billion plan for equitable-access focused R&D; and the Pandemic Antiviral Discovery collaboration between the Novo Nordisk Foundation, Open Philanthropy, and the Gates Foundation. For any initiative, it is critical that LICs/LMICs are involved in discussions about prioritizing the most important diseases.

Focus resources on new vaccine technologies that can strengthen the business case for diseases with outsized need. Technological innovation, such as adjuvants or mRNA platforms, has shown potential to address unmet needs. Private-sector resources could be directed toward innovations that lower barriers, such as improved thermostability and extended shelf-life.

Prioritize geographic breadth in trial footprints. Although many LICs/LMICs have expanded clinical trial capacities in recent years, especially during the pandemic, work remains to increase their inclusion in global trials. Innovators could more consistently expand their R&D footprint to include geographies that are most affected by the studied disease, partnering with a more diverse set of local sites, research networks, and contract research or site management organizations. A coordinated approach among innovators and health authorities and governments in these regions can help establish shared priorities and address vaccine development barriers, including costs.

Adopt a more locally led approach to prioritize unmet needs. The role of country stakeholders such as governments, academic institutions and healthcare providers in prioritizing investments to develop suitable vaccines can be elevated. This could include prioritization of product attributes that meet the needs of specific geographies, considering shelf-life, cold chain requirements, doses per vial, combination vaccines and needle-less options.

The points discussed here are only part of what needs to be done to move the needle on the unmet needs across infectious diseases. Maintaining the momentum from pandemic-era innovations will require sustained commitment to equitable R&D and vaccine development.

Fuente: Nature Reviews Drug Discovery. Disponible en <https://n9.cl/byz0z>

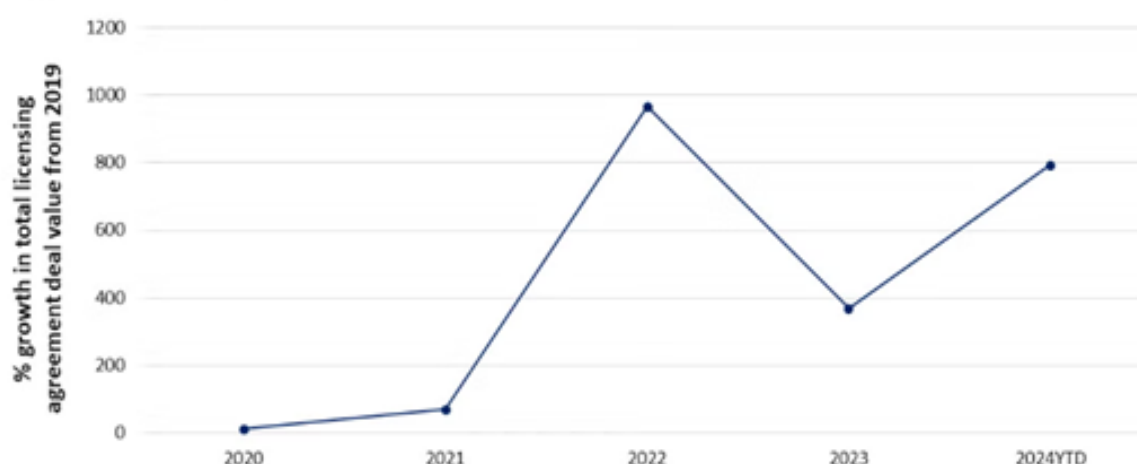
Modular manufacturing: The key to unlocking mRNA expansion?

Jul 10. The mRNA therapeutics field is rapidly evolving beyond vaccines to include treatments for cancer, genetic disorders and in vivo cell therapies, bringing with it diverse production challenges. As the industry seeks to refine and futureproof its models of production, modular manufacturing is emerging as a key solution.

The evolving mRNA landscape has been marked by rapid advancements and a broadening scope of applications, primarily driven by the success of mRNA vaccines during the COVID-19 pandemic. mRNA-based vaccines, which instruct cells to produce specific proteins for disease prevention or treatment, show great promise in precision medicine for treating infectious diseases, genetic disorders, and cancers.

The pandemic, while presenting significant challenges globally, showcased the effectiveness of mRNA technology in vaccine development, highlighting its rapid production, precise immune targeting and streamlined manufacturing processes. Since then, pharma companies have invested heavily in mRNA therapeutics development; global sales for mRNA-based pharmaceuticals are projected to reach \$26.2bn by 2030, according to GlobalData's Drugs Database.

% Growth of innovator mRNA-based pharmaceuticals' licensing agreements globally from 2020 to 2024YTD



The rise in mRNA pharmaceuticals' licensing agreement values suggests that this field will remain a major area for innovation and investment. Source: GlobalData.

Many assets are still in pre-clinical stages, with rapid clinical research and ongoing innovation in process development and manufacturing technologies. Rising research focus areas include different mRNA lengths, base modifications, circular RNAs and lipid compositions. Emerging application trends include strong growth in oncology, increasing interest in protein replacement therapies and potential for in vivo cell therapies.

Ongoing research and innovation has highlighted the complexity of mRNA interactions, such as those between mRNA and microRNAs, which play critical roles in regulating mRNA stability and function. Research groups are now characterizing the transcriptome in various diseases, including atherosclerosis, to identify potential biomarkers and therapeutic targets. Further, initiatives such as the mRNA Technology Transfer Program[iii] aim to establish sustainable vaccine manufacturing ecosystems in low- and middle-income countries, enhancing global health equity.

The mRNA technology landscape's evolution beyond vaccines indicates a growing confidence in the technology's potential for various therapeutic applications. However, as the market opens up, it brings

production challenges. Moving forward, the key focus will be on developing more efficient, flexible, and cost-effective manufacturing platforms that can adapt to the evolving mRNA therapeutic landscape.

Modular mRNA production

The production of mRNA faces several challenges. These include high costs due to expensive raw materials, high reagent costs for in vitro transcription (IVT), and limited economies of scale compared to traditional biologics. Additionally, processes are highly complex, with diverse product requirements and varying lipid compositions requiring unique purification strategies.

In terms of manufacturing limitations, issues include scalability, temperature control challenges, and short reaction timeframes. Technical challenges, like optimizing IVT efficiency, managing RNA secondary structures and ensuring consistent yield and quality must all be addressed, in addition to developing predictive models for process optimization. As pressure to reduce overall production costs continue, future production demands will likely include increasing flexibility to address different patient populations or therapeutic targets and increasing manufacturing efficiency.

In answer to these challenges, and as the industry seeks to refine and futureproof its models of production, modular manufacturing is emerging as a key solution. Modular systems allow for the customization of production lines without the need for extensive modifications to existing infrastructure, so that pharmaceutical companies can quickly adapt their manufacturing capabilities to meet the specific demands of individual vaccines. This method utilizes standardized, off-the-shelf functional modules that enhance operational efficiency while ensuring compliance with good manufacturing practices (GMP).

In a recent webinar, The next frontier in mRNA modular manufacturing for scalable RNA-LNP therapies, Linda Mathiasson, strategic customer leader for Cytiva, discussed the rapidly evolving RNA field and how a modular platform solution offers flexibility, scalability and potential for automation in production. “Standardized, modular solutions will be the key to ensure sustainable investments in manufacturing,” says Mathiasson, “because, when needs change over time, it will bring you flexibility by keeping speed. At Cytiva, our mission is to advance and accelerate therapeutics, and we’re doing that by developing tools and services and solutions for research process development and manufacturing of genomic medicines and other biologics.”

Mathiasson says that different applications reflect different challenges and needs: “We must continue working closely together with industry and academia to innovate and develop the tools, the technologies, the services, to make it possible to commercially manufacture these therapeutics, and this includes having scalable manufacturing solutions.”

The flexibility of modular production

What does a modular setup offer that other solutions do not? Crucially, flexibility. As the scope of mRNA therapeutics widens, biomanufacturers need to be able to adapt quickly. With modular platforms, they can — keeping the workforce familiar with manufacturing pipelines while also supporting efficient production of any type of molecule.

Investing in modular production can also lower capital costs. This is achievable through, for example, reduced risks of batch loss due to cross-contamination and the elimination of extensive cleaning operations.

Shorter delivery times and better process flexibility are two further benefits of modular platforms. They enable a rapid response to market demands — particularly in public health emergencies such as the pandemic — with the ability to respond rapidly to emerging needs and changing objectives.

The future of personalized medicines

Current manufacturing approaches can make personalized therapies prohibitively expensive. However, the rise of adaptable production platforms and modular tools offer opportunities for introducing automation and predictive modeling. Intensifying manufacturing processes, optimizing the IVT stages, and developing more efficient purification strategies could all help enable rapid, patient-specific RNA-LNP production. Manufacturing pods could be used to create various lines in a single facility, with the goal of making personalized mRNA vaccines economically and technologically feasible. Somewhere down the road, we might even see the promotion of personalized vaccines from last-resort to first-line treatments.

Because of its many advantages in both clinical and manufacturing settings, mRNA has the potential to bring about a revolution in the treatment and prevention of diseases. However, mRNA-LNP therapies are precise and targeted, requiring high levels of expertise. This is where Cytiva comes in. They provide end-to-end, adaptable solutions that can support the evolving mRNA manufacturing landscape, from research through to commercial production — including modular manufacturing solutions. Cytiva has a track record of accelerating growth, productivity and innovation in the personalized biological therapies sector, with facilities across Asia, Europe, and the Americas.

Fuente: Clinical Trials Arena. Disponible en <https://n9.cl/4b9wj>

Antibody mapping chip speeds up vaccine research by revealing hidden binding sites quickly

Jul 11. A new microchip invented by Scripps Research scientists can reveal how a person's antibodies interact with viruses—using just a drop of blood. The technology offers researchers faster, clearer insights that could help accelerate vaccine development and antibody discovery.

"This lets us take a quick snapshot of antibodies as they are evolving after a vaccine or pathogen exposure," says Andrew Ward, professor in the Department of Integrative Structural and Computational Biology at Scripps Research and senior author of the new paper published in Nature Biomedical Engineering on June 3, 2025. "We've never been able to do that on this timescale or with such tiny amounts of blood before."

When someone is infected with a virus, or receives a vaccine, their immune system creates new antibodies to recognize the foreign invader. Some antibodies work well against the pathogen, while others attach to it only weakly. Figuring out exactly which parts of the virus the best antibodies stick to is key information for scientists trying to optimize vaccines, since they want to design vaccines that elicit strong, reliable immune responses.

"If we know which particular antibodies are leading to the most protective response against a virus, then we can go and engineer new vaccines that elicit those antibodies," says Leigh Sewall, a graduate student at Scripps Research and first author of the new paper.



In 2018, Ward's lab unveiled a technique known as electron microscopy-based polyclonal epitope mapping (EMPEM). This method allowed scientists to visualize how antibodies in blood samples attach to a virus. Although groundbreaking, it had downsides: it took a full week to complete and required relatively large amounts of blood.

"During the COVID-19 pandemic, we began really wanting a way to do this faster," says Alba Torrents de la Peña, a Scripps Research staff scientist who helped lead the work. "We decided to design something from scratch."

With the new system, known as microfluidic EM-based polyclonal epitope mapping (mEM), researchers start with four microliters of blood extracted from a human or animal—about one hundred times less than what's required in original EMPEM. The blood is injected in a tiny, reusable chip where viral proteins are stuck to a special surface. As the blood flows through the chip, antibodies recognize and bind to those. Then, the viral proteins—with any antibodies attached—are gently released from the chip and prepared for imaging using standard electron microscopy. The entire process only takes about 90 minutes.

To test the value and effectiveness of mEM, the research team used the system to map antibodies in humans and mice that had either received a vaccination against or been infected with a virus, including influenza, SARS-CoV-2 and HIV. The new technique was not only fast at mapping out the interactions between antibodies and those viruses, but more sensitive than EMPEM; it revealed new antibody binding sites on both influenza and coronavirus proteins that had not been picked up by EMPEM.

To track how antibodies evolved over time in individual mice after they received a vaccination against one of the pathogens, the team took small blood samples from a mouse at different time points.

"That was something that wouldn't have been possible in the past, because of the amount of blood needed for EMPEM," says Sewall. "So to be able to look at an individual over time was really exciting."

The researchers are now working to automate and multiplex the system, which could eventually allow dozens of samples to be processed in parallel. Ultimately, they envision mEM becoming a widely adopted tool to monitor and guide vaccine development in pathogens ranging from coronaviruses to malaria.

"This technology is useful in any situation where you have really limited sample volume, or need initial results quickly," says Torrents de la Peña. "We hope this becomes accessible to more researchers as it is simplified and streamlined."

Fuente: PHYS.ORG. Disponible en <https://n9.cl/twib0t>

How EU researchers are helping us to stay one step ahead of the next pandemic

Jul 14. As the world woke up to a global pandemic in early 2020, a EU-funded research initiative was just getting under way – the Versatile Emerging Infectious Diseases Observatory (VEO).

The researchers involved in this timely initiative had set out to improve how we respond to public health emergencies through better disease surveillance. Their efforts became all the more relevant and important in the face of the COVID-19 health crisis.



Five years on, lessons about the importance of pandemic preparedness still resonate strongly for principal investigator Professor Marion Koopmans, a Dutch virologist at the Erasmus Medical Centre in Rotterdam. Internationally recognised for her expertise in emerging infectious diseases and zoonoses, Prof Koopmans is co-ordinating the VEO initiative.

“Covid instilled a sense of urgency about the risks of pandemics. It also showed that infrastructures were not ready for this fast movement and scaling up of disease spread,” she says.

Detecting disease hotspots

For decades, Prof Koopmans has worked in public health, studying how diseases move between humans, animals and the environment, including outbreaks of flu, smallpox, Ebola, Zika and M-pox.

Through this work, she realised that existing surveillance systems were not built to keep pace with the rapid emergence of new infectious diseases.

“We run after one virus today, another tomorrow, and we need to get smarter,” she says.

With VEO, she has pioneered a more proactive, joined-up approach to surveillance, combining data on emerging diseases – whether spread by mosquitoes, birds or through wastewater – with new threats linked to climate change.

Instead of focusing on just one issue or pathogen, VEO takes a holistic approach, scanning multiple potential hotspots for early warning signs.

“Our aim with VEO is to be at the right place at the right time, as early as possible, and to nip problems in the bud before they become big outbreaks,” she says.

Mosquito monitoring

Professor Frederic Bartumeus from the Blanes Centre for Advanced Studies in Spain leads Mosquito Alert, one element of VEO’s work on the rise of mosquito-borne diseases in Europe.

Diseases such as dengue or West Nile virus, once largely confined to tropical regions, are increasingly appearing in Europe.

Since 2010, there has been a steady rise in dengue, with more than 400 local cases, mainly in Italy and France. West Nile virus is also spreading north. In 2024, it was reported in humans, birds and horses as far north as Germany and Poland, according to the European Centre for Disease Prevention and Control.

Prof Bartumeus points to increased human movement, climate change and the expanding geographic range of different types of mosquitoes as significant drivers. Now, through VEO, his team was able to unearth new insights into how they spread.

For instance, Mosquito Alert is a citizen science app that allows the general public to send in photos of mosquitoes, crowd-sourcing data across vast areas.

The app is available in 19 languages, and is used across Europe and beyond. Through VEO, it was used to train AI models to identify mosquito species from photos. It is helping local health teams anticipate risks and guide targeted control strategies.

But pooling this data with other sources is the bigger win.

