VacCiencia

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EN ESTE NÚMERO

VacCiencia es una publicación dirigida a investigadores y especialistas dedicados a la vacunología y temas afines, con el objetivo de serle útil. Usted puede realizar sugerencias sobre los contenidos y de esta forma crear una retroalimentación que nos permita acercarnos más a sus necesidades de información.

- Resumen de la información publicada por la OMS sobre vacunas en desarrollo contra la COVID-19, a nivel mundial.
- 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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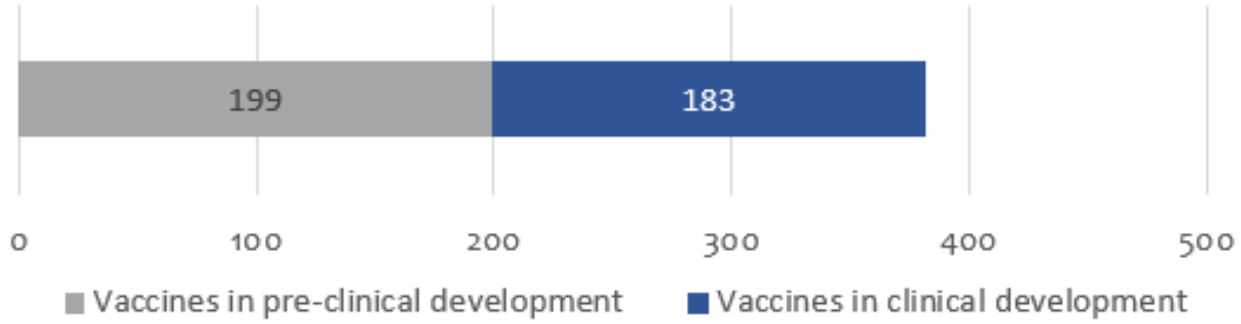
Resumen de la información publicada por la OMS sobre vacunas en desarrollo contra la COVID-19, a nivel mundial

Última actualización por la OMS: 30 de marzo de 2023.

Fuente de información utilizada: World Health Organization | R&DBlueprint Powering research to prevent epidemics

183 Vacunas en evaluación clínica y 199 en evaluación preclínica



Vacunas en evaluación clínica por plataforma

Platform		Candidate vaccines (no. and %)	
PS	Protein subunit	59	32%
VVnr	Viral Vector (non-replicating)	25	14%
DNA	DNA	17	9%
IV	Inactivated Virus	22	12%
RNA	RNA	43	24%
VVr	Viral Vector (replicating)	4	2%
VLP	Virus Like Particle	7	4%
VVr + APC	VVr + Antigen Presenting Cell	2	1%
LAV	Live Attenuated Virus	2	1%
VVnr + APC	VVnr + Antigen Presenting Cell	1	1%
BacAg-SpV	Bacterial antigen-spore expression vector	1	1%
		183	

Vacunas en evaluación clínica por vía de administración

Oral		5	3%
Injectable		164	90%
SC	Sub cutaneous	5	3%
ID	Intra dermal	9	5%
IM	Intra muscular	150	82%
IN	Intra nasal	16	9%
AE	Aerosol	1	1%
IH	Inhaled	2	1%
TBD / No Data (ND)		14	8%

Número de dosis de las vacunas en evaluación clínica

Number of doses & schedule	Candidate vaccines (no. and %)	
1 dose	47	26%
Day 0	47	
2 doses	101	55%
Day 0 + 14	8	
Day 0 + 21	37	
Day 0 + 28	56	
3 doses	2	1%
Day 0 + 28 + 56	2	
TBD / No Data (ND)	33	18%

Vacunas mucosales en evaluación clínica

Desarrollador de la vacuna/fabricante/país	Plataforma de la vacuna	Vía de administración	Fase
University of Oxford/Reino Unido	Vector viral no replicativo	Intranasal	1
CanSino Biological Inc./Beijing Institute of Biotechnology/China	Vector viral no replicativo	Inhalación	4
CanSino Biological Inc./China	Vector viral no replicativo	Intranasal	3
Vaxart/Estados Unidos	Vector viral no replicativo	Oral	2
Univ. Hong Kong, Xiamen Univ./Beiging Wantai Biol. Pharm./China	Vector viral replicativo	Intranasal	3
Symvivo/Canadá	ADN	Oral	1
ImmunityBio, Inc./Estados Unidos	Vector viral no replicativo	Oral y Sublingual	1/2
Codagenix/Serum Institute of India	Virus vivo atenuado	Intranasal	3
Center for Genetic Engineering and Biotechnology (CIGB)/Cuba	Subunidad proteica	Intranasal	1/2
Razi Vaccine and Serum Research Institute/India	Subunidad proteica	Intranasal	3
Bharat Biotech International Limited/India	Vector viral no replicativo	Intranasal	3
Meissa Vaccines, Inc./Estados Unidos	Virus vivo atenuado	Intranasal	1
Laboratorio Avi-Mex/México	Virus inactivado	Intranasal	2/3
USSF + VaxForm/Estados Unidos	Subunidad proteica	Oral	1
CyanVac LLC/Estados Unidos	Vector viral no replicativo	Intranasal	2
DreamTec Research Limited/Hong Kong	BacAg-SpV	Oral	NA
Sean Liu, Icahn School of Medicine at Mount Sinai	Vector viral replicativo	Intranasal	2/3
Hannover Medical School/Alemania	Vector viral no replicativo	Inhalación	1
ACM Biolabs/Singapur	Subunidad proteica	Intranasal	1
Intravacc B.V/Holanda	Vector viral no replicativo	Intranasal	1
McMaster University/Canadá	Vector viral no replicativo	Aerosol	1
Research Institute of Influenza/Estados Unidos	Vector viral no replicativo	Intranasal	1/2
Wuhan BravoVax / China	Vector viral no replicativo	Intranasal	1

Vacunas en fase 4 de evaluación clínica

Candidatos vacunales más avanzados/fabricante/país	Plataforma de la vacuna
Sinovac/China	Virus Inactivado
Sinopharm/Beijing Institute of Biological Products/China (2)	Virus Inactivado
University of Oxford/AstraZeneca/Reino Unido	Vector viral no replicativo
CanSino Biological Inc./Beijing Institute Biotechnology/China (IM e IH)	Vector viral no replicativo
Janssen Pharmaceutical Companies/Estados Unidos	Vector viral no replicativo
Moderna/NIAID/Estados Unidos (2)	ARN
Pfizer/BioNTech Fosun Pharma/Estados Unidos	ARN
Medigen Vaccine Biol./Dynavax/NIAID/Taiwán/EE.UU	Subunidad proteica

Vacunas en fase 3 de evaluación clínica

Candidatos vacunales más avanzados/fabricante/país	Plataforma de la vacuna
Gamaleya Research Institute/Rusia	Vector viral no replicativo
Novavax/Estados Unidos	Subunidad proteica
Anhui Zhifei Longcom Biopharmac./Inst. Microbiol, Chin Acad Sci/China	Subunidad proteica
CureVac AG/Alemania	ARN
Institute of Medical Biology/Chinese Academy of Medical Sciences	Virus inactivado
Research Institute for Biological Safety Problems, Kazakhstan	Virus inactivado
Inovio Pharmac. + Intern. Vacc Inst. + Advaccine Biopharm Co., Ltd	ADN
Zydus Cadila Healthcare Ltd./India	ADN
Bharat Biotech International Limited/India	Virus Inactivado
Sanofi Pasteur + GSK/Francia/Gran Bretaña	Subunidad proteica
Shenzhen Kangtai Biological Products Co., Ltd./China	Virus Inactivado
Clover Biopharmaceuticals Inc./GSK/Dynavax/China/Reino Unido/EE.UU	Subunidad proteica
Vaxine Pty Ltd. + CinnaGen Co./Australia, Irán	Subunidad proteica
Instituto Finlay de Vacunas/Cuba	Subunidad proteica
Federal Budget Res Inst State Res Cent Virol Biotechnol "Vector"/Rusia	Subunidad proteica
West China Hospital + Sichuan University/China	Subunidad proteica
Vaxxinity/EE.UU	Subunidad proteica
Univ. Hong Kong, Xiamen Univ. & Beijing Wantai Biological Pharm./China	Vector viral replicativo
Acad Milit Sci (AMS) Walvax Biotechnol, Suzhou Abogen Biosci/China	ARN
Medicago Inc./Canadá	Partícula similar a virus
Codagenix/Serum Institute of India	Virus vivo atenuado
Center for Genetic Engineering and Biotechnology (CIGB)/Cuba	Subunidad proteica
Valneva, National Institute for Health Research, Reino Unido	Virus inactivado
Biological E. Limited/India	Subunidad proteica
Nanogen Pharmaceutical Biotechnology/Vietnam	Subunidad proteica
Shionogi/Japón	Subunidad proteica
Erciyes University/Turquía	Virus inactivado
SK Bioscience Co., Ltd./CEPI/Corea del Sur/Noruega	Subunidad proteica
Razi Vaccine and Serum Research Institute/Irán, India	Subunidad proteica
Bharat Biotech International Limited/India	Vector viral no replicativo (IN)
Providence Therapeutics/Canadá	ARN
POP Biotechnologies and EuBiologics Co.,Ltd/EEUU, Corea del Sur	Subunidad proteica
Jiangsu Rec-Biotechnology/China	Subunidad proteica
Radboud University/Holanda	Partícula similar a virus
Arcturus Therapeutics, Inc./Estados Unidos	ARN
Livzon Pharmaceutical/China	Subunidad proteica
National Vaccine and Serum Institute, China; Beijing Zhong Sheng Heng Yi	Subunidad proteica
KM Biologics Co., Ltd./Japón	Virus inactivado
Shanghai East Hospital and Stemirna Therapeutics/China	ARN
Bagheiat-allah University of Medical Sciences/AmitisGen/Irán	Subunidad proteica
Laboratorios Hipra, S.A./España	Subunidad proteica
Sinocelltech Ltd./China	Subunidad proteica
Chumakov Federal Scientific Center for Research/Rusia	Virus Inactivado
Yantai Patronus Biotech Co., Ltd.	Partícula similar a virus
Airlangga University/Indonesia	Virus Inactivado
PT Bio Farma/Indonesia	Subunidad proteica
AIM Vaccine and Liverna Therapeutics/China	ARN
Cansino Biolgics Inc./China	Vector viral no replicativo (IM)
China National Biotec Group Company Limited	Virus inactivado
Moderna TX	ARN

Noticias en la Web

La vacuna contra la COVID-19 genera células inmunitarias de memoria en los pulmones que podrían contribuir a la protección ante una nueva infección

12 abr. Determinar la duración de la respuesta inmunitaria y entender las diferencias según si es generada por una infección natural por SARS-CoV-2 o por la vacunación será clave para mejorar las vacunas que existen actualmente. En este sentido, el grupo de Enfermedades Infecciosas del Vall d'Hebron Instituto de Investigación (VHIR) ha liderado un trabajo donde se ha demostrado la presencia de células inmunitarias residentes en el pulmón de personas vacunadas. Estas células, aunque en principio no pueden evitar la infección, contribuyen al control de la enfermedad, ya que pueden matar las células infectadas. El estudio, publicado en *Nature Communications*, se ha llevado a cabo en colaboración con el Servicio de Cirugía Torácica y Trasplante Pulmonar y la Unidad de Virus Respiratorios del Servicio de Microbiología del Hospital Universitario Vall d'Hebron.

Un estudio publicado en la misma revista, *Nature Communications*, en 2021 por el mismo equipo identificó la presencia de linfocitos T de memoria residentes en el pulmón en personas que habían pasado la COVID-19. Estas células inmunitarias se encuentran en la capa más superficial de las vías respiratorias y son una de las primeras líneas de defensa ante posibles futuras infecciones por SARS-CoV-2. En esta ocasión, han estudiado la presencia de células inmunitarias en el pulmón también en personas vacunadas con Pfizer-BioNTech o Moderna (vacunas de mRNA). Hasta ahora, en el caso de la vacunación, los estudios internacionales se han centrado en la respuesta de anticuerpos y de células de memoria que circulan en la sangre, pero la que se produce en los pulmones es desconocida.

Ahora, los investigadores han comparado la respuesta de células T de memoria residente en muestras de pulmón de cuatro grupos de personas: no infectadas y no vacunadas, infectadas sin vacunar, no infectadas y vacunadas con dos dosis, y no infectadas y vacunadas con tres dosis (la última, reciente). "Observamos que los pulmones de las personas vacunadas tenían células T de memoria específicas contra el SARS-CoV-2 después de más de 6 meses de la segunda dosis de la vacuna. Sin embargo, la respuesta era menor que en pacientes que se habían recuperado de la COVID-19 y su perfil tenía menos frecuentemente características de células residentes. Esto indicaría que estas células pueden tener menos capacidad de ofrecer protección de larga duración y, sobre todo, de ser una primera línea de defensa", explica el Dr. Daan K.J. Pieren, investigador del grupo de Enfermedades Infecciosas del VHIR y primer autor del trabajo.

En relación con la administración de la tercera dosis, el trabajo mostró un incremento en la respuesta inmunitaria presente en sangre y en pulmón, pero no se vieron diferencias en los subtipos de células presentes en el pulmón. "Las vacunas que se han administrado hasta ahora generan una respuesta que se reparte de forma generalizada por todo nuestro cuerpo, pero que no está dirigida a las vías respiratorias.

En cambio, la infección del tracto respiratorio que sucede ante la infección natural con el virus estimula nuestra respuesta inmunitaria a establecerse como memoria residente de larga duración en el tejido afectado", afirma la Dra. Meritxell Genescà, investigadora principal del grupo de Enfermedades Infecciosas del VHIR, quien ha liderado el estudio. "En cualquier caso, aunque sea una repuesta limitada, son buenas noticias que encontremos células de memoria establecidas en el pulmón en personas vacunadas, porque estas células contribuirán a disminuir la gravedad de la enfermedad", destaca la Dra. Genescà.

Para mejorar la eficacia de futuras vacunas, los investigadores proponen la administración a través de vías diferentes a la intramuscular, como la intranasal, ya que así podrían llegar directamente a la zona afectada. De hecho, en algunos países ya se han aprobado vacunas de refuerzo que utilizan estas vías. También recomiendan dirigirlas a diferentes proteínas del virus para conseguir una respuesta más completa y eficaz, puesto que actualmente las vacunas aprobadas emplean una sola proteína del SARS-CoV-2 conocida como proteína S o Spike para estimular nuestro sistema inmunitario.

El estudio se llevó a cabo en muestras pulmonares de 30 personas obtenidas gracias a biopsias extraídas por varias causas, como la presencia de un tumor. Pese a ser una muestra pequeña, aporta información valiosa por la dificultad que comporta la obtención y análisis de este tipo de tejido a lo largo de diferentes momentos de la pandemia.

Fuente: Vall d´Hebron. Disponible en https://bit.ly/43Wk0ce

Ghana first to approve 'world-changer' malaria vaccine

Apr 13. Ghana is the first country to approve a new malaria vaccine that has been described as a "world-changer" by the scientists who developed it.

The vaccine - called R21 - appears to be hugely effective, in stark contrast to previous ventures in the same field. Ghana's drug regulators have assessed the final trial data on the vaccine's safety and effectiveness, which is not yet public, and have decided to use it.

The World Health Organization is also considering approving the vaccine.

Malaria kills about 620,000 people each year, most of them young children. It has been a massive, century-long, scientific undertaking to develop a vaccine that protects the body from the malaria parasite.

Trial data from preliminary studies in Burkina Faso showed the R21 vaccine was up to 80% effective when given as three initial doses, and a booster a year later. But widespread use of the vaccine hinges on the results of a larger trial involving nearly 5,000 children.

These had been expected to take place at the end of last year, but have still not been formally published.

Prof Adrian Hill, director of the Jenner Institute at the University of Oxford, where the vaccine was invented, says African countries are declaring: "we'll decide", after being left behind in the rollout of Covid-19 vaccines during the pandemic.

He told me: "We expect R21 to make a major impact on malaria mortality in children in the coming years, and in the longer term [it] will contribute to overall final goal of malaria eradication and elimination."

The Serum Institute of India is preparing to produce between 100-200 million doses per year, with a vaccine factory being constructed in Accra, Ghana. Each dose of R21 is expected to cost a couple of dollars.

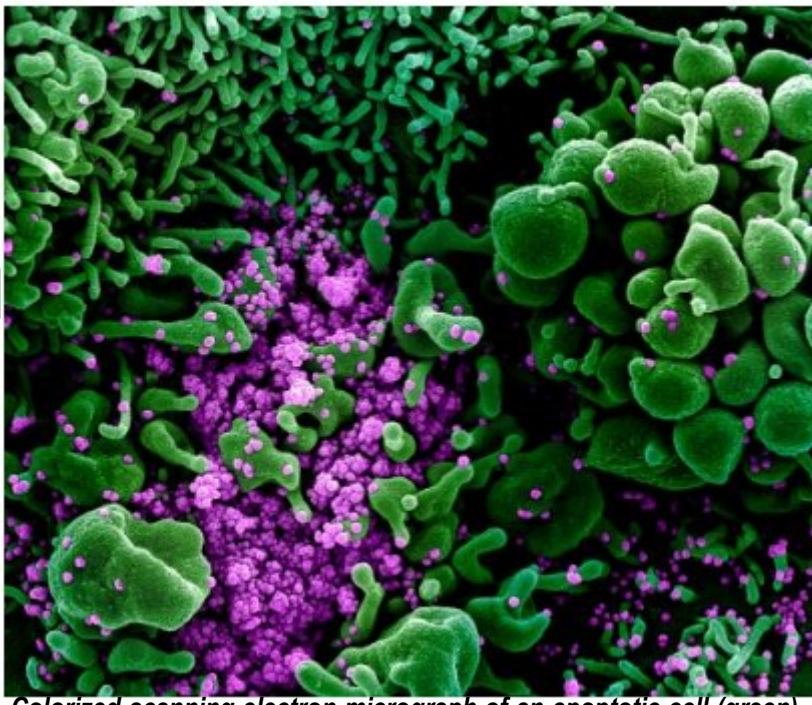
Adar Poonawalla, CEO of the Serum Institute, said: "Developing a vaccine to greatly impact this huge disease burden has been extraordinarily difficult."

