VacCiencia

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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 esta forma crear una retroalimentación que nos permita acercarnos más a sus necesidades de información.

- II edición BioHabana 2024.
- Noticias más recientes en la Web sobre vacunas.
- Artículos científicos más recientes de Medline sobre vacunas.
- Patentes más recientes en Patentscope sobre vacunas.

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Se desarrolla en Cuba II edición de BioHabana 2024

Con sede en el Centro de Convenciones Plaza América de Varadero, el evento deviene espacio para la construcción de redes de colaboración entre científicos, líderes de opinión, empresarios, hombres de negocios y una cifra total de más de 1300 delegados entre los que se incluyen importantes conferencistas y representantes de 25 países.

En la jornada inicial de BioHabana 2024 se inauguró una feria expositiva y en las siguientes jornadas se efectuarán simposios sobre cáncer, enfermedades neurodegenerativas y otros tratamientos cerebrales, enfermedades infecciosas y autoinmunes y uno sobre tecnología médica e industria 4.0.

Otras temáticas vinculadas a la innovación en modelos de negocios, la biotecnología agropecuaria, colaboración academia-empresa y ciencia regulatoria se han insertado dentro del amplio programa del certamen en el cual se ejecutarán además firmas de convenios y rondas de negocios.

Con auspicio del Grupo Empresarial BioCubaFarma y el Grupo de la Industria Biotecnológica, Farmacéutica y de Tecnología Médica Cubana, la cita supone una oportunidad especial para analizar la nueva revolución de las ciencias del siglo XXI y analizar las enseñanzas dejadas durante la COVID-19 en el país.

Bajo el lema Ciencia para una Vida Saludable, BioHabana 2024 pretende ser un congreso único por su alcance y diversidad tanto en temas como actores, un acelerador de la innovación y una herramienta para el fomento de la cooperación y los negocios.

Fuente: Cubadebate. Disponible en https://acortar.link/BkFQsh

Noticias en la Web

AstraZeneca to Initiate Trial for Triple-Combination Inhaled Therapy for Chronic Obstructive Pulmonary Disease

Mar 22. AstraZeneca has announced it will initiate a phase 3 trial to investigate the effect of the triple-combination inhaled therapy budesonide/glycopyrronium/formoterol fumarate (BGF [Breztri Aerosphere]) on severe cardiopulmonary outcomes, including death, with individuals who have chronic obstructive pulmonary disease (COPD) and elevated cardiopulmonary risk, according to a press release from the company.

"The 2024 GOLD Report highlights the treatment effect of non-pharmacologic interventions and inhaled triple combination therapies on mortality. The Report calls for a more proactive therapeutic approach to improve outcomes in COPD. If positive, the THARROS trial will provide critical evidence about the potential of single inhaler, triple combination therapy to reduce severe cardiopulmonary events and further advance treatment goals in COPD, including for patients with no history of exacerbations, for whom no evidence currently exists," Fernando Martinez MD, MS, chief of the division of pulmonary and critical care medicine at Weill Cornell Medicine and New York-Presbyterian Hospital, said in the press release.

According to the CDC, the age-adjusted prevalence of COPD has remained unchanged from 2011 to 2022, with estimates higher for women across years. Further, the age-standardized COPD death rates in adults decreased from 1999 to 2021, with a smaller difference between men and women in 2021 compared with 2019, according to the data from the CDC.

The THARROS study will be the first prospective trial to investigate the potential of inhaled triple therapy to reduce cardiopulmonary events in COPD. The study will investigate death from respiratory and cardiac causes will be the severe cardiopulmonary outcome measures. The trial will be multi-centered and double blinded and include 5000 individuals with COPD who have cardiopulmonary risk. Patients will be aged 40 to 80 years old and will receive the triple combination therapy or dual bronchodilator therapy, glycopyrronium/formoterol fumarate, according to the press release.

Furthermore, the company has announced that the first participants have also been dosed in the ATHLOS phase 3 clinical trial, investigating the triple therapy drug compared to inhaled corticosteroids and long-acting β-agonist, budesonide/formoterol fumarate (Symbicort; AstraZeneca), or the placebo on cardiopulmonary parameters, including hyperinflation and exercise endurance time, according to the press release. This study will include 180 individuals aged 40 to 80 years old.

BGF is currently approved to treat COPD in 75 countries, including the United States. The drug is indicated for the maintenance treatment of individuals with COPD. The most common adverse reactions included upper respiratory tract infection, pneumonia, back pain, oral candidiasis, influenza, muscle spasms, urinary tract infection, cough, sinusitis, and diarrhea, according to the press release.

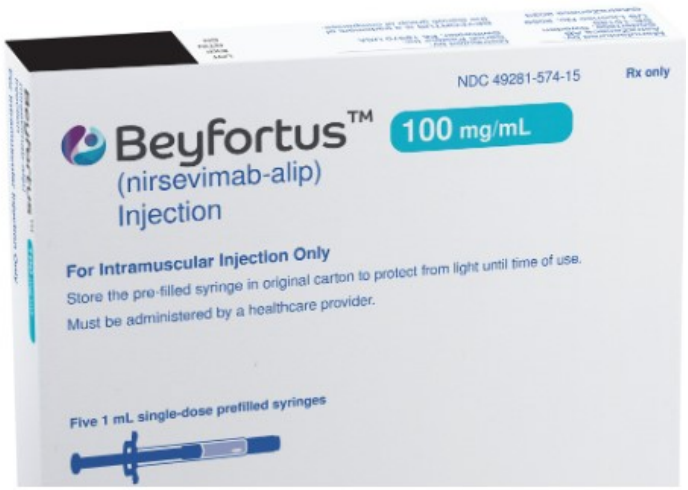
"Large outcomes trials have transformed the management of cardiovascular diseases by enhancing our understanding of the potentially broad impact of therapies targeting those diseases. Current evidence already supports a proactive treatment approach in COPD. Now THARROS is seeking to provide first-of-its-kind evidence to support a strategy of comprehensive cardiopulmonary risk reduction with a triple therapy," David Berg, MD, MPH, associated physician in cardiovascular and critical care medicine at Brigham and Women's Hospital at Harvard Medical School, said in the press release.

Fuente: Pharmacy Times. Disponible en https://l1nq.com/V8AJp

- **The THARROS trial investigates the effect of Breztri Aerosphere (triple-combination therapy) on severe cardiopulmonary outcomes (including death) in high-risk COPD patients.**
- **These trials address the need for a more proactive approach to COPD treatment, potentially reducing severe cardiopulmonary events.**
- **Breztri is already approved for COPD maintenance treatment in many countries.**

60% of Children Protected From RSV this Season

Mar 22. During the recent Respiratory Syncytial Virus (RSV) season, two types of immunization were available to protect young children from this respiratory disease.



As of March 20, 2024, the RSVVaxView Dashboard indicated about 60% of children were protected during the 2023-2024 season.

RSVVaxView reported that 43% of mothers with infants under eight months reported that their child had received Beyfortus™ (Nirsevimab), a single-dose, extended half-life monoclonal antibody offering passive immunization to prevent lower respiratory tract infections caused by RSV.

In February 2024, 38.8% of pregnant women reported that they plan to get nirsevimab for their infant, while 43.7% of women who are trying to get pregnant also reported that they plan to get nirsevimab for their future infant.

In early March 2024, the U.S. CDC reported that nirsevimab was 90% effective at preventing RSV-associated hospitalization in infants during their first RSV season.

With the increasing availability of nirsevimab in future RSV seasons, the CDC will assess its effectiveness over an entire season.

Additionally, among pregnant women with a gestational age of ≥32 weeks, the overall RSV vaccine coverage was about 17.9%.

As of January 31, 2024, the vaccination coverage was highest among non-Hispanic Asian (25.2%) pregnant women.

The CDC wrote, 'These RSV prevention products remain our single most important tool to protect infants during RSV outbreaks.'

Fuente: Precision Vaccinations. Disponible en https://l1nq.com/BfVrG

Children RSV Vaccine Candidate Posts Positive Interim Clinical Data

Mar 22. A clinical-stage intranasal vaccine company developing parainfluenza virus 5 (PIV5)-vectored vaccines that harness the full breadth of the immune system to protect against serious infectious diseases today announced preliminary data from the first two cohorts of a Phase 1/2a clinical trial studying BLB201, a vaccine candidate against severe respiratory syncytial virus (RSV) disease.

On March 21, 2024, Blue Lake Biotechnology, Inc., stated the data show that BLB201 is immunogenic and well tolerated, with no significant safety events reported to date following a single intranasal dose in RSV seropositive children 18-59 months of age.

The ongoing trial is currently enrolling both RSV seropositive and RSV seronegative children as young as eight months of age.

No vaccine-related severe safety signals have been reported among the initial 10 participants ages 18-59 months who received the BLB201 study vaccine in this Phase 1/2a study (NCT05655182).

In the five participants who received the higher dose of 10^7 PFU of BLB201, prominent increases in RSV neutralizing antibody (nAb) responses were observed at four weeks post-vaccination, with 80% having a 3.6- to 57-fold rise in nABs over baseline.

RSV-specific mucosal IgA antibody and cellular immune responses were also observed.

“Given the challenges of developing an RSV vaccine for children, it is highly encouraging that BLB201, our intranasal RSV vaccine candidate, has been well tolerated in this age group so far,” said Biao He, Ph.D., founder and CEO of Blue Lake Biotechnology, in a press release.

“It is also very exciting to see RSV-specific immune responses to our vaccine in children who have previously been exposed to RSV. We are eager to generate more data in younger children, including infants who have not had prior exposure to RSV, and to develop a highly effective and safe vaccine to protect this vulnerable population from RSV.”

As of March 2024, approved antibody drugs and a maternal RSV vaccine can provide passive immunity against RSV in infants. However, no RSV vaccine has been approved for generating prophylactic immunity in infants and children.

Fuente: Precision Vaccinations. Disponible en https://l1nq.com/4Kokq

11 Tuberculosis Vaccine Candidates Nearing Completion

Mar 23. As World Tuberculosis Day approaches on March 24, everyone should focus on preventing this disease to reduce its impact on society.

According to GlobalData, an analytics company, various TB vaccines are in late-stage development and hold promise in containing the disease burden.

GlobalData reported today that there are currently 11 TB vaccine candidates in the late stages of development.

For example, the M72/AS01E vaccine candidate could be the first licensed TB vaccine in decades.

While the 100-year-old Bacillus Calmette-Guérin (BCG) vaccine is up to 80% effective at preventing TB infection in young children, it provides reduced protection against pulmonary TB.

This means there is a significant need for improved prophylactic vaccines.

Currently, there are about 16 approved TB vaccines in use worldwide.

Anaelle Tannen, Infectious Disease Analyst at GlobalData, commented in a press release on March 22, 2024, "Progress in this area has the potential to save countless lives as well as reduce the health and socio-economic burden associated with this disease."

Tannen added, "Prevention and early diagnosis are key to stopping the ongoing spread of the disease. The BCG vaccine is currently the only prophylactic on the market. It is given to babies in countries where TB is common."

"In areas where TB is less common, it is only given to those at high risk, including those that are more likely to be exposed to the bacterium."

TB remains a global pandemic, with 1.8 billion people estimated to be infected with the bacteria, according to the World Health Organization (WHO). India leads most countries in reporting TB cases and deaths.

The disease exists in both a latent and active form; the latent type does not express symptoms and is not transmissible unless it develops into the active type.

The lifetime risk for latently infected persons is about 5-10%.

Antibiotics are typically administered for at least six months, and ensuring the course is completed is vital to prevent antibiotic resistance, says the WHO.

In the United States, the TICE® BCG vaccine is available at most health departments but not retail pharmacies.

Fuente: Precision Vaccinations. Disponible en https://acesse.dev/bBU5j

1 million pertussis vaccines to arrive in June – DOH

Mar 23. Around one million doses of pertussis vaccine are expected to arrive in Manila, Philippines by June, the Department of Health (DOH) announced yesterday.

The DOH said the fresh supply of the pentavalent vaccine, which also provides protection to children against diphtheria, tetanus, hepatitis B and Haemophilus influenza type B, is seen to boost the government's vaccination drive.

"More or less between 800,000 to one million doses," DOH spokesperson Undersecretary Eric Tayag told a news forum at the Dapo Restaurant and Bar in Quezon City.

The DOH has given 1,500 doses to Quezon City after the city government declared an outbreak of pertussis.

Tayag said the doses are not enough, citing studies which showed that 1.9 to 2.1 million babies are born every year.

In the absence of vaccines, Tayag said antibiotics are available to cure patients.

As of March 9, the DOH has documented 167 confirmed cases nationwide with 35 deaths.

Metro Manila, Calabarzon and Central Visayas have recorded the highest number of cases.

Tayag said Iloilo City is also at risk for pertussis outbreak after it recorded 10 cases.

The lack of supply of vaccines is among the reasons why cases of pertussis in the country have increased, including in Quezon City wherein Mayor Joy Belmonte has declared an outbreak of the disease.

Tayag said some programs of the DOH were sacrificed during the COVID pandemic as the focus was to address the infectious disease.

He said the public vaccination rate dropped by 65 percent in 2018 due to reported deaths allegedly caused by a dengue vaccine.

Bulacan logs 2 cases

Meanwhile, two cases of pertussis have been reported in San Jose del Monte and Meycauayan in Bulacan.

Bulacan Gov. Daniel Fernando ordered the provincial health office to determine if there are other cases and to identify children with incomplete vaccinations against pertussis.

A routine DPT (diphtheria, pertussis and tetanus) vaccine is given to children in three doses.

Fernando said the vaccination campaign at the border of Meycauayan and San Jose Del Monte and neighboring areas should continue.

Fuente: Phil Star Global. Disponible en https://acesse.dev/wcb6b

Study Shows Elimination of Cervical Cancer With Vaccination; Oncologist Highlights the Importance

Mar 25. Dr Maurie Markman, from City of Hope, talks very briefly about a paper that he recently published. According to the Dr, this is one of the most spectacular studies.

The paper is "Invasive Cervical Cancer Incidence Following Bivalent Human Papillomavirus Vaccination: A Population-Based Observational Study of Age at Immunization, Dose, and Deprivation."

The Dr says: I can't be clearer on what the results of the study demonstrate and how important this is for young individuals — in the case of cervical cancer, of course, we are talking about women — but also regarding HPV-related cancers in general.

This was a population-based study from Scotland where they monitored the records of all women — because it's population-based data — who were born between 1988 and 1996, who are eligible to receive screening for cancer. This included a very large population of 450,000 women.

Important to the conclusion is that there were 40,000 women at the time who were vaccinated between the ages of 12 and 13. Obviously, we're talking in the past. There were 40,000 of these women who were vaccinated and then followed. There were also 124,000 women who received vaccines at the age of 14 or over. A total of 300,000 women were not vaccinated.

Again, this was not a trial. This was real, hardcore, population-based data. This is as good as it gets from the point of if you want to know whether a therapy works or doesn't work.

The bottom line is — and I'm going to say this twice because I really want this to sink in — there were no cases. Let me say it again: There were no cases of cervical cancer among the 40,000 women who were vaccinated before the age of 14 years. One more time: Zero cases. Complete prevention of cervical cancer in this population with vaccination. This included even the women who had received only one or two doses of the vaccine. We're beginning to learn that perhaps we don't even need the three doses. It was a three-dose protocol, but there no cases in 40,000 women if they were vaccinated before the age of 14.

In the women who were vaccinated between 14 and 22 years of age, there was also substantial benefit. There were 3.2 cases per 100,000 women compared with 8.4 cases if they weren't vaccinated. That's two and a half times lower risk compared with the unvaccinated. There was benefit in that population.

Again, if vaccination occurred, generally, say, before sexual debut, complete eradication and elimination of cervical cancer.

I would encourage you to read this paper. It's not the only one that's shown data for this, but this is population -based data with long-term follow-up and very careful analysis showing that cervical cancer can almost be, if not actually be, eliminated with vaccination before sexual debut.

I encourage you to read this paper if you're a parent, a pediatrician, or a family care doctor. Obviously, as an oncologist, I never want to see these cases again. That may happen if the young population is vaccinated.

I encourage you to read this paper, review the data for yourself, and let people know how important this is, particularly parents of young children. I thank you for your attention.

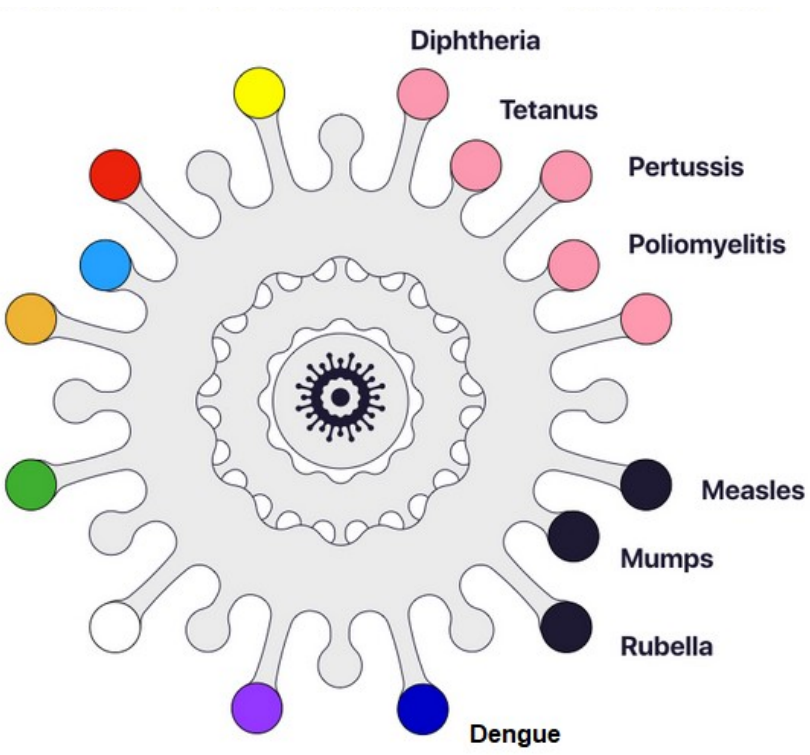
Fuente: Medscape. Disponible en https://acortar.link/LIlJDk

Vaccine-preventable diseases on the upswing again in Philippines

Mar 25. As of today, there are reports of multiple outbreaks of vaccine-preventable diseases in different areas of the country.

In Pasig City, two of 17 children with pertussis (known as whooping cough because of the sound produced by coughing in affected persons) died of the disease. Eight other children are being monitored as probable cases. Pertussis cases are also increasing in the Cordillera region. Five pertussis cases were reported in Iloilo. Quezon City declared a pertussis outbreak after recording 23 cases with four deaths, all in infants.

Pertussis is preventable with the three-in-one vaccine known as Tdap (formerly DPT) vaccine, which also protects against tetanus and diphtheria.



As of Feb. 24, 569 measles and rubella cases were reported, with all regions except Bicol and Central Visayas experiencing an increase in cases over the past month. Measles, mumps and rubella are preventable with the MMR vaccine, which is highly effective and has been used all over the world for decades.

Measles cases have been on the increase since the WHO reported the Philippines as having the largest measles outbreak in the Western Pacific region with 2,428 cases in 2017, to 20,827 cases in 2018, to 48,525 cases in 2019. The rise in cases coincided with the onset of the Dengvaxia controversy starting in 2017. It was also cited as the main cause of vaccine hesitancy among many parents, and led to doubts about the safety and efficacy of other vaccines, including MMR and Tdap.

The Vaccine Confidence Project stated that there has been a marked decline in vaccine acceptance in the Philippines from a high of 93 percent acceptance in 2015 to a low of 32 percent in 2018. This was attributed to the controversy surrounding the Dengvaxia vaccination program.

Then, news media engaged in a campaign of reporting including live televised reporting of “autopsies” on alleged Dengvaxia victims by a government agency whose mandate was to provide legal aid to poor citizens and does not have the budget for medicolegal autopsies (which the PNP and NBI are mandated to do). Even the Senate conducted hearings in aid of legislation on Dengvaxia which were attended with much publicity of grieving parents.

Dengue epidemics are now hyper-endemic, with no more seasonality but present year-round. In 2022, the Philippines reached almost 221,000 cases with 722 deaths and a case fatality ratio of 0.3 percent. This is the highest recorded figure so far.

What is sad is that DOH vaccination teams who used to be welcomed in communities are now viewed with distrust and even threatened with violence by parents who not only refuse to have their children vaccinated, but also actively prevent access to communities by health workers.

The COVID-19 pandemic severe lockdown restrictions on movement contributed to a lack of access to these childhood vaccines, causing more disruptions in vaccination programs nationwide. Hence, the Department of Health is playing catch-up to vaccinate at least 90 percent of children in order to produce herd immunity. As of 2022, only 69 percent of the target children population has been immunized with routine childhood vaccines (MMR and Tdap). This has failed to reach herd immunity levels.

These outbreaks are a huge burden on the public health system with no less than the PhilHealth reporting dengue as the number three diagnosis in claims payment amounting to almost ₱1 billion in 2021, number two diagnosis in 2022 with claims payments of almost ₱2 billion, number three again in 2023 with claims payments of over ₱759 million. We can just imagine how much the country will save had there been an effective dengue vaccination program. Unfortunately, we may never know if we continue to have widespread vaccine hesitancy.

The human cost of vaccine-preventable diseases is likewise enormous, considering the premature loss of lives and the morbidity endured by the unwitting victims of a political war they cannot comprehend nor deserve. Who knows if one or more of those lost children could have grown up to be the doctor who discovers a medical breakthrough or one who invents a device that will benefit mankind.

For once, let us put aside our animosities and biases and protect our children’s health, for they are truly this country’s future. Let the Dengvaxia trials proceed to their conclusion, whatever it may be. It should not be too much to ask for the sake of the children.

Let me state that I am a respondent of several Dengvaxia cases following a testimony in Congress in 2017. I fervently wish a quick resolution of all the Dengvaxia cases, no matter what the outcome is. As a medical practitioner, I absolutely believe in the efficacy and safety of properly tested and researched vaccines, as documented in medical literature.

Fuente: Manila Bulletin. Disponible en https://acortar.link/FsfQ1v

Asociación Española de Vacunología. Noticias

26 mar. Datos provisionales positivos en niños de una vacuna intranasal frente a VRS.

La compañía Blue Lake Technology ha anunciado datos provisionales de la fase I/II del ensayo clínico de su vacuna BLB201 en diez participantes de 18 a 59 meses de edad en cuanto a su perfil de seguridad y a la inmunogenicidad ya que en cinco participantes que recibieron la dosis más alta de vacuna (107 PFU) se observó a las cuatro semanas una importante respuesta de anticuerpos neutralizantes con el 80% de ellos que experimentaron un incremento de anticuerpos séricos de entre 3.6 a 57 veces respecto a la situación basal. Adicionalmente, se constataron respuestas inmunes de IgA específica en mucosas y respuestas celulares. La vacuna BLB201 codifica la proteína F del virus respiratorio sincitial vehiculizada en un vector vírico canino parainfluenza 5 (PIV5). La FDA de los Estados Unidos ha concedido a la vacuna la condición de Fast-Track.

26 mar. Las vacunas antineumocócicas conjugadas pueden ofrecer protección frente a infecciones respiratorias víricas en la infancia.

Se acumulan evidencias en relación a que las vacunas antineumocócicas conjugadas pudieran reducir, indirectamente, las infecciones víricas del tracto respiratorio mediante interacciones neumococo-virus, según estudio publicado Sepúlveda-Chacón I, Dunne E, Hanquetti G et al. Effect of pneumococcal conjugate vaccines on viral respiratory infections: a systematic literature review. J Infect Dis 2024 Mar 11:jiae125. doi: 10.1093/infdis/jiae125. Epub ahead of print. PMID: 38462672 en https://pubmed.ncbi.nlm.nih.gov/38462672/

Para comprobar la hipótesis, los autores llevan a cabo una revisión sistemática de estudios observacionales y de intervención llevados a cabo entre 2000 y 2022 y que incluyeran datos de eficacia y de efectividad de las vacunas PVC7, PVC9, PVC10 y PVC13. De 1.671 registros solo fueron trece las que analizaron por ajustarse a los criterios de efecto sobre la infección respiratoria vírica en niños. La efectividad vacunal frente a la gripe osciló entre el 41% y el 86% excepto para la temporada gripal 2010/2011. En un ensayo aleatorio controlado la vacuna PVC9 mostró eficacia frente a infección respiratoria frente a cualquier virus, a coronavirus estacionales, a parainfluenza y frente a metapneumovirus humano. Los datos obtenidos en adultos fueron limitados (3 trabajos) y la efectividad de la vacuna de trece serotipos osciló entre el 4% y el 25% frente a la infección respiratoria inferior, de un 32%-35% frente a desenlaces relacionados con COVID-19, del 24%-51% frente a coronavirus estacionales humanos y del 13%-36% frente a infección respiratoria baja por virus gripal. En algunos de los porcentajes anteriores los intervalos de confianza al 95% incluyeron al cero. No encontraron protección frente a adenovirus o a rinovirus tanto en niños como en adultos. Los autores concluyen que las vacunas antineumocócicas conjugadas ofrecen cierta protección frente a infecciones respiratorias causadas por algunos virus, siendo más robusta frente a la gripe infantil, por lo que el restringir las evaluaciones de esas vacunas a cuadros neumocócicos pudiera infraestimar el valor de las mismas.