“Preparedness is not only about pathogens and human disease, it’s about systems that anticipate and connect them. Projects like VEO are no longer optional – they are essential,” says Prof Bartumeus.

Preparing for Disease X

At the Technical University of Denmark, VEO antimicrobial resistance expert Professor Frank Aarestrup heads up another part of VEO’s work: monitoring wastewater to track early signs of 'silent epidemics'.

Traditional surveillance focuses on symptomatic patients. In contrast, sewage surveillance tracks changes across healthy populations. It can capture the presence of bacterial pathogens, viruses, parasites and antimicrobial-resistance genes all in one go.

“For completely novel pathogens, which we’re not yet looking for in clinical diagnostics, sewage-based surveillance might be a really good opportunity,” says Prof Aarestrup.

Further north, in Greenland, VEO has also explored how rising Arctic temperatures might unlock hidden pathogens that have been trapped in permafrost for centuries.

The project involved expeditions onto the ice to analyse bacteria in soil found in archaeological 'hotspots' – places where human waste was historically deposited.

Their results showed that traces of bacteria were still present, and future permafrost melt could reveal important clues for tracing new diseases.

Prof Koopmans believes Greenland’s changing climate will also influence broader disease patterns, such as shifts in bird migrations.

“Parts of Greenland are places where migratory movements from Europe, Asia and the Americas meet. With climate change and melting ice, there’s potential to attract more birds for longer periods of time, opening a new highway for diseases to spread,” she says.

Set against all of this, VEO’s real goal is to facilitate the identification and rapid reaction to 'Disease X' – a hypothetical yet unknown pathogen that could one day spark a future pandemic like Covid-19. In June 2025, the team is running a mock outbreak simulation to test their system.

Leaving a legacy

The end of this year will mark the official completion date of the VEO project, but Prof Koopmans hopes its legacy will live on, helping to provide the stepping stones to assist future pandemic preparedness initiatives.

In the immediate term, much of the VEO data already generated will be open for reuse by others, and the team is busy creating a user-friendly app for anybody interested in the field.

The VEO team’s achievements will also be showcased at the EU’s 'Nurturing Tomorrow' pavilion at World Expo 2025 in Osaka, Japan. For Prof Koopmans, it is an opportunity to present VEO’s mission to a global audience and underline a vital message: smarter disease surveillance depends on robust systems and close international collaboration.

“VEO really shows how you can build a surveillance system that’s ready – no matter what pathogen emerges next, the tools are already in place,” she says. “It would be fantastic to continue this work through future partnerships.”

Fuente: ENGINEERS IRELAND. Disponible en <https://n9.cl/q7vss>

Peptide-Based Monkeypox Vaccine Candidate Designed Using Viral Glycoprotein Target

Jul 14. A new study has introduced a computationally designed peptide-based vaccine candidate targeting the monkeypox virus (MPXV), using the virus's membrane glycoprotein to guide epitope selection. The research, led by scientists at the University of North Bengal in collaboration with multiple international institutions, was published online in Current Medicinal Chemistry.

"Computationally designed vaccine construct shows promise against monkeypox virus, with predicted global coverage and immune activation—pending laboratory validation."

Using immunoinformatics tools, the team designed a multi-epitope construct that demonstrated strong predicted binding to human immune receptors and favorable immune activation in simulation models. While further laboratory testing is needed, the findings represent a promising direction in the search for next-generation monkeypox vaccines, particularly those that could be produced efficiently and tailored to global populations.

Targeting Viral Surface Proteins to Inform Vaccine Design

The vaccine candidate focuses on MPXV's membrane glycoprotein—a surface protein essential for host cell entry and a potential target for neutralizing immune responses. From a strain linked to international travel, researchers identified multiple B-cell and T-cell epitopes with high predicted immunogenicity and low allergenic or toxic potential.

Specifically, the construct integrates three B-cell epitopes, four MHC class I, and two MHC class II T-cell epitopes, linked together with immune-compatible spacers. The design also incorporates β -defensin I and the PADRE sequence as adjuvants to boost innate and adaptive immune responses.

Binding Simulations Indicate Receptor Engagement

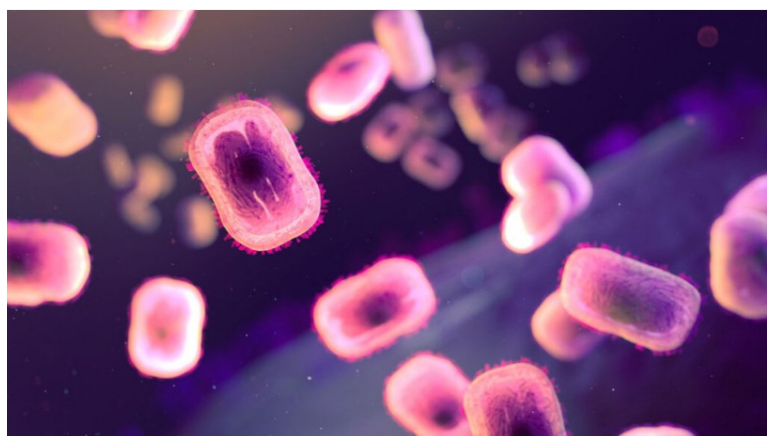
To evaluate how the vaccine might perform in a host immune environment, the team performed molecular docking studies with Toll-Like Receptor 3 (TLR3), a pattern recognition receptor involved in antiviral responses. The candidate showed a favorable binding affinity of -17.2 kcal/mol, and molecular dynamics simulations over 500 nanoseconds confirmed complex stability.

These results suggest that the designed construct could be effectively recognized by the immune system—though confirmation will require laboratory validation.

Simulated Immune Response and Global Applicability

In silico immune simulations projected strong primary and secondary immune responses, with elevated levels of immunoglobulins (IgG1, IgM), memory T-cell activation, and cytokines such as IFN- γ and IL-2. These findings indicate the potential for both humoral and cellular protection against MPXV.

The selected T-cell epitopes also mapped to common HLA alleles, providing an estimated global population coverage of 80.89%.



This suggests the candidate could be broadly relevant across regions and genetic backgrounds—an important consideration for global deployment.

Expression Potential and Production Readiness

To evaluate the candidate's manufacturability, the authors performed codon optimization for *E. coli* expression systems. The construct achieved a Codon Adaptation Index of 1.0 and a GC content of 51.4%, indicating high potential for protein expression. In silico cloning into the pET28a(+) vector further supports the feasibility of laboratory-scale production.

Relevance for Public Health Security

Monkeypox virus continues to present a health threat globally, with over 124,000 mpox cases and ongoing outbreaks reported by the World Health Organization. While existing vaccines like JYNNEOS are approved for emergency use, there remain gaps in global supply, efficacy in some populations, and long-term durability.

Computational design approaches such as this offer a cost-effective and rapid pathway for identifying viable candidates that may complement existing countermeasures. By focusing on a novel target and leveraging multi-epitope peptide technology, this study contributes to a broader effort to strengthen the global response to orthopoxvirus threats.

Outlook and Research Needs

Though the vaccine construct shows strong predicted properties, it remains in the preclinical research phase. The next steps include laboratory expression, in vitro immunogenicity studies, and eventually in vivo testing to assess efficacy, safety, and durability.

As with all computational vaccine designs, experimental confirmation will be critical. However, the methodical pipeline demonstrated here—combining antigen prediction, immune simulation, and expression modeling—provides a solid foundation for further development.

Fuente: News Medical Life Sciences. Disponible en <https://n9.cl/6e5gb>

Japan's Next-generation 'nanoball' approach strives for a paradigm shift in vaccine technology

Jul 16. A New Frontier in Pandemic Preparedness: Novel AI-Powered Nanoball Vaccines Platform developed by Japan's Nagasaki University to tackle emerging pandemics and zoonotic viral outbreaks like SFTS (Severe Fever with Thrombocytopenia Syndrome). The pioneer collaborative discovery in association with NEC Oncolmmunity funded by CEPI (Coalition for Epidemic Preparedness Innovations) aims to combat viral vector diseases by utilizing cutting-edge vaccine technologies and strategies.

Experts at Nagasaki University in Japan have developed a new "nanoball" mRNA vaccine platform aimed at tackling infectious diseases with pandemic potential. A key advantage of this platform is its ability to be freeze-dried and stored at room temperature, making it especially suitable for distribution in low- and middle-income countries without the need for cold-chain logistics.

This cutting-edge technology integrates artificial intelligence from NEC Oncolmmunity to optimize vaccine design. The project has received a \$5 million grant from CEPI (Coalition for Epidemic Preparedness Innovations) to support further development.

In an exclusive interview with Biospectrum Asia, distinguished researchers and pioneers who contributed to this groundbreaking discovery discussed the revolutionary breakthrough in detail illuminating prospects for future therapeutics.

The nanoball technology developed at Nagasaki University shows strong potential as a next-generation mRNA delivery platform with several advantages over conventional lipid nanoparticles (LNPs). One of its key features is the negatively charged outer shell composed of polyglutamic acid. While both the Nanoball surface and the cell membrane possess negative charges—typically thought to cause repulsion—the nanoball's nanoscale design and surface chemistry enable efficient cellular uptake, likely via endocytosis pathways that overcome simple electrostatic repulsion.

Furthermore, this polyglutamic acid-based coating plays a critical role in stabilizing the internal mRNA. By physically shielding the mRNA from enzymatic degradation and environmental stresses, the Nanoball significantly enhances the stability of its payload during storage and after administration. This is particularly important for deployment in regions where cold-chain logistics are limited.

Compared to widely used LNPs, Nanoballs could demonstrate:

Superior physical and chemical stability, contributing to improved mRNA preservation.

Enhanced cellular uptake, despite the negative surface charge, due to optimized nanoscale interactions.

Improved storage characteristics, with potential for longer shelf life and higher thermal tolerance.

Collectively, these properties could make the Nanoball platform highly promising for faster and more effective vaccine responses to emerging infectious diseases such as Disease X, as well as Severe Fever with Thrombocytopenia Syndrome (SFTS), while also offering practical benefits in terms of manufacturing, distribution, and field deployment.

Nanoball technology offers significant potential to address two major challenges in mRNA vaccine deployment: the need for improved stability and the optimization of immune response.

First, the Nanoball platform could provide enhanced mRNA stability through its negatively charged outer shell composed of polyglutamic acid. This biodegradable coating protects the mRNA from enzymatic degradation and environmental stressors, improving thermal stability and extending shelf life. Unlike conventional lipid nanoparticles (LNPs), which often require ultra-cold storage, the nanoball may allow for more flexible cold-chain requirements, an essential advantage for vaccine rollout in low- and middle-income and resource-constrained settings.

Second, Nanoballs are designed to facilitate efficient intracellular delivery despite their negative surface charge. Their nanoarchitecture supports effective cellular uptake—likely via endocytosis—and subsequent cytoplasmic release of the mRNA, which is critical for antigen expression and induction of a robust immune response. The scaffold can also be engineered to co-deliver immunostimulatory elements or display antigens in ways that enhance both humoral and cellular immunity.

For low- and middle-income countries, these features could be transformative:

Improved storage and distribution: reducing dependence on ultra-cold storage infrastructure.

Lower manufacturing costs: due to potential dose-sparing effects and simplified formulation processes.

Enhanced vaccine equity: by enabling faster, more localized production and deployment during outbreaks of

emerging infectious diseases.

In summary, the nanoball technology holds potential not only as a scientifically advanced delivery system but also as a practical innovation that supports greater global access to effective mRNA vaccines, particularly in low- and middle-income countries.

The partnership between NEC Corporation and Nagasaki University aims to accelerate the development of next-generation nanoball vaccines by integrating cutting-edge artificial intelligence (AI)-based antigen design with novel mRNA delivery technology. This collaboration is part of a CEPI-supported initiative to develop a vaccine candidate against Severe Fever with Thrombocytopenia Syndrome (SFTS), a high-consequence emerging infectious disease.

The key objectives of the partnership include:

Optimizing antigen selection and immunogenicity: NEC Corporation contributes advanced AI algorithms developed through its subsidiary, NEC Oncolmmunity, to identify highly conserved and immunodominant epitopes for vaccine inclusion. This allows rapid in silico screening and design of vaccine targets with the potential to elicit strong protective responses.

Enhancing delivery and stability via Nanoball technology: Nagasaki University provides its proprietary nanoball platform, a biodegradable polyglutamic acid-based carrier that protects mRNA, improves intracellular delivery, and offers enhanced thermal stability—key attributes for pandemic preparedness and global deployment.

Accelerating preclinical development: By combining computational design with efficient delivery, the partnership seeks to reduce the time required for preclinical optimization and scale-up, enabling faster transitions to clinical evaluation.

Laying the foundation for pandemic preparedness: The platform is intended not only for SFTS but also as a flexible, rapid-response system for future emerging infectious disease threats, especially those affecting underserved regions.

This collaboration exemplifies how academic-industrial synergy, supported by global health partners such as CEPI, can fast-track vaccine innovation with both scientific rigor and practical scalability.

In this partnership, CEPI is both a funder and a facilitator. Our funding of up to \$5m is supporting preclinical studies to investigate whether Nagasaki University's next-generation technology could overcome challenges with current mRNA vaccines to help confront the next worrisome threat. Learnings could help to advance the development of a vaccine against SFTS, while also being applicable to other epidemic and pandemic viral threats.

The partnership with Nagasaki University and NOI also joins a growing network of hundreds of CEPI-supported partners working together to prepare for the next pandemic and advance the 100 Days Mission, an ambitious goal spearheaded by CEPI and embraced by Japan and other G7 and G20 nations to develop a vaccine against a new virus with outbreak potential in as little as three months.

CEPI can act as a facilitator, connecting Nagasaki University with relevant partners and research organisations to advance the research.

Fuente: BioSpectrum Asia. Disponible en <https://n9.cl/qjqcs>

Peptide-Based Monkeypox Vaccine Candidate Designed Using Viral Glycoprotein Target

17 jul. SK bioscience, un destacado actor en la industria de la Biotecnología con un sólido balance que muestra más efectivo que deuda, anunció el jueves que ha presentado una solicitud de Nuevo Fármaco en Investigación (IND) al Ministerio de Seguridad Alimentaria y Farmacéutica de Corea del Sur para ensayos clínicos de Fase 1/2 de su nuevo candidato a vacuna contra la influenza, NBP607B.

El candidato incorpora un adyuvante a la vacuna existente contra la influenza basada en células de la compañía, SKYCellflu, para mejorar la eficacia protectora. El adyuvante, desarrollado por el Instituto de Formulación de Vacunas, una organización sin fines de lucro con sede en Suiza, contiene múltiples componentes potenciadores del sistema inmunológico destinados a fortalecer las respuestas inmunitarias en personas mayores. Según los datos de InvestingPro, los analistas anticipan un crecimiento de ventas para SK bioscience en el año actual, potencialmente impulsado por estos desarrollos innovadores.

El ensayo clínico planificado inscribirá aproximadamente a 320 adultos mayores en Corea y en el extranjero durante la próxima temporada de gripe del hemisferio norte. El estudio tiene como objetivo evaluar la inmunogenicidad y seguridad de la vacuna en comparación con una vacuna contra la gripe de alta inmunogenicidad aprobada, con resultados provisionales esperados para 2027.

Esto marca el primer intento de una empresa coreana de desarrollar una vacuna contra la influenza de alta inmunogenicidad utilizando un adyuvante. El desarrollo se alinea con las recomendaciones de las autoridades sanitarias globales, incluidos los Centros para el Control y la Prevención de Enfermedades de EE.UU., que recomiendan vacunas contra la influenza de alta dosis o con adyuvante para adultos de 65 años o más.