He added that Ghana, as the first country to approve the vaccine, represents a "significant milestone in our efforts to combat malaria around the world".

Fuente: BBC NEWS. Disponible en https://bbc.in/41AahXu

The potential and challenges of mucosal COVID-19 vaccines

Apr 13. In November 2022, a virtual workshop on the significance and complexities of creating mucosal vaccines for SARS-COV-2 was jointly organized by the National Institute of Allergy and Infectious Diseases (NIAID). The key insights and findings from this workshop have recently been published as a comprehensive report in npj Vaccines.



Colorized scanning electron micrograph of an apoptotic cell (green) heavily infected with SARS-COV-2 virus particles (purple), isolated from a patient sample.

While current COVID-19 vaccines are generally effective at preventing severe disease, hospitalization, and death, researchers acknowledge the need for further improvement. A vaccine that is more effective at preventing transmission or infection with SARS-CoV-2 could significantly reduce the overall replication of the virus and the associated disease burden. Since SARS-CoV-2 primarily enters and is transmitted through the respiratory tract, a vaccine that promotes a mucosal immune response in the respiratory tract could potentially be more adept at blocking transmission and infection. Despite there being at least 44 mucosal vaccines currently in preclinical development and several others in clinical development or authorized for use in other countries, there are no COVID-19 mucosal vaccines that have been authorized for use by regulatory agencies in the United States or Europe.

In a collaborative effort, the National Institute of Allergy and Infectious Diseases (NIAID) joined forces with the Coalition for Epidemic Preparedness Innovation, the Bill and Melinda Gates Foundation, the Biomedical Advanced Research and Development Authority, and the Wellcome Trust to organize a workshop. This two-day virtual event took place on November 7-8, 2022, and brought together vaccine researchers and

developers in eight sessions to engage in discussions on the challenges and priorities in mucosal vaccine development.

The report highlights several crucial considerations for the development of mucosal vaccines for SARS-CoV-2. First, the identification and verification of new correlates of protection are necessary to assess whether a vaccine enhances recipients' mucosal immune responses and to facilitate clinical testing and regulatory approval. Additionally, improved animal models are needed to aid researchers in developing potential mucosal vaccines.

Furthermore, careful clinical trial design is essential to evaluate the safety concerns associated with mucosal vaccines and to determine their efficacy in blocking virus transmission. Trial design must also account for the context in which these vaccines will be used, as mucosal vaccines are likely to be administered as boosters to individuals who have previously received a SARS-CoV-2 vaccine or had a natural infection. Researchers need to understand how well these vaccines function in individuals with prior immunity.

The means of vaccine delivery is also a critical consideration. Options such as nasal sprays, pills, liquids taken orally, or even nebulizers could deliver the vaccine directly to the respiratory system, but each method presents unique challenges in terms of manufacturing, testing, and distribution. Thus, the delivery system must be carefully considered in the development of mucosal vaccines for SARS-CoV-2.

Despite the obstacles and complexities discussed during the workshop, participants expressed optimism about the prospects of mucosal vaccines for COVID-19. Recognizing the significant benefits that a successful candidate could offer, they emphasized the need to prioritize further research in mucosal vaccine development. Additionally, they highlighted the potential for advancements in COVID-19 vaccinology to also contribute to improved vaccines for other diseases, such as influenza, respiratory syncytial virus (RSV), and tuberculosis. The workshop attendees concluded that continued research in mucosal vaccines could have far-reaching impacts beyond COVID-19, extending to other areas of vaccinology as well.

Fuente: NewsWise. Disponible en https://bit.ly/40sCSwb

¿Qué países han puesto fin a la emergencia por COVID-19?

15 abr. A raíz de la pandemia en 2019, cientos de países declararon estados de emergencia por la enfermedad causada por el virus SARS-CoV-2, conocida como COVID-19. Después de 762 mil 200 millones 405 casos y seis mil millones 271 muertes, en 2023, diversos países han puesto fin a la emergencia.

En enero de 2022, Dinamarca decretó el fin de la pandemia, siendo el primer país en hacerlo. Desde hace más de un año, los daneses ya no consideran la COVID-19 como una enfermedad crítica para la sociedad, por lo cual algunas medidas restrictivas fueron levantadas.

Igualmente, en abril de 2022, Australia eliminó y flexibilizó varias de las normas relacionadas con la prevención de contagios; asimismo anunció darle fin al

estado de emergencia por coronavirus. La decisión se dio tras la vacunación de la población , la cual es una de las tasas más altas del mundo, según el ministro de salud australiano Greg Hunt.

El 30 de junio de 2022, Colombia puso fin a la emergencia sanitaria que inició el 12 de marzo de 2020 como consecuencia de la COVID-19. De acuerdo con el presidente Iván Duque, no había razones epidemiológicas, analizadas científicamente para mantener la emergencia sanitaria en el país.

Por su parte, Estados Unidos levantó la emergencia sanitaria el 10 de abril de 2023, después de que el presidente Joe Biden firmara una ley para cesarla. El fin de la emergencia sanitaria traería consigo la derogación del Título 42, aunque la Casa Blanca precisó que las restricciones migratorias continuarían por medio de otras normas. La norma sanitaria permite a Estados Unidos expulsar en caliente a los migrantes de su territorio con la excusa de la pandemia. El Título 42 será levantado hasta el 11 de mayo, informó el gobierno demócrata.

México por su parte, sigue estando en emergencia sanitaria, pero la Secretaría de Salud ya se encuentra analizando ponerle fin, anunció el presidente Andrés Manuel López Obrador. Desde hace algunos meses, el país ha relajado las medidas sanitarias, pues desde octubre de 2022 el uso de cubrebocas es recomendado, mas no obligatorio.

Otros países como Israel, Sudáfrica e Italia también han declarado el fin de la pandemia por la COVID-19. De acuerdo con el director de la Organización Mundial de la Salud Tedros Adhanom Ghebreyesus, el 2023 podría ser el año en el que se declare fin a la emergencia por COVID-19 en el mundo.

Fuente: EL PERIÓDICO. Disponible en https://bit.ly/43Sd1ke

Nuevas vacunas contra la COVID-19 mejoran 'modestamente' a la original, según la OMS

16 abr. El Grupo Asesor Técnico sobre la composición de la vacuna contra la COVID-19 de la Organización Mundial de la Salud (OMS) concluyó que la vacuna adaptada a Ómicron solo aumenta "modestamente" la protección contra los síntomas, en comparación con la vacuna basada en el virus original, y tiene cifras "similares" para la enfermedad grave.

"En comparación con las vacunas basadas en el virus original, las dosis de refuerzo de las vacunas bivalentes de ARNm que contienen BA.1 o BA.4/5 pueden aumentar modestamente la eficacia de la vacuna frente a la enfermedad sintomática, mientras que el pequeño número de estudios que evalúan los resultados graves muestran estimaciones similares de la eficacia de la vacuna", señaló este grupo de expertos a través de un comunicado el viernes 14 de abril de 2023.

Al respecto, indican que las dosis de refuerzo de la vacuna basada en el virus original "siguen confiriendo altos niveles de protección frente a la enfermedad grave y la muerte causadas por todas las variantes de SARS-CoV-2, incluidos los linajes descendientes de Ómicron".

En cuanto a la comparación con las nuevas vacunas, que se están utilizando ya en todos los países desarrollados para continuar con la campaña de vacunación, la OMS esgrime que la más moderna "aumenta la magnitud y provoca una mayor amplitud de las respuestas inmunitarias de reacción cruzada frente a las variantes cuando se utilizan como dosis de refuerzo, en comparación con las vacunas basadas en el virus original".

Según los estudios referenciados por la OMS, las vacunas bivalentes que contienen BA.4/5 "inducen mayores anticuerpos neutralizantes" contra las subvariantes recientes de ómicron BQ.1 y XBB.1, que son las mayoritarias a nivel mundial en estos momentos, en comparación con las vacunas bivalentes de ARNm que contienen BA.1 cuando se utilizan como dosis de refuerzo.

Este grupo de expertos tiene previsto volver a reunirse dos veces en 2023: una en mayo y otra aproximadamente 6 meses después. En cada reunión se evaluará la evolución genética y antigénica de las variantes, el rendimiento de las vacunas contra las variantes en circulación y las implicaciones para la composición del antígeno de la vacuna de este año. En función de esta evaluación, los expertos emitirán recomendaciones para mantener la composición actual de la vacuna o considerar actualizaciones.

Fuente: EL COMERCIO. Disponible en https://bit.ly/3mST4Js

24-Valent Pneumococcal Conjugate Vaccine Candidate Posts Positive Results

Apr 17. Vaxcyte, Inc. today announced positive results from the VAX-24 Phase 2 study in adults aged 65 and older, as well as data from the full six-month safety assessment and prespecified pooled immunogenicity analyses from both the Phase 2 study in adults aged 65 and older and the prior Phase 1/2 study in adults aged 18-64.

VAX-24, the Company's lead, broad-spectrum 24-valent pneumococcal conjugate vaccine (PCV) candidate, is being studied to prevent invasive pneumococcal disease (IPD).

The Company says, 'The public health community continues to affirm the need for vaccines that offer broader protection to prevent IPD.'

"Based on the overall strength of our data and the well-established regulatory pathway, we look forward to meeting with regulators and advancing VAX-24 into a pivotal Phase 3 study for which we expect topline data in 2025," said Grant Pickering, Chief Executive Officer and Co-Founder of Vaxcyte, in a press release on April 17, 2023.

"We developed VAX-24 to create a best-in-class PCV that provides broader coverage and better immune responses than standard-of-care vaccines."

"These data support that objective and demonstrate the potential of our PCV franchise, including VAX-31, our 31-valent PCV candidate."

In the Phase 2 study in adults aged 65 and older, VAX-24 demonstrated robust OPA immune responses for all 24 serotypes at all doses studied, confirming the prior adult study results.

The VAX-24 2.2mcg dose, which Vaxcyte plans to advance to Phase 3, showed an overall improvement in immune responses vs. PCV20 relative to the results from the prior Phase 2 study in adults aged 50-64.

And the six-month safety data from both studies showed safety and tolerability results for VAX-24 similar to PCV20 at all doses studied.

Fuente: Precision Vaccinations. Disponible en https://bit.ly/3UUhoHz

EEUU aprobó vacuna de refuerzo contra la COVID-19 para personas de edad avanzada o con sistemas inmunológicos débiles

18 abr. Los reguladores estadounidenses aprobaron el martes otra vacuna de refuerzo contra la COVID-19 para personas de edad avanzada o con sistemas inmunológicos débiles para que puedan protegerse mejor esta primavera, al mismo tiempo que toman medidas para hacer más fácil las vacunas para el resto de la población.

La Administración de Alimentos y Medicamentos (FDA) declaró que las personas de 65 años o más pueden recibir otro refuerzo siempre y cuando hayan pasado cuatro meses desde que recibieron la vacuna bivalente, que apunta a tipos de la variante Ómicron.

Y la mayoría de los que tienen sistemas inmunológicos débiles pueden recibir otra vacuna de refuerzo bivalente al menos dos meses después, con otras dosis en el futuro a discreción del médico. Para todos los demás, independientemente de si se trata de una primera vacuna o una de refuerzo, la FDA dijo que las versiones originales de las vacunas de Pfizer y Moderna están obsoletas y ya no serán usadas. En lugar de ello, quienes reciban una vacuna Pfizer o Moderna recibirán la versión nueva que apunta al ómicron. Para la mayoría de la gente, si se trata de su primera vacuna, una sola dosis bivalente será suficiente.

Los que recibieron la vacuna original pero no han recibido la versión contra Ómicron podrán recibir esa nueva versión, pero la agencia decidirá en el verano si personas jóvenes y saludables podrán recibir el segundo refuerzo bivalente.

"En esta etapa de la pandemia, los datos recabados apoyan la simplificación del uso" de las vacunas de Pfizer y Moderna, expresó en un comunicado el jefe de vacunas de la FDA, doctor Peter Marks. "La agencia cree que esta estrategia ayudará a animar vacunaciones futuras".

Las autoridades de Gran Bretaña y Canadá han emitido recomendaciones similares, de ofrecer un refuerzo extra en la primavera para las poblaciones vulnerables. Muchos estadounidenses de alto riesgo que recibieron su última dosis en el otoño han estado preguntándose cuándo podrán recibir otra.

Los Centros para el Control y la Prevención de Enfermedades (CDC) de Estados Unidos tendrán que aprobar la nueva serie de vacunas de refuerzos. Sus asesores se reunirán el miércoles.

Fuente: infobae. Disponible en https://bit.ly/41T3oAh

Child vaccination in sharp decline in Latin America

Apr 20. The United Nations Children's Fund (Unicef) acknowledged that this decline is part of a global trend, which has taken the region over the last 10 years from one of the highest child immunization rates in the world to one of the lowest.

"One in four children in Latin America and the Caribbean lacks vital vaccines, indicating a decline in immunization coverage rates to levels of almost 30 years ago, Unicef reported today."

During the presentation of the report, The State of the World's Children 2023: For Every Child, Immunization, the agency warned that 67 million children worldwide did not receive one or more vaccines in three years due to the interruption of health services caused by tensions in health systems.

It also pointed to the diversion of scarce resources, conflicts and the decline in people's confidence in immunization as causes of this deterioration.

In Latin America, coverage of the third dose of diphtheria, tetanus and pertussis vaccine, also known as DTP3, among children under one year of age fell 18 percentage points, from 93 percent in 2012 to 75 percent in 2021.

"This is the lowest vaccination rate in the region in nearly 30 years, placing Latin America and the Caribbean below the global average (81 percent) and just ahead of Eastern and Southern Africa (74 percent)," the UN agency highlighted.

According to the latest estimates by the World Health Organization and Unicef, this regional decline in immunization has left 2.4 million infants, one in four children under the age of one, unprotected against preventable diseases through immunization.

In addition, they noted that more than 1.7 million of these children are medically qualified as zero doses, meaning that they have never received any vaccination.

Meanwhile, those living in the poorest households are almost three times more likely to have never been immunized in their lifetime than those in the wealthiest households, the new report revealed.

Unicef's regional director for Latin America and the Caribbean, Garry Conille said that diseases such as diphtheria, measles and polio, once thought to have been eradicated in many countries, are reappearing throughout the region, endangering the lives of the most marginalized children and the well-being of all."

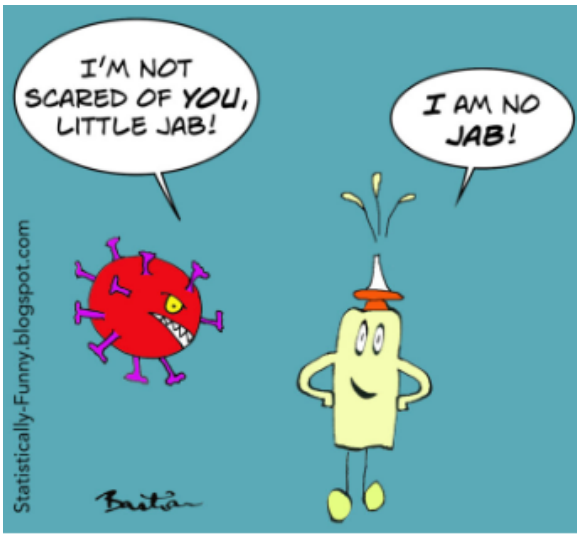
Fuente: Prensa Latina en inglés. Disponible en https://bit.ly/3Ha0peK

Progress on Intranasal & Oral Covid Vaccines. Overview

Apr 21. There has been progress on several fronts in the months since my last post on mucosal vaccines (September 2022):

- 1 more vaccine has been authorized in China – Pneucolin, a viral vector nasal spray from Beijing Wantai BioPharm. There are now 5 mucosal vaccines in use in 4 countries: China, India, Iran, and Russia.
- 4 more vaccines have entered clinical trials, bringing the total to 24. They are:
  - an intranasal protein subunit vaccine from Intravacc (Netherlands),
  - an oral live attenuated vaccine from Symvivo (Canada),
  - an oral protein subunit vaccine from USSF/VaxForm (US), and
  - an inhaled viral vector vaccine from Wuhan BravoVax (China).

- Most of the vaccines in clinical trials are viral vector vaccines. There have been preclinical studies released at least on most vaccine types, including Moderna's mRNA vaccine.
- 1 more vaccine has progressed to phase 2 trial – an intranasal viral vector vaccine from CyanVac (US). It's the fourth mucosal vaccine at that stage.
- An oral vaccine in phase 2 has reportedly been put on hold, as its manufacturer, Vaxart (US), switches to developing an oral pancoronavirus vaccine.
- No additional vaccine has advanced into phase 3 trials. There are still 6 that reached that point, 5 of which have been authorized in one country each.
- The sixth mucosal vaccine in phase 3 is a live attenuated nasal spray from Codagenix (US), being manufactured by the Serum Institute of India. Codagenix hopes it could roll out next year.
- CIGB (Cuba), the manufacturers of Mambisa, an intranasal protein subunit vaccine, have reported to a conference that immune responses have been high in their trial. (They are reportedly going to seek authorization based on phase 2 trial results.)



- Publications on mucosal vaccines are growing quickly. There are now more than 150 published reports of preclinical studies of mucosal Covid vaccines.
- There have been 2 more reports of phase 1 trial results, bringing the total to 7. They are:
  - For the AstraZeneca viral vector vaccine in intranasal form. Immune response was inadequate, and that vaccine hasn't progressed to further trials.
  - For Razi Cov Pars, the protein subunit vaccine booster from Iran that was the first mucosal vaccine authorized internationally. The trial determined which of 3 doses would progress.
- The first articles with phase 3 trial results have been released for:
  - iNCOVACC, an intranasal viral vector vaccine developed in the US. It is authorized in Bharat Biotech's version in India. A trial in India assessed immune responses, concluding it was superior to Bharat Biotech's inactivated vaccine, Covaxin.
  - Pneucolin, a nasal spray of a viral vector vaccine developed by Beijing Wantai BioPharm and now authorized in China: Vaccine efficacy against symptomatic infection in Omicron waves was similar to some injected vaccines – around 55%. Additional vaccine efficacy as a booster was lower, especially for people who were previously mRNA-mvaccinated. Efficacy against severe Covid was substantial, however, and around 100% for hospitalization (though with a lot of uncertainty, as few people were hospitalized). Adverse events were very low, and similar to placebo. Less than 8% had reactions in the nose or throat.

Authorized mucosal vaccines

Another mucosal Covid vaccine was authorized in December 2022 – and it's the one with the largest placebo -controlled phase 3 trial (discussed later). Its trade name is Pneucolin, and it's an intranasal viral vector

vaccine, based on the influenza virus, developed by Beijing Wantai BioPharm. The company reportedly plans to produce 200 million doses in the first 6 months.

Pneucolin was the fifth mucosal Covid vaccine authorized internationally, and the second in China. Here are all 5, in order of authorization:

- Razi Cov Pars: intranasal protein unit vaccine, authorized in Iran at the end of October 2021. It follows 2 injections of the same vaccine.
- Sputnik Nasal: the first viral vector component of Sputnik V (Gam-Covid-Vac) used intranasally, authorized in Russia in April 2022.
- Convidecia Air: CanSino's viral vector vaccine (Ad5-nCoV), inhaled with a nebulizer, authorized in China in September 2022.
- iNCOVACC: intranasal viral vector vaccine (ChAd-SARS-CoV-2-S) by Bharat Biotech authorized in India in September 2022. (This vaccine was developed in the US, and US biotech Ocugen announced in September that they have an exclusive license to develop, manufacture, and commercialize this vaccine in the US, Europe, and Japan.)
- Pneucolin: intranasal viral vector vaccine (DNS1-RBD), by Beijing Wantai BioPharm, authorized in China in December 2022.

Clinical trial progress

In this post, I'm focusing on vaccine progress by charting those in clinical trials, whether or not there are any preclinical or clinical results available, and whether not the vaccine is still being developed. I found 24. This table breaks them all down by the furthest clinical trial phase they have reached at the time of writing, as well as vaccine type. (The details are in this post's addendum.)

Phase 1	Phase 2	Phase 3
14	4	6
Viral vector (8) *Protein subunit (4)* *Live attenuated (1)* *Inactivated (1)*	*Viral vector (3)* *Protein subunit (1)*	*Viral vector (4)* *Protein subunit (1)* *Live attenuated (1)*

Most of these vaccines are based on viral vectors. (You can read up about vaccine types here.) None are mRNA vaccines. Moderna released results of a preclinical study of an intranasal version of their mRNA vaccine in January, but developing a mucosal vaccine hasn't been featuring as a priority at their website.

Since my last post, no additional vaccine has advanced to phase 3. However, last time I reported that Codagenix had announced their live attenuated intranasal vaccine had joined the WHO Solidarity Trial for Vaccines (STV) as a phase 2/3 trial, but I couldn't find confirmation. I found it since then at a website for the trial in Mali. Recruitment began there, apparently in August 2022, apparently for a single dose of the nasal spray. The STV is a phase 3 trial for multiple vaccines, sharing a placebo group. It's an event-driven trial – the goal isn't achieving a particular recruitment number, but continuing until enough people have had Covid (the "event") to give a solid answer to the trial's questions.

Participants are contacted weekly to check up on their Covid status.

The Codagenix vaccine is the one by the US manufacturer that I mentioned earlier. It's a live attenuated vaccine, using a "disabled" form of the virus, and a company's spokesperson has said they hope to roll it out next year if all goes well – but without mentioning which country or countries they are aiming for. (The company ran phase 1 trials in the UK.)

The other 5 mucosal vaccines that have reached phase 3 trials are the ones that have also already been authorized. Unless another vaccine leaps ahead, that puts Codagenix next to potentially cross the line – along with Mambisa, the intranasal vaccine from CIGB in Cuba. The manufacturers had said they were going to seek authorization from the Cuban drug regulator based on phase 2 results. They recently presented results at a conference, and reportedly said signs of immune response in the nasal mucosal tissue was high. (It's not yet been established, though, that this translates to reduced risk of infection.)

Another of the manufacturers with advanced plans was Vaxart, who had planned a human challenge trial for their oral vaccine in 2023. However, they have now reportedly put that vaccine on hold, turning their attention to developing an oral pan-betacoronavirus vaccine instead. (That's the group of coronaviruses that includes both SARS viruses and MERS – update post on these coming soon.)

Since my last post, a vaccine advanced to phase 2: CyanVac's intranasal parainfluenza-based viral vector vaccine. CyanVac is a US company, and a trial for 400 people was registered in February – it didn't appear to be recruiting yet as I was writing.

I've added 5 more vaccines in phase 1 clinical trials – one which I had missed in my last post, and 4 that recently moved into clinical trial:

- Intravacc's Avacc 10. This is an intranasal protein subunit vaccine, from a Dutch company. The phase 1 trial is in Australia.
- Oravax's oral vaccine (PRAK-03202) had been in phase 1 for some time – it's the one I missed previously. Oravax is a US company formed by Oramed (Israel) to develop this Covid vaccine. The phase 1 trial is in South Africa. (Some preliminary results are included in the next section of this post.)
- Symvivo's bacTRL-Spike-1. This is an oral live attenuated vaccine, from a Canadian company. The phase 1 trial is in Australia.
- USSF/VaxForm – an oral protein subunit vaccine from the US. The phase 1 trial is in New Zealand.
- Wuhan BravoVax's BV-AdCoV-1. This is an inhaled viral vector vaccine, from a Chinese company. The phase 1 trial is in Singapore.

Recent clinical and preclinical results

Since my last post, reports have been released for 4 clinical trials, each for different vaccines – 2 phase 1 trials, and 2 for phase 3 trials.

Phase 1 results:

- ChAdOx1 – the AstraZeneca vaccine (viral vector, UK): Results for 36 people, including some as a booster. The vaccine didn't stimulate adequate immune responses, so the vaccine did not progress to another trial.

- Razi Cov Pars (subunit vaccine, Iran): Results for 153 people in a trial of 2 injections and a third intranasal dose. The study tested 3 dosages: The middle dose was the one selected for further trials. (This became the first mucosal vaccine authorized internationally.)

Phase 3 results were released for 2 intranasal viral vector vaccines (both preprints), both of which were run during Omicron waves:

- iNCOVACC (ChAd-SARS-CoV-2-S), manufactured by Bharat Biotech in India. The virus vector is adenovirus.
- Pneucolin (DNS1-RBD), manufactured by Beijing Wantai BioPharm in China. The virus vector is influenza.

The goals of the iNCOVACC trial were signs of immune response, not Covid outcomes. Around 3,000 previously unvaccinated people got 2 nasal vaccine doses, and 162 got another Bharat Biotech Covid vaccine for comparison – the inactivated vaccine, Covaxin. Signs of immune response were superior for the nasal vaccine, and adverse events were very low.

The Pneucolin trial reports the first Covid outcomes for a mucosal vaccine so far. Before we get into its results, if you'd like an explainer of the terms I use, including the way the statistics and uncertainty are shown, I have a short explainer here. And for context as we look at results, below are some estimates of the effectiveness of injected vaccines against Omicron – they are broadly similar to the estimates from CDC studies:

- Vaccination with mRNA plus boosters was estimated to be around 50% effectiveness against laboratory-confirmed infection after mRNA vaccination plus boosters – a bit higher for Moderna than BNT/Pfizer.
  - Results from a case control study based on record linkage in Spain, with over 3 million matched pairs.
- For people without compromised immune systems, mRNA vaccination was under 40% effectiveness against hospitalization for Covid, and around 65% effectiveness with one or two boosters. Effectiveness was a bit higher for people with immunocompromise. Booster effectiveness peaked at 4 weeks (waning from then).
  - Results from a test negative study of 4,760 people admitted to US hospitals with acute respiratory symptoms, so there's a lot more uncertainty around these estimates than first study.

Back to the Pneucolin trial. It was a placebo-controlled trial with 30,990 participants in Colombia, Philippines, South Africa, and Vietnam, about 13,000 of whom were previously unvaccinated. Running this trial was complicated, and so interpreting it as well.

For example, the countries had different vaccines in their primary vaccination programs, so people in the booster groups were systematically different in more ways than whether they were in the placebo group or not – and there were large inconsistencies in how long it had been since people had been vaccinated. It's a big trial, but because there was such a variety of previous vaccination statuses, there's a lot of uncertainty around specific outcomes.

Adverse events were very low in the trial – similar to placebo. Less than 8% of people had a runny and/or blocked nose or sore throat. These are the efficacy rates reported:

Efficacy against symptomatic Covid:

- No previous vax: 55.2% (CI 13.8 to 76.7)
- Inactivated: 38.2% (CI -49.2 to 74.4)
- Viral vector: 39.9% (CI -16.7 to 69.1)
- mRNA: 10.1% (CI -45.9 to 44.5)

Efficacy against severe Covid:

- No previous vax: 66.7% (CI 8.3 to 87.9)
- Inactivated: 54.6% (CI -47.3 to 86.0)
- Viral vector: 50.0% (CI -6.8 to 76.6)
- mRNA: 19.5% (CI -39.2 to 53.4)

Efficacy against hospitalization: 100% (CI -9.2 to 100)

Preclinical results for mucosal Covid vaccines are coming in quite large numbers. (You can browse over 150 preclinical results I've found for mucosal vaccines here.) Here are new reports of preclinical results for vaccines that are also already in clinical trials:

- ACM-001 (ACM Biolabs' intranasal protein subunit vaccine, Singapore/Switzerland).
- BV-AdCoV-1 (Wuhan BravoVax's orally inhaled viral vector vaccine, China).
- COVI-VAC (Codagenix's intranasal live attenuated vaccine, USA, manufactured by the Serum Institute of India).
- iNCOVACC (Bharat Biotech's intranasal viral vector vaccine, India – vaccine developed in the US).
- Pneucolin (DNS1-RBD) (Beijing Wantai BioPharm's intranasal viral vector vaccine, China).
- Vaxart's oral viral vector vaccine, USA – now on hold.

Fuente: Absolutely Maybe. Disponible en https://bit.ly/3N8FVXx

El coronavirus vuelve a dispararse tres años después del inicio de la pandemia: la incidencia sube un 55% en una semana

21 abr. Los contagios de COVID-19 vuelven a dispararse en España tres años después del inicio de la pandemia y el coronavirus SARS-CoV-2 ya es el causante de la mayoría de las infecciones respiratorias agudas, según los últimos datos del Instituto de Salud Carlos III.

Con un porcentaje de positividad del 13,3 %, el coronavirus supera las tasas de la gripe (10,8 %) y del virus respiratorio sincitial VCR (0,2 %), causante de la mayoría de las bronquiolitis en niños, cuando hace solo dos semanas la positividad de la gripe era muy superior a la del coronavirus (14,4 % por 8,4 %).

En Atención Primaria, la incidencia del coronavirus se sitúa en 59 casos por cada 100.000 habitantes, un incremento del 55 % respecto a la semana anterior, cuando había 38 casos de media. Asimismo, las mayores tasas se registran en el grupo de edad de entre 45 y 64 años, con una incidencia de 80,4 casos.

También suben las hospitalizaciones desde hace tres semanas, con una media de 2,6 ingresos por cada

100.000 habitantes, siendo los más vulnerables las personas mayores de 79 años, con 21,7 hospitalizaciones por cada 100.000 habitantes.

Las hospitalizaciones por Covid son también superiores a las causadas por la gripe, que alcanzó su pico a finales del año pasado (4,2 ingresos), pero cuya tasa ha ido descendiendo hasta situarse actualmente en 0,7 casos.

182 nuevos ingresados

El Ministerio de Sanidad contabiliza en su informe de este viernes 2.331 personas ingresadas por Covid en los hospitales españoles, lo que supone 182 nuevos ingresos respecto a su anterior balance, de la semana pasada. Sin embargo, han bajado los pacientes en la UCI, que actualmente son 105, diez menos que hace siete días.

Asimismo, ha registrado en la última 11.222 nuevos contagios y 61 muertes por coronavirus, 14 más que la semana pasada.

La incidencia acumulada entre los mayores de 60 años se sitúa en 89 casos por cada 100.000 habitantes, según los datos del Ministerio. Por comunidades autónomas, la tasa más elevada se encuentra en Castilla-La Mancha (150) y la más baja, en Cataluña (47).

Fuente: 20 minutos. Disponible en https://bit.ly/3osXIOM

Canada and PAHO collaborate to strengthen vaccine manufacturing in Latin America and the Caribbean

Apr 21. The Government of Canada and the Pan American Health Organization (PAHO) are collaborating to strengthen manufacturing capacities to increase the safe and timely access to vaccines in countries of Latin America and the Caribbean.

Through C$ 15 million (US$ 11.1 million) funding provided by Global Affairs Canada (GAC), PAHO will reinforce its current work to enhance the existing regional vaccine production capacities, including the manufacturing of messenger RNA (mRNA) vaccines against COVID-19 and other diseases.

“The COVID-19 pandemic underscored the severe impact of unequal access to vaccines and other health technologies,” PAHO Director, Dr. Jarbas Barbosa, said. “We thank Canada for supporting PAHO in this effort to expand and develop regional production capacities for medical products - an objective that is at the heart of our strategy to end the acute phase of the COVID-19 pandemic and a key step towards achieving universal access to health.”

Dr. Barbosa discussed the collaboration during a visit to PAHO headquarters by Mr. Jason Tolland, Director General for South America and Inter-American Affairs at GAC.

“Canada is looking forward to the implementation of its $15M support to PAHO’s COVID-19 Vaccine Manufacturing Platform to strengthen vaccine production capacities in Latin America and the Caribbean,” Mr. Tolland said. “Canada is committed to addressing barriers to equitable access of vaccines by supporting regional manufacturing initiatives in low- and middle-income countries. We recognize the enormous potential of initiatives that promote local ownership and enable regions to address their own needs, not only for COVID-19 but also for other diseases.”

The Latin American and Caribbean region imports six times more pharmaceuticals than it exports, leaving it vulnerable to fluctuations in global supply, particularly during emergencies. During the first years of the

pandemic, severe shortages of COVID-19 vaccines heightened the need to rapidly increase regional production.

The new initiative supported by the Government of Canada will promote activities to foster an enabling environment for regional vaccine production, including the promotion of greater coordination across countries and public and private partners, and the strengthening of national regulatory systems and policies.

The project will support PAHO's Regional Platform for Advancing the Production of Vaccines and Other Health Technologies for COVID-19 in the Americas, including ongoing work with the mRNA Vaccine Technology Transfer Program. This multilateral collaboration by the World Health Organization, the Medicines Patent Pool and other partners aims to facilitate mRNA vaccine manufacturing technology transfer to low- and middle-income countries. Currently, it includes two institutions in the region, Sinergium Biotech of Argentina and the Institute of Technology in Immunobiologicals Bio-Manguinhos of Brazil.

In the next two years, PAHO will assist Bio-Manguinhos in planning and implementing clinical trials for vaccine development and will support Sinergium Biotech in technology transfer and the acquisition of necessary equipment for vaccine production.

The organization will produce a guide for the establishment of vaccine manufacturing pilot facilities, including key inputs for the development of business plans, technical brochures, and equipment and supply needs.

PAHO is also working on the selection of a regional training center and is developing a tool to assess country readiness for vaccine development, as well as conducting several studies on topics such as COVID-19 mRNA vaccine patents in the region, and health technology production value chain.

Canada's overall support to boosting manufacturing capacities for vaccines and medicines in low- and middle income countries was announced last year by Prime Minister Justin Trudeau during the G20 Summit. It adds to the wider support provided by Canada since 2021 to increase access to COVID-19 vaccines for populations in situations of vulnerability in the Americas through two contributions of C$ 50 million and C$ 45 million, delivered to PAHO in 2021 and 2023, respectively.

In the past years, PAHO has assisted 37 countries and territories in increasing access to COVID-19 vaccines, including in the development and implementation of national plans for their deployment and use. PAHO has also supported 32 countries and territories in expanding cold chain storage and transportation capacities, mainstreaming gender equality in all its work.

As part of these efforts, 13 countries have implemented activities with a specific focus on gender and ethnicity, including actions to bring vaccines to remote communities. These included workshops and knowledge dialogues to identify local perceptions about vaccines, explain the benefits of vaccines to communities, and empower women, girls, Indigenous and Afro-descendant people and LGBT groups to communicate effectively about this issue through science-based and culturally appropriate content.

Fuente: reliefweb. Disponible en https://bit.ly/41yXaFF

Proveerán vacunas contra neumococo a través de fondos de la OPS

22 abr. El doctor Héctor Castro, director del Programa Ampliado de Inmunización (PAI), aseguró que recibirán nuevas dosis de la Neumo 23, que serán proveídas por el fondo rotatorio de la Organización Panamericana de la Salud (OPS).

Informó que se agotaron los biológicos que protegen contra el neumococo, indicados para los mayores de 60 años.

“Son vacunas importantes que nosotros accedemos a través del fondo rotatorio de OPS. Claro que vamos a volver a tenerlas, la fecha yo no quiero hoy confirmarla porque está sujeta a trámites administrativos”, manifestó Castro.

Señaló que mediante dicho fondo rotatorio se permite la sostenibilidad a los países para acceder a los biológicos. “El hecho de que existan vacunatorios ya sin disponibilidad, obviamente es una situación que nosotros debemos corregir. Y apenas lleguen más dosis vamos a avisar”, puntualizó.

Destacó el éxito de la campaña de vacunación contra la influenza, el covid-19 y el neumococo, que arrancó el 10 de abril y se extenderá hasta el 14 de julio. “Resaltamos el éxito de anticiparse en toda la población porque puede llegar a ocurrir lo mismo. Que las vacunas contra la influenza empiecen a disminuir en cantidad y después avisar que ya no queda ninguna”, precisó.

Las autoridades sanitarias confirmaron que se aplicaron 300.000 dosis de la vacuna contra la influenza y 125.000 personas recibieron la dosis anual bivalente contra el covid 19. En ese sentido, solicitan inmunizarse para prevenir casos graves de enfermedades respiratorias en la Campaña Invierno 2023, que inició el pasado 10 de abril.

Recordó que se encuentra disponible la vacuna contra la influenza con 1.500.000 dosis, la bivalente contra el covid y también las últimas dosis de Neumo 23, que ya fueron distribuidas con anticipación a los vacunatorios, porque en el nivel Central ya se agotaron.

Fuente: adn digital. Disponible en https://bit.ly/41MoeAY

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IS THERE A SAFETY SIGNAL GENERATION FOR SUDDEN SENSORINEURAL HEARING LOSS FOLLOWING mRNA COVID-19 VACCINATION: NATIONWIDE POST-MARKETING SURVEILLANCE USING THE FRENCH PHARMACOVIGILANCE SPONTANEOUS REPORTING DATABASE.
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Patentes registradas en Patentscope

Estrategia de búqueda: *Vaccine in the title or abstract AND 20230411:20230420 as the publication date 23 records*

1.WO/2023/057650A METHOD FOR PREDICTING SIDE EFFECTS OF DRUGS AND VACCINES
WO - 13.04.2023
Clasificación Internacional G16H 10/20 Nº de solicitud PCT/EP2022/078040 Solicitante CENTRE HOSPITALIER UNIVERSITAIRE VAUDOIS (CHUV) Inventor/a MANSOURI, Nahal
The present invention relates to a method for predicting side effects of a drug or a vaccine, a method for predicting side effects of a coronavirus vaccine and to a method for selecting a subject qualifying for vaccination with a coronavirus vaccine. Instant methods are particularly useful wherein the coronavirus vaccine is a SARS-CoV2 vaccine

2.WO/2023/062515MULTIEPITOPE SELF-ASSEMBLED NANOPARTICLE VACCINE PLATFORM (MSN-VACCINE PLATFORM) AND USES THERE OF
WO - 20.04.2023
Clasificación Internacional A61K 39/00 Nº de solicitud PCT/IB2022/059713 Solicitante TRANSLATIONAL HEALTH SCIENCE AND TECHNOLOGY INSTITUTE Inventor/a SAMAL, Sweety
The present invention is drawn to a next generation nano vaccine platform by using structure- based design to utilize the conserved or less variable or highly immunogenic domains or epitopes and displaying it in a nano cage and produces it in as nanoparticle protein in prokaryotic expression system. The present invention is illustrated in detail by a vaccine design and construct for SARS CoV-2, SARS-CoV-2 variants, betacorona viruses, Monkey pox virus and Dengue virus.

3.WO/2023/057870NEMATODE VACCINE
WO - 13.04.2023
Clasificación Internacional A61P 33/10 Nº de solicitud PCT/IB2022/059394 Solicitante AGRESEARCH LIMITED Inventor/a UMAIR, Saleh
The present invention is directed to a vaccine comprising recombinant antigens derived from the parasitic nematode *Haemonchus contortus*, which will raise an immune response in farmed and wild ruminants that are susceptible or predisposed to infection by one or more nematode worm species. The recombinant antigens used in the invention are conserved among species of nematode worms so that the vaccine will provide protection against multiple types of nematode worms. In particular, the invention provides a composition or vaccine composition comprising the recombinant *H. contortus* antigens: (i) enolase (EN); (ii) arginine kinase (AK); and (iii) ornithine decarboxylase (ODC), or antigenic fragments thereof, together with a veterinary acceptable carrier or diluent.

4.WO/2023/062353NANOPARTICULATE FORMULATION
WO - 20.04.2023
Clasificación Internacional A61K 9/00 Nº de solicitud PCT/GB2022/052569 Solicitante NEWIMMUNE II, LLC Inventor/a HORSBURGH, Brian
The present disclosure relates to nanoparticulate vaccine adjuvants, and to vaccine compositions which contain nanoparticulate vaccine adjuvants; to methods of preparing such adjuvants and compositions; and to methods of using such compositions and adjuvants for vaccination. The vaccine adjuvants disclosed herein are effective for enhancing the immune response to vaccination.

5.WO/2023/064631ENGINEERING ANTIGEN BINDING TO, AND ORIENTATION ON, ADJUVANTS FOR ENHANCED HUMORAL RESPONSES AND IMMUNOFOCUSING
WO - 20.04.2023

Clasificación Internacional A61K 39/215 Nº de solicitud PCT/US2022/046890 Solicitante CHAN ZUCKERBERG BIOHUB, INC. Inventor/a XU, Duo
New vaccine compositions comprising a modified antigen bound to the surface of an adjuvant or carrier by electrostatic interactions are disclosed. The antigen of the vaccine composition is presented in a defined orientation on an adjuvant surface such that epitope accessibility is altered and an immune response is redirected toward specific epitopes. In some embodiments the vaccine composition comprises one or more recombinant antigen polypeptides adsorbed to an alum particle. In some embodiments, the recombinant antigen polypeptide comprises a Region of Repetitive Carboxylic Groups (RRC) or a Region of Repetitive Lysyl/Guanidino Groups (RRL).

6.WO/2023/059857MULTIVALENT INFLUENZA VACCINES
WO - 13.04.2023
Clasificación Internacional A61K 39/12 Nº de solicitud PCT/US2022/045992 Solicitante SANOFI PASTEUR INC. Inventor/a ALEFANTIS, Timothy
Disclosed are multivalent vaccine or immunogenic compositions comprising influenza virus hemagglutinin (HA) from standard of care influenza virus strains, or ribonucleic acid molecules encoding the same; and one or more influenza virus HA identified or designed by machine learning, or one or more ribonucleic acid molecules that encode the influenza virus HA identified or designed by machine learning. Also disclosed are methods of using the vaccine or immunogenic compositions.

7.WO/2023/064755A NOVEL POULTRY SALMONELLA VACCINE AND DIAGNOSTIC METHODOLOGY TO CONTROL FOODBORNE SALMONELLOSIS
WO - 20.04.2023
Clasificación Internacional A61K 39/02 Nº de solicitud PCT/US2022/077887 Solicitante UNIVERSITY OF FLORIDA RESEARCH FOUNDATION, INCORPORATED Inventor/a KARIYAWASAM, Subhashinie
A vaccine for treating Salmonella enteriditis that includes an immunogenically effective amount of a Salmonella Enteritidis protein InvG, and optionally a pharmaceutically acceptable carrier is described. Methods of using compositions that include the Salmonella Enteritidis protein InvG or a delivery vector that expresses Salmonella Enteritidis protein InvG for immunizing poultry against Salmonella Enteritidis are also described.

8.WO/2023/064860MRNA VACCINE DESIGN VIA THE ALTERATION OF CODON USAGE
WO - 20.04.2023
Clasificación Internacional A61K 39/12 Nº de solicitud PCT/US2022/078052 Solicitante THE CLEVELAND CLINIC FOUNDATION Inventor/a JUNG, Jae U.
The present disclosure provides compositions and polynucleotides for increasing expression of an immunogenic and/or antigenic polypeptide (e.g., in a vaccine). The disclosure further provides methods of using the disclosed compositions, polynucleotides, and vaccines for the treatment of diseases and disorders (e.g., infections). The compositions and polynucleotides include a first nucleic acid encoding a viral regulatory protein and a second nucleic acid encoding an immunogenic polypeptide, wherein the immunogenic polypeptide is codon-optimized to a vims from which the regulatory protein is derived.

9.WO/2023/062182VACCINE COMPOSITIONS AGAINST BOVINE VIRAL DIARRHEA VIRUS
WO - 20.04.2023
Clasificación Internacional A61K 39/12 Nº de solicitud PCT/EP2022/078616 Solicitante AQUILÓN CYL, S.L. Inventor/a GARCÍA DÍEZ, Marta
The invention relates to an antigenic polypeptide derived from the E2 protein of the bovine viral diarrhea virus, to a fusion protein comprising said polypeptide and to a virus-like particle comprising said fusion protein. The invention also relates to a vaccine composition comprising said virus-like particle and its medical use.

10.WO/2023/063801MANUFACTURING METHOD FOR COVID-19 VACCINE
WO - 20.04.2023
Clasificación Internacional A61K 39/215 Nº de solicitud PCT/KR2022/015664 Solicitante SK BIOSCIENCE CO., LTD. Inventor/a YANG, Seon-young
The present invention relates to a manufacturing method for a COVID-19 vaccine.

11.WO/2023/063769GENE CONSTRUCT FOR EXPRESSING MRNA
WO - 20.04.2023
Clasificación Internacional C12N 15/63 Nº de solicitud PCT/KR2022/015581 Solicitante GENOMICTREE, INC. Inventor/a AN, Sungwhan
The present invention relates to a gene construct for expressing an mRNA, and a pharmaceutical composition, a vaccine composition, and a gene therapy composition, each comprising the gene construct. More specifically, the present invention relates to a gene construct including a coronavirus (SARS-CoV-2: Severe acute respiratory syndrome coronavirus 2)-derived 5' untranslated region (UTR) and/or 3' untranslated region (UTR), and a pharmaceutical composition, a vaccine composition, and a gene therapy composition, each comprising the gene construct.

12.WO/2023/060086METHODS FOR DETERMINING NOROVIRUS-REACTIVE ANTIBODIES
WO - 13.04.2023
Clasificación Internacional C07K 16/10 Nº de solicitud PCT/US2022/077540 Solicitante TAKEDA VACCINES, INC. Inventor/a BRAUN, Ralph
The present disclosure is directed to methods for determining the presence and/or amount of norovirus-reactive antibodies in a sample from a subject. The subject may be vaccinated with a norovirus vaccine or infected with a norovirus. The present disclosure further relates to *in vitro* methods for diagnosing a norovirus infection and determining protection against a norovirus infection in a subject for instance after vaccination with a norovirus vaccine. The present disclosure is further directed to kits for determining norovirus-reactive antibodies in a sample. The present disclosure is further directed to microsphere complexes comprising microspheres coupled to norovirus virus like particles.

13.WO/2023/062651VIRUS-LIKE PARTICLES FOR RESPIRATORY SYNCYTIAL VIRUS AND METHOD OF PREPARATION THEREOF
WO - 20.04.2023
Clasificación Internacional A61K 39/00 Nº de solicitud PCT/IN2022/050914 Solicitante PADMANABH PATIL, Harshad Inventor/a PADMANABH PATIL, Harshad
The present invention relates to virus-like particles (VLP) for respiratory syncytial virus (RSV) comprising of prefusogenic F (preFG) associated with G and M proteins using baculovirus system wherein the VLP is having lipid bilayer. Also, the present invention provides a method for preparation of respiratory syncytial virus-virus like particles (RSV-VLP). Further, the present invention provides an immunogenic composition wherein the immunogenic composition induces a highly effective immune response in a subject. Also, the present invention provides a VLP candidate vaccine for RSV wherein said vaccine is embedded with or without adjuvants in the lipid bilayer of VLP.

14.WO/2023/060279USE OF DOPAMINE PRODUCING PRODUCTS TO INCREASE VACCINE EFFICACY
WO - 13.04.2023
Clasificación Internacional A61K 35/66 Nº de solicitud PCT/US2022/077835 Solicitante IOWA STATE UNIVERSITY RESEARCH FOUNDATION, INC. Inventor/a LYTE, Mark
The present disclosure is directed to dopamine producing probiotics to increase immune responses to vaccination and to provide increased immune protection. The present disclosure is further directed to dopamine producing synbiotic compositions, formulations, plants, and synthetic compounds and their use

for targeted clinical and veterinary applications, for example, in promoting health and well-being and enhancing vaccine efficacy. The present disclosure also provides an approach for optimization of synbiotic delivery of a probiotic or other dopamine producing product with a dopamine precursor to beneficially aid in the use of such products for a variety of conditions and diseases, and particularly in the field of vaccines, whether prophylactic or therapeutic.

15.WO/2023/061918METHODS OF TREATING MULTIPLE SCLEROSIS
WO - 20.04.2023
Clasificación Internacional A61K 31/426 Nº de solicitud PCT/EP2022/078064 Solicitante ACTELION PHARMACEUTICALS LTD Inventor/a SPILLER, Krista
The disclosure relates to methods of treating multiple sclerosis and maintaining or maximizing vaccine effectiveness. In certain aspects, the methods comprise administrating ponesimod, administering a vaccine, and interrupting the administration of the ponesimod.

16.WO/2023/064708VACCINE COMPOSITIONS AGAINST SARS-COV-2 VARIANTS OF CONCERN TO PREVENT INFECTION AND TREAT LONG-HAUL COVID
WO - 20.04.2023
Clasificación Internacional A61K 39/215 Nº de solicitud PCT/US2022/077748 Solicitante WANG, Chang-Yi Inventor/a WANG, Chang-Yi
The present disclosure is directed to amino acid sequences from SARS-CoV-2 S1-RBD variants of concern (VoCs) including Omicron variants BA.4/BA.5 protein and N, M and S2 derived Th and CTL epitope peptides and an idealized pathogen derived artificial Th epitope peptide to offer effective prevention and treatment of long-haul COVID with specificities against SARS-CoV-2 VoCs including SARS-CoV-2 Omicron variants BA.4/BA.5. The disclosed vaccine compositions utilize amino acid sequences for the design and manufacture of optimal SARS-CoV-2 antigenic proteins, Th/CTL peptide immunogen constructs, CHO- derived S1- RBD VoCs-sFc proteins including CHO- derived S1-RBD Omicron variants BA.4/BA.5-sFc protein, and compositions thereof, as vaccines for prevention and treatment of long-haul COVID.

17.WO/2023/064612PHARMACEUTICAL COMPOSITIONS FOR DELIVERY OF VIRAL ANTIGENS AND RELATED METHODS
WO - 20.04.2023
Clasificación Internacional C12N 7/00 Nº de solicitud PCT/US2022/046799 Solicitante BIONTECH SE Inventor/a GAYNOR, Richard B.
The present disclosure provides pharmaceutical compositions for delivery of viral antigens (e.g., a viral vaccine) and related technologies (e.g., components thereof and/or methods relating thereto).

18.WO/2023/064822NUCLEIC ACID ARRAYS FOR MRNA CHARACTERIZATION
WO - 20.04.2023
Clasificación Internacional C12Q 1/6841 Nº de solicitud PCT/US2022/077990 Solicitante INDEVR, INC. Inventor/a ROWLEN, Kathy L.
Provided herein are methods and related systems, including assays and kits, for characterization of one or more polynucleotides, including mRNA polynucleotides or other nucleic acid targets. Capture agents are provided on a substrate that are specific to a target region of mRNA in a vaccine or therapeutic sample, wherein the nucleic acid capture agents specifically bind to the target region. Contacting the capture agents with a sample containing relevant mRNA sequences forms a capture agent-target hybridized complex that can be labeled with a variety of detection label agents to generate a measurable signal that may be used for identity, quantification, integrity and/or stability measurements of mRNA in mRNA-based vaccines and therapeutics.

19.WO/2023/057617SPECIFIC BACULOVIRUS MAJOR ENVELOPE GLYCOPROTEIN GP64 BINDING PROTEINS
WO - 13.04.2023
Clasificación Internacional C07K 14/31 Nº de solicitud PCT/EP2022/077921 Solicitante NAVIGO PROTEINS GMBH Inventor/a FIEDLER, Erik
gp64 is the major envelope glycoprotein of baculoviruses. The present invention relates to novel proteins that specifically bind to the baculovirus envelope protein gp64. The novel proteins of the present invention are advanced and powerful tools because they allow precise capturing of gp64 in affinity chromatography. The gp64 binding proteins are particularly useful tools within the process of protein production (e.g. vaccine production) to provide for gp64 free samples. Further, the binding protein for gp64 are useful for methods to analyze the presence of gp64.

20.WO/2023/057979RNA VACCINE LIPID NANOPARTICLES
WO - 13.04.2023
Clasificación Internacional C12N 15/85 Nº de solicitud PCT/IB2022/059616 Solicitante PRECISION NANOSYSTEMS ULC Inventor/a GEALL, Andy John
Disclosed are recombinant expression vectors useful as RNA vaccines. Also disclosed are pharmaceutically acceptable carriers for the recombinant expression vectors, particularly lipid nanoparticles.

21.WO/2023/060220METHODS OF IMMUNIZATION AGAINST CORONAVIRUS
WO - 13.04.2023
Clasificación Internacional A61K 39/215 Nº de solicitud PCT/US2022/077737 Solicitante BIOVAXYS INC. Inventor/a BERD, David
In some embodiments, immunization methods are disclosed which encompass a pansarbecovirus vaccine which induces a broadly cross-reactive neutralizing antibody response to multiple species of sarbecovirus.

22.WO/2023/064931ENGINEERED RABIES VIRUS GLYCOPROTEIN, COMPOSITIONS, AND METHODS OF USE THEREOF
WO - 20.04.2023
Clasificación Internacional A61K 39/205 Nº de solicitud PCT/US2022/078162 Solicitante LA JOLLA INSTITUTE FOR IMMUNOLOGY Inventor/a SAPHIRE, Erica Ollmann
Provided herein are, inter alia, methods and compositions for treating and preventing rhabdoviridae infection, including rabies virus. Compositions include recombinant rabies virus glycoproteins that are able to form glycoprotein trimers. The glycoprotein trimers are contemplated to be effective for preventing and/or treating rabies virus infections, including for use in the formulation of rabies virus vaccine compositions.

23.WO/2023/061508NEBULIZER CUP AND USE THEREOF IN NEBULIZATION INHALATION ADMINISTRATION
WO - 20.04.2023
Clasificación Internacional A61M 11/00 Nº de solicitud PCT/CN2022/130338 Solicitante CANSINO BIOLOGICS INC. Inventor/a SI, Weixue
A nebulizer cup and a use thereof in nebulization inhalation administration, in particular, the use of the nebulizer cup in the nebulization inhalation administration of drugs (e.g. SARS-CoV-2 vaccine) for preventing and/or treating respiratory system diseases . After adding an anti-static agent into the nebulizer cup, the stability of the drug aerosol can be effectively maintained within a certain time, the particle size state is stable, the drug residues in the cup are few, an effective inhalable amount is ensured,

the administration operation is simple and convenient, the inoculation efficiency can be obviously improved, and the nebulizer cup can be used for large-scale inoculation.

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