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CONCORSO PUBBLICO, PER TITOLI ED ESAMI, PER LA COPERTURA DI N. 1 POSTO DI CATEGORIA D - POSIZIONE ECONOMICA D1, AREA TECNICA, TECNICO-SCIENTIFICA ED ELABORAZIONE DATI PER IL DIPARTIMENTO DI SCIENZE CHIMICHE E FARMACEUTICHE

ELENCO DOMANDE PROVA ORALE

Gruppo 1

Elettroforesi monodimensionale.

Indicare gli strumenti collaborativi presenti nella suite applicativa Google.

It works! Scientists have greeted with cautious optimism a press release declaring positive interim results from a coronavirus vaccine phase III trial — the first to report on the final round of human testing. New York City-based drug company Pfizer made the announcement on 9 November. It offers the first compelling evidence that a vaccine can prevent COVID-19 — and bodes well for other COVID-19 vaccines in development.

Gruppo 2

Elettroforesi bidimensionale.

Caratteristiche e funzionalità della posta elettronica (destinatari, cc, allegati...).

But the information released at this early stage does not answer key questions that will determine whether the Pfizer vaccine, and others like it, can prevent the most severe cases or quell the coronavirus pandemic."We need to see the data in the end, but that still doesn't dampen my enthusiasm. This is fantastic," says Florian Krammer, a virologist at Icahn School of Medicine at Mount Sinai in New York City, who is one of the trial's more than 40,000 participants. "I hope I'm not in the placebo group."

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Gruppo 3

Cromatografia liquida ad alte prestazioni (HPLC).

Modalità e applicativi per la condivisione di documenti e materiale di lavoro.

The vaccine, which is being co-developed by BioNTech in Mainz, Germany, consists of molecular instructions — in the form of messenger RNA — for human cells to make the coronavirus spike protein, the immune system's key target for this type of virus. The two-dose vaccine showed promise in animal studies and early-stage clinical trials. But the only way to know whether the vaccine works is to give it to a large number of people and then follow them over weeks or months to see whether they become infected and symptomatic.

Gruppo 4

Gas Cromatografia.

Servizi Cloud, funzionalità ed esempi.

These results are compared with those for a group of participants who are given a placebo. In the press release, Pfizer and BioNTech said they had identified 94 cases of COVID-19 among 43,538 trial participants. The companies did not indicate how many of those cases were in the placebo group or among those who got the vaccine. But they said that the split of cases between the groups suggested that the vaccine was more than 90% effective at preventing disease, when measured at least one week after trial participants had received a second vaccine dose 3 weeks after the first.

Gruppo 5

Spettrometria di massa.

Definire le caratteristiche di funzionamento di un foglio elettronico.

The trial will continue until a total of 164 COVID-19 cases are detected, so initial estimates of the vaccine's effectiveness could change. Although the vaccine might not turn out to be quite so effective once the trial is complete and all the data have been analysed, its effectiveness is likely to stay well above 50%, says Eric Topol, a cardiologist and director of the Scripps Research Translational Institute in La Jolla, California.

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Gruppo 6

Tecniche spettroscopiche.

Definire le caratteristiche di funzionamento di un word processor (e.g. Microsoft Word).

This is the threshold that the US Food and Drug Administration (FDA) says is required for a coronavirus vaccine to be approved for emergency use. "I think this is an extraordinary achievement, even without many details, because there was no assurance of vaccine efficacy before we got the first read-out from a trial," Topol says.

Gruppo 7

Test di tossicità.

Cosa comporta la modalità di navigazione anonima in un browser web?

What's missing, say Topol and other scientists, are details about the nature of the infections the vaccine can protect against — whether they are mostly mild cases of COVID-19 or also include significant numbers of moderate and severe cases. "I want to know the spectrum of disease that the vaccine prevents," says Paul Offit, a vaccine scientist at the Children's Hospital of Philadelphia in Pennsylvania who sits on a US Food and Drug Administration advisory committee that is set to evaluate the vaccine next month.

Gruppo 8

Valutazione attività chimica di molecole naturali e di sintesi.

Caratteristiche della PEC (Posta Elettronica Certificata), differenza con posta elettronica ordinaria

"You'd like to see at least a handful of cases of severe disease in the placebo group," he adds, because it would suggest that the vaccine has the potential to prevent such cases. It's unclear whether the vaccine can prevent people who show no or only very mild symptoms of COVID-19 from spreading the coronavirus. A transmission-blocking vaccine could accelerate the end of the pandemic.

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Gruppo 9

Valutazione attività biologica di molecole naturali e di sintesi.

Indicare la differenza tra sistema operativo e software applicativo.

But it will be difficult to determine whether the Pfizer vaccine, or others in late-stage trials, can achieve this, says Krammer, because it would involve routinely testing trial participants. "You can't do that with 45,000 people," he says. Another missing detail is how well the vaccine works in different groups of trial participants.

Gruppo 10

Caratterizzazione chimica di molecole.

Indicare le principali caratteristiche e differenze tra applicativo web e software installato.

"We don't know yet if it works in the population that needs it most, which is elderly," says Krammer. Because of the small number of cases it will accrue before ending, the Pfizer trial is unlikely to conclusively determine the vaccine's efficacy in particular demographic groups, such as over-65s or African Americans, says Offit. But he adds that if the trial enrolled enough participants from such groups, it could be possible to generalize the vaccine's probable effectiveness in them from its overall efficacy.

Gruppo 11

Analisi di metaboliti.

Indicare la funzione del sistema SPID (Sistema Pubblico di Identità Digitale).

One key unanswered question is how long the vaccine's effectiveness will last. On the basis of when the trial started and previously published data on immune responses in early-stage trials, many trial participants are likely to still have high levels of protective antibodies in their blood, says Rafi Ahmed, an immunologist at Emory University in Atlanta, Georgia. "To me, the main question is what about six months later, or even three months later," he says.

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Gruppo 12

Sorgenti laser in sistemi multiparametrici.

Indicare la differenza tra il protocollo HTTP e HTTPS, quali sono le principali implicazioni?

There will be a chance to answer that question if the trial continues for several more months, says Ahmed. Answers could also come from analysis of the immune responses of people who took part in early-stage trials of the Pfizer vaccine, some of whom might have been given the vaccine up to six months ago.

Gruppo 13

Molecole di sintesi o naturali con attività antiossidante.

Caratteristiche e vantaggi di un software di backup.

And although little is known about the vaccine's long-term effectiveness, that is unlikely to hold up its use, says Ahmed. "I don't think we should say, 'Well, I'll only take a vaccine that protects me for five years.' I mean, that could be crazy." The results are a boost for other COVID-19 vaccine candidates. That includes an mRNA vaccine being developed by Moderna, a biotechnology company in Cambridge, Massachusetts, and the US National Institute of Allergy and Infectious Diseases in Bethesda, Maryland, says Krammer. "I expect Moderna stocks will go up today."

Gruppo 14

Brevetti.

Indicare un tipo di minaccia informatica a sistemi personali o aziendali.

Shane Crotty, a vaccine immunologist at the La Jolla Institute for Immunology in California, thinks that Moderna isn't the only developer that should celebrate Pfizer's preliminary results. Several other candidate vaccines triggered immune responses similar to those elicited by Pfizer's vaccine in early-stage trials, so they should work well, too.

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Gruppo 15

Spin off.

Descrivere gli strumenti mailing list, forum e chat.

One thing about Pfizer's vaccine is certain: regulators will soon decide whether it's ready for roll-out. The company said it would seek an emergency use authorization from the FDA around the third week of November, at which point half of the participants will have been followed for two months — an FDA safety requirement for COVID-19 vaccines.

Gruppo 16

Trasferimento tecnologico.

Descrivere le funzionalità utili per l'analisi dei dati in un foglio elettronico (esempi di funzione e grafici).

And although researchers want to see the data behind Pfizer's vaccine trial, they are prepared to accept caveats that come with them. "Right now, we need a vaccine that works," says Krammer, even if it works for only a few months or doesn't stop transmission. "That's what we need in order to get half-way back to normal."

Gruppo 17

Strumenti per la diffusione dei risultati della ricerca.

Definizione e utilizzo del linguaggio HTML.