SK bioscience utilizó previamente la tecnología de adyuvantes en su vacuna contra la COVID-19, SKYCovione, y ahora está expandiendo este enfoque a las vacunas contra la influenza. La vacuna SKYCellflu existente de la compañía ha recibido la precalificación de la Organización Mundial de la Salud y actualmente está aprobada en 11 países.

"Creemos que la combinación de nuestra plataforma SKYCellflu probada y nuestra experiencia en el desarrollo de vacunas con adyuvantes nos posiciona bien para el éxito", dijo Jaeyong Ahn, director ejecutivo de SK bioscience, según el comunicado de prensa de la compañía. Las acciones de la compañía han mostrado fuertes rendimientos en los últimos tres meses, reflejando la confianza del mercado en su cartera de desarrollo. InvestingPro ofrece información adicional con 8 consejos clave más sobre la salud financiera y la posición de mercado de SK bioscience.

En otras noticias recientes, SK bioscience ha sido exonerada en una demanda por infracción de patente contra Pfizer relacionada con su vacuna conjugada neumocócica, PCV13. La Corte Suprema de Corea dictaminó que las exportaciones de SK bioscience de componentes de la vacuna PCV13 a Rusia no infringían las patentes de Pfizer. Esta decisión permite a SK bioscience continuar con sus planes de exportar componentes de PCV13 a regiones con alta demanda de vacunas, como el Sudeste Asiático y América Latina. La compañía también está trabajando en una vacuna conjugada neumocócica 21-valente en colaboración con Sanofi, que entró en ensayos clínicos de Fase 3 a finales de 2024. Además, SK bioscience está desarrollando una vacuna de próxima generación destinada a proporcionar una protección en general.

A pesar de ser la primera en desarrollar la vacuna conjugada neumocócica 13-valente de Corea, SKYPneumo, en 2016, SK bioscience enfrentó una prohibición de fabricación y venta en Corea hasta 2027 debido a la disputa de patentes. La compañía planea fabricar y vender la vacuna a nivel nacional después de 2027. Además, SK bioscience recientemente invalidó una patente de Moderna en Corea relacionada con la tecnología de vacunas de ARNm, reduciendo los riesgos de patentes y fomentando la innovación entre las empresas biotecnológicas nacionales.

Fuente: INVESTING.COM. Disponible en <https://n9.cl/g9d0z0>

Hyderabad's Genome Valley, biopharma's scale-up hub

Jul 18. Genome Valley, the 2,000-acre life sciences cluster just outside Hyderabad, is at the heart of Telangana's claim to being the "vaccine capital of the world." Data show the region produces around one-third of global vaccine doses, an output that confirms India's reputation as the pharmacy of the world. Beyond vaccines, Hyderabad accounts for approximately 35% of India's pharmaceutical and bulk drug production.

Yet, even as Genome Valley strengthens its status as a manufacturing powerhouse, a question arises: Can it transcend its identity as India's production bedrock and emerge as a genuine innovation hub?

Genome Valley: Major scale-up hub and vaccine powerhouse

While Genome Valley's ambitions now reach into areas like cell and gene therapy, its foundation remains firmly industrial. The recent debacles between the U.S. and China following the WuXi AppTec controversy also sent additional business opportunities to Indian contract development and manufacturing organizations (CDMOs) as they witnessed more site visits from companies following the BIOSECURE Act discussions.

The cluster's role in global supply chains is not a matter of aspiration but of scale: the region produces roughly one-third of the world's vaccine doses. Shakthi M. Nagappan, CEO of Telangana Life Sciences, confirmed that the hub has firmly established itself as the vaccine capital of the world.

"As of mid-2025, Hyderabad supplies over 11 billion vaccine doses annually, with projections indicating a rise to 14 billion doses by the end of the year or early next year. This accounts for approximately 65% of India's total vaccine production. Vaccines manufactured in Telangana are exported to over 140 countries, often through World Health Organization (WHO)-backed programs, and supported by WHO-prequalified and U.S. Food and Drug Administration (FDA)-approved facilities."

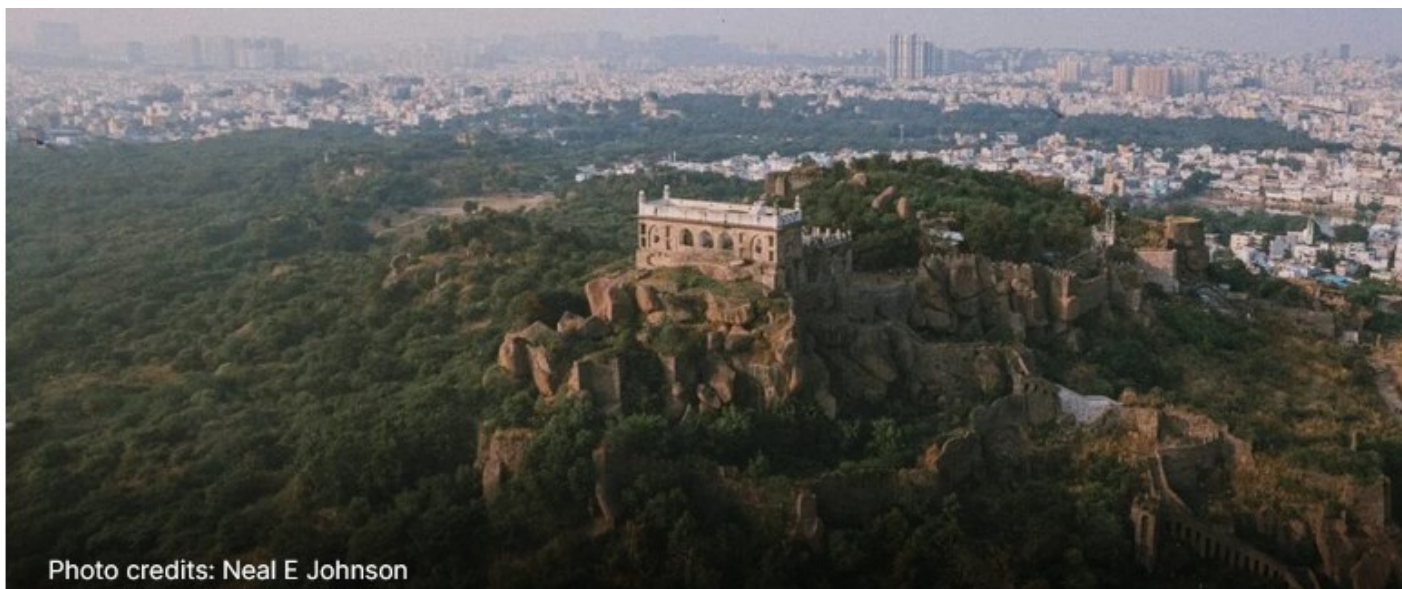


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To back this claim, Nagappan cited some of the vaccine contributions of the region: Hyderabad's Bharat Biotech's production of India's first indigenous COVID vaccine during the pandemic, or Biological E. Limited's partnership with Takeda to produce 50 million dengue vaccine doses per year in Genome Valley.

Genome Valley, launched in 1999, was initially designed to consolidate and formalize the Telangana state's manufacturing power. Over the past two decades, it has evolved into one of India's largest organized biotech and pharmaceutical clusters. Today, Genome Valley brings together more than 200 companies from 18 countries, employing around 25,000 people.

While global names like Novartis, GSK, and Thermo Fisher have a presence in the region, many local manufacturers and contract development firms drive the cluster's activity. Nagappan cited a few contract research organizations (CROs) and CDMOs implanted in the hub, including Syngene, Sai Life Sciences, Aurigene, and Cohance.

In essence, Genome Valley's strength is density. It combines companies involved in large-scale vaccine manufacturing, active pharmaceutical ingredients (API) production, and contract manufacturing into a single region.

Another strength Nagappan claims the hub presents is speed. "Genome Valley supports the entire spectrum from discovery to global delivery. It offers ready-to-occupy lab space, including plug-and-play facilities that enable companies to become operational in three to five months."

Hyderabad Pharma City, a distinct initiative from Genome Valley in development nearby, is set to expand the region's manufacturing focus further, but at what cost? Indeed, it is important to note that the Hyderabad Pharma City project is highly controversial and sparked local protests, notably among farmers, regarding the environmental and societal impact of the region's pharma manufacturing capabilities expansion.

Due to these concerns, the project was rebranded into Green Pharma City and comes with zero liquid discharge policies, but the real-world application of these greener practices remains to be seen. Becoming the world's pharmacy comes at a cost that the local populations are currently paying through polluted water and serious health concerns.

In 2023, Arte.tv asked the question whether Hyderabad Pharma City was curing the world at the cost of creating tomorrow's diseases in the name of economic growth. While Genome Valley was not mentioned in Arte's investigation as it operates in accordance with tighter international regulations and follows Good Manufacturing Practices (GMP), the broader pharma industrial belt around Hyderabad was designated as responsible for serious environmental impact in the region.

While Genome Valley itself operates under tighter regulations, its position within Hyderabad's broader pharmaceutical belt inevitably links it to wider environmental concerns affecting the region.

The profile of Genome Valley also raises a key strategic point: Genome Valley is above all a hub of production. While manufacturing capacity is indispensable to global healthcare, it does not automatically translate into the kind of early-stage innovation that defines hubs like Boston or Singapore. In Genome Valley, the question is not whether the cluster can produce; it already does at a global scale, but whether it can shift its weight towards discovery and the development of proprietary therapies.

From manufacturing to innovation: Is the shift real?

Nagappan highlighted that Genome Valley was shifting away from a purely manufacturing hub to an innovation-driven ecosystem. "In the domain of drug discovery, Genome Valley hosts top-tier CROs and

CDMOs such as Syngene, Sai Life Sciences, Aurigene, and Cohance. In cell and gene therapy, Genome Valley is pioneering India's progress with companies such as Bharat Biotech's vertically integrated CGT facility, Miltenyi Biotec's CAR-T manufacturing unit, and Yapan Bio's viral vector platform. The B-Hub, supported by the Department of Biotechnology (DBT), adds further strength by enabling biological scale-up manufacturing and workforce training in this emerging domain."

In early 2025, Bharat Biotech launched a cell and gene therapy (CGT) and viral vector production plant at Genome Valley with a \$75 million investment. The facility is configured for GMP-grade production of adeno-associate virus (AAV), lentivirus, and adenovirus vectors, core components in gene and cell therapies. The company reports they are advancing a pipeline of five platform products, including CAR-T, CAR-NK, and off-the-shelf gene therapies, targeting launches by 2028.

The company press release frames this move as a strategic pivot from vaccine manufacturing to personalized therapy, aiming to democratize CGT access by producing human-grade vectors domestically. Yet, despite its vertical integration, the initiative remains rooted in vector production, a manufacturing-intensive task. Bharat Biotech has not disclosed any late-stage clinical trials or proprietary therapeutic candidates in advanced development, suggesting that proof of clinical innovation lies more in the future than the present.

Additionally, global tools provider Miltenyi Biotec launched India's first CGT Center of Excellence in Genome Valley in early 2024.

Genome Valley has made deliberate investments in cutting-edge CGT infrastructure and training, a departure from conventional manufacturing, yes, but more of an incremental shift than a full transformation. These platforms establish the right conditions for biotech R&D, yet the absence of ongoing clinical proof points means the cluster's evolution into an innovation hub remains aspirational. The next 24 months, when Bharat Biotech's CGT pipeline data is expected and startups engage with Miltenyi's tools, will be decisive in determining whether the hub has genuinely taken flight beyond production.

The B-Hub Nagappan mentioned is another step toward innovation. It is a public-private accelerator operated jointly by the Government of Telangana, the Department of Biotechnology (DBT), and the Telangana State Industrial Infrastructure Corporation. While the word "accelerator" may suggest early-stage research support, the B-Hub's facilities are explicitly geared toward GLP/GMP biomolecule production rather than discovery.

It offers plug-and-play labs and shared equipment, helping startups and mid-sized firms to scale manufacturing, which is valuable, but more in the realm of tech transfer, rather than novel R&D. With training spaces and accessible equipment, it does address the gap of the lack of hands-on manufacturing and regulatory skills in the CGT space.

Unlike traditional accelerators, the B-Hub does not offer seed funding, mentorship, or drug discovery support. Its mission is to help firms convert bench research into regulatory-grade material, not necessarily to guide pipeline development to clinical stages.

So, is the shift real? The answer might not be yes or no, but a more nuanced not yet.

Genome Valley's future: Between policy push and innovation reality

Despite its manufacturing scale and expanding infrastructure, Genome Valley's transformation into a true innovation hub remains constrained. The most pressing of these constraints is talent. "Talent development is another area of ongoing focus. While Hyderabad has a strong technical workforce, emerging fields like

biologics, digital health, and regulatory science require new skills. Upskilling programs and academic-industry partnerships are underway, but continued investment in human capital is essential to meet future demand,” said Nagappan.

The region also faces limitations in its broader innovation ecosystem. Compared to biotech innovation clusters, Genome Valley lacks a deep base of venture capital, early-stage biotech startups, and proprietary drug discovery efforts. Much of the activity remains focused on contract research and manufacturing services for global firms. Intellectual property generation, regulatory infrastructure for innovative products, and startup funding mechanisms are still developing, factors that limit the emergence of homegrown biotech pipelines.

To address these weaknesses, Telangana’s government has rolled out a series of policy initiatives. The TG-iPASS system, offering streamlined approvals and regulatory support, has made it easier for companies to establish operations. The MSME (Micro, Small and Medium Enterprises) Life Sciences Policy aims to further strengthen the sector through incentives.

These measures consolidate Genome Valley’s position as a manufacturing leader, but whether they will catalyze discovery and pipeline innovation at scale is still to be seen. Initiatives like the B-Hub improve scale-up capacity but need more time to foster a true biotech innovation ecosystem. The policy focus remains focused toward infrastructure development and operational efficiency, rather than the discovery, funding, and clinical development that define leading innovation hubs globally.

Nagappan trusts that the upcoming Life Sciences Policy 2025-2030 will catalyze new partnerships and translational research. “This will further support global companies and early-stage ventures alike in establishing or expanding their footprint here.”

Telangana’s Vision 2030 sets ambitious targets: contributing to 40% of India’s objective to reach a life science market value of \$120 billion by 2030 and creating 400,000 new jobs. Whether those jobs will support manufacturing lines or biotech innovation remains a critical question.

In the meantime, Genome Valley is undoubtedly a manufacturing and scale-up powerhouse for biopharma. Today, it stands as a global supplier, efficient, scalable, and increasingly sophisticated. But its transition from a manufacturing hub to a biotech innovator depends on whether this infrastructure boom can be matched by the emergence of proprietary science, clinical-stage products, and venture-driven companies.

After all, it’s Genome Valley’s ability to support the life science value chain that sets it apart. “The ongoing developments signal not just quantitative growth but qualitative transformation deepening Genome Valley’s ability to support the full life sciences value chain,” said Nagappan.

Then again, the social and environmental concerns are serious. While Hyderabad Pharma City and Genome Valley are distinct projects, it does raise the question of the cost the region is ready to pay to become an essential biopharma partner in the industry, and how these costs may be managed in the future.

Fuente: LABIOTECH. Disponible en <https://n9.cl/blsrs>



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Patentes registradas en Patentscope

Estrategia de búsqueda: *FP:(vaccine) AND DP:([01.07.2025 TO 18.07.2025])* 94 records

1. [20250228935](#) CONSTRUCTION AND APPLICATION OF FUSION PROTEIN VACCINE PLATFORM
US - 17.07.2025

Int.Class [A61K 39/395](#) Appl.No 19172135 Applicant INSTITUTE OF BIOPHYSICS, CHINESE ACADEMY OF SCIENCES Inventor Yangxin FU

The present invention relates to the construction and application of a fusion protein vaccine platform. The present invention provides a vaccine, comprising a fusion protein containing an interferon-target antigen-immunoglobulin Fc region (or antibody) and a Th cell helper epitope. The present invention also relates to use of a fusion protein containing an interferon-target antigen-immunoglobulin Fc region (or antibody) and a Th cell helper epitope in the preparation of prophylactic or therapeutic compositions. The vaccine of the present invention can be produced by eukaryotic cell expression systems to prepare wild-type and various mutant antigen vaccines, and vaccination by means of subcutaneous/muscular or nasal or other routes can lead to a strong immune response to a body. The vaccine of the present invention can be used as a prophylactic or therapeutic vaccine.

2. [WO/2025/143908](#) PRIMER SET CAPABLE OF DIFFERENTIATING FIELD STRAIN OF AFRICAN SWINE FEVER VIRUS FROM LIVE VACCINE VIRUS, AND USE THEREOF
WO - 03.07.2025

Int.Class [C12Q 1/70](#) Appl.No PCT/KR2024/021342 Applicant THE INDUSTRY & ACADEMIC COOPERATION IN CHUNGNAM NATIONAL UNIVERSITY (IAC) Inventor LEE, Jong-Soo

The present invention relates to a primer set capable of differentiating a field strain of African swine fever virus from a live vaccine virus, and a use thereof and, more specifically, to: 13 types of primer sets for conventional PCR and 12 types of primer sets for qRT-PCR capable of differentiating a field strain of African swine fever virus from a live vaccine virus; a kit for differentiating a field strain from a vaccine strain of African swine fever virus, comprising the primer sets; and a method for differentiating suids infected with a field strain of African swine fever virus from suids inoculated with a vaccine strain, using the primer sets.

3. [WO/2025/149143](#) CANCER VACCINE BASED ON MHC-II EPIOTOPE SELECTION
WO - 17.07.2025

Int.Class [A61K 39/00](#) Appl.No PCT/DK2025/050007 Applicant CATALYST VACCINATION A/S Inventor NØRGAARD, Anders, Kaare

The present disclosure provides a vaccine against cancers that express MHC-II. That includes hormone positive breast cancers and some prostate cancers and melanoma. It is possible, based on a genomic test of the individual, to either (1) design a personal vaccine consisting of a polytope based on epitopes

from the TAA that in most cases display on MHC-II and not on MHC-I, or (2) select previously manufactured sequences based on epitopes from the TAA as constituents of the vaccine, such that the cancer after vaccination will reveal itself to the immune system and get eradicated while there are little side effects in that the vaccine will not make the immune system harm the healthy tissue.

4. [WO/2025/140126](#) THERAPEUTIC LY6K MRNA VACCINE FOR CANCER

WO - 03.07.2025

Int.Class [C07K 19/00](#) Appl.No PCT/CN2024/141537 Applicant EVEREST MEDICINES (CHINA) CO., LTD. Inventor HU, Gang

Provided herein are a fusion polypeptide comprises (i) a first polypeptide comprising LY6K protein; and (ii) a second polypeptide comprising major histocompatibility complex (MHC) class I transmembrane and trafficking domain (MITD), nucleic acids encoding the fusion polypeptide, a vaccine comprising an RNA polynucleotide that encodes the fusion polypeptide, wherein the vaccine is formulated in a lipid nanoparticle, and a method of treating a cancer in the subject by administering to the subject a therapeutically effective amount of the vaccine.

5. [WO/2025/138501](#) OFF-THE-SHELF IN-VIVO IN-SITU CAR AND TUMOR VACCINE COMBINED IMMUNOTHERAPY TECHNOLOGY BASED ON CIRCULAR RNA AND USE THEREOF

WO - 03.07.2025

Int.Class [A61K 39/00](#) Appl.No PCT/CN2024/089289 Applicant FUDAN UNIVERSITY Inventor QU, Liang
Provided is an in-vivo in-situ CAR immunotherapy and cancer vaccine combined therapy strategy based on circular RNA, which is a novel tumor immunotherapy that combines the cyclic RNA-based in-vivo in-situ CAR-T/M technology and the circular RNA cancer vaccine technology. This novel tumor immunotherapy enables rapid and efficient generation of CAR-T/M cells in vivo and further produces an enhanced collaborative anti-tumor immunotherapy effect with the synergistic action of the corresponding circular RNA cancer vaccine. In addition, a specific non-complementary region of an I-type intron from tetrahymena is split, and thus in-vitro efficient RNA cyclization can be achieved by means of self-splicing of the I-type intron without requiring homologous arms or additional GTP catalysis.

6. [WO/2025/139352](#) DABIE BANDAVIRUS MRNA VACCINE AND PREPARATION METHOD THEREFOR

WO - 03.07.2025

Int.Class [A61K 39/12](#) Appl.No PCT/CN2024/128947 Applicant NANJING MEDICAL UNIVERSITY Inventor LIU, Xinjian

Provided are a Dabie bandavirus mRNA vaccine and a preparation method therefor. Specifically an optimized mRNA molecule is provided, and is cloned into a pGEM-3Zf(+)mRNA vaccine vector; the plasmid is linearized by means of enzyme digestion, and subjected to capping and poly(A) tail addition by means of an in-vitro transcriptase method to prepare an mRNA; the obtained mRNA is transfected into eukaryotic cells, and it is verified by means of an immunoblotting experiment that the mRNA can be expressed in vitro; and the mRNA is encapsulated by a lipid nanoparticle delivery system to obtain the mRNA vaccine, which, after immunizing mice, can induce the generation of a relatively high antibody level in serum. A viral neutralization test further proves that the immune serum can bind to viruses to prevent the viruses from infecting cells.

7. [WO/2025/146158](#) DISCOVERY METHOD FOR FLAVIVIRUS VACCINE ANTIGEN, AND USE THEREOF

WO - 10.07.2025

Int.Class [C07K 14/18](#) Appl.No PCT/CN2025/070534 Applicant BEIJING CHANGPING LABORATORY Inventor YAN, Jinghua

A discovery method for a flavivirus vaccine antigen, and a use thereof. The discovery method is capable of efficiently discovering a flavivirus vaccine antigen in which a FL epitope is destroyed while maintaining

proper expression and folding of a prME protein. The obtained flavivirus vaccine antigen can avoid the ADE effect and has good immunogenicity, and can be used for the construction of flavivirus vaccines.

8. [4581133](#) VESICULAR STOMATITIS VIRUS MARBURG VIRUS VACCINE

EP - 09.07.2025

Int.Class [C12N 7/00](#) Appl.No 23861585 Applicant INT AIDS VACCINE INITIATIVE INC Inventor PARKS CHRISTOPHER L

The present invention relates to a vesicular stomatitis virus vaccine vector encoding a MARV glycoprotein (rVSVΔG-MARV-GP). Vaccination with as little as 200 plaque-forming units was 100% efficacious against MARV lethality and prevented development of viremia. rVSVΔG-MARV-GP vaccination induced MARV GP-specific serum IgG, and virus-neutralizing activity in serum was detectable in animals vaccinated with the highest doses.

9. [WO/2025/146130](#) Therapeutic BIRC5 mRNA Vaccine for Cancer

WO - 10.07.2025

Int.Class [C07K 14/705](#) Appl.No PCT/CN2025/070409 Applicant EVEREST MEDICINES (CHINA) CO., LTD. Inventor HU, Gang

Provided is a fusion polypeptide comprises (i) a first polypeptide comprising BIRC5 protein; and (ii) a second polypeptide comprising major histocompatibility complex (MHC) class I transmembrane and trafficking domain (MITD), a nucleic acid encoding the fusion polypeptide, and a vaccine comprising an RNA polynucleotide that encodes the fusion polypeptide. Provided is a method of treating a cancer in the subject by administering to the subject a therapeutically effective amount of the vaccine.

10. [20250222096](#) CORONAVIRUS VACCINE

US - 10.07.2025

Int.Class [A61K 39/215](#) Appl.No 18701804 Applicant BioNTech SE Inventor Ugur Sahin

This disclosure relates to the field of RNA to prevent or treat coronavirus infection. In particular, the present disclosure relates to methods and agents for vaccination against coronavirus infection and inducing effective coronavirus antigen-specific immune responses such as antibody and/or T cell responses. Specifically, in one embodiment, the present disclosure relates to methods comprising administering to a subject RNA encoding a peptide or protein comprising an epitope of SARS-CoV-2 spike protein (S protein) for inducing an immune response against coronavirus S protein, in particular S protein of SARS-CoV-2, in the subject, i.e., vaccine RNA encoding vaccine antigen.

11. [4582097](#) DIPHTHERIA-TETANUS-PERTUSSIS COMPOUND ADJUVANT COMBINED VACCINE

EP - 09.07.2025

Int.Class [A61K 39/00](#) Appl.No 23876375 Applicant CHANGCHUN BCHT BIOTECHNOLOGY CO Inventor WANG MENGSHU

Disclosed in the present invention is a compound adjuvant combined vaccine, comprising an immunogenic composition and a compound adjuvant. The immunogenic composition comprises a pertussis antigen, a diphtheria antigen and a tetanus antigen; and the compound adjuvant is composed of an aluminum adjuvant and a TLR9 receptor agonist. Further disclosed in the present invention is a use of the compound adjuvant in the preparation of the compound adjuvant combined vaccine for preventing pertussis, diphtheria and tetanus in a subject.

12. [WO/2025/149609](#) FORMULATIONS FOR STAPHYLOCOCCUS AUREUS VACCINE

WO - 17.07.2025

Int.Class [A61K 39/085](#) Appl.No PCT/EP2025/050520 Applicant LIMMATECH BIOLOGICS AG Inventor AMAN, Mohammad Javad

A lyophilized pharmaceutical composition for Staphylococcus Aureus vaccine and the method of generating the lyophilized pharmaceutical composition are provided. Also provided is a spray-freezed dried pharmaceutical composition for Staphylococcus Aureus vaccine and the method of generating the spray-freezed dried pharmaceutical composition.

13. [4585688](#) NUCLEIC ACID MOLECULE, FUSION PROTEIN AND MRNA VACCINE HAVING RECRUITMENT LIGAND FOR ENHANCING ANTIGEN-PRESENTING EFFECT

EP - 16.07.2025

Int.Class [C12N 15/62](#) Appl.No 23881754 Applicant WESTGENE BIOPHARMA CO LTD Inventor SONG XIANGRONG

The present invention relates to the field of biomedicine, and mainly relates to a vaccine design method for enhancing an antigen-presenting effect. A target antigen and a ligand such as a polypeptide or a protein domain having an E3 ubiquitin ligase binding or recruitment function are jointly coded in a same nucleic acid sequence, thereby promoting the degradation of the antigen protein by means of a proteasome approach, increasing the number and abundance of antigen peptides having antigen epitopes, and forming more peptide-MHC (p-MHC) complexes, and the complexes are presented on the surfaces of the cells, thereby enhancing subsequent immune response, and exerting an efficient tumor immunotherapy effect. The nucleic acid, the protein and the polypeptide vaccine provided have an efficient antigen-presenting effect and strong immunogenicity, and have good clinical application prospects.

14. [WO/2025/147639](#) IMPROVED FORMULATION PROVIDING INCREASED STABILITY FOR VACCINES COMPOSITION

WO - 10.07.2025

Int.Class [A61K 39/12](#) Appl.No PCT/US2025/010273 Applicant CYANVAC LLC Inventor LI, Zhuo

The disclosure is directed to a novel liquid vaccine formulation and composition. In one embodiment the novel liquid vaccine formulation comprises an immunogen such as PIV5, a stabilizing agent, and a buffer, with the resulting liquid vaccine formulation maintaining storage-stable immunogenicity with a potency loss of less than 0.5 Log₁₀ at 4°C for at least 4 months. In yet another embodiment the PIV5 immunogen expresses the SARS-CoV-2 S or N protein.

15. [20250232833](#) Cyclin D1 Based Cancer Vaccine

US - 17.07.2025

Int.Class [G16B 15/30](#) Appl.No 18412484 Applicant Anders Kaare Nørgaard Inventor Anders Kaare Nørgaard

The present disclosure provides a vaccine against cancers that express both high levels of Cyclin D1 and MHC-II. That includes hormone positive breast cancers and some prostate cancers and melanoma. Cyclin D1 is not presented well on MHC-I, and it expresses very little on non-cancerous tissues, so that it is possible, based on a genomic test of the individual, to design a polytope based on epitopes from Cyclin D1 that in most cases display on MHC-II and not on MHC-I, such that the cancer after vaccination with the polytope will reveal itself to the immune system and get eradicated while there are little side effects in that the vaccine will not make the immune system harm the healthy tissue. Since the invention utilizes the fact that the cancer expresses MHC-II, it may work with other antigens than Cyclin D1 as long as the cancer expresses MHC-II.

16. [WO/2025/151522](#) ENTEROTOXIGENIC ESCHERICHIA COLI COLONIZATION FACTOR CS2-CS3 EXPRESSION IN ATTENUATED SHIGELLA LIVE VECTORS

WO - 17.07.2025

Int.Class [A61K 39/108](#) Appl.No PCT/US2025/010752 Applicant UNIVERSITY OF MARYLAND, BALTIMORE Inventor BARRY, Eileen

A broadly protective *Shigella*-ETEC vaccine includes components to cover multiple *Shigella* species and serotypes as well as multiple different colonization factors of ETEC. ETEC colonization factors CS2 and CS3 are among the most prevalent CFs found on ETEC isolates associated with diarrhea. These two factors are important components of a vaccine that can confer broad protection against ETEC. High level expression of these heterologous antigens in *Shigella* live vectors results in stronger immune responses. This specification describes the genetic engineering of DNA sequences encoding upstream sequences, including promoter and ribosome binding sites, that results in increased expression of CS2 and CS3 in *Shigella* live vectors and that leads to stronger immune responses when used as a vaccine in animal models.

17.[WO/2025/140246](#)MPOX VIRUS NUCLEIC ACID VACCINE

WO - 03.07.2025

Int.Class [C07K 19/00](#) Appl.No PCT/CN2024/142122 Applicant SUZHOU ABOGEN BIOSCIENCES CO., LTD. Inventor TIAN, Siyu

The present invention relates to the fields of biomedicine and virology, and in particular to a nucleic acid vaccine for preventing and/or treating mpox virus infections. In particular, provided in the present invention are a polypeptide or a polypeptide combination, a nucleic acid or a nucleic acid combination (in particular an mRNA or an mRNA combination), a composition, a pharmaceutical composition, a kit and the use thereof for preventing and/or treating mpox virus infections. Further provided in the present invention are an expression vector containing the nucleic acid or the nucleic acid combination and a host cell containing the nucleic acid or the nucleic acid combination or the expression vector.

18.[WO/2025/140421](#)IONIZABLE LIPID COMPOUND AND USE THEREOF IN DELIVERING NUCLEIC ACID VACCINE

WO - 03.07.2025

Int.Class [C07C 229/12](#) Appl.No PCT/CN2024/142751 Applicant BEIJING JITAI PHARMACEUTICAL TECHNOLOGY CO., LTD. Inventor ZHANG, Lin

The present invention belongs to the technical field of biomedicine, and specifically relates to an ionizable lipid compound and a use thereof in delivering a nucleic acid vaccine. Provided is the ionizable lipid compound represented by formula (I), or a pharmaceutically acceptable salt, isotopic variant, tautomer or stereoisomer thereof. The definition of each group in the formula is described in detail.

19.[20250222089](#)KLEBSIELLA VACCINE AND METHODS OF USE

US - 10.07.2025

Int.Class [A61K 39/108](#) Appl.No 19095930 Applicant Cornell University Inventor Rodrigo Bicalho

Provided are compositions and methods that include a *K. pneumoniae* yidR protein or an antigenic segment of the protein, and homologous of the protein, and antigenic segments of the homologs. The compositions can be provided as vaccine formulations for use with humans and non-human animals, including but not limited to dairy cows. The compositions and methods are useful for prophylaxis and/or therapy of conditions associated with Gram negative bacteria that include *K. pneumoniae*, *E. coli*, and other pathogenic Gram negative bacteria. The conditions include such bacterial infections generally, and include specifically mastitis and metritis. The compositions and methods can also improve fertility and milk production. Administration of the compositions can improve the likelihood of a first service conception.

20.[20250222099](#)DENDRITIC CELL TARGETING FILAMENTOUS PHAGE-BASED CANCER TREATMENT VACCINE

US - 10.07.2025

Int.Class [A61K 39/385](#) Appl.No 19015516 Applicant The University of Hong Kong Inventor Jian-Dong HUANG

A dendritic cell (DC)-targeting M13 phage vaccine platform is provided herewith, where spy-tagged neoantigens can be attached to the phage surface with spy-catchers. By expressing DC-targeting peptides and spy-catchers as foreign antigens on the phage surface, its therapeutic and antigenic properties can be enhanced to combat solid cancers. SLS-spy catcher phage (SCP), with or without neoantigen conjugation, significantly repressed tumour growth by boosting systemic anti-tumour immunity and increasing intratumoral infiltration of both innate and adaptive immune cells. Intratumoral administration of SCP also hugely reduced PDL1 expression on tumour cells, making them more susceptible to immune attacks. Additionally, SCP administration restricted the size of blood vessels inside the tumour mass, suggesting multiple factors contribute to restrict tumour growth.

21. [WO/2025/140102](#) METAL-POLYPHENOL NANO-COATING-WRAPPED TUMOR WHOLE CELL, PREPARATION METHOD THEREFOR, AND USE THEREOF

WO - 03.07.2025

Int.Class [A61K 45/06](#) Appl.No PCT/CN2024/141431 Applicant SUZHOU BANGJIA MEDICAL CO., LTD Inventor GUO, Junling

Disclosed are a metal-polyphenol nano-coating-wrapped tumor whole cell, a preparation method therefor, and use thereof. A plant polyphenol in the present invention and manganese ions can be rapidly assembled at room temperature to form a dense coating on the membrane of a tumor cell. The nano-coating wrapping inactivates the tumor cell, ensuring that the vaccine is safe. The nano-coating can prevent any potential tumor antigen from being lost under physiological conditions. The nano-coating is further modified with a lipopolysaccharide, which can promote the endocytosis of the formed whole-cell vaccine by antigen-presenting cells. While forming the structural coating, ions of the metal manganese can stimulate the STING pathway to enhance the anti-tumor effect.

22. [20250222092](#) PROTEIN NANOSTRUCTURE VACCINE

US - 10.07.2025

Int.Class [A61K 39/095](#) Appl.No 19010881 Applicant Icosavax, Inc. Inventor Julia McKechnie

Provided are protein nanostructures that display *Neisseria meningitidis* factor H binding protein (fHBP). The protein nanostructure may be a two-component icosahedral nanostructure. Further provided are vaccine compositions, methods of manufacturing, and methods of use, e.g., immunizing a subject to generate a protective immune response to *Neisseria meningitidis*.

23. [WO/2025/146125](#) LIPID COMPOUND AND LIPID NANOPARTICLE FOR DELIVERY

WO - 10.07.2025

Int.Class [C07D 317/28](#) Appl.No PCT/CN2025/070378 Applicant RINUAGENE BIOTECHNOLOGY CO., LTD. Inventor DONG, Yijie

Disclosed in the present application are a compound having a structural formula as represented by formula (I), and a salt and an isomer thereof. Further disclosed in the present application is a nanoparticle composition containing the compound, or the salt thereof or the isomer thereof. The nanoparticle of the present application can efficiently deliver a drug or a vaccine into cells to exert the therapeutic or preventive purpose of the drug or the vaccine.

24. [0002842689](#) CHIMERIC PROTEIN OF HUMAN PAPILLOMA VIRUS TYPE 31 AND USE THEREOF

RU - 01.07.2025

Int.Class [C12N 15/62](#) Appl.No 2023118375 Applicant Inventor СЮЙ Сюэмэй (CN)

FIELD: biotechnology. SUBSTANCE: described is a human papilloma virus (HPV) chimeric protein for use as a vaccine, containing or consisting of L1 protein of HPV type 31 or a mutant of L1 protein of HPV type 31 and a polypeptide from protein L2 of HPV type 73 inserted into protein L1 of HPV type 31 or a mutant of protein L1 of HPV type 31, where said protein L1 of HPV type 31 is as shown in SEQ ID NO: 1; mutant of L1 protein of HPV type 31 contains one or more mutations selected from i) to iii), as compared to L1 protein of HPV type 31, as shown in SEQ ID NO: 1; i) a T274N substitution mutation; ii) mutation with truncation of 2, 4, 5, 8 or 10 amino acids truncated at the N-terminus; and iii) a mutation with truncation of 29 amino acids truncated at the C-terminus; and the polypeptide of L2 protein of HPV type 73 is as shown in SEQ ID NO: 15, SEQ ID NO: 16 or SEQ ID NO: 17; and the polypeptide of the L2 protein of HPV type 73 is inserted in the region of amino acids 428-431 of the L1 protein of HPV type 31 or a mutant of L1 protein of HPV type 31 by non-isometric substitution. What is disclosed is a polynucleotide coding a chimeric protein of human papilloma virus. Expression vector and a cell containing said vector are described. Disclosed is use of chimeric protein of human papilloma virus for producing vaccines for preventing papillomavirus infection and/or diseases induced by papillomavirus infection. Described is a vaccine for preventing papillomavirus infection and/or a papillomavirus infection induced disease, comprising a chimeric protein of human papilloma virus, an adjuvant, as well as an excipient or carrier for vaccines. EFFECT: invention widens the range of agents for preventing papillomavirus infection and diseases induced by infection in a subject. 17 cl, 4 dwg, 6 tbl, 12 ex

25. [WO/2025/151358](#) PROTEIN NANOSTRUCTURE VACCINE

WO - 17.07.2025

Int.Class [A61K 39/095](#) Appl.No PCT/US2025/010417 Applicant ICOSAVAX, INC. Inventor MCKECHNIE, Julia

Provided are protein nanostructures that display *Neisseria meningitidis* factor H binding protein (fHBP). The protein nanostructure may be a two-component icosahedral nanostructure. Further provided are vaccine compositions, methods of manufacturing, and methods of use, e.g., immunizing a subject to generate a protective immune response to *Neisseria meningitidis*.

26. [4583909A](#) LIVE ATTENUATED SARS-COV-2 AND A VACCINE MADE THEREOF

EP - 16.07.2025

Int.Class [A61K 39/12](#) Appl.No 23773170 Applicant UNIV BERLIN FREIE Inventor TRIMPERT JAKOB

The invention relates to a polynucleotide encoding a) severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) spike protein; and/or b) at least one non-structural SARS-CoV-2 protein selected from the group consisting of non-structural protein 7, non-structural protein 8, non-structural protein 9, non-structural protein 10, non-structural protein 11, non-structural protein 12, an endoribonuclease, and a 2'-O-methyltransferase, wherein the polynucleotide comprises or consists of at least one sequence part comprising codon-pair deoptimizations in comparison to the SARS-CoV-2 genome, and wherein the polynucleotide further comprises a furin cleavage site modification resulting in a loss of a furin cleavage site being naturally present in the SARS-CoV-2 genome. The invention further relates to a live attenuated SARS-CoV-2 comprising this polynucleotide, to a vaccine comprising this live attenuated SARS-CoV-2, as well as to associated methods.

27. [WO/2025/147051](#) CHIMERIC VIRUS EXPRESSING INFECTIOUS BURSAL DISEASE ANTIGEN AND VACCINE COMPOSITION COMPRISING SAME

WO - 10.07.2025

Int.Class [C12N 15/86](#) Appl.No PCT/KR2024/021545 Applicant BIOD CO.,LTD Inventor JANG, Hyung-Kwan

The present disclosure relates to a chimeric virus expressing an infectious bursal disease antigen and a vaccine composition comprising same.

28. [20250222090](#) TUBERCULOSIS VACCINES

US - 10.07.2025

Int.Class [A61K 39/04](#) Appl.No 18853636 Applicant THE JOHNS HOPKINS UNIVERSITY Inventor Richard MARKHAM

Provided herein are nucleic acid vaccine constructs comprising synthetic polynucleotides encoding a *Mycobacterium tuberculosis* (Mtb) RelA-SpoT homolog (RSH) protein, Rel_{Mtb}, or a functional portion, fragment, or variant thereof, conjugated to a macrophage inflammatory protein-3 alpha (MIP-3α) or other chemokine that binds to a chemokine receptor 6 (CCR6), or a functional portion, fragment, or variant thereof, or to an antibody, or antigen binding portion thereof, that binds to a CCR6. Methods for making the vaccine constructs and their use in prophylaxis and treatment of Mtb infections are also provided.

29. [WO/2025/149594](#) HYPERTONIC THERMOSTABLE VACCINE COMPOSITIONS

WO - 17.07.2025

Int.Class [A61K 39/02](#) Appl.No PCT/EP2025/050487 Applicant STABLEPHARMA LIMITED Inventor GARCIA DE CASTRO, Arcadio

Provided herein are thermostable lyophilisate vaccine compositions containing an antigen, trehalose, a soluble inorganic salt and an insoluble particulate adjuvant. These compositions are stable at both high and low temperatures, and thus may be stored and transported without temperature control.

30. [4583841](#) IMMUNOGENIC VACCINE COMPOSITION INCORPORATING A SAPONIN

EP - 16.07.2025

Int.Class [A61K 9/00](#) Appl.No 23772597 Applicant ACCESS TO ADVANCED HEALTH INST Inventor FOX CHRISTOPHER BRADFORD

Provided herein are lipid-based nanoparticle compositions, and methods of making and using thereof. The compositions include nanostructured lipid carriers (NLC), liposomes, lipid nanoparticles (LNPs), solid lipid nanoparticles (SLNs), oil-in-water emulsions, cationic lipid-nucleic acid complexes, cationic nanoemulsions (CNE), charge-altering releasable transporters (CARTs), or polymeric nanoparticles, and further comprise a saponin adjuvant, and optionally a sterol and/or a bioactive agent. The bioactive agent can be self-amplifying RNA. The compositions are capable of delivery of a biomolecule to a cell for the generation of an immune response, for example, for vaccine, therapeutic, allergy desensitization, or diagnostic uses. Compositions and methods related to making the compositions and using the compositions for stimulating an immune response are also provided.

31. [4585610](#) MAKING INFLUENZA VIRUS VACCINES WITHOUT USING EGGS

EP - 16.07.2025

Int.Class [C07K 14/10](#) Appl.No 25165998 Applicant SEQIRUS UK LTD Inventor TSAI THEODORE F
Currently, the steps performed prior to release of influenza strains to vaccine manufacturers involve passaging influenza virus through eggs. The invention aims to provide procedures useful in manufacturing influenza vaccines, in which the use of eggs is reduced, and preferably is avoided altogether. For instance, rather than use chicken eggs for influenza vaccine isolation, MDCK cells (Madin Darby canine kidney cells) may be used e.g. growing in suspension, growing in a serum-free medium, growing in a protein-free medium, being non-tumorigenic, grown in the absence of an overlay medium, etc.

32. [4577652](#) DNA ORIGAMI VACCINES

EP - 02.07.2025

Int.Class [C12N 15/11](#) Appl.No 23858293 Applicant OHIO STATE INNOVATION FOUNDATION Inventor ROKI NIKSA

Disclosed herein is a vaccine device that involves a DNA origami nanostructure formed from a plurality of scaffold strands and a plurality of staple strands assembled into a rod shape, wherein a peptide antigen is attached to the DNA of the nanostructure by electrostatic interaction. Also disclosed herein is a method for vaccinating a subject that involves administering to the subject a therapeutically effective amount of a vaccine device disclosed herein.

33.[WO/2025/147050](#)CHIMERIC VIRUS EXPRESSING AVIAN INFLUENZA ANTIGEN AND VACCINE COMPOSITION COMPRISING SAME

WO - 10.07.2025

Int.Class [C12N 15/86](#) Appl.No PCT/KR2024/021544 Applicant BIOD CO.,LTD Inventor JANG, Hyung-Kwan

The present specification relates to a chimeric virus expressing an avian influenza antigen and a vaccine composition comprising same.

34.[20250228930](#)SARS-COV-2 RNA VACCINE COMPOSITIONS AND METHODS OF USE

US - 17.07.2025

Int.Class [A61K 39/215](#) Appl.No 19057608 Applicant HDT Bio Corp. Inventor Steven Gregory Reed

The disclosure provides compositions, methods of treatment, and methods of making and using compositions to deliver a nucleic acid to a subject. Methods of using the compositions as a COVID-19 vaccine for the treatment of a coronavirus infection are also provided.

35.[WO/2025/146159](#)RECOMBINANT ANTIGEN AGAINST ZIKA/DENGUE VIRUS, AND VACCINE COMPOSITION THEREOF AND USE THEREOF

WO - 10.07.2025

Int.Class [C07K 14/18](#) Appl.No PCT/CN2025/070536 Applicant BEIJING CHANGPING LABORATORY Inventor YAN, Jinghua

A recombinant antigen against Zika/Dengue virus, and a vaccine composition thereof and the use thereof. The recombinant antigen is obtained by means of introducing a specific mutation into the FL fusion loop region and optionally the non-FL fusion loop region of the E protein of a wild-type Zika/dengue virus. By means of introducing the specific mutation, the FL epitope of the recombinant antigen is disrupted, which can avoid inducing the generation of antibodies against the FL epitope; thus, the purpose of reducing or eliminating the ADE effect is achieved. In addition, the recombinant antigen has a correct E protein conformation, has a protein expression level similar to or higher than that of a wild type, and can induce a relatively high titer of specific binding antibodies and neutralizing antibodies in an animal body, so that an effective immune protection can be provided, and good clinical application values and industrialization prospects are achieved.

36.[20250222098](#)Novel Peptides and Vaccines Capable of Eliciting Protective Immunity Against SARS-CoV-2

US - 10.07.2025

Int.Class [A61K 39/215](#) Appl.No 18852698 Applicant BIOMED PROTECTION, L.L.C. Inventor VELJKO VELJKOVIC

The invention generally relates to the development of a vaccine capable of providing broad protection against SARS-CoV-2 virus as well as the production of antibodies to treat the COVID-19 disease. More particularly, the invention related to the use of an informational spectrum method (ISM) to identify novel

peptides sharing structural and informational homology with spike protein subunit 1 (SP1) from SARS-CoV-2, and vaccines comprising the SP1 multi-epitope peptide antigen that is capable of eliciting protective immunity against SARS-CoV-2. The SARS-CoV-2 vaccine can be used alone or in combination with other COVID-19 vaccines.

37. [4580669](#) PEPTIDE-LOADED ANTIGEN PRESENTING CELL-DERIVED EXTRACELLULAR BLEBS AS A MOLECULARLY TARGETED VACCINE

EP - 09.07.2025

Int.Class [A61K 39/12](#) Appl.No 23861575 Applicant UNIV CALIFORNIA Inventor KWON YOUNG JIK

The disclosure provides for vaccine preparations comprising isolated or purified extracellular blebs that display engineered MHC I and MHC II peptides that target specific antigen(s) or a specific epitope(s) from a pathogen, and uses thereof, including for vaccination against the pathogen and disease.

38. [20250223320](#) HEPATITIS B VACCINES AND USES OF THE SAME

US - 10.07.2025

Int.Class [C07K 14/005](#) Appl.No 19023657 Applicant PRECIGEN, INC. Inventor Douglas E. BROUGH

Provided herein are engineered hepatitis B virus (HBV) molecular vaccine constructs. Vaccine constructs can also include ligand-inducible engineered gene switch systems for modulating expression of heterologous genes, such as cytokines, in host cells.

39. [WO/2025/149184](#) HYPERTONIC THERMOSTABLE VACCINE COMPOSITIONS

WO - 17.07.2025

Int.Class [A61K 39/02](#) Appl.No PCT/EP2024/061655 Applicant STABLEPHARMA LIMITED Inventor GARCIA DE CASTRO, Arcadio

Provided herein are thermostable lyophilisate vaccine compositions containing an antigen, trehalose, a soluble inorganic salt and an insoluble particulate adjuvant. These compositions are stable at both high and low temperatures, and thus may be stored and transported without temperature control.

40. [4582458](#) MICELLE COMPRISING AMPHIPHILIC PEPTIDE, AND ANTIGEN CARRIER NANOPARTICLE USING SAME

EP - 09.07.2025

Int.Class [C07K 19/00](#) Appl.No 23860829 Applicant RTAB CO LTD Inventor RHIM TAIYOUN

The present invention relates to a nanoparticle and a preparation method therefor, the nanoparticle comprising an amphiphilic peptide, which forms a micelle structure through self-assembly, and a target peptide (preferably, a water-soluble antigen peptide), which electrically binds to the surface of the amphiphilic peptide. The target peptide electrically binds to the surface of the amphiphilic peptide micelle structure and becomes particulated, and thus can be effectively presented to an antigen-presenting cell, and the weight ratio of the amphiphilic peptide and the target peptide is controlled so that the size of nanoparticles is controlled and endocytosis thereof is carried out, and thus immunity by means of cytotoxic T cells can be induced. Nanoparticles of the present invention exhibit use only an epitope of a more accurate region so as to be effective as a vaccine, and thus have minimal side effects. Therefore, the present invention exhibits excellent antigen-specific antibody and cell immunotherapy effects, and thus can be used in various fields such as vaccine production.

41. [20250222088](#) MULTIVALENT VACCINE COMPOSITIONS AND USES THEREOF

US - 10.07.2025

Int.Class [A61K 39/108](#) Appl.No 19025061 Applicant Janssen Pharmaceuticals, Inc. Inventor Jan Theunis POOLMAN

Compositions and methods are described for inducing an immune response against extra-intestinal pathogenic *Escherichia coli* (ExPEC) to thereby provide immune protection against diseases associated with ExPEC. In particular, compositions and methods are described for using conjugates of *E. coli* polysaccharide antigen O75 covalently bound to a carrier protein for the prevention of invasive ExPEC disease.

42. [2637114](#) Akabane disease virus strain and use thereof

GB - 16.07.2025

Int.Class [C12N 7/00](#) Appl.No 202317543 Applicant JINYUBAOLING BIO PHARMACEUTICAL CO LTD Inventor YANTING ZHANG

Provided are an Akabane disease virus strain and a use thereof. The Akabane disease virus strain is Akabane disease virus AKAV/JL/2022, and the accession number thereof is CGMCC No. 45375. The Akabane disease virus strain has excellent passage stability, high pathogenicity and excellent immunogenicity, can induce a body to generate high-titer neutralizing antibodies, can target epidemic Akabane disease after being prepared into a vaccine, and can be used in the control and treatment of Akabane disease in a pasturing region.

43. [4580660](#) CANCER VACCINE COMPRISING EXOSOMES OBTAINED OR DERIVED FROM ACTIVATED AND MATURE HUMAN B-LYMPHOCYTES

EP - 09.07.2025

Int.Class [A61K 39/00](#) Appl.No 23764595 Applicant TERASOM S R O Inventor PANKOVA DANIELA

The present invention relates to compositions comprising one or more populations of activated exosomes, which are suitable for use as cancer vaccines. The activated exosomes in a first population each display CD19 and one or more further surface molecules which are characteristic of mature or activated B-lymphocytes, and each comprise or display one or more tumour antigens selected from MAGEA4, GAGE2D and 5T4. Also provided are methods for the prevention or treatment of cancer using such compositions, and processes for the production of such compositions.

44. [20250223335](#) PEPTIDES AND SCAFFOLDS FOR USE IN IMMUNOTHERAPY AGAINST HEAD AND NECK SQUAMOUS CELL CARCINOMA AND OTHER CANCERS

US - 10.07.2025

Int.Class [C07K 14/74](#) Appl.No 19016523 Applicant Immatics Biotechnologies GmbH Inventor Andrea MAHR

The present invention relates to peptides, proteins, nucleic acids and cells for use in immunotherapeutic methods. In particular, the present invention relates to the immunotherapy of cancer. The present invention furthermore relates to tumor-associated T-cell peptide epitopes, alone or in combination with other tumor-associated peptides that can for example serve as active pharmaceutical ingredients of vaccine compositions that stimulate anti-tumor immune responses, or to stimulate T cells ex vivo and transfer into patients. Peptides bound to molecules of the major histocompatibility complex (MHC), or peptides as such, can also be targets of antibodies, soluble T-cell receptors, and other binding molecules.

45. [WO/2025/143906](#) DOUBLE MUTANT HEAT LABILE ENTEROTOXIN GENE COMPRISING SPACER

WO - 03.07.2025

Int.Class [C07K 14/245](#) Appl.No PCT/KR2024/021339 Applicant INNOVAC INC. Inventor HAHN, Tae-Wook

The present invention relates to a double mutant heat labile enterotoxin gene comprising a spacer and, more specifically, to a use of a heat labile enterotoxin protein, encoded by the gene, for enhancing

immunity. It was found that when the double mutant heat labile enterotoxin gene comprising a spacer according to the present invention is introduced to host cells, the translations of LTA and LTB constituting the labile enterotoxin gene do not affect each other, and thus LTB expression increases more than fivefold. In addition, it was experimentally confirmed that the expressed double mutant heat labile enterotoxin protein exhibits weak enterotoxic activity and simultaneously activates humoral and cellular immunity. Thus, the double mutant heat labile enterotoxin gene according to the present invention can be variously utilized in the fields of vaccines and vaccine adjuvants.

46. [3252878](#) RESPIRATORY SYNCYTIAL VIRUS-BASED ADENOVIRUS VECTOR VACCINE, METHOD FOR PREPARING SAME, AND USE THEREOF

CA - 07.07.2025

Int.Class [A61K 39/155](#) Appl.No 3252878 Applicant CANSINO BIOLOGICS INC. Inventor YANG, Zening

47. [WO/2025/144636](#) ENGINEERED hMPV F PROTEIN IMMUNOGENS AND RELATED VACCINES

WO - 03.07.2025

Int.Class [A61K 39/12](#) Appl.No PCT/US2024/060449 Applicant THE SCRIPPS RESEARCH INSTITUTE Inventor HE, Linling

The present invention provides engineered human metapneumovirus (hMPV) F protein trimer immunogens. These engineered proteins are stabilized via specific modifications introduced into both the F2 subunit and the F1 subunit of a wildtype hMPV soluble F sequence, e.g., shortened F2 subunit C-terminus and interprotomer disulfide bond in the F1 subunit. Also provided in the invention are nanoparticle vaccines that contain the engineered hMPV soluble F immunogens displayed on self-assembling nanoparticles. The invention also provides methods of using such vaccine compositions in various therapeutic applications, e.g., for preventing or treating hMPV infections.

48. [20250230195](#) PREFUSION STABILIZED EBV GB MUTATIONS AND USES THEREOF

US - 17.07.2025

Int.Class [C07K 14/005](#) Appl.No 18876289 Applicant Seattle Children's Hospital dba Seattle Children's Research Institute Inventor Jason Price

We have generated a 3D model of the glycoprotein B (gB) of Epstein-Barr virus (EBV) to design candidate stabilizing mutations that increase the stability of the prefusion state essential for an effective EBV gB based vaccine. Provided herein are engineered polypeptides derived from the EBV gB, which include an altered EBV gB ectodomain that has modifications relative to the native EBV gB ectodomain that stabilize a prefusion conformation of the polypeptides. In various aspects, the modifications are amino acid substitutions to generate pairs of cysteine amino acid residues, preferably positioned to connect different domains of the poly peptide or different copies of the polypeptide in a trimeric or multimeric conformation via formation of disulfide bonds during protein expression. In additional aspects, the modifications and/or the engineered polypeptides do not contain pairs of cysteine amino acid residues that may form disulfide bonds in a postfusion conformation.

49. [2025902785](#) AI-Based System and Method for Personalised Vaccine Recommendation and Clinical Workflow Automation in Community Pharmacy and Aged Care Settings

AU - 17.07.2025

Int.Class Appl.No 2025902785 Applicant Dragatron Pty Ltd Inventor

50. [20250228923](#) COMBINED VACCINE AGAINST MYCOBACTERIUM TUBERCULOSIS

US - 17.07.2025

Int.Class [A61K 39/04](#) Appl.No 18787546 Applicant THE CHILDREN'S MEDICAL CENTER CORPORATION Inventor Fan ZHANG

The present embodiments provide for a *Mycobacterium tuberculosis* (*M. tuberculosis*) Multiple Antigen Presenting System (MAPS) immunogenic composition comprising an immunogenic polysaccharide which induces an immune response, where at least one *M. tuberculosis* peptide or polypeptide antigen is associated to the immunogenic polysaccharide by complementary affinity molecules. In some embodiments, the immunogenic polysaccharide can be an antigenic capsular polysaccharide of a *Mycobacterium tuberculosis*, Type 5 (CP5) or Type 8 (CP8), or a combination of Type 5 or Type 8 capsular polysaccharide from *Staphylococcus aureus*, or alternatively, a different immunogenic capsular or noncapsular polysaccharide, and where the protein or peptide *M. tuberculosis* antigens are indirectly linked via an affinity binding pair. The present *M. tuberculosis*-MAPS immunogenic compositions can elicit both humoral and cellular immune responses to the immunogenic polysaccharide and one or multiple *M. tuberculosis* antigens at the same time.

51. [4585591](#) LIPID NANOPARTICLES

EP - 16.07.2025

Int.Class [C07D 309/10](#) Appl.No 23863186 Applicant UNIV KYUSHU NAT UNIV CORP Inventor HIRAI GO

The present invention provides candidate molecules for constituent components of various lipid nanoparticles. The present invention relates to a C-glycoside glycolipid compound represented by formula (I): or formula (II): or a lipid nanoparticle comprising the same, or a pharmaceutical composition, particularly a vaccine, which comprises the lipid nanoparticle.

52. [WO/2025/151620](#) FUNCTIONALIZED IMIDAZOPYRIMIDINE COMPOUNDS AND USES THEREOF

WO - 17.07.2025

Int.Class [A61K 31/395](#) Appl.No PCT/US2025/010919 Applicant THE CHILDREN'S MEDICAL CENTER CORPORATION Inventor LEVY, Ofer

The present disclosure provides compounds of Formula (I), and pharmaceutically acceptable salts, solvates, hydrates, polymorphs, co-crystals, tautomers, stereoisomers, isotopically labeled derivatives, and compositions thereof. The compound of Formula (I) is used as an enhancer and/or modifier of an immune response (e.g., innate and/or adaptive immune response), and is useful in treating and/or preventing a disease, as an adjuvant in a vaccine for a disease, (e.g., a proliferative disease, an inflammatory disease, an autoimmune disease, an infectious disease, an allergy, a fibrotic disease, a cardiovascular disease, a graft rejection, graft-versus-host disease, chronic disease, addiction, or risk of drug overdose), or as stand alone anti-infective or immune response modifying agents. Also provided in the present disclosure are vaccines, pharmaceutical compositions, kits, methods, and uses including or using compounds of Formula (I).

53. [20250222082](#) PROTEIN AND PEPTIDE VACCINES TARGETING METHANOGENS

US - 10.07.2025

Int.Class [A61K 39/00](#) Appl.No 19016420 Applicant Arkea Bio Corp. Inventor Matthew Dunn

The present invention relates to polypeptide and peptide vaccine compositions and methods that reduce methane and/or hydrogen production in animals. The present invention also relates to the treatment of diseases that are associated with methanogens.

54. [4577237](#) IMMUNOGENIC PROTEINS AND NUCLEIC ACIDS ENCODING THE SAME

EP - 02.07.2025

Int.Class [A61K 39/12](#) Appl.No 23858300 Applicant INT AIDS VACCINE INITIATIVE INC Inventor WILLIS JORDAN

The invention relates to proteins and nucleic acids for immunization regimens, modifications thereof, and/or development of nanoparticles, and/or development of membrane-anchored immunogens, and methods of making and using the same. The invention also encompasses cell surface trimers that bind to the broadly neutralizing antibodies and/or nucleic acids encoding the same.

55. [20250228928](#) IMMUNE ENHANCEMENT AND INFECTIOUS DISEASE TREATMENT

US - 17.07.2025

Int.Class [A61K 39/215](#) Appl.No 18853434 Applicant Spark Therapeutics, Inc. Inventor Xavier ANGUELA

The present invention features methods utilizing nanoparticles for double-stranded DNA (dsDNA). The nanoparticles are able to deliver the dsDNA intracellularly where the dsDNA can stimulate the innate immune response. Uses of the described methods include enhancing an immune response to a vaccine and infectious disease treatment.

56. [4580671](#) PREFUSION-STABILIZED CMV GB PROTEINS

EP - 09.07.2025

Int.Class [A61K 39/245](#) Appl.No 23861623 Applicant UNIV TEXAS Inventor MCLELLAN JASON

Provided herein are engineered hCMV gB polypeptides. In some aspects, the engineered gB polypeptides exhibit enhanced conformational stability and/or antigenicity. Methods are also provided for use of the engineered gB polypeptides as diagnostics, in screening platforms, and/or in vaccine compositions.

57. [3214465](#) INTRANASAL VACCINE COMPOSITION AND METHOD FOR BOOSTING USING THE SAME

CA - 07.07.2025

Int.Class [A61K 9/00](#) Appl.No 3214465 Applicant ADVAGENE BIOPHARMA CO., LTD. Inventor HSU, YU-SHEN

58. [WO/2025/140679](#) A LIVE BACTERIA STRAIN OF STAPHYLOCOCCUS SP.

WO - 03.07.2025

Int.Class [C12N 1/21](#) Appl.No PCT/CN2024/143562 Applicant SHANGHAI YUGUAN BIOTECH CO., LTD. Inventor ZHANG, Mengya

Provided are a live bacteria strain of Staphylococcus sp., such as a live bacteria strain of Staphylococcus aureus, with reduced activity of saePQRS, reduced activity of adsA, and/or reduced production of capsules; the uses of said live bacteria strain; a vaccine against bacterial infection comprising said live bacteria strain; and a method for preventing and/or treating bacterial infection in a subject by administering said live bacteria strain.

59. [4583899](#) AFRICAN HORSE SICKNESS VIRUS (AHSV) VIRAL PROTEIN 2 (VP2) FUSION PROTEINS

EP - 16.07.2025

Int.Class [A61K 38/00](#) Appl.No 23768649 Applicant CSIR Inventor O'KENNEDY MARTHA MAGARETHA

This invention relates to a plant-produced African horse sickness virus (AHSV) VP2 fusion protein and to uses of the VP2 fusion protein in a vaccine and/or diagnostic test. The VP2 fusion protein, comprises of an AHSV VP2 polypeptide which is fused to a synthetic peptide which includes a thrombin cleavage site, a linker, a histidine tag and an endoplasmic reticulum retention signal. The invention specifically relates to the fusion proteins described herein, methods of producing the fusion proteins in plant cells and pharmaceutical compositions comprising the fusion proteins.

60. [WO/2025/151713](#) PROTEIN AND PEPTIDE VACCINES TARGETING METHANOGENS

WO - 17.07.2025

Int.Class [A61K 39/02](#) Appl.No PCT/US2025/011065 Applicant ARKEA BIO CORP. Inventor SOUTH, Colin

The present invention relates to polypeptide and peptide vaccine compositions and methods that reduce methane and/or hydrogen production in animals. The present invention also relates to the treatment of diseases that are associated with methanogens.

61.[WO/2025/138665](#)NATURAL ATTENUATED STRAIN OF INFECTIOUS LARYNGOTRACHEITIS VIRUS WITH GOOD SAFETY AND GOOD IMMUNOGENICITY AND USE

WO - 03.07.2025

Int.Class [C12N 7/00](#) Appl.No PCT/CN2024/102158 Applicant INSTITUTE OF ANIMAL HUSBANDRY AND VETERINARY MEDICINE, FUJIAN ACADEMY OF AGRICULTURAL SCIENCES Inventor HOU, Bo
A natural attenuated strain of infectious laryngotracheitis virus with good safety and good immunogenicity. The natural attenuated strain is named infectious laryngotracheitis virus ILTV FJ19, and has been deposited in the China Center for Type Culture Collection on November 29, 2023, with the deposit number of CCTCC NO: V2023109, and the deposit address of No. 299, Bayi Road, Wuchang District, Wuhan City, Hubei Province. Experiments show that the avian infectious laryngotracheitis virus ILTV FJ19 strain has stable passage ability, can adapt to inoculation via the allantoic cavity route, has very good safety and immunogenicity when inoculated in 14-day-old SPF chickens, can be used for eye-drop inoculation or oral inoculation, and can be used as a candidate strain of a live attenuated vaccine against ILTV.

62.[2637234](#)Stem cell compositions for culturing coronaviruses and methods of making and using thereof
GB - 16.07.2025

Int.Class [C12N 7/00](#) Appl.No 202500092 Applicant CENTRE FOR TRANSLATIONAL STEM CELL BIOLOGY LTD Inventor DEGONG RUAN

Disclosed are methods for culturing coronavirus particles in early syncytiotrophoblasts (eSTBs). The derived eSTBs are mononucleated or bi-nucleated cells with high ACE2 expression and are not multi-nucleated or mature cells. The methods can also include assessing the eSTBs for coronavirus susceptible markers. Also disclosed are compositions and methods (i) for inducing the differentiation of eSTBs and mature STBs from trophoblast stem cells (TSCs), (ii) for inducing the differentiation of TSCs from EPSCs, primed and naïve stem cells, pre-implantation embryos, placental stem cells, and iPSCs, and (iii) for producing TSCs by reprogramming non-trophoblast cells. The disclosed compositions and methods can be used for producing large quantities of coronavirus particles, including human, non-human, and variant coronavirus particles for virus production, the vaccine industry, disease modeling studies, screening and evaluation of antiviral reagents, compound candidates, testing kits, and evaluation of clinical therapies.

63.[WO/2025/143588](#)RECOMBINANT SALMONELLA STRAIN AND USE THEREOF

WO - 03.07.2025

Int.Class [C12N 15/74](#) Appl.No PCT/KR2024/019231 Applicant INDUSTRY-ACADEMIC COOPERATION FOUNDATION, CHOSUN UNIVERSITY Inventor BANG, Iel Soo

The present invention relates to a spheroplast protein y (Spy)-exogenous protein-secreting Salmonella strain, which possesses a Spy protein-coding gene and has the *rpoE* gene deleted. The recombinant Salmonella strain according to the present invention, while exhibiting attenuated virulence due to the Spy protein, can maintain structural stability when fused with exogenous proteins such as pathogenic viruses, therapeutic proteins, or antigenic epitopes, through the structure and chaperone functions of the Spy protein. Therefore, the present invention can serve as a live attenuated vaccine. Furthermore, the present invention can be used as a protein delivery vehicle, a drug delivery vehicle, and in antigen-antibody reaction-based techniques for applications in other areas of biotechnology.

64. [WO/2025/144938](#) SYSTEMS FOR NUCLEIC ACID TRANSFER

WO - 03.07.2025

Int.Class [A61K 48/00](#) Appl.No PCT/US2024/061965 Applicant EMMUNE, INC. Inventor QUINLAN, Brian D.

The disclosure relates generally to systems and methods for nucleic acid transfer. RNA encoding a double membrane fusogen protein facilitates the transfer of a DNA of interest into the nucleus of a cell where it can be expressed. Nucleic acid transfer can be used in connection with gene therapy, vaccine administration, cell modification, and the like. The methods and systems of nucleic acid transfer can be used to transfect non-dividing cells, such as muscle cells. The disclosure further relates to promoters for muscle-specific expression of a gene of interest.

65. [20250228926](#) RNA VACCINE LIPID NANOPARTICLES

US - 17.07.2025

Int.Class [A61K 39/215](#) Appl.No 18690988 Applicant GLOBAL LIFE SCIENCES SOLUTIONS CANADA ULC Inventor Andy John Geall

Disclosed are recombinant expression vectors useful as RNA vaccines. Also disclosed are pharmaceutically acceptable carriers for the recombinant expression vectors, particularly lipid nanoparticles.

66. [2025205220](#) VACCINE POLYPEPTIDE COMPOSITIONS AND METHODS

AU - 17.07.2025

Int.Class Appl.No 2025205220 Applicant Arizona Board of Regents on behalf of the University of Arizona Inventor MORTON, Daniel

67. [3249351](#) Human Immunodeficiency Virus (HIV)-Neutralizing Antibodies

CA - 03.07.2025

Int.Class [A61K 39/42](#) Appl.No 3249351 Applicant INTERNATIONAL AIDS VACCINE INITIATIVE Inventor CHAN-HUI, PO-YING68. [4580668](#) VETERINARY COMPOSITIONS OF MODIFIED VIRUS-LIKE PARTICLES OF CMV AND NGF ANTIGENS

EP - 09.07.2025

Int.Class [A61K 39/12](#) Appl.No 23764287 Applicant SAIBA ANIMAL HEALTH AG Inventor ZELTINS ANDRIS

The present invention relates to compositions comprising modified virus-like particles (VLPs) of Cucumber Mosaic Virus (CMV), and in particular to modified VLPs of CMV comprising chimeric CMV polypeptides which comprises a stretch of consecutive negative amino acids selected from aspartic acid or glutamic acid to which nerve growth factor (NGF) antigens are linked as well as pharmaceutical compositions thereof, which compositions preferably serve as vaccine platform for generating immune responses, in particular antibody responses, against said NGF antigens linked to the modified CMV VLPs.

69. [4580667](#) MODIFIED VIRUS-LIKE PARTICLES OF CMV

EP - 09.07.2025

Int.Class [A61K 39/12](#) Appl.No 23764285 Applicant SAIBA ANIMAL HEALTH AG Inventor ZELTINS ANDRIS

The present invention relates to a modified virus-like particle (VLP) of cucumber mosaic virus (CMV) comprising at least one chimeric CMV polypeptide, wherein said at least one chimeric CMV polypeptide comprises, preferably consists of (i) a CMV polypeptide, wherein said CMV polypeptide comprises a coat

protein of CMV or an amino acid sequence having a sequence identity of at least 75% with SEQ ID NO:48; and (ii) a polypeptide comprising, preferably consisting of, a stretch of consecutive negative amino acids, wherein said negative amino acids are independently selected from aspartic acid or glutamic acid, wherein said polypeptide is inserted between any amino acid residue of said CMV polypeptide corresponding to any amino acid residue between position 75 and position 85 of SEQ ID NO:48, as well as to compositions and pharmaceutical compositions comprising such modified VLPs to which antigens are linked, which compositions preferably serve as vaccine platform for generating immune responses, in particular antibody responses, against said antigens linked to the modified CMV VLPs.

70. [20250228924](#) IDENTIFICATION OF *G. PARASUIS* IMMUNOGENIC PROTEINS AND SUBUNIT VACCINE COMPRISING SUCH

US - 17.07.2025

Int.Class [A61K 39/102](#) Appl.No 18990203 Applicant The United States of America, as Represented by the Secretary of Agriculture Inventor SAMANTHA J. HAU

Provided herein are methods to identify immunogenic *G. Parasuis* proteins, compositions comprising such immunogenic proteins, kits comprising such immunogenic proteins, and methods of using such immunogenic proteins to prevent *G. Parasuis* in pigs.

71. [WO/2025/151711](#) NUCLEIC ACID VACCINES TARGETING METHANOGENS

WO - 17.07.2025

Int.Class [A61K 39/02](#) Appl.No PCT/US2025/011061 Applicant ARKEA BIO CORP. Inventor HSU, Alexander

The present invention relates to nucleic acid vaccine compositions and methods that target methanogens and reduce their production of methane and/or hydrogen. The present invention also relates to the treatment of diseases that are associated with methanogens.

72. [WO/2025/151606](#) IDENTIFICATION OF *G. PARASUIS* IMMUNOGENIC PROTEINS AND SUBUNIT VACCINE COMPRISING SUCH

WO - 17.07.2025

Int.Class [A61K 39/102](#) Appl.No PCT/US2025/010899 Applicant THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY OF AGRICULTURE Inventor HAU, Samantha J.

Provided herein are methods to identify immunogenic *G. Parasuis proteins*, compositions comprising such immunogenic proteins, kits comprising such immunogenic proteins, and methods of using such immunogenic proteins to prevent *G. Parasuis* in pigs.

73. [320790](#) LOW DOSE VACCINE COMPOSITIONS

IL - 01.07.2025

Int.Class [A61K 39/00](#) Appl.No 320790 Applicant CENTIVAX, INC. Inventor GLANVILLE, Jacob

74. [3031660](#) MAMMALIAN MHC PEPTIDE DISPLAY AS AN EPITOPE SELECTION TOOL FOR VACCINE DESIGN

ES - 10.07.2025

Int.Class [G01N 33/569](#) Appl.No 19716211 Applicant ETH Zürich Inventor KISIELOW, Jan

75. [20250222094](#) POLYNUCLEOTIDE MOLECULES USED FOR THE PREVENTION OR TREATMENT OF HPV INFECTION RELATED DISEASES

US - 10.07.2025

Int.Class [A61K 39/12](#) Appl.No 19089584 Applicant RINUAGENE BIOTECHNOLOGY CO., LTD. Inventor Shan CEN

The present application relates to a polynucleotide molecule that can be used for preventing or treatment HPV infection-related diseases, and a pharmaceutical product, a pharmaceutical composition, or an mRNA vaccine comprising said polynucleotide.

76.[2636832](#) Uses, methods, polypeptides and polynucleotides

GB - 02.07.2025

Int.Class [A61K 39/12](#) Appl.No 202319922 Applicant UNIV TARTU Inventor ALAR AINTS

Polypeptides comprising bacteriophage polypeptides for use in preventing or treating autoimmune diseases, for example type 1 diabetes. Polypeptides comprising fragments or variants of bacteriophage polypeptides may also be used for this purpose. Nucleic acid molecules encoding such polypeptides may also be used for this purpose. The present invention also relates to vaccine compositions comprising such a polypeptide or comprising a nucleic acid molecule encoding such a polypeptide. Certain isolated peptides comprising fragments of bacteriophage polypeptides also form part of the present invention. The present invention also relates to methods of screening for an autoimmune disease by determining the level, in a body fluid sample obtained from a subject, of an antibody that binds to a bacteriophage polypeptide or fragment or variant thereof.

77.[20250228933](#) Human Cytomegalovirus Immunogenic Composition

US - 17.07.2025

Int.Class [A61K 39/245](#) Appl.No 19020003 Applicant Sanofi Pasteur Inventor Pascal Chaux

The invention relates to an immunogenic composition comprising an HCMV gB antigen, an HCMV gH/gL/UL128/UL130/UL131 pentameric complex antigen and a Th1-inducing adjuvant. It further relates to the immunogenic composition for use as an HCMV vaccine.

78.[20250223568](#) METHOD OF ORGANOID DERIVED PRODUCTION OF HUMAN EXTRACELLULAR MATRIX HYDROGELS

US - 10.07.2025

Int.Class [C12N 5/09](#) Appl.No 19011037 Applicant The Board of Trustees of The University of Alabama Inventor Alexandra DeVera Avera

Disclosed herein is a method of extracting extracellular matrix (ECM) from organoids via decellularization and hydrogels formed from methods thereof. The hydrogels can be used in medical devices for regenerative medicine like tissue grafts, and research and development applications to enhance disease modeling utilizing 3D bioprinting or other hydrogel embedding processes. The hydrogels can also be used to enhance tissue culture flasks for cells by offering a softer environment than polystyrene for cell culture. The hydrogels can be used in drug and vaccine delivery as well.

79.[20250228931](#) ALPHAVIRUS REPLICON ENCODING CHIMERIC SARS-COV-2 RECEPTOR BINDING DOMAINS

US - 17.07.2025

Int.Class [A61K 39/215](#) Appl.No 19098884 Applicant VLP Therapeutics, Inc. Inventor Wataru AKAHATA

Provided herein is an isolated polynucleotide, which encodes alphavirus non-structural proteins nsp1, nsp2, nsp3 and nsp4 and a polypeptide comprising a coronavirus protein fused to a signal sequence and/or transmembrane domain. The coronavirus protein may be the receptor binding domain of the S1 subunit of coronavirus spike (S) protein. The polynucleotide such as RNA is useful for as a vaccine against coronavirus infection, especially, COVID-19 infection.

80.[2025902715](#) VACCINE AND METHOD OF TREATMENT

AU - 10.07.2025

Int.Class Appl.No 2025902715 Applicant HE, Hong Inventor HE, Hong

81.[20250223321](#) RESPIRATORY SYNCYTIAL VIRUS RECOMBINANT FUSION PROTEIN WITH PRE-FUSION CONFORMATION, PREPARATION METHOD AND USES THEREOF

US - 10.07.2025

Int.Class [C07K 14/005](#) Appl.No 19093301 Applicant BEIJING BENEWILL TECHNOLOGY DEVELOPMENT CO., LTD. Inventor Jinghua YAN

The present application relates to a respiratory syncytial virus subtype A (RSV-A) recombinant F protein, a polynucleotide encoding the RSV-A recombinant F protein, a nucleic acid construct comprising the polynucleotide, an expression vector comprising the nucleic acid construct, a host cell into which the polynucleotide, the nucleic acid construct, or the expression vector is transformed or transfected, a stabilized trimer formed from the RSV-A recombinant F protein, an immunogenic composition comprising any of the foregoing, and use of any of the foregoing in the preparation of a vaccine for the prevention and/or treatment of respiratory syncytial virus infections. The RSV-A recombinant F protein comprises at least one epitope specific to the pre-fusion F protein, and can form a stable, pre-fusion conformation of F protein trimer. Furthermore, the RSV-A recombinant F protein can be expressed stably in a uniform form and with a significantly increased yield.

82.[4578878](#) RESPIRATORY SYNCYTIAL VIRUS RECOMBINANT FUSION PROTEIN HAVING PRE-FUSION CONFORMATION, AND PREPARATION METHOD THEREFOR AND USE THEREOF

EP - 02.07.2025

Int.Class [C07K 19/00](#) Appl.No 23870950 Applicant BEIJING BENEWILL TECH DEVELOPMENT CO LTD Inventor YAN JINGHUA

The present application relates to a respiratory syncytial virus subtype A (RSV-A) recombinant F protein, a polynucleotide encoding the RSV-A recombinant F protein, a nucleic acid construct comprising the polynucleotide, an expression vector comprising the nucleic acid construct, a host cell into which the polynucleotide, the nucleic acid construct, or the expression vector is transformed or transfected, a stabilized trimer formed from the RSV-A recombinant F protein, an immunogenic composition comprising any of the foregoing, and use of any of the foregoing in the preparation of a vaccine for the prevention and/or treatment of respiratory syncytial virus infections. The RSV-A recombinant F protein of the present application comprises at least one epitope specific to the pre-fusion F protein, and can form a stable, pre-fusion conformation of F protein trimer. Furthermore, the RSV-A recombinant F protein of the present application can be expressed stably in a uniform form and with a significantly increased yield. The formed F protein trimer has strong immunogenicity and thus can stimulate the body to produce a high-level antibody titer, which is of great significance for the clinical treatment and prevention of respiratory syncytial virus.

83.[WO/2025/149032](#) RESPIRATORY SYNCYTIAL VIRUS VACCINE COMPOSITIONS AND THEIR USE

WO - 17.07.2025

Int.Class [C12N 15/62](#) Appl.No PCT/CN2025/071741 Applicant IMMORNA (HANGZHOU)

BIOTECHNOLOGY CO., LTD. Inventor WANG, Zihao

Provided are respiratory virus ribonucleic acid (RNA) vaccines as well as methods of using the vaccines and compositions comprising the vaccines.

84.[321069](#) PNEUMOCOCCAL CONJUGATE VACCINE FORMULATIONS

IL - 01.07.2025

Int.Class [A61K 39/00](#) Appl.No 321069 Applicant PFIZER INC. Inventor DIOP, Awa

85.[320588](#) TGF-BETA-1 VACCINE

IL - 01.07.2025

Int.Class [A61K 38/00](#) Appl.No 320588 Applicant IO BIOTECH APS Inventor MADS HALD ANDERSEN
86.[20250230197](#)MALARIA VACCINE

US - 17.07.2025

Int.Class [C07K 14/02](#) Appl.No 18791268 Applicant OXFORD UNIVERSITY INNOVATION LIMITED
Inventor Adrian V.S. HILL

The invention relates to a composition comprising a polypeptide comprising, or consisting of, the amino acid sequence of SEQ ID NO: 1, or a sequence having at least 80%, 85%, 90%, 95%, 98%, or 99% sequence identity to SEQ ID NO: 1 (R21), wherein said polypeptide is in the form of a virus-like particle (VLP), wherein said particle comprises less than 10% free hepatitis B surface antigen protein, for use in the immunisation of a human subject susceptible to *Plasmodium falciparum* infection, characterised in that said composition is administered in a dosage regimen of at least one dose of 1 µg to 20 µg R21 per administration for a subject at least 18 years old, or at least one dose of 0.5 µg to 10 µg R21 per administration for a subject less than 18 years old. The invention also relates to kits, methods and uses.

87.[4580672](#)NANOPARTICLE-DERIVED VACCINES AGAINST POXVIRUSES, AND METHODS FOR MAKING AND USING THE SAME

EP - 09.07.2025

Int.Class [A61K 39/385](#) Appl.No 23776760 Applicant US HEALTH Inventor MOSS BERNARD

The present disclosure relates generally to vaccines against orthopoxviruses, and methods for making and using such vaccines. In particular, in some embodiments, the present disclosure relates to nanoparticle-derived vaccines, and compositions based thereon, that elicit an immune response against an orthopoxvirus. The present disclosure further relates to the use of vaccines and vaccine compositions for preventing; decreasing the severity, morbidity and/or mortality of; shortening the duration of; and/or reducing the symptoms of, a poxvirus infection, such as, for example, an orthopoxvirus infection.

88.[2025/08238](#)DENGUE VACCINE FORMULATION

ID - 07.07.2025

Int.Class [A61K 47/00](#) Appl.No P00202504306 Applicant TAKEDA VACCINES, INC. Inventor YAZDI, Sara

Invensi ini berkaitan dengan suatu formulasi vaksin dengue yang terdiri dari suatu komposisi virus dengue tetraavalen yang terdiri dari suatu virus dengue serotipe 1 hidup yang dilemahkan, suatu virus dengue serotipe 2 hidup yang dilemahkan, suatu virus dengue serotipe 3 hidup yang dilemahkan, dan suatu virus dengue serotipe 4 hidup yang dilemahkan, setidaknya satu disakarida non-pereduksi, setidaknya poloksamer, urea, setidaknya satu asam amino yang memiliki suatu rantai samping bermuatan positif pada pH netral, trometamina, dan albumin serum manusia.

89.[20250222095](#)RESPIRATORY SYNCYTIAL VIRUS RECOMBINANT FUSION PROTEIN WITH PRE-FUSION CONFORMATION, PREPARATION METHOD AND USES THEREOF

US - 10.07.2025

Int.Class [A61K 39/155](#) Appl.No 19093295 Applicant BEIJING BENEWILL TECHNOLOGY DEVELOPMENT CO., LTD. Inventor Jinghua YAN

The present application relates to a respiratory syncytial virus subtype B (RSV-B) recombinant F protein, a polynucleotide encoding the RSV-B recombinant F protein, a nucleic acid construct comprising the polynucleotide, an expression vector comprising the nucleic acid construct, a host cell into which the polynucleotide, the nucleic acid construct, or the expression vector is transformed or transfected, a

stabilized trimer formed from the RSV-B recombinant F protein, an immunogenic composition comprising any of the foregoing, and use of any of the foregoing in the preparation of a vaccine for the prevention and/or treatment of respiratory syncytial virus infections. The RSV-B recombinant F protein comprises at least one epitope specific to the pre-fusion F protein, and can form a stable, pre-fusion conformation of F protein trimer. Furthermore, the RSV-B recombinant F protein can be expressed stably in a uniform form and with a significantly increased yield.

90. [2025205182](#) Dengue Vaccine Unit Dose And Administration Thereof

AU - 17.07.2025

Int.Class Appl.No 2025205182 Applicant Takeda Vaccines, Inc. Inventor LEFEVRE, Inge

91. [WO/2025/147676](#) NOVEL COMPOSITIONS OF MATTER COMPRISING PROTEINS THAT INCORPORATE PFS230 OR PVS230 DOMAIN 1 (PFS230D1 OR PVS230D1) AT THE N-TERMINUS, MALARIA VACCINE ANTIGENS, AND THEIR USE

WO - 10.07.2025

Int.Class [A61K 39/00](#) Appl.No PCT/US2025/010325 Applicant THE UNITED STATES OF AMERICA, AS REPRESENTED BY THE SECRETARY, DEPARTMENT OF HEALTH AND HUMAN SERVICES Inventor DUFFY, Patrick E.

The invention provides a protein comprising, from amino- to carboxy-termini: (a) a first polypeptide domain derived from the Pfs230 domain 1 (Pfs230D1) of *Plasmodium falciparum* or the Pvs230 domain 1 (Pvs230D1) of *Plasmodium vivax*, (b) an optional linker domain, and (c) a second polypeptide domain, which can be a 6-Cys polypeptide, wherein the fusion protein is not the native Pfs230 or Pvs230 protein. The invention also provides nucleic acids encoding the inventive protein, genetic vectors comprising such nucleic acid, cells comprising the protein, nucleic acid or vector, compositions comprising such reagents. The invention also provides a method for vaccinating a subject using the inventive protein and composition and the use of the inventive protein and composition in connection with such a method.

92. [4578870](#) RESPIRATORY SYNCYTIAL VIRUS RECOMBINANT FUSION PROTEIN WITH PREFUSION CONFORMATION, AND PREPARATION METHOD THEREFOR AND USE THEREOF

EP - 02.07.2025

Int.Class [C07K 14/135](#) Appl.No 23870952 Applicant BEIJING BENEWILL TECH DEVELOPMENT CO LTD Inventor YAN JINGHUA

The present application relates to a respiratory syncytial virus subtype B (RSV-B) recombinant F protein, a polynucleotide encoding the RSV-B recombinant F protein, a nucleic acid construct comprising the polynucleotide, an expression vector comprising the nucleic acid construct, a host cell into which the polynucleotide, the nucleic acid construct, or the expression vector is transformed or transfected, a stabilized trimer formed from the RSV-B recombinant F protein, an immunogenic composition comprising any of the foregoing, and use of any of the foregoing in the preparation of a vaccine for the prevention and/or treatment of respiratory syncytial virus infections. The RSV-B recombinant F protein of the present application comprises at least one epitope specific to the pre-fusion F protein, and can form a stable, pre-fusion conformation of F protein trimer. Furthermore, the RSV-B recombinant F protein of the present application can be expressed stably in a uniform form and with a significantly increased yield. The formed F protein trimer has strong immunogenicity and thus can stimulate the body to produce a high-level antibody titer, which is of great significance for the clinical treatment and prevention of respiratory syncytial virus.

93. [4580670](#) HIV VACCINE IMMUNOGENS FOR THE INDUCTION OF V3-GLYCAN TARGETING ANTIBODIES

EP - 09.07.2025

Int.Class [A61K 39/12](#) Appl.No 23861577 Applicant UNIV DUKE Inventor HENDERSON RORY

The invention is directed to modified HIV-1 envelopes, compositions comprising these modified envelopes, nucleic acids encoding these modified envelopes, compositions comprising these nucleic acids, and methods of using these modified HIV-1 envelopes and/or these nucleic acids to induce immune responses.

94. [20250228932](#) HUMAN CYTOMEGALOVIRUS VACCINE

US - 17.07.2025

Int.Class [A61K 39/245](#) Appl.No 18926517 Applicant ModernaTX, Inc. Inventor Giuseppe Ciaramella

The disclosure relates to HCMV ribonucleic acid (RNA) vaccines, as well as methods of using the vaccines and compositions comprising the vaccines.

Patentes registradas en United States Patent and Trademark Office (USPTO)

Estrategia de búsqueda: *vaccine.ti. AND @PD>="20250701"<=20250718* 54 records

Document ID	Title	Inventor	Applicant Name
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US 20250228932 A1	Human cytomegalovirus vaccine	Ciaramella; Giuseppe et al.	Modernatx, Inc.
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US 12357682 B2	DNA plasmid-launched live-attenuated vaccines for plus-sense singel stranded RNA	Zou; Jing et al.	Board of Regents, The University of Texas System
US 12357686 B2	Porcine epidemic diarrhea (PED) virus vaccine composition and preparation method thereof	Sohn; Eun-Ju et al.	Bioapplications Inc.
US 12357687 B2	Compositions and vaccines for treating and/or preventing viral infections, and methods of using the same	Brahmbhatt; Himanshu et al.	Engeneic Molecular Delivery Pty Ltd
US 12357667 B2	Nutraceutical formulations to prevent, treat, and inhibit excess cytokines, SARS-cov-2 spike proteins, and mrna vaccine spike proteins	Fluga; Mark A	Pono Lifestyle Colorado, Llc
US 20250222098 A1	Novel Peptides and Vaccines Capable of Eliciting Protective Immunity Against SARS-cov-2	VELJKOVIC; VELJKO et al.	Biomed Protection, L.L.C.
US 20250222086 A1	Cancer vaccines targeting muc16 and uses thereof	YAN; Jian et al.	Inovio Pharmaceuticals, Inc.
US 20250223320 A1	Hepatitis b vaccines and uses of the same	BROUGH; Douglas E. et al.	Precigen, Inc.
US 20250222089 A1	Klebsiella vaccine and methods of use	Bicalho; Rodrigo	Cornell University
US 20250222088 A1	Multivalent vaccine compositions and uses thereof	POOLMAN; Jan Theunis et al.	Janssen Pharmaceuticals, Inc.
US 20250222096 A1	Coronavirus vaccine	Sahin; Ugur et al.	Biontech SE
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US 20250222090 A1	Tuberculosis vaccines	MARKHAM; Richard et al.	The Johns Hopkins University
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US 20250222099 A1	Dendritic cell targeting filamentous phage-based cancer treatment vaccine	HUANG; Jian-Dong et al.	The University of Hong Kong
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US 12350328 B2	Multivalent live-attenuated influenza vaccine for prevention and control of equine influenza virus (EIV) in horses	Martinez-Sobrido; Luis et al.	University of Rochester, University of Kentucky Research Foundation, Zoetis Services Llc
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US 12350329 B2	RNA vaccines against infectious diseases	Reed; Steven Gregory et al.	Hdt Bio Corp.
US 12350300 B2	Use of dopamine producing products to increase vaccine efficacy	Lyte; Mark	Iowa State University Research Foundation, Inc.
US 12350327 B2	Compositions and methods for therapeutic or vaccine delivery	Fischer-Lougheed; Jacqueline et al.	Genvivo, Inc.
US 20250213678 A1	VACCINE DEVELOPMENT PLATFORM USING PLANT-SECRETED NANO-VESICLES FOR DELIVERY OF RECOMBINANT PROTEIN AND mrna	CHO; Young-Eun	Andong National University Industry-Academic Cooperation Foundation
US 20250213643 A1	Compositions and method for optimized peptide vaccines using residue optimization	GIFFORD; David Kenneth et al.	Think Therapeutics, Inc.
US 20250213669 A1	Attenuated bordetella bronchiseptica strains, oral vaccines containing the attenuated strains, and methods of making & use thereof	Fischer; Laurent Bernard et al.	Boehringer Ingelheim Animal Health Usa Inc.
US 20250213675 A1	Immunogens and vaccine compositions against hiv	ROLLAND; Morgane Marie et al.	The Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc.
US 20250213667 A1	Clostridium difficile vaccine	Lundberg; Urban et al.	Valneva Austria Gmbh
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US 12343390 B2	Recombinant biologically contained filovirus vaccine	Kawaoka; Yoshihiro et al.	Wisconsin Alumni Research Foundation (Warf)
US 12344636 B2	Respiratory syncytial virus recombinant F protein and vaccine composition containing same	Kim; Eun-som et al.	Sk Bioscience Co., Ltd.
US 12343388 B2	Clostridioides difficile tcdB variants, vaccines and methods of use	Ballard; Jimmy D. et al.	The Board of Regents of The University of Oklahoma
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US 12343431 B2	Lyophilized and stabilized live attenuated formulated vaccine against tularemia	Carson; Kenneth H. et al.	Southwest Research Institute

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