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## Scientists claim Covid virus contains tiny chunk of DNA that 'matches sequence patented by Moderna THREE YEARS before pandemic began'

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- Genetic match discovered in Covid's unique furin cleavage site on spike protein
- Matched genetic sequence patented by Moderna for cancer research purposes
- Researchers say one in 3trillion chance Covid developed the code naturally
- Critics of the study are sceptical of its author's conclusions, suggesting that the sequence match is not as rare as has been claimed

By [CONNOR BOYD DEPUTY HEALTH EDITOR FOR MAILONLINE](#)  
**PUBLISHED:** 12:48 EDT, 23 February 2022 | **UPDATED:** 04:25 EDT, 3 March 2022

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Fresh suspicion that Covid may have been tinkered with in a lab emerged today after scientists found genetic material owned by **Moderna** in the virus's spike protein.

They identified a tiny snippet of code that is identical to part of a gene patented by the vaccine maker three years before the pandemic.

It was discovered in SARS-CoV-2's unique furin cleavage site, the part that makes it so good at infecting people and separates it from other coronaviruses.

The structure has been one of the focal points of debate about the virus's origin, with some scientists claiming it could not have been acquired naturally.

The international team of researchers suggest the virus may have mutated to have a furin cleavage site during experiments on human cells in a lab.

They claim there is a one-in-three-trillion chance Moderna's sequence randomly appeared through natural evolution.

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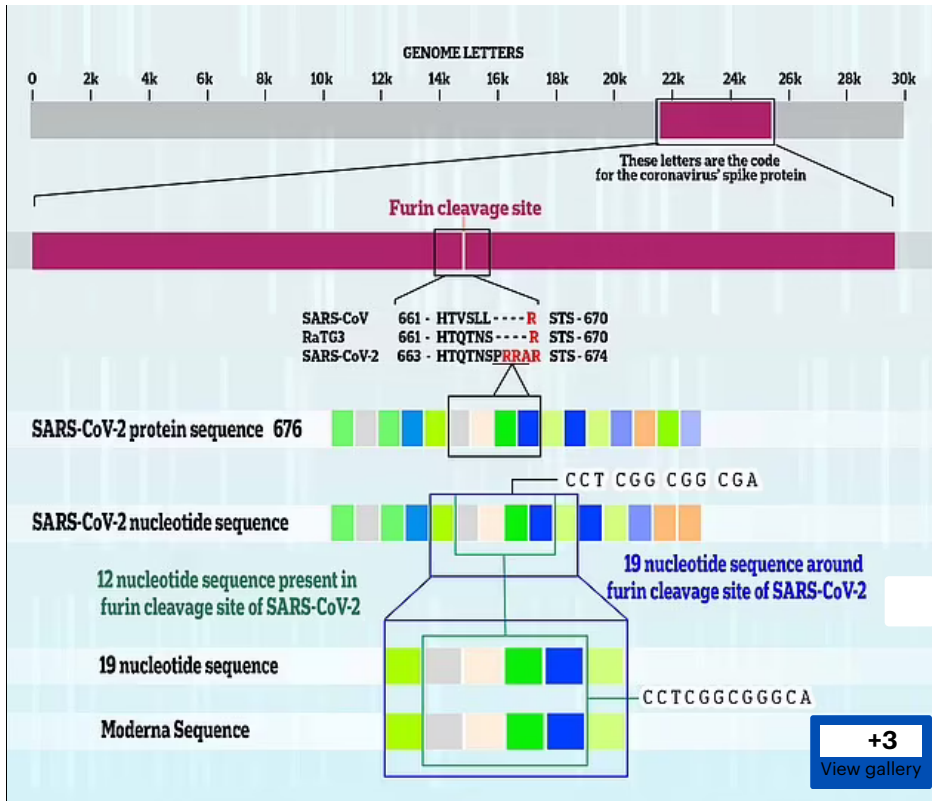
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But there is some debate about whether the match is as rare as the study claims, with other experts describing it as a 'quirky' coincidence rather than a 'smoking gun'.