Fuente: https://acortar.link/6sfhu8

26 mar. Compatibilidad de la vacuna recombinante frente a HZ con otras vacunas rutinarias del adulto.

Se realizó una revisión de la información disponible en Ali O, Dessart Ch, Parikh. Co-administration of the adjuvanted recombinant zoster vaccine with other adult vaccines: An overview. Vaccine Available online 28 February 2024 https://www.sciencedirect.com/science/article/pii/S0264410X24001944 con relación a la coadministración de la vacuna recombinante de subunidades RZV frente al virus del herpes zóster en relación a la seguridad, reactogenicidad e inmunogenicidad. Los datos se obtuvieron de cinco ensayos clínicos de fase III, aleatorios y abiertos, todos ellos con un diseño similar. Las vacunas coadministradas fueron la antigripal estacional tetravalente inactivada, la antineumocócica polisacárida simple de 23 serotipos, la vacuna Tdap, la antineumocócica conjugada de trece serotipos y la vacuna frente a SARS-CoV-2 de mRNA administrada como dosis de recuerdo. Todos los individuos incluidos fueron mayores de cincuenta años. En los cinco estudios se dispuso de 3.974 participantes de los que en coadministración se incluyeron a 1.973 y a 2.001 en secuencial. Las tasas de respuesta a RZV fue similar entre la secuencial y la simultánea. Las respuestas inmunes a otras vacunas (con la excepción de la pertactina de la vacuna antitosferinosa) no fueron inferiores entre ambas formas de vacunación. La incidencia global de efectos adversos solicitados locales y generales, no solicitados, graves o potencialmente inmunomediados también fueron similares. La mialgia fue el sistémico más frecuente (coadministración: 38%-64% y secuencial: 30%-59%). Los escalofríos y la fiebre fueron más habituales en la administración simultánea de RZV y la antineumocócica polisacárida. Los autores concluyen que la administración de RZV con otras rutinarias del adulto no altera significativamente la reactogenicidad, inmunogenicidad o la seguridad para ninguna de ellas, lo que es un factor importante para aumentar las coberturas de vacunación.

Fuente: https://acortar.link/mEVgg9

Debunking myths during the pandemic to putting her foot down on dengue vaccine

Mar 27. On November 30, 2022, Dr Soumya Swaminathan stepped out to take in the sights and sounds of Geneva “one last time”. It was her last working day as Chief Scientist of the World Health Organization (WHO) and a leisurely walk through the streets brought on a rush of memories — from how, early into her five-year stint, she sat through a crucial WHO board meeting “that would just not end” while she popped pills to keep a fever down, to planning the first research and innovation forum on COVID-19 as she went on to become the global voice for WHO during the pandemic.

When Dr Swaminathan took on the WHO role in 2019, it was a completely “unscripted play”. For one, there was no clarity on the chief scientist’s role that had just been created. And then, just as she settled in, the world was gripped by the raging COVID-19 pandemic that brought in its wake deep fears, doubts and rumours.

Through all the uncertainties, what kept Swaminathan going was her faith in science. “In the face of opposition, stick to science. Have faith in your findings and defend them. Luckily, there was science to fall back on. Ultimately it was science that saved us,” she is quoted as saying in At The Wheel Of Research, a soon-to-be-released biography of the senior scientist authored by Anuradha Mascarenhas, Senior Editor with The Indian Express.

The book provides insights into the life of the acclaimed researcher who emerged as one of the most trusted scientific voices in the world. So whether it was taking to social media to address doubts related to vaccines to fight Covid-19, debunking conspiracy theories, or personally writing to a Bollywood celebrity asking for a tweet to be taken down, she patiently worked to fight fake news and misinformation during the pandemic.

The eldest of three daughters born to Dr M S Swaminathan, the 'Father of the Green Revolution', and educationist Mina Swaminathan, Dr Soumya Swaminathan earned her MBBS from Pune's Armed Forces Medical College and MD from AIIMS, Delhi. She then moved to the US for a postdoctoral medical fellowship in neonatology and paediatric pulmonology. Dr Swaminathan would later join ICMR's National Institute of Research in Tuberculosis (NIRT), where she researched extensively on pulmonary physiology and pathology in children. She would go on to do pioneering work in HIV and TB, winning accolades for her research contributions. In August 2015, she became the second woman Director General of the Indian Council of Medical Research, the apex body in the country for medical research.

As DG-ICMR, Dr Swaminathan was caught in a raging debate in 2015 over a prospective dengue vaccine. That year, as dengue cases rose, she was under tremendous pressure from some officials to introduce Dengvaxia, the first licensed dengue vaccine developed by French company Sanofi Pasteur.

Dr Swaminathan backed an expert committee that had serious concerns about the vaccine and, despite pressure from several quarters, stood her ground. India never approved Dengvaxia – a call that would in hindsight prove to be prescient as the vaccine ran into a controversy in the Philippines, where it was banned in 2017. The book mentions how a relieved Dr Swaminathan wrote an email to her colleagues in the ICMR and the health ministry, saying, "Thank God for the systems that were in place. We must respect our institutional systems and mechanisms and listen to scientific opinion."

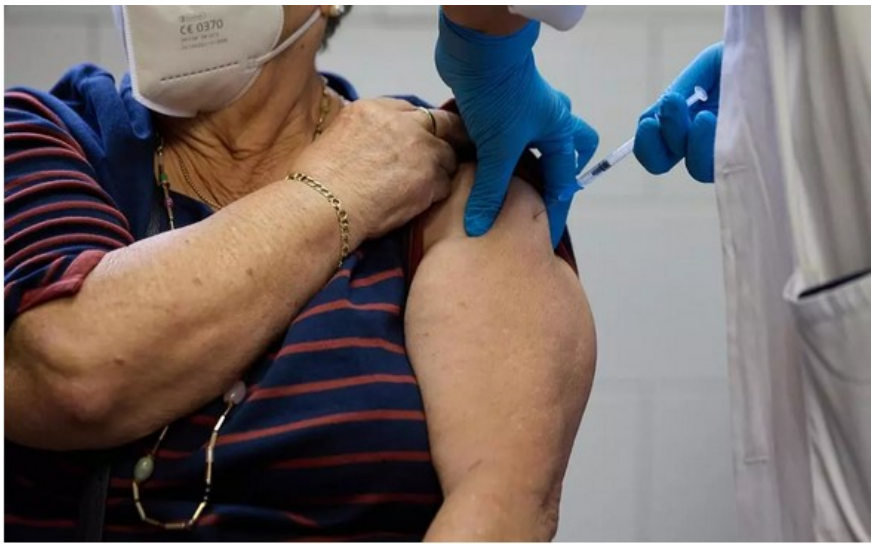
Dr Swaminathan also understood how vital it was to explain technical details to policy makers. The book talks about an episode when her intervention proved crucial. As DG-ICMR, she was aware of how key files often get stuck with government departments, endlessly awaiting approval. One such file pertained to funding at the Pune-based ICMR-National Institute of Virology's Biosafety level 4 facility. Aware of how critical the facility was, Dr Swaminathan decided to meet the then finance secretary to explain the role of the laboratory that was capable of detection and research on viruses and dangerous pathogens. Dr Swaminathan managed to convince the bureaucrat, who went on to clear the file. Needless to say, the laboratory ended up as one of the most prized assets in the country during Covid-19, when it was tasked with the isolation and genomic sequencing of the SARS-CoV2 virus and its variants.

In December 2017, when she was offered the post of Director General at WHO, after which she transitioned into the role of WHO's first Chief Scientist, Dr Swaminathan accepted it "reluctantly" since she thought she had many more tasks to accomplish at ICMR, but looking back, she is glad she took up the new role. "The opportunity it provided me to put to best use all of my skills during an emergency is a once-in-a-lifetime opportunity," the book quotes her as saying.

Late in 2022, just as the world was recovering from the pandemic, Dr Swaminathan left WHO. In the book, she talks about how the learnings from the pandemic should be utilised to tackle other diseases while providing a comprehensive overview of why adopting a planetary health approach is the only way forward. Now back in India, another new chapter unfolds for Dr Swaminathan, who heads the M S Swaminathan Research Foundation and works on her father's vision of interlinking agriculture, nutrition and health.

Fuente: The Indian Express. Disponible en https://acortar.link/TQ8qa0

La OMS lanza CoViNet, una red mundial de laboratorios para coordinar el seguimiento de los coronavirus



27 mar. La Organización Mundial de la Salud (OMS) ha puesto en marcha una nueva red para los coronavirus, llamada CoViNet, con el fin de facilitar y coordinar los conocimientos especializados y las capacidades mundiales para la detección precoz y precisa, el seguimiento y la evaluación del SARS-CoV-2, el MERS-CoV y los nuevos coronavirus de importancia para la salud pública.

Esta nueva iniciativa amplía la red de laboratorios de referencia COVID-19 de la OMS, creada durante los primeros días de la pandemia. Inicialmente, la red de laboratorios se centraba en el SARS-CoV-2, el virus causante de COVID-19, pero ahora se ocupará de una gama más amplia de coronavirus, incluidos el MERS-CoV y posibles nuevos coronavirus. CoViNet es una red mundial de laboratorios especializados en la vigilancia de coronavirus humanos, animales y ambientales.

La red cuenta actualmente con 36 laboratorios de 21 países de las seis regiones de la OMS: Australia, Brasil, Francia, Alemania, Ghana, China, India, Japón, México, Pakistán, Federación Rusa, Senegal, Sudáfrica, Suiza, Tailandia, Países Bajos, Uganda, Emiratos Árabes Unidos, Reino Unido, Estados Unidos y Singapur.

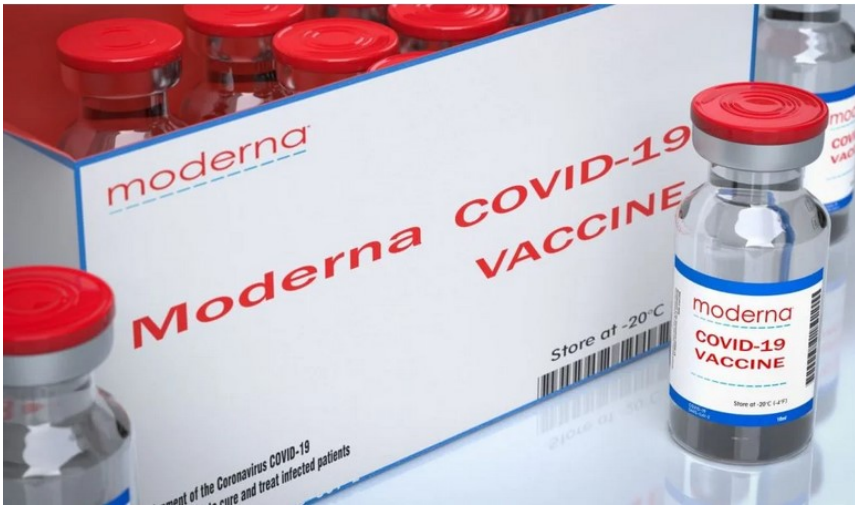
Los representantes de los laboratorios se han reunido en Ginebra los días 26 y 27 de marzo para ultimar un plan de acción para 2024-2025 a fin de que los estados miembros de la OMS estén mejor equipados para la detección precoz, la evaluación de riesgos y la respuesta a los problemas de salud relacionados con los coronavirus.

La reunión de CoViNet congrega a expertos mundiales en salud humana, animal y ambiental, que adoptan un enfoque integral de "Una sola salud" para vigilar y evaluar la evolución y propagación de los coronavirus. La colaboración subraya la importancia de mejorar la vigilancia, la capacidad de los laboratorios, la secuenciación y la integración de datos para fundamentar las políticas de la OMS y apoyar la toma de decisiones.

"Los coronavirus han demostrado una y otra vez su riesgo epidémico y pandémico. Damos las gracias a nuestros socios de todo el mundo que están trabajando para comprender mejor los coronavirus de alta amenaza como el SARS, el MERS y la COVID-19 y para detectar nuevos coronavirus", ha dicho la doctora Maria Van Kerkhove, directora en funciones del Departamento de Preparación y Prevención de Epidemias y Pandemias de la OMS. "Esta nueva red mundial para los coronavirus garantizará la detección, vigilancia y evaluación oportunas de los coronavirus de importancia para la salud pública".

Fuente: El Periódico. Disponible en https://acortar.link/zNWWLA

Moderna's Phase III COVID-19 vaccine trial meets primary endpoints



Mar 27. Moderna has announced positive interim results from the Phase III NextCOVE clinical trial, where its next-generation COVID-19 vaccine candidate, mRNA-1283, met the primary endpoints.

The randomised, active-controlled, observer-blind trial included nearly 11,400 participants aged 12 years and above from the UK, US, and Canada.

It is designed to assess the safety, efficacy, reactogenicity, immunogenicity, and relative vaccine efficacy (rVE) of the mRNA-1283.222 vaccine as a booster dose, versus the mRNA-1273.222 vaccine, a licensed COVID-19 vaccine of the company.

In the trial, mRNA-1283 elicited a higher immune response against the SARS-CoV-2 virus, including the Omicron BA.4/BA.5 and original strains, when compared to mRNA-1273.222.

This enhanced response was particularly significant in participants above 65 years of age, a group at higher risk for severe COVID-19 outcomes.

Participants reported common local adverse events, such as pain at the injection site, and systemic adverse events, including fatigue, headache, myalgia, and chills.

mRNA-1283's safety profile was found to be similar to that of the approved COVID-19 vaccines of Moderna.

The storage and handling characteristics of mRNA-1283, including its shelf life and pre-filled syringe presentation, could potentially reduce the burden on healthcare providers and improve vaccine access in public health settings.

Moderna is expected to share a detailed analysis of the Phase III trial data for mRNA-1283 in the near future.

Moderna CEO Stéphane Bancel said: "We are excited to announce our fourth infectious disease vaccine programme with positive Phase III data, further validating our robust mRNA platform.

"mRNA-1283 is a critical component of our combination vaccine against flu and COVID-19, mRNA-1083, and this milestone gives us confidence in our ability to bring this much needed vaccine to market."

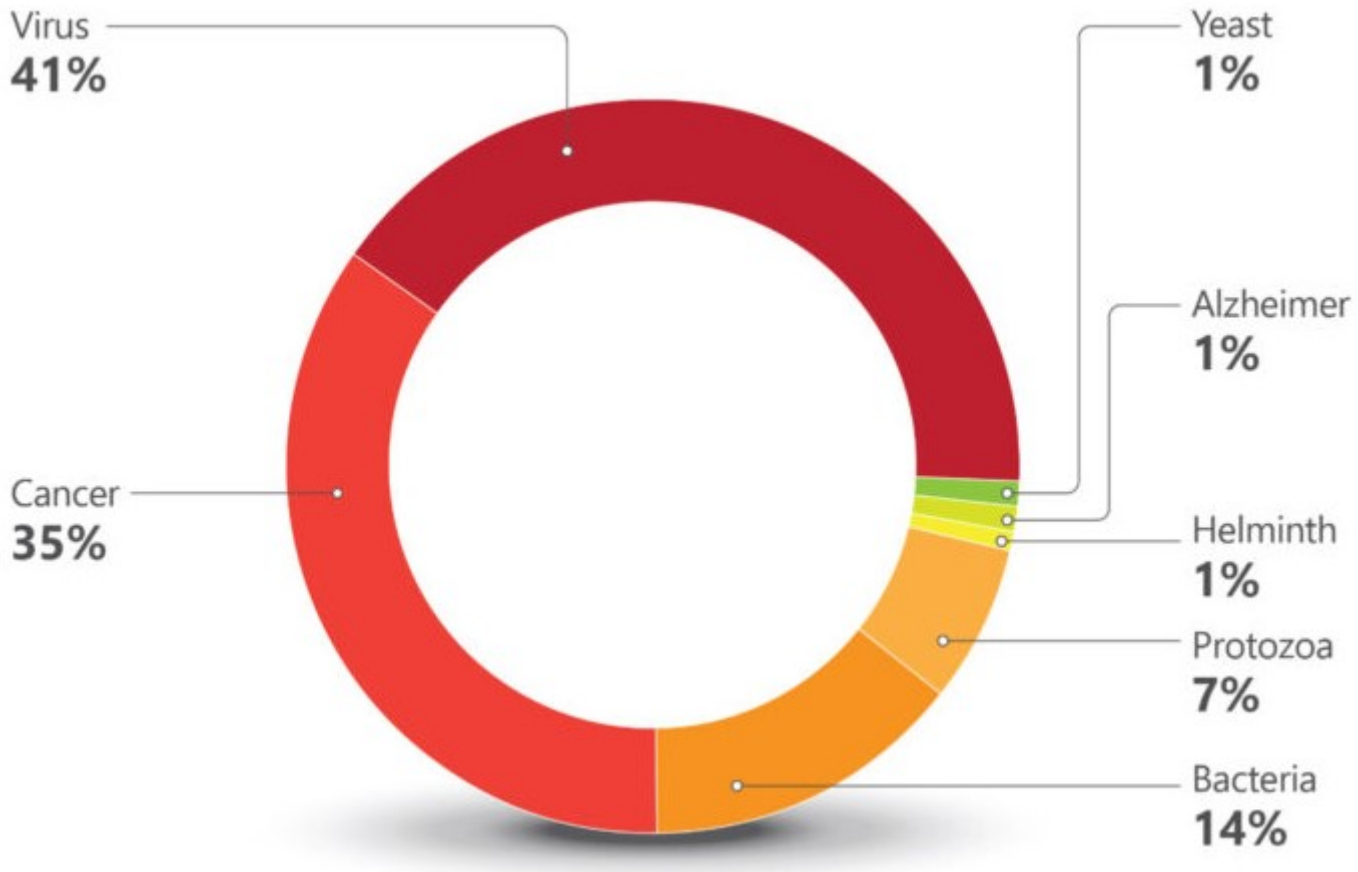
The latest development comes after last year, when the company announced plans to commence a Phase III trial of its flu and Covid-19 vaccine, mRNA-1083.

Moderna reported data from the Phase I/II trial, which demonstrated that this combination vaccine mRNA-1083 was as effective as individual doses.

Fuente: Clinical Trials Arena. Disponible en https://acortar.link/8ntXun

Vaccines in Development

Mar 28. RNA-based immunizing agents have enriched the repertoire of technologies used for vaccine development. An analysis of the active clinical trials in early Phase I and Phase I during the year of 2023 illustrates this point. A total of 161 active vaccine trials were registered at clinicaltrials.gov. Information from these trials was used to plot SARS-CoV-2/COVID-19 trials were excluded to give more evidence to other disease targets.



Targets for Vaccines in Early Stages of Clinical Development. Early Phase I and Phase I clinical trials were grouped according to the diseases (cancer or Alzheimer) or type of infectious agents (viruses, bacteria, protozoa, helminth, and yeast). One-hundred-sixty-one trials were identified using vaccine as keyword and filters for active trials and therapeutic intervention during the period of 01/01/2023 to 1/7/2024. COVID 19/SARS-CoV-2 related trials were excluded. [clinicaltrials.gov]

The highest number of trials were against viral infections (67 trials). Most have influenza, Herpes zoster, RSV (Respiratory Syncytial virus), and HIV as targets. The commercially available flu vaccines do need improvement and RNA technologies provide hope for better products. Different companies are exploring this space, including Moderna, Sanofi, Pfizer, Arcturus, Seqirus, and GSK.

The commercial success of Shingrix®, the GSK vaccine against Herpes zoster, has led to five companies in China to follow suit with their own products. Moderna is also pursuing the shingles market with an mRNA-based candidate, while Immorna (China) is testing a self-replicating RNA vaccine. Another competitive market is vaccines for respiratory tract infections. RSV is the leading causative agent for lower track respiratory diseases, causing 3.4 million hospitalizations and 950,00–150,000 deaths every year.

Until recently, no vaccines against the virus were commercially available, but two were approved by the FDA in 2023. Arexvy® from GSK, was approved for older adults, and Abrysvo® from Pfizer, for adults and

pregnant women (to protect infants from birth to six months). Four other companies are developing vaccines against RSV.

Blue Lake Biotechnology (U.S.) and Codagenix (U.S.) are testing pediatric vaccines. The former is working on an intranasal recombinant parainfluenza virus type 5 for infants and children, and the latter, also developing an intranasal pediatric vaccine, but based on a live-attenuated engineered virus. Sanofi has two trials, one for infants (intranasal) based on live attenuated virus and one for adults (intramuscular) against both RSV and hMPV (human metapneumovirus).

Targeting both these viruses in one jab is also in Moderna's and AstraZeneca's pipeline. While Moderna is developing an mRNA-based formulation for infants, AstraZeneca, through the acquisition of Icosavax, has a VLP (Virus-Like Particle) platform technology with a lead program targeting both viruses.

Decades of difficulties in the development of vaccines against HIV resulted in many companies dropping their research programs targeting the virus. Of the eight ongoing trials, seven are sponsored by research institutions and only one is sponsored by a company, Vir Biotechnology.

Second largest target

The second largest target in number of trials is cancer (56 trials). The vast majority involve the development of immunotherapies and a recurrent approach are therapeutic vaccines using dendritic cells loaded with personalized neoantigens. Ten out of the 56 cancer trials are based on RNA technologies. *Nature's* publication from June 2023, showing promising results of a personalized neoantigen mRNA immunotherapy for pancreatic cancer, indicated the feasibility of this complex approach.

The number of companies as sponsors of early-stage trials for vaccines for cancer is smaller than that for viral infections (many cancer trials are sponsored by research/academic institutions). Nevertheless, a good proportion of the company-sponsored trials are for cancers associated with viruses, such as is the case for the HPV vaccines. The vast majority of cervical cancers is associated with the presence of the HPV virus and immunization programs almost eliminated cervical cancer in women born in England since 1995.

It is reasonable to hope that the vaccines being developed for EBV (Epstein–Barr virus) or CMV (Cytomegalovirus) associated cancers (hematological malignancies and glioblastomas, respectively) can be successful as well. Immunomic Therapeutics has a DNA formulation based on its UNITE® proprietary technology that explores the CMV-GBM association.

The twelve trials in the protozoa group are all against just one protozoan, *Plasmodium*, the causative agent of malaria. Six are sponsored by the University of Oxford. R21, the vaccine developed by Oxford University and the Serum Institute of India, is based on a recombinant protein. It is the second vaccine recommended by the WHO for malaria, a fusion recombinant product which is part circumsporozoite protein of *Plasmodium falciparum* and part Hepatitis B surface protein antigen.

Recombinant construct

Expressed in yeast, this recombinant construct is more immunogenic and cheaper to manufacture than Mosquirix® (the first malaria vaccine recommended by WHO, developed by GSK). It is worthy to note that all formulations in University of Oxford's trials employ the Matrix-MTM adjuvant, which was developed by Novavax and is made with compounds from the bark of the Chilean tree *Quillaja saponaria*.

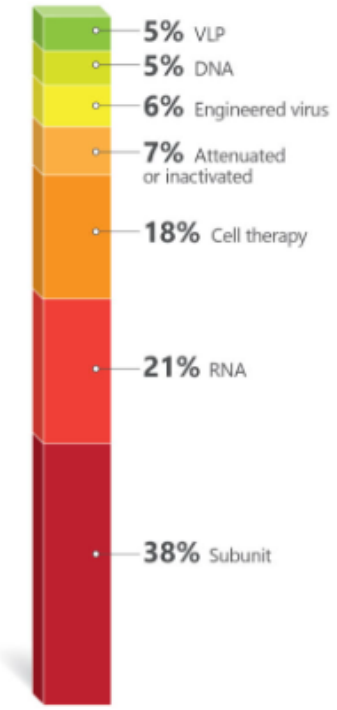
Twenty trials are registered against bacterial infections: tetanus, diphtheria, Shigellosis, pneumococcal, streptococcal, and meningococcal infections, tuberculosis, and Lyme Disease are the targets. Old unmet

medical needs, such as Lyme disease and tuberculosis, are being addressed (also) by mRNA technologies. The Austrian company Eveliqure has a new approach for attenuating genetically engineered bacteria and is testing its oral ShigETEC against Shigellosis. In Australia, GPN Vaccines innovated on inactivation of whole organisms and is using its technology against pneumococcal infections.

Lastly are the trials that comprise a low percentage of the pipeline, which is unfortunate since they address unmet medical needs of millions. There is just one trial against helminths, against schistosomiasis, a disease that affects 240 million people. Sponsored by the International Vaccine Institute, it has Seattle-based PAI Life Sciences as a collaborator.

Two trials are against Alzheimer disease, both sponsored by research institutions. One is a DNA based vaccine that aims to elicit antibodies against amyloid-β.The other, interestingly, is testing if the BCG vaccine (Bacillus Calmette–Guérin) has an effect on reducing biomarkers for the disease. BCG vaccines are based on attenuated forms of the bacterium *Mycobacterium bovis*.

The only trial against a fungal infection targets yeast. The goal is to generate protection for women who experience recurrent vulvovaginal candidiasis, and the trial is sponsored by the Swiss company LimmaTech Biologics, in collaboration with GSK. There are no available vaccines against fungal infections, which are responsible for an annual global death rate of approximately 1.5 million.



Technologies Used for Vaccine Development. [Golgher and Rodrigues]

More input needed from South America

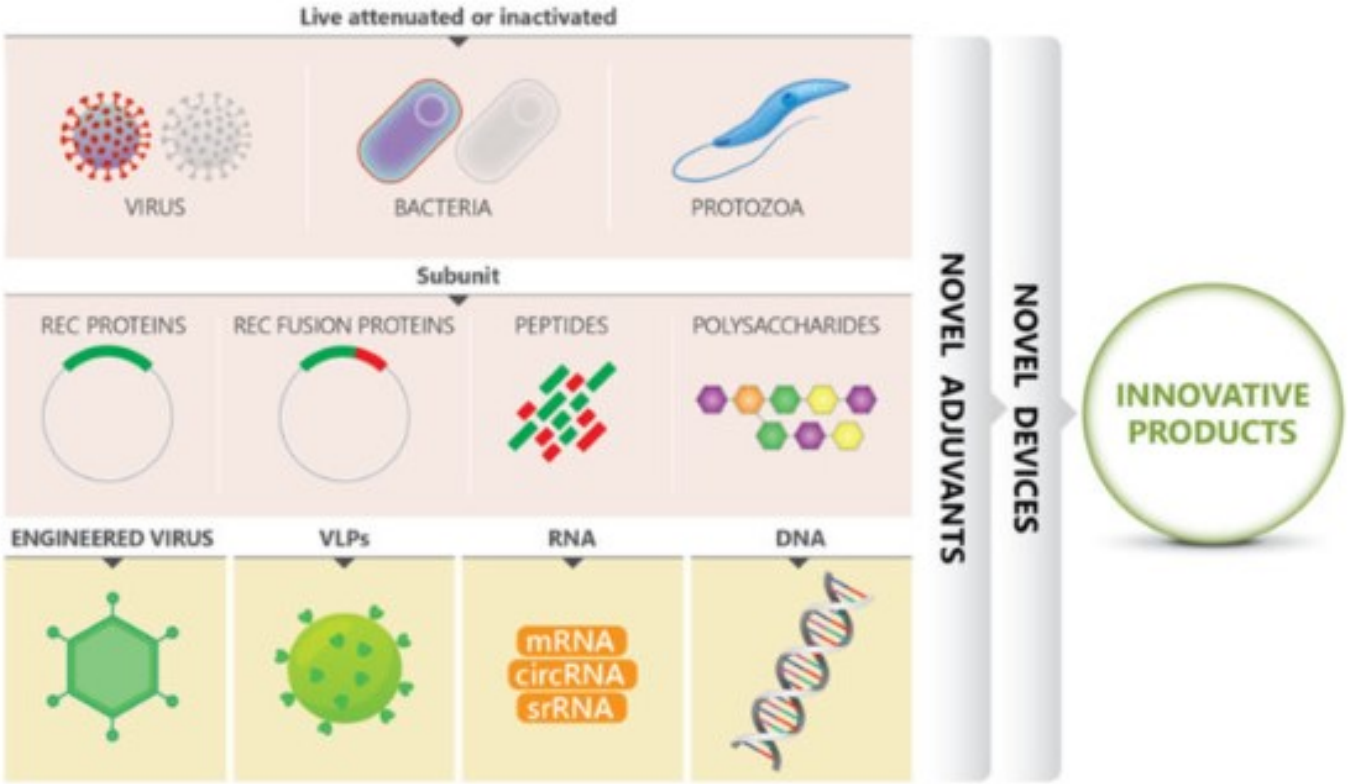
Interesting points could be drawn from the analysis of the ongoing early Phase I and Phase I clinical trials on vaccines. There were more European biotechnology companies (11) (Austria, Denmark, France, Germany, Switzerland, Sweden) plus one in the U.K., than there were American companies.

By adding the Australian and Asian companies in early stages clinical trials, there were 30 biotechs dedicated to the development of interesting immunizing agents. By mix and matching old approaches (inactivated or attenuated) with more modern ones (recombinant proteins, fusion constructs, VLPs, RNA, DNA), using systems biology, genetic engineering, AI), innovation in vaccines is flourishing.

Some of the diseases studied by the companies developing these early-stage clinical trials are predominantly health problems of low- and middle-income countries. It is disappointing to note the absence of companies from South America among the sponsors or collaborators in these trials. According to IQVIA, the global vaccine market (excluding COVID-19) reached $39 billion in 2022, with a growth rate of seven percent CAGR between 2017–2022. The market is mostly driven by innovative vaccines and is bound to grow. South American countries must work to have a better share of it.

Brazil has an admirable vaccination program and internationally recognized governmental vaccine factories (Butantan and Biomanguinhos), but a poor track record on innovation in this area. It is senseless to invest so much in the training of excellent immunologists, vaccinologists, and infectious disease experts and not translate this into novel products. A lot more can be done.

If it depends on the initiative, CTVacinas (soon to be CN Vaccines, CN for National Center), coordinated by the researcher Ricardo Gazzinelli, DSc, DVM, Oswaldo Cruz Foundation and Universidade Federal de Minas Gerais (UFMG), it will be done.



Novel, and not so novel, technologies incrementing the vaccine pipeline. [Golgher and Rodrigues]

For those who know Gazzinelli, it is easy to bet that the enterprise under his leadership, which includes the collaboration of several other researchers from UFMG, will thrive. When it comes to partnerships, CTVacinas is open and agnostic; what matters is that meaningful projects move forward, and partners can come from private, public, international or national institutions. An important part of their mission is to be an institute good at translating academic research into novel immunizing formulations. The aim is to generate more businesses, products, and startups.

CTVacinas has a history: part of its revenues come from royalties from a vaccine for dogs against visceral leishmaniasis, developed by Gazzinelli and his business partner, Ana Paula Fernandes.

In CTVacinas pipeline is SpiN-Tec, a vaccine against SARS-CoV-2, now in Phase II trials. It is the first 100% Brazilian vaccine. SpiN-Tec is a made of a recombinant fusion product of the S and N proteins of the virus, and the hope is that it will confer protection irrespective of the strain.

Helton Santiago, MD, PhD, a professor at UFMG who works with Gazzinelli, is responsible for SpiN-Tec's clinical program, among others. He is an enthusiastic member of the CTVacinas vaccine team and is optimistic about the future of Brazil in the vaccine field. According to Santiago, the COVID-19 pandemic stimulated the national players to move at a faster pace toward innovation.

If some needed a pandemic to shake them out of a sluggish mode, others have started out going as fast as possible. It is the case, for example, of Luana Raposo, Bruna Porchia, and Mariana Diniz, founders of ImunoTera, a spinoff from the University of São Paulo. With proprietary technology developed during their PhDs, they have succeeded in securing funds for their company's first steps.

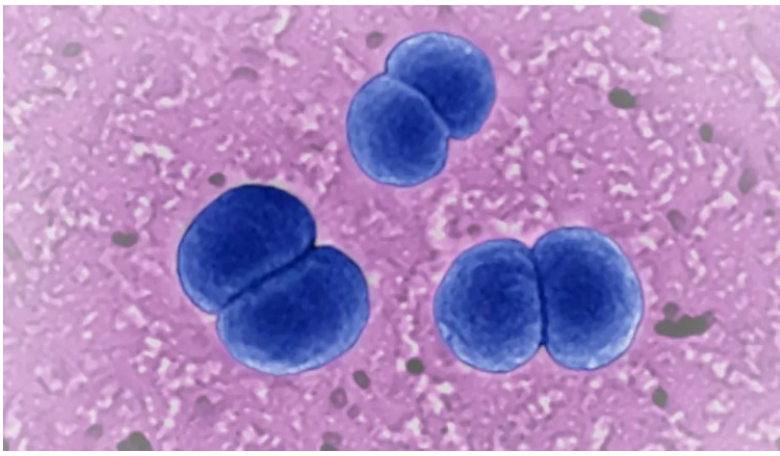
ImunoTera is dedicated to developing immunotherapies against infectious diseases and cancer and has been selected for competitive preincubation and incubation programs in the country. The founders have chosen wisely and, with the support of the best programs and partners to develop their pipeline, are advancing.

Their first product has been tested in patients with HPV-induced high grade cervical neoplasia, with promising results. ImunoTera may be the one to develop the next 100% Brazilian vaccine.

Fuente: GEN Genetic Engineering & Biotechnology News. Disponible en https://acortar.link/Q89Lrt

Los CDC advierten a los médicos sobre una infección bacteriana rara y grave con síntomas inusuales

29 mar. Las autoridades sanitarias están alertando a los médicos para que estén atentos a ciertos tipos de infecciones meningocócicas graves y poco frecuentes que están registrando un aumento en Estados Unidos.



Los CDC instan a los médicos a estar atentos a ciertos tipos de infecciones raras y graves causadas por la bacteria Neisseria meningitidis. (Foto: BSIP/Grupo Universal Images/Getty Images).

Los Centros para el Control y la Prevención de Enfermedades de EE.UU. (CDC) señalan en una nueva alerta sanitaria que estas infecciones, causadas por una determinada cepa de la bacteria *Neisseria meningitidis*, pueden manifestarse con síntomas inusuales. En los casos identificados hasta ahora este año, alrededor de 1 de cada 6 personas ha fallecido, una tasa de mortalidad superior a la que suelen registrar con las infecciones meningocócicas.

Estos casos también son inusuales porque afectan a adultos de mediana edad. Normalmente, las infecciones meningocócicas afectan a bebés, adolescentes y adultos jóvenes.

La alerta de los CDC se produce después de que el Departamento de Salud de Virginia advirtiera en septiembre de cinco muertes por la misma forma grave y poco frecuente de enfermedad meningocócica.

La enfermedad meningocócica consiste en cualquier enfermedad causada por *Neisseria meningitidis*. La infección puede provocar tanto meningitis como una grave infección del torrente sanguíneo denominada septicemia o envenenamiento de la sangre.

La bacteria puede transmitirse de una persona a otra a través del intercambio de secreciones respiratorias y faríngeas, y suele producirse al besar, toser, estornudar o vivir en estrecho contacto con otras personas infectadas.

Hay cuatro grupos diferentes de bacterias meningocócicas que se sabe que circulan en Estados Unidos: B, C, W e Y. Los CDC dicen que en 2023 se registraron 422 casos de enfermedad causada por estas bacterias en Estados Unidos, el mayor número registrado desde 2014. La mayoría de ellos fueron producto de una cepa en particular, ST-1466, que se encuentra en el subgrupo Y.

De momento, 2024 va en camino a superar esa cifra. Hasta la fecha, se han notificado 143 casos en Estados Unidos, casi un 80% más de los que se habían notificado en el mismo periodo en 2023.

Los CDC afirman que la mayoría de las personas a las que se está diagnosticando esta enfermedad son adultos de entre 30 y 60 años. Un número desproporcionado de casos, el 63%, se da en personas negras y, el 15%, en personas con VIH.

Los síntomas típicos de las infecciones por meningitis incluyen fiebre, dolor de cabeza, rigidez de cuello, aversión a la luz y náuseas. Sin embargo, muchos de los casos notificados recientemente no presentan estos síntomas.

Alrededor de dos tercios de los pacientes presentan infecciones del torrente sanguíneo, y cerca del 4% han tenido articulaciones dolorosas e infecciones.

Los síntomas de las infecciones meningocócicas del torrente sanguíneo incluyen fiebre y escalofríos, fatiga, vómitos, manos y pies fríos, respiración rápida, diarrea y, en fases avanzadas, una erupción de color morado oscuro.

Los síntomas iniciales pueden parecerse a los de muchas infecciones diferentes, pero empeoran rápidamente y pueden poner en peligro la vida en cuestión de horas, según los CDC. El tratamiento inmediato con antibióticos es fundamental. Los supervivientes pueden sufrir efectos a largo plazo, como sordera, o incluso necesitar amputaciones de brazos y piernas.

Existe una vacuna que protege contra la meningitis bacteriana. Se recomienda para niños de 11 a 12 años y, dado que la protección disminuye, suele administrarse una dosis de refuerzo a los 16 años. También se recomienda a personas con ciertas afecciones médicas que comprometen la función inmunitaria, como el VIH. Según los CDC, las personas pertenecientes a grupos vulnerables deben recibir dosis de refuerzo de esta vacuna cada 3 a 5 años.

Fuente: CNN en español. Disponible en https://acortar.link/G0Zqpg

Does India need a typhoid vaccine?

Mar 31. Last December, Khalid Shaikh missed 20 days of school and had to be hospitalised for nearly two weeks, as he battled a serious bout of typhoid that gave him fever, splitting headaches, stomach and body pain. His family spent Rs 1 lakh on his treatment.

Krishna Ella, chairman and managing director of Bharat Biotech, holds a package of the typhoid vaccine Typbar-TCV in Hyderabad in January 2018. | AFP

The 15-year-old and his friend had eaten food from a street vendor. Both ended up with typhoid, a water-borne disease caused by the bacteria Salmonella Typhi that attacks multiple organs, causes vomiting and, in rare cases, leads to death. The bacteria spreads through contaminated food and water, often in unsanitary environments.

India accounts for more than half of the global typhoid burden.

When Shaikh first developed a headache and stomach ache, a local doctor prescribed antibiotics. Then followed high fever that recurred every four hours. He was admitted to a hospital in Jogeshwari, a western suburb of Mumbai. When his fever did not subside, his parents shifted him to the Kokilaben Dhirubhai Ambani hospital.

“The doctors there suspected typhoid,” his mother Shabina Shaikh said. The teenager was given a strong dose of antibiotics because milder ones did not work on him. Twenty days after discharge, the typhoid relapsed. This time, he was in hospital for three more days.

Shaikh is a classic example of antimicrobial resistance, a condition in which the drug is not able to kill or control the bacteria because the bug grows resistant to it.

Antibiotic therapy is the only treatment option for typhoid. “Increasing hospitalisation and treatment is leading to antimicrobial resistance,” said Shaikh’s treating doctor Tanu Singhal, an infectious disease specialist.

As a result, doctors often have to resort to increasing the dosage of drugs.

In south Mumbai’s Bombay hospital, physician Dr Gautam Bhansali said until a few years ago, typhoid patients responded well to a daily dose of 1 gram ceftriaxone, an antibiotic that prevents bacteria from growing. “Now I have to use 2 grams twice a day,” he said. “This means additional cost of treatment but also increases resistance risk in the bacteria,” he said.

All these factors – antimicrobial resistance, the high burden of the disease and its treatment cost – led the National Technical Advisory Group on Immunisation, or NTAGI, a body that advises the government on vaccinations, to strongly recommend introducing the typhoid vaccination in 2022, a year before Shaikh contracted typhoid.

In its recommendation, a technical committee of NTAGI warned that India could record 4.6 crore typhoid cases and 89,300 deaths in a 10-year period “if nothing was done”.

It advised the government to provide free typhoid vaccines for children aged between nine months and 12 months and conduct a one-time campaign in schools under the universal immunisation programme to vaccinate older children.

In the same meeting, the group had also recommended introducing the human papillomavirus, or HPV, vaccine against cervical cancer, the second-most common cancer amongst women, in India’s immunisation programme.

While the health ministry has agreed in principle to introduce the HPV vaccine, on typhoid it remains undecided even after two years.

The case for a typhoid vaccine

The World Health Organization first recommended typhoid vaccination for countries where typhoid was endemic in 2008. But discussions in India began much later.

The health ministry decided to conduct typhoid surveillance to assess the disease burden only in 2016. Until then, there was no data on its incidence.

A Surveillance for Enteric Fever in India, or SEFI, consortium began to collect data from 18 sites, including urban and rural regions.

Between 2017 and 2020, the consortium generated enough data to suggest that typhoid incidence varies, from low in rural areas – 12 cases per one lakh children admitted in hospitals for fever – to very high in some urban populations – 1,622 cases per one lakh children.

In Vellore, Delhi and Kolkata, typhoid incidence was higher than 500 cases per lakh children. In sites where only hospital data was surveyed, Chandigarh and Anantpur had a high incidence of the disease. The study also looked at the use of antibiotic drugs for typhoid and found it 2.5 times higher in Pune than in other sites.

Overall typhoid incidence was found to be higher than measles or rubella, vaccines for which are a part of the universal immunisation programme in India.

“There was enough data to suggest that typhoid burden is high. In a lot of cases, it is not even diagnosed,”

said Dr Gagandeep Kang, a former member of NTAGI and chairperson of the typhoid working group that recommended the vaccine.

In 2018, the ministry began a pilot study to assess the impact of vaccination. For this, health workers immunised 3.2 lakh children aged between nine months and 14 years with a conjugate vaccine in Navi Mumbai.

The study, carried out between 2018 and 2021, found that vaccination reduced the risk of infection by 56%. Dr Shanta Datta, the study's co-author from National Institute of Cholera and Enteric Diseases, said this was “enough evidence for a vaccine to be used” in the national programme.

An 11-year-old typhoid patient at a private hospital in Saraspur in Ahmedabad in November 2014. Credit: AFP.

“Typhoid is a serious disease. If not treated, people could die. Considering the risk it presents, a vaccine is the safest option to prevent the infection,” Datta told Scroll.

Another study published this year analysed the cost of the Navi Mumbai vaccination drive. For the government, the cost of the vaccine and related supplies was Rs 127.70 per person, while the cost of delivering it ranged from Rs 30 to Rs 44.

In the private sector, the cost of typhoid conjugate vaccine, currently manufactured by Bharat Biotech, Biological E and Zydus Cadila, is much higher, ranging between Rs 1,500 and Rs 2,000. But there is no data on how many people have taken this shot. “Awareness about it is quite low,” Dr Singhal, from Kokilaben Dhirubhai hospital, said.

Till March 2023, the World Health Organization has prequalified two conjugate vaccines against typhoid, both have long-lasting immunity – Bharat Biotech’s Typbar TCV and Biological E’s Typhibev.

An urban problem

But several experts argue that a vaccine might not be the answer to India’s typhoid burden.

Epidemiologist and virologist Dr Jacob T John argued that typhoid does not uniformly infect the entire population. “It is an urban phenomenon.” Which is why, he added, immunising the entire population indiscriminately is not the best solution.

He gave the example of Japanese Encephalitis, which affects a select population, and said interventions on typhoid should only be made in limited geographic regions.

“The presence of typhoid indicates something is wrong with the water supply,” John said. “If we chlorinate and filter water, typhoid will not occur. This will also eliminate other water-related infections like cholera and dysentery. That is a cheaper solution”.

Kang, the former NTAGI member, however, said there is enough evidence to suggest typhoid poses a threat to public health. “Our priorities are people who are the poorest and most vulnerable, and they are also the ones most at risk of typhoid – for example, urban slum areas,” she said.

This pool cannot buy vaccines on their own. Kang said the technical group recommended that the

government try out different mechanisms to immunise them – either through a phased introduction in which children of various age groups are immuned in phases, or targeted introduction of vaccines, in which immunisation is carried in pockets with high typhoid incidence.

Another expert on typhoid, Dr Jacob John, who is a community health professor in Christian Medical College, Vellore, said if the government is able to conduct targeted immunisation in the urban population, then the typhoid burden can be controlled. “But we must remember that urban and rural areas are not water-tight compartments. There is migration between the two,” he said.

Jacob John also headed the Surveillance for Enteric Fever in India study and said that typhoid incidence has not reduced over the years despite best efforts to improve sanitation. “When we get to good sanitation, like the West, we will not need a vaccine,” he said. “But that will not happen in the immediate future. We still need a huge quantum of investment to improve our water supply and sanitation. And because it will take a long time, we need other solutions.”

The answer, he said, could lie in introducing vaccines in the universal immunisation programme. “We are seeing cases of drug resistant bacteria in Pakistan. Gujarat is noting cases of resistance too. There are reports of ceftriaxone and azithromycin resistance. Which means we are left with fewer antibiotics to work,” he said.

Other constraints

A member of the NTAGI, who did not want to be identified, said that the delay in introduction of the typhoid vaccine was due to “other priorities” and “constraints” of the health ministry.

The vaccine is recommended for children aged between nine and 12 months. In this window, the measles, mumps and rubella vaccines also have to be administered. Health officials say that two or more shots in such a short span may not be welcomed by parents.

The current focus is on measles coverage, where India is lagging at present, the official added.

For many families dealing with the fallout of typhoid, these arguments ring hollow.

It has been a month since Neeshka Kothare, aged 20, first developed a sore throat and then recurring fever, followed by bouts of vomiting. She continues to have a high-grade fever for a few hours every day. She was diagnosed with typhoid earlier this month.

Kothare was recently part of an education tour to Bhopal. She suspects unclean drinking water served to them spread infection amongst all students. Students and teachers complained of sore throat, and some like Kothare, worsened, developing typhoid and a persistent fever of over 99 degrees.

Earlier this month, Kothare required intravenous injection of antibiotics for three days. She still has fever and continues to take cefuroxime antibiotics. Before this, she was put on azithromycin, another antibiotic to treat infections.

“If I knew about a vaccine, we would have given it to her. It is not-an-easy-to-tackle infection,” her mother Sanjana Kothare, a lawyer, told Scroll.

Fuente: Scroll.in. Disponible en https://acortar.link/bH55sD

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Patentes registradas en Patentscope

Estrategia de búqueda: *Vaccine in the title or abstract AND 20240322:20240331 as the publication date 36 records*

1.WO/2024/061188CORONAVIRUS MULTIVALENT VACCINE AND USE THEREOF
WO - 28.03.2024
Clasificación Internacional C07K 14/165 Nº de solicitud PCT/CN2023/119592 Solicitante BIO-THERA SOLUTIONS, LTD. Inventor/a SU, Huafei
The present invention provides a coronavirus multivalent vaccine and use thereof. The coronavirus multivalent vaccine comprises a coronavirus Spike protein extracellular domain containing a mutation, a truncated fragment thereof, or a fusion protein comprising same. The present invention further provides

use of the coronavirus multivalent vaccine in the preparation of a drug for preventing or treating coronavirus infection.

2.4340870IMPFSTOFF, VERWENDUNG DAVON UND KREBSIMPFSTOFFCOCKTAIL
EP - 27.03.2024
Clasificación Internacional A61K 39/00 Nº de solicitud 22803972 Solicitante HUNG MIEN CHIE Inventor/a CHAO KUN-SAN
A vaccine including a vector and a transgene is provided. The transgene encodes a plurality of peptides and is packaged in the vector, in which the peptides in order include a secretion signal peptide, at least one tumor antigen, at least one co-inhibitory peptide and a toll-like receptor 9 (TLR9) antagonist.

3.4342490INFLUENZAVIRUS-NUKLEINSÄURE-LIPIDPARTIKELIMPFSTOFF
EP - 27.03.2024
Clasificación Internacional A61K 39/145 Nº de solicitud 22804735 Solicitante DAIICHI SANKYO CO LTD Inventor/a TOMOZAWA TAKANORI
Provided is a vaccine for preventing and/or treating an infection with an influenza virus. The vaccine comprises lipid particles containing a nucleic acid capable of expressing a haemagglutinin (HA) protein of the influenza virus, wherein a lipid is a cationic lipid having general formula (Ia), or a pharmaceutically acceptable salt thereof.[In the formula, R^1, R^2, p, L^1 and L^2 are as defined in the specification.]

4.4342993IMPFSTOFF GEGEN HPV-INFEKTIONSKRANKHEITEN
EP - 27.03.2024
Clasificación Internacional C12N 15/88 Nº de solicitud 22804725 Solicitante DAIICHI SANKYO CO LTD Inventor/a ONODERA YOSHIKUNI
Provided are lipid particles encapsulating a nucleic acid capable of expressing an E6 antigen and an E7 antigen of human papillomavirus, whereby a vaccine for preventing and/or treating infection with human papillomavirus type 6 and/or type 11 can be provided. The lipid particles comprise a lipid that is a cationic lipid having the general formula (Ia), or a pharmaceutically acceptable salt thereof.[In the formula, R^1, R^2, p, L^1 and L^2 are as defined in the specification.]

5.WO/2024/064965NUCLEIC ACID-BASED UNIVERSAL VACCINE AND METHODS OF USE THEREOF
WO - 28.03.2024
Clasificación Internacional A61K 39/215 Nº de solicitud PCT/US2023/075052 Solicitante ADVANCED RNA VACCINE (ARV) TECHNOLOGIES, INC. Inventor/a ZHU, Huabin
Described herein are compositions including a nucleic acid sequence (e.g., mRNA) encoding an infection agent antigenic polypeptide and a nucleic acid sequence (e.g., mRNA) encoding at least one universal T-cell epitope (UTE), as well as compositions including a nucleic acid sequence (e.g., mRNA) encoding an infection agent antigenic polypeptide and at least one universal T-cell epitope, and methods for using the compositions.

6.4340945IMPFSTOFFZUSAMMENSETZUNG FÜR PLASMAZELLERKRANKUNGEN MIT MULTIPLEM MYELOM UND VERFAHREN ZUR IMMUNITÄTSINDUZIERUNG DAMIT
EP - 27.03.2024
Clasificación Internacional A61P 35/00 Nº de solicitud 22833982 Solicitante MERIDIAN THERAPEUTICS INC Inventor/a NOONAN KIMBERLY A
A vaccine composition is described that is composed of 3 cells lines, the U266, H929, and K562. Methods are described for using the vaccine composition in methods of immunizing against plasma cell disorders, including multiple myeloma and related disorders.

7.WO/2024/062106MULTIEPITOPE UNIVERSAL INFLUENZA VACCINE
WO - 28.03.2024

Clasificación Internacional A61K 39/12 Nº de solicitud PCT/EP2023/076265 Solicitante UNIVERSITY OF VETERINARY MEDICINE HANNOVER, FOUNDATION Inventor/a DAM, Sharmistha
The invention discloses polyepitope vaccine formulations relating to at least 5 of influenza A virus (IAV) derived peptides capable of inducing IFNγ by CD8+ T cells selected from the group of peptides with amino acid sequences SEQ ID NO: 1 (ILRGSVAHK), SEQ ID NO: 2 (ELRSRYWAI), SEQ ID NO: 3 (SRYWAIRTR), SEQ ID NO: 4 (CTELKLSDY), SEQ ID NO: 5 (GILGFVFTL), SEQ ID NO: 6 (SIIPSGPLK), SEQ ID NO: 7 (ASCMGLIY), SEQ ID NO: 8 (FMYSDFHFI), SEQ ID NO: 9 (FVRQCFNPM), SEQ ID NO: 10 (VSDGGPNLY), SEQ ID NO: 11 (FLKDVMESM), SEQ ID NO: 12 (NMLSTVLGV), SEQ ID NO: 13 (MMMGMFNML), SEQ ID NO: 14 (YSHGTGTGY), SEQ ID NO: 15 (HSNLNDATY), SEQ ID NO: 16 (RRSGAAGAAVK), SEQ ID NO: 17 (LLTEVETYV), SEQ ID NO: 18 (MVLASTTAK), SEQ ID NO: 19 (RGINDRNFW) and SEQ ID NO: 20 (FLLMDALKL).

8.4340946ZUSAMMENSETZUNGEN UND VERFAHREN ZUR BEHANDLUNG VON PLASMAZELLERKRANKUNGEN EINSCHLIESSLICH MULTIPLEM MYELOM MIT EINER IMPFSTOFFZUSAMMENSETZUNG UND MYELOMSPEZIFISCHEN CAR-T-ZELLEN
EP - 27.03.2024
Clasificación Internacional A61P 35/00 Nº de solicitud 22833984 Solicitante MERIDIAN THERAPEUTICS INC Inventor/a BORRELLO IVAN M
A multiple myeloma- specific CAR+ T-cell composition and a vaccine composition composed of 3 cells lines, the U266, H929, and K562 are described. Methods are described for using the vaccine composition in conjunction with the MM-specific CAR+ T cell composition in methods of immunizing against plasma cell disorders, including multiple myeloma and related disorders.

9.4342491HTLV-1 NUKLEINSÄURE-LIPIDPARTIKEL-IMPFSTOFF
EP - 27.03.2024
Clasificación Internacional A61K 39/21 Nº de solicitud 22804712 Solicitante NAT INST BIOMEDICAL INNOVATION HEALTH & NUTRITION Inventor/a ISHII KEN
Provided is a vaccine for preventing and/or treating infection with human T-cell leukemia virus type 1 (HTLV-1).A lipid particle encapsulating a nucleic acid expressing a gp46 antigen or a Tax antigen of human T-cell leukemia virus type 1 (HTLV-1), wherein the lipid comprises a cationic lipid represented by general formula (Ia):or a pharmaceutically acceptable salt thereof,whereinR^1 and R^2 each independently represent a C_1-C_3 alkyl group;L^1 represents a C_{17}-C_{19} alkenyl group optionally having one or more C_2-C_4 alkanoyloxy groups;L^2 represents a C_{10}-C_{19} alkyl group optionally having one or more C_2-C_4 alkanoyloxy groups, or a C_{10}-C_{19} alkenyl group optionally having one or more C_2-C_4 alkanoyloxy groups; andp is 3 or 4.

10.20240101612Tuberculosis Compositions And Methods Of Using The Same
US - 28.03.2024
Clasificación Internacional C07K 14/35 Nº de solicitud 18461754 Solicitante International AIDS Vaccine Initiative, Inc. Inventor/a Ravi Anantha
The present disclosure provides fusion proteins comprising *Mycobacterium tuberculosis* (Mtb) antigens, nucleic acid molecules encoding the same, vectors comprising nucleic acid molecules, compositions comprising the same, and methods of eliciting an immune response against tuberculosis.

11.WO/2024/064904ORTHOPOXVIRUS SEROLOGY ASSAYS
WO - 28.03.2024
Clasificación Internacional G01N 33/543 Nº de solicitud PCT/US2023/074923 Solicitante MESO SCALE TECHNOLOGIES, LLC. Inventor/a SIGAL, George

The invention relates to methods and kits for detecting one or more antibody biomarkers in a sample, wherein the antibody biomarker specifically binds a viral antigen. In embodiments, the viral antigen is a monkeypox virus (MPXV) antigen, a vaccinia virus (VACV) antigen, or combination thereof.

12.20240100149SARS-COV-2 CONSTRUCTS, VACCINES, AND METHODS
US - 28.03.2024
Clasificación Internacional A61K 39/215 Nº de solicitud 18251963 Solicitante THE HOSPITAL FOR SICK CHILDREN Inventor/a Jean-Philippe JULIEN
Described herein is an anti-class II MHC antibody fused to a SARS-CoV-2 antigen. Also described is a vaccine comprising the antibody and methods for treating and/or preventing SARS-CoV-2, wherein the methods comprise administering the antibody to a subject in need thereof. In typical aspects, the vaccine is free of an adjuvant.

13.2024900659Eimeria vaccine
AU - 28.03.2024
Clasificación Internacional Nº de solicitud 2024900659 Solicitante Eimeria Pty Ltd Inventor/a VRBA, Vladimir

14.20240101719YEAST GLUCANS, METHODS AND USES THEREOF
US - 28.03.2024
Clasificación Internacional C08B 37/00 Nº de solicitud 18276761 Solicitante Universidade Catolica Portuguesa-UCP Inventor/a Joao Cruz Fernandes
The present disclosure relates to method of obtaining high purity glucans, in particular yeast glucans with immunomodulatmy properties, including vaccine adjuvant properties for the use as adjuvant in vaccines.

15.4342454POLYINOSIN-POLYCYTIDYL-SÄURE ENTHALTENDE ZUSAMMENSETZUNGEN
EP - 27.03.2024
Clasificación Internacional A61K 9/00 Nº de solicitud 23198035 Solicitante HIGHLIGHT THERAPEUTICS S L Inventor/a FUNES JUAN-MANUEL
An aqueous formulation, comprising particles formed by a combination of polyinosinic-polycytidylic acid [Poly(I:C)] molecules and polyethyleneimine, wherein the formulation comprises a pH of between pH 5.0 and pH 7.5. Said composition for use in therapy, wherein the therapy is stimulating an immune response, treating or preventing cancer, or a vaccine therapy.

16.3528839EXPEC GLYCOCONJUGATE VACCINE FORMULATIONS
PL - 25.03.2024
Clasificación Internacional A61K 39/108 Nº de solicitud 17794931 Solicitante Inventor/a OLGA LABOVITIADI

17.WO/2024/064579IMMUNOGENIC PROTEINS FROM BORDETELLA PERTUSSIS
WO - 28.03.2024
Clasificación Internacional A61K 39/09 Nº de solicitud PCT/US2023/074302 Solicitante OHIO STATE INNOVATION FOUNDATION Inventor/a DUBEY, Purnima
Recent evidence accumulating over the last decade demonstrates that generation of CD4+ T cells is critical for sustained immunity against Bordetella Pertussis. B. pertussis contains hundreds of antigens that are processed and presented on MHC Class II and recognized by CD4'T cells. The present disclosure relates to a vaccine comprising Bordetella pertussis antigen peptides to prevent infection of the Bordetella pertussis bacterium.

18.4341274PEPTIDIMPFSTOFF GEGEN VIRUSINFEKTIONEN
EP - 27.03.2024

Clasificación Internacional C07K 7/04 Nº de solicitud 22803756 Solicitante VACINO BIOTECH CO LTD Inventor/a CHANG JIA-MING
Provided is an immunogenic composition against virus infection, especially to an immunogenic composition having peptides that are capable of binding to major histocompatibility complex（MHC）molecules and inducing a broad-spectrum immunityagainst coronavirus.

19.WO/2024/064140METHODS AND MATERIALS FOR USING ADENOVIRUS VECTORS TO IMMUNIZE MAMMALS
WO - 28.03.2024
Clasificación Internacional C12N 15/86 Nº de solicitud PCT/US2023/033145 Solicitante MAYO FOUNDATION FOR MEDICAL EDUCATION AND RESEARCH Inventor/a BARRY, Michael A.
This document provides methods and materials related to using adenovirus vectors to immunize mammals (e.g., humans). For example, methods and materials for intranasally administering adenovirus vectors (e.g., single-cycle adenovirus vectors) as a heterologous vaccination boost to induce IgG, IgA, and T cell immune responses within a mammal (e.g., a human) that received at least one prior vaccine (e.g., one or more prior mRNA-based vaccines) against the targeted pathogen are provided.

20.4342460LIPIDNANOPARTIKEL MIT NUKLEINSÄUREFRACHT
EP - 27.03.2024
Clasificación Internacional A61K 9/51 Nº de solicitud 22196901 Solicitante NOVOARC GMBH Inventor/a WURM DAVID
Disclosed is a lipid nanoparticle (LNP) encapsulating a nucleic acid cargo preferably comprising messenger ribonucleic acid (mRNA). The LNP comprises at least a cationic lipid fraction, and a stabilizer fraction. The stabilizer fraction preferably comprises at least one polyethylenglycol (PEG) lipid. Furthermore, the LNP comprises at least one glycerol dialkyl glycerol tetraether (GDGT) lipid, as obtained e.g. from archaea of the genus Sulfolobus, optionally among other ether lipids. Also disclosed is a pharmaceutical composition comprising the LNP, such as an mRNA vaccine.

21.WO/2024/062001LIPID NANOPARTICLE WITH NUCLEIC ACID CARGO
WO - 28.03.2024
Clasificación Internacional A61K 9/51 Nº de solicitud PCT/EP2023/076004 Solicitante NOVOARC GMBH Inventor/a WURM, David
Disclosed is a lipid nanoparticle (LNP) encapsulating a nucleic acid cargo preferably comprising messenger ribonucleic acid (mRNA). The LNP comprises at least a cationic lipid fraction, and a stabilizer fraction. The stabilizer fraction preferably comprises at least one polyethylenglycol (PEG) lipid. Furthermore, the LNP comprises at least one glycerol dialkyl glycerol tetraether (GDGT) lipid, as obtained e.g. from archaea of the genus Sulfolobus, optionally among other ether lipids. Also disclosed is a pharmaceutical composition comprising the LNP, such as an mRNA vaccine.

22.WO/2024/064264COMPOSITIONS AND METHODS FOR INCREASING GLUTATHIONE LEVELS
WO - 28.03.2024
Clasificación Internacional A61K 38/39 Nº de solicitud PCT/US2023/033352 Solicitante LILE METHOD RESEARCH, LLC Inventor/a LILE, Laura
Glutathione support compositions and methods for increasing glutathione levels, especially intracellular glutathione levels, and/or methods for improving vaccine therapy and reducing gamma-glutamyltransferase (GGT) levels in an individual. In addition, the disclosure describes methods for boosting immunity, treating and preventing infectious diseases such as tuberculosis and MRSA, and combating the effects of aging and age-related stress, oxidative stress, and inflammation. The glutathione

support compositions include a collagen source, a glutamate source, a cysteine source, and a selenium source, and, optionally, a boron source.

23.2622709Microneedle patch
GB - 27.03.2024
Clasificación Internacional A61M 37/00 Nº de solicitud 202318416 Solicitante MICRONEEDLE SOLUTIONS LTD Inventor/a IAN BARTENEV
The patch comprises a base 4a having a plurality of cylinders 6a arranged in an array and extending perpendicularly away from the base. The cylinders have a coating 12 of a matrix solution containing a vaccine which forms a microneedle. The base is formed by fused deposition modelling (FDM), stereolithography (SLA) or digital light processing (DLP) 3D printing. The base may be formed from a polyethylene terephthalate glycol thermoplastic polyester. The patch may contain between 72 and 125 cylinders or arranged as a 10 x 10 array. Alternate rows off cylinders may be offset.

24.20240100078METHODS AND COMPOSITIONS FOR TREATING CANCERS USING ANTISENSE
US - 28.03.2024
Clasificación Internacional A61K 31/7105 Nº de solicitud 18471355 Solicitante Thomas Jefferson University Inventor/a David W. Andrews
The present disclosure relates to compositions and methods for treating cancers using antisense (AS) nucleic acids directed against Insulin-like Growth Factor 1 Receptor (IGF-1R). The AS may be administered to the patients systemically, or may be used to produce an autologous cancer cell vaccine. In embodiments, the AS are provided in an implantable irradiated biodiffusion chamber comprising tumor cells and an effective amount of the AS. The chambers are irradiated and implanted in the abdomen of subjects and stimulate an immune response that attacks tumors distally. The compositions and methods disclosed herein may be used to treat many different kinds of cancer, for example glioblastoma.

25.20240100137PEPTIDES AND COMBINATION OF PEPTIDES FOR USE IN IMMUNOTHERAPY AGAINST NON-SMALL CELL LUNG CANCER AND OTHER CANCERS
US - 28.03.2024
Clasificación Internacional A61K 39/00 Nº de solicitud 18533733 Solicitante Immatics Biotechnologies GmbH Inventor/a Toni WEINSCHENK
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.

26.WO/2024/064708AVIRULENT LIVE BACTERIAL VACCINES CURED OF PLASMIDS CONTAINING ANTIMICROBIAL RESISTANCE GENES
WO - 28.03.2024
Clasificación Internacional A61K 39/02 Nº de solicitud PCT/US2023/074622 Solicitante DRS. KOEHNK & FELDMAN, LLP Inventor/a KOEHNK, Hans
A vaccine comprising a live avirulent strain of bacteria or an immunogenic composition that comprises a live avirulent strain of bacteria, wherein the bacteria is cured of plasmids and/or transposons that contain AMR genes, and a non-conjugative synthetic curing plasmid that cures plasmids and/or transposons that contain AMR genes from such bacteria. A method for producing the live avirulent strain of bacteria or an immunogenic composition that comprises a live avirulent strain of bacteria; a method for treating, preventing, or reducing the severity, duration, or incidence of clinical signs, of a virulent bacterial infection;

and a method for preventing, or reducing the risk or incidence of transference of AMR genes are also disclosed.

27.WO/2024/061748SALMONELLA STRAIN WITH CHROMOSOMALLY INTEGRATED LANDING PAD
WO - 28.03.2024
Clasificación Internacional C12N 15/74 Nº de solicitud PCT/EP2023/075364 Solicitante PROKARIUM LIMITED Inventor/a CARRERA, Marc Biarnes
The present invention relates to a modified live attenuated strain of Salmonella, said strain comprising at least one chromosomally integrated synthetic polynucleotide sequence inserted into a pre-determined pseudogenomic location, said sequence comprising at least one defined recombination site for the introduction of a heterologous polynucleotide sequence encoding a polypeptide, wherein said chromosomally integrated synthetic polynucleotide sequence is located within at least one genomic locus as defined by any one of SEQ ID NOs: 1-30, or a sequence comprising at least 70% identity to any one of SEQ ID NOs: 1-30. The present invention also relates to a vaccine composition comprising the modified strain and various uses and methods thereof.

28.2622710Microneedle patch
GB - 27.03.2024
Clasificación Internacional A61M 37/00 Nº de solicitud 202318417 Solicitante MICRONEEDLE SOLUTIONS LTD Inventor/a IAN BARTENEV
The method comprises the steps of forming a first base 4a having a plurality of cylinders arranged in an array; applying a droplet comprising a vaccine to each of the plurality of cylinders; forming a second base 4b having a second plurality of cylinders arranged in an array; superimposing the first and second bases so as to adhere the droplets between opposing cylinders forming a microneedle patch precursor 10; cooling the microneedle patch precursor in a refrigerator at a temperature between 2 and 8 degrees Celsius and a humidity of less than 65%; and increasing the distance between the first and second bases so as to elongate and separate the droplets into microneedles 12 forming two microneedle patches.

29.4340872PROPHYLAKTISCHER IMPFSTOFF MIT BREITEM SCHUTZ GEGEN PSEUDOMONAS AERUGINOSA
EP - 27.03.2024
Clasificación Internacional A61K 39/02 Nº de solicitud 22805667 Solicitante UNIV KANSAS Inventor/a PICKING WENDY L
Disclosed are compositions comprising a fusion polypeptide comprising i) a fusion of a needle tip protein or an antigenic fragment thereof and/or a translocator protein or an antigenic fragment thereof from a Type III secretion system (T3SS) of a Gram negative bacteria and ii) the A1 subunit of the labile toxin (LTA1) from enterotoxigenic *Escherichia coli* or cholera toxin. and methods of their use.

30.WO/2024/062113METHOD FOR PRODUCING ONE OR SEVERAL SHARED CANCER EPITOPE(S) DERIVED FROM ALTERNATIVE TRANSLATIONAL CONTROL
WO - 28.03.2024
Clasificación Internacional A61K 39/00 Nº de solicitud PCT/EP2023/076274 Solicitante CENTRE LEON BERARD Inventor/a DEPIL, Stéphane
The present invention relates to a method for producing or identifying one or several shared cancer epitope(s), as well as peptides comprising or consisting of the epitopes identified or produced by said method, expression vectors encoding said peptides, cytotoxic T lymphocytes (CTLs) generated in vitro by stimulation of T cells with the said peptides or vectors, CTLs of a subject treated with said peptides or vectors, and engineered T cells expressing T-cell receptors recognizing said peptides. The present invention also relates to the use of said peptides, expression vectors, CTLs or engineered T cells as a

vaccine or a medicament, and in particular, the use of said peptides, expression vectors, CTLs, or engineered T cells for preventing or treating at least one cancer in a subject in need thereof.

31.20240102031OPTIMIZED HOST/VECTOR SYSTEM FOR PRODUCING PROTECTIVE MONO- AND MULTIVALENT SUBUNIT VACCINES ON THE BASIS OF THE YEAST KLUYVEROMYCES LACTIS
US - 28.03.2024
Clasificación Internacional C12N 15/81 Nº de solicitud 18481345 Solicitante VEROVACCINES GMBH Inventor/a Hans Caspar HÜHRLIMANN
Described herein are recombinant *Kluyveromyces lactis* (*K. lactis*) yeasts which are capable of the highly efficient expression of one or more foreign proteins and are suitable for use as a vaccine for generating a protective immune response against pathogens. The invention provides in particular *K. lactis* strains for the targeted cloning of foreign antigen-coding nucleic acids into the yeast genome of the *K. lactis* strain, which is characterized in that the *K. lactis* strain has integrated expression cassettes for foreign antigens as an alternative or in addition to the KILAC4 locus on the KIURA3-20 locus (KLLA0E22771g) and/or on the KIMET5-1 locus (KLLA0B03938g). The invention further relates to integrative expression vectors and to methods for producing the *K. lactis* strains of the invention as well as to the use thereof as vaccines.

32.2622711Microneedle patch
GB - 27.03.2024
Clasificación Internacional A61M 37/00 Nº de solicitud 202318419 Solicitante MICRONEEDLE SOLUTIONS LTD Inventor/a IAN BARTENEV
The method comprises the steps of forming a first base 4a having a plurality of cylinders arranged in an array; applying a droplet comprising a vaccine to each of the plurality of cylinders; forming a second base 4b having a second plurality of cylinders arranged in an array; superimposing the first and second bases so as to adhere the droplets between opposing cylinders forming a microneedle patch precursor 10; cooling the microneedle patch precursor in a freezer at a temperature between -55 and -99 degrees Celsius and at a pressure of less than 10 Pa for a period of at most 12 hours; and increasing the distance between the first and second bases so as to elongate and separate the droplets into microneedles 12 forming two microneedle patches.

33.WO/2024/064749NEURAMINIDASE-INHIBITED INFLUENZA VIRUS
WO - 28.03.2024
Clasificación Internacional A61K 39/145 Nº de solicitud PCT/US2023/074686 Solicitante VAXDOME INC. Inventor/a TANG, De-Chu Christopher
A composition, method of making, and method of using an active agent against a myriad of known as well as unknown pathogens comprising: binding a live influenza virus with a neuraminidase inhibitor *in vitro*; and administering the active agent with or without elimination of unbound neuraminidase inhibitors by intranasal administration or oral inhalation into patients. The active agent confers rapid and broad protection to a patient performing at least one of: i) elicit an innate immune response against known or unknown pathogens; ii) mitigate lymphopenia in general; iii) enable natural infection to activate adaptive immunity by allowing pathogens to harmlessly linger in an infected patient for a limited amount of time; and/or iv) eliciting protective immunity against influenza virus as a rapid-response influenza vaccine by making a clinically-isolated influenza virus immediately benign with a neuraminidase inhibitor *in vitro* without the time-consuming requirement to generate conventional influenza vaccines.

34.20240100146Neuraminidase-Inhibited Influenza Virus
US - 28.03.2024
Clasificación Internacional A61K 39/145 Nº de solicitud 18470999 Solicitante VaxDome Inc. Inventor/a De-chu Christopher Tang

A composition, method of making, and method of using an active agent against a myriad of known as well as unknown pathogens comprising: binding a live influenza virus with a neuraminidase inhibitor in vitro; and administering the active agent with or without elimination of unbound neuraminidase inhibitors by intranasal administration or oral inhalation into patients. The active agent confers rapid and broad protection to a patient performing at least one of: i) elicit an innate immune response against known or unknown pathogens; ii) mitigate lymphopenia in general; iii) enable natural infection to activate adaptive immunity by allowing pathogens to harmlessly linger in an infected patient for a limited amount of time; and/or iv) eliciting protective immunity against influenza virus as a rapid-response influenza vaccine by making a clinically-isolated influenza virus immediately benign with a neuraminidase inhibitor in vitro without the time-consuming requirement to generate conventional influenza vaccines.

35.20240104243SECURE MESSAGING IN A MACHINE LEARNING BLOCKCHAIN NETWORK
US - 28.03.2024
Clasificación Internacional G06F 21/62 Nº de solicitud 18520455 Solicitante LEDGERDOMAIN INC.
Inventor/a Victor Bovee DODS
Multi-layer ensembles of neural subnetworks are disclosed. Implementations can classify inputs indicating various anomalous sensed conditions into probabilistic anomalies using an anomaly subnetwork. Determined probabilistic anomalies are classified into remedial application triggers invoked to recommend or take actions to remediate, and/or report the anomaly. Implementations can select a report type to submit, or a report recipient, based upon the situation state, e.g., FDA: Field Alert Report (FAR), Biological Product Deviation Report (BPDR), Medwatch, voluntary reporting by healthcare professionals, consumers, and patients (Forms 3500, 3500A, 3500B, Reportable Food Registry, Vaccine Adverse Event Reporting System (VAERS), Investigative Drug/Gene Research Study Adverse Event Reports, Potential Tobacco Product Violations Reporting (Form 3779), USDA: *APHIS* Center for Veterinary Biologics Reports, Animal and Plant Health Inspection Service: Adverse Event Reporting, FSIS Electronic Consumer Complaints, DEA Tips, Animal Drug Safety Reporting, Consumer Product Safety Commission Reports, State/local reports: Health Department, Board of Pharmacy.

36.WO/2024/064886USING N-TERMINAL DEGRONS TO ENHANCE RNA T CELL VACCINE IMMUNOGENICITY
WO - 28.03.2024
Clasificación Internacional A61K 39/00 Nº de solicitud PCT/US2023/074891 Solicitante BIONTECH SE
Inventor/a ROTHENBERG, Daniel Abram
The present invention relates to a nucleic acid molecule for eliciting an antigen-specific $CD8^+$ T-cell response in a subject comprising a coding sequence encoding a polypeptide comprising an N-terminal degron and an antigenic peptide and medical use applications for the nucleic acid molecule of the invention.

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