The ongoing COVID-19 pandemic is associated with substantial morbidity and mortality. Although much has been learned in the first months of the pandemic, many features of COVID-19 pathogenesis remain to be determined. For example, anosmia is a common presentation and many patients with this finding show no or only minor respiratory signs.

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Gruppo 18

Tecniche di separazione di molecole.

Spiegare brevemente le nozioni di Internet ed Intranet.

Studies in animals experimentally infected with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the cause of COVID-19, provide opportunities to study aspects of the disease not easily investigated in human patients. Although COVID-19 severity ranges from asymptomatic to lethal, most experimental infections provide insights into mild disease.

Gruppo 19

Start up.

Strumenti hardware e software funzionali ad un contesto home-working.

Here, using K18-hACE2 mice that we originally developed for SARS studies4, we show that infection with SARS-CoV-2 causes severe disease in the lung, and in some mice, the brain. Evidence of thrombosis and vasculitis was detected in mice with severe pneumonia. Furthermore, we show that infusion of convalescent plasma from a recovered patient with COVID-19 protected against lethal disease.

Gruppo 20

Sistemi di ionizzazione in spettrometria di massa.

La firma elettronica, avanzata, qualificata.

Mice developed anosmia at early times after infection. Notably, although pre-treatment with convalescent plasma prevented notable clinical disease, it did not prevent anosmia. Thus, K18-hACE2 mice provide a useful model for studying the pathological underpinnings of both mild and lethal COVID-19 and for assessing therapeutic interventions.

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Gruppo 21

Sorgenti laser in strumenti di laboratorio.

Indicare definizione e costruzione di una tabella Pivot.

To assess the susceptibility of K18-hACE2 mice to SARS-CoV-2, we intranasally challenged male and female animals using inocula of 103 , 104 , and 105 PFU. We observed a dose-dependent increase in weight loss and mortality (Fig. 1a). At the 105 PFU inoculum, all animals succumbed, while all mice survived when challenged with 103 PFU. There was variable mortality when mice were inoculated with 104 PFU (2/3 female and 3/7 male mice survived). To better understand the cause(s) of this morbidity and mortality.

Gruppo 22

Test di efficacia di una molecola ad attività biologica.

G-suite: elencare i principali applicativi forniti.

The predominant target organs were the lung at early timepoints, and variably, the brain at later timepoints. Virus replicated to high titers in lung tissue at 2 dpi and decreased at 4 and 6 dpi. In some, but not all animals, brain titers gradually increased from 2 to 6 dpi. Variability in brain infection was also described in a recent study of SARS-CoV-2-infected K18-hACE2 micell. Small amounts of infectious virus were detected in the kidney, small intestine, and colon, perhaps signifying low level hematogenous dissemination.

Gruppo 23

Caratterizzazione biologica di molecole.

Descrizione dei meccanismi con OTP (One Time Password).

We also detected viral RNA in heart, liver, spleen, kidney, intestine, and colon. These results demonstrate that SARS-CoV-2 infection of K18-hACE2 mice causes a dose-dependent lethal respiratory illness, with a subset of animals developing brain infection that also contributes to death. Convalescent plasma (CP) from COVID-19 survivors is being tested as a treatment in patients with clinical COVID-1919. Studies have demonstrated positive effects of CP on outcomes in several infectious diseases, if titers are sufficiently high and if CP is administered early in the disease course20.

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Gruppo 24

Gas cromatografia interfacciata alla spettrometria di massa (gas massa).

Software di web conference: funzionamento (ruoli) e strumenti.

In view of the early pulmonary virus replication, we stained lungs at 4 and 6 dpi for SARS-CoV-2 antigen. Using an inoculum of 105 PFU, we observed extensive and diffuse parenchymal localization of SARS-CoV-2 nucleocapsid (N) protein at 4 dpi that was less intense by 6 dpi . Uninfected tissues showed no N protein signal. Examination of hematoxylin and eosin stained tissues revealed evidence of diffuse alveolar damage with progressive alveolar/interstitial lesions characterized by edema, inflammation, and focal cytomegaly in some alveolar lining cells.

IL PRESIDENTE DELLA COMMISSIONE
Prof.ssa Luisa PASTI