SARS-CoV-2, which causes Covid, carries all the information needed for it to spread in around 30,000 letters of genetic code, known as RNA. The virus shares a sequence of 19 specific letters with a genetic section owned by Moderna. Twelve of the shared letters make up the structure of Covid's furin cleavage site, with the rest being a match with nucleotides on a nearby part of the genome

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US009587003B2

(12) **United States Patent**  
**Bancel et al.**

(10) **Patent No.:** US 9,587,003 B2  
(45) **Date of Patent:** Mar. 7, 2017

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(54) **MODIFIED POLYNUCLEOTIDES FOR THE PRODUCTION OF ONCOLOGY-RELATED PROTEINS AND PEPTIDES**

(71) Applicant: **Moderna Therapeutics, Inc.**, Cambridge, MA (US)

(72) Inventors: **Stephane Bancel**, Cambridge, MA (US); **Tirtha Chakraborty**, Medford, MA (US); **Antonin de Fongeres**, Waterloo (BE); **Sayda M. Elbashir**, Cambridge, MA (US); **Matthias John**, Cambridge, MA (US); **Atanu Roy**, Stoneham, MA (US); **Susan Whoriskey**, Belmont, MA (US); **Kristy M. Wood**, Wellesley, MA (US); **Paul Hatata**, Charlestown, MA (US); **Jason P. Schrum**, Philadelphia, PA (US); **Kenechi Ejebe**, New York, NY (US); **Jeff Lynn Ellsworth**, Lexington, MA (US); **Justin Guild**, Framingham, MA (US)

(73) Assignee: **ModernaTX, Inc.**, Cambridge, MA (US)

(\* ) Notice. Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **15015,684**

(22) Filed: **Feb. 4, 2016**

(65) **Prior Publication Data**  
US 2016/0152678 A1 Jun. 2, 2016

**Related U.S. Application Data**

(63) Continuation of application No. 14/106,988, filed on Dec. 16, 2013, now Pat. No. 9,301,993, which is a continuation of application No. PCT/US2013/030070, filed on Mar. 9, 2013.

(60) Provisional application No. 61/681,742, filed on Aug. 10, 2012, provisional application No. 61/737,224, filed on Dec. 14, 2012, provisional application No. 61/618,862, filed on Apr. 2, 2012, provisional application No. 61/681,645, filed on Aug. 10, 2012, provisional application No. 61/737,130, filed on Dec. 14, 2012, provisional application No. 61/618,866, filed on Apr. 2, 2012, provisional application No. 61/681,647, filed on Aug. 10, 2012, provisional

61/618,873, filed on Apr. 2, 2012, provisional application No. 61/681,650, filed on Aug. 10, 2012, provisional application No. 61/737,147, filed on Dec. 14, 2012, provisional application No. 61/618,878, filed on Apr. 2, 2012, provisional application No. 61/681,654, filed on Aug. 10, 2012, provisional application No. 61/737,152, filed on Dec. 14, 2012, provisional application No. 61/618,885, filed on Apr. 2, 2012, provisional application No. 61/681,658, filed on Aug. 10, 2012, provisional application No. 61/737,155, filed on Dec. 14, 2012, provisional application No. 61/618,896, filed on Apr. 2, 2012, provisional application No. 61/668,157, filed on Jul. 5, 2012, provisional application No. 61/681,661, filed on Aug. 10, 2012, provisional application No. 61/737,160, filed on Dec. 14, 2012, provisional application No. 61/618,911, filed on Apr. 2, 2012, provisional application No. 61/681,667, filed on Aug. 10, 2012, provisional application No. 61/737,168, filed on Dec. 14, 2012, provisional application No. 61/618,922, filed on Apr. 2, 2012, provisional application No. 61/681,675, filed on Aug. 10, 2012, provisional application No. 61/737,174, filed on Dec. 14, 2012, provisional application No. 61/618,935, filed on Apr. 2, 2012, provisional application No. 61/681,687, filed on Aug. 10, 2012, provisional (Continued)

(51) **Int. Cl.**  
**C07K 14/535** (2006.01)  
**C07K 14/505** (2006.01)

(52) **U.S. Cl.**  
CPC ..... **C07K 14/535** (2013.01); **C07K 14/505** (2013.01)

(58) **Field of Classification Search**  
None  
See application file for complete search history.

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(Continued)

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**Moderna filed the patent in February 2016 as part of its cancer research division, records show. The patented sequence is part of a gene called MSH3 that is known to affect how damaged cells repair themselves in the body. It was approved on March 7 the following year**

In the latest study, published in **Frontiers in Virology**, researchers compared Covid's makeup to millions of sequenced proteins on an online database.

The virus is made up of 30,000 letters of genetic code that carry the information it needs to spread, known as nucleotides.


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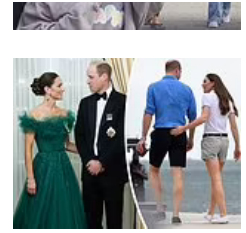
It is the only coronavirus of its type to carry 12 unique letters that allow its spike protein to be activated by a common enzyme called furin, allowing it to spread between human cells with ease.

Analysis of the original Covid genome found the virus shares a sequence of 19 specific letters with a genetic section owned by Moderna, which has a total of 3,300 nucleotides.

The US-based pharmaceutical firm filed the patent in February 2016 as part of its

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cancer research division, records show.

The patented sequence is part of a gene called MSH3 that is known to affect how damaged cells repair themselves in the body.

Scientists have highlighted this pathway as a potential target for new cancer treatments.

Twelve of the shared letters make up the structure of Covid's furin cleavage site, with the rest being a match with nucleotides on a nearby part of the genome.

Writing in the paper, led by Dr Balamurali Ambati, from the University of Oregon, the researchers said the matching code may have originally been introduced to the Covid genome through infected human cells expressing the MSH3 gene.

Professor Lawrence Young, a virologist at Warwick University, admitted the latest finding was interesting but claimed it was not significant enough to suggest lab manipulation.

He told MailOnline: 'We're talking about a very, very, very small piece made up of 19 nucleotides.'

'So it doesn't mean very much to be frank, if you do these types of searches you can always find matches.'

'Sometimes these things happen fortuitously, sometimes it's the result of convergent evolution (when organisms evolve independently to have similar traits to adapt to their environment).'

'It's a quirky observation but I wouldn't call it a smoking gun because it's too small.'

He added: 'It doesn't get us any further with the debate about whether Covid was engineered.'

Dr Simon Clarke, a microbiologist at Reading University, questioned whether the find was as rare as the study claims.

He told MailOnline: 'There can only be a certain number of [genetic combinations within] furin cleavage sites.'

'They function like a lock and key in the cell, and the two only fit together in a limited number of combinations.'

## WHAT IS THE FURIN CLEAVAGE SITE?

SARS-CoV-2, which causes Covid, carries all the information needed for it to spread in around 30,000 letters of genetic code, known as RNA.

But it is the only coronavirus of its type to carry 12 unique letters that allow it to be activated by a common enzyme called furin.

This in turn makes the virus better at invading neighbouring cells.

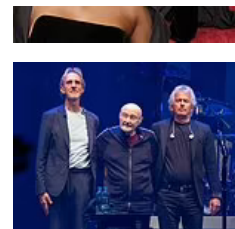
The so-called furin cleavage site is located on the virus' spike protein, the structure that binds to human cells in the first place.

Scientists sometimes add this element to lab viruses to make them more infectious, but in nature, pathogens can acquire it by swapping genetic code with other members of their family.

The furin has been the focal point of intrigue for many scientists studying the origins of the virus because no other known member of Covid's family - a group called Sarbecoviruses - have the site.

movie star

▶ 'After tonight, we'll all have to get real jobs': Frail Phil Collins, 71, stands with Genesis bandmates as iconic band bid farewell to fans at FINAL ever concert in London



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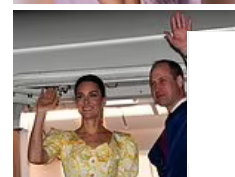
▶ Oscars 2022: Lily James puts on a VERY leggy display in daring pink lace dress as she wows on the red carpet in yet another racy awards season outfit



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▶ Prince William 'holds emergency crisis talks with senior aides' after being rocked by the backlash against royal tour of the Caribbean for being 'tone death' to Britain's colonial past



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'So it's an interesting coincidence but this is surely entirely coincidental.'

MailOnline has approached Moderna for comment.

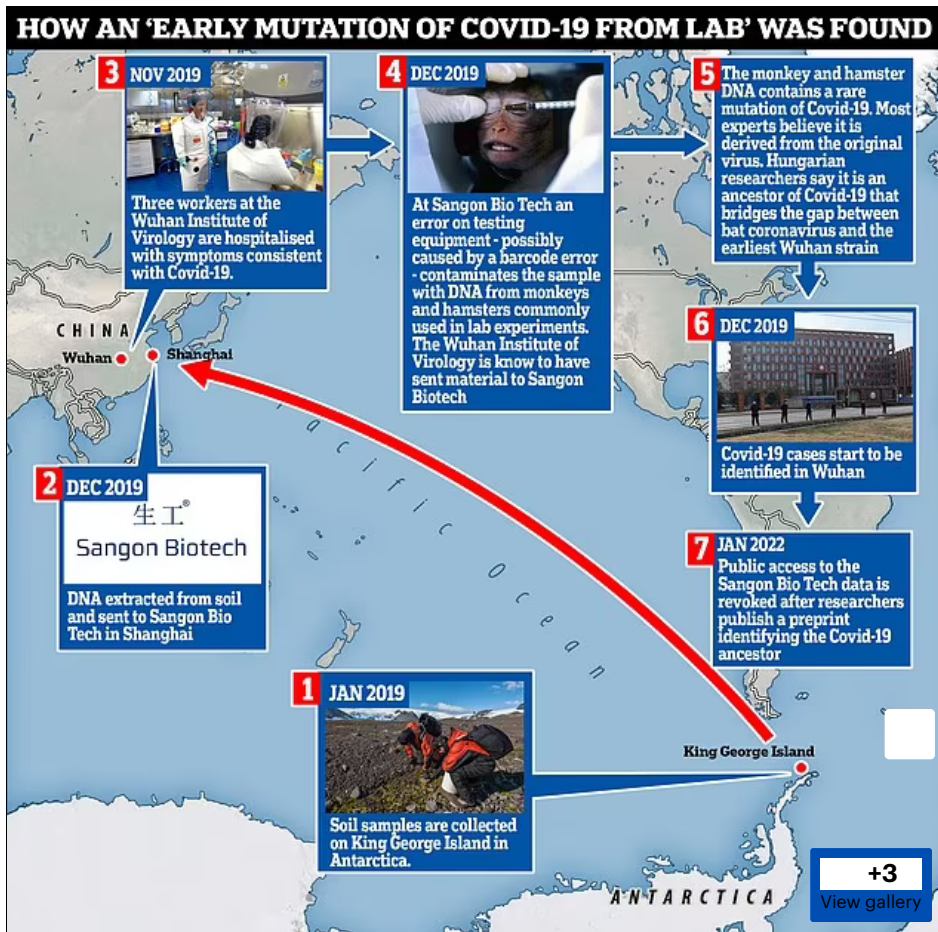
Circumstantial evidence has long raised questions about the origin of Covid and its link to the Wuhan Institute of Virology.

The facility was known to be conducting experiments on bat coronavirus strains similar to the one responsible for the pandemic.

China insisted early and often that the virus did not leak from the lab, claiming that crossover to humans must have occurred at a 'wet market' in Wuhan that sold live animals.

Perhaps driven by animosity for then-US President Donald Trump, who embraced the lab leak theory early on, mainstream media and academics in the West heaped scorn on the possibility, calling it an unhinged conspiracy theory.

But leaked emails showed that top scientists advising the UK and US Governments expressed concerns about the official narrative privately.



A study earlier this month found traces of Covid samples that contained genetical material from humans, hamsters and monkeys and may have predated the official pandemic timeline.

Sir Jeremy Farrar, an eminent British expert who publicly denounced the theory as a 'conspiracy', admitted in a private email in February 2020 that a 'likely explanation' was that the virus was man-made.

The then-UK Government adviser said at the time he was '70:30 or 60:40' in favour of an accidental release versus natural origin.

In the email, sent to American health chiefs Dr Anthony Fauci and Dr Francis Collins,

▶ Zoe Saldana and husband Marco Perego treat their boys to toys during LA shopping spree



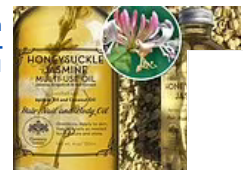
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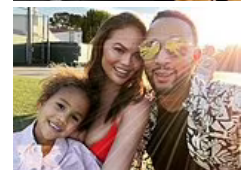
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▶ Prince William is hailed for 'very wise' words after admitting he might never be head of the Commonwealth in an unprecedented statement



▶ Taylor Swift and beau Joe Alwyn spotted by eagle-eyed fans in background of a photo taken during the CAA pre-Oscar Party in West Hollywood



▶ Lady Gaga's dog walker Ryan Fischer testifies about 'hitting attacker with champagne bottle' as they tried to steal his boss' French Bulldogs,



Sir Jeremy said it was possible Covid had been evolved from a Sars-like virus in the lab.

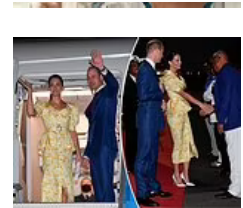
He went on that this seemingly benign process may have 'accidentally created a virus primed for rapid transmission between humans'.

But the British scientist was shut down by his counterparts in the US who warned further debate about the origins of the virus could damage 'international harmony'.

In the latest twist, a study earlier this month found traces of Covid samples that contained genetical material from humans, hamsters and monkeys and may have predated the official pandemic timeline.

**Koji and Gustav**

William and Kate wave goodbye to the Caribbean after visiting a center for vulnerable children in the Bahamas on the final day of their tumultuous tour



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# China's official pandemic timeline of the coronavirus pandemic and the evidence that undermines it

## Official timeline

**Dec 8, 2019** - Earliest date that China has acknowledged an infection

**Dec 31** - China first reported 'pneumonia of unknown cause' to the World Health Organisation

**Jan 1, 2020** - Wuhan seafood market closed for disinfection

**Jan 7** - President Xi Jinping discusses coronavirus outbreak with his politburo

**Jan 9** - China makes public the genome of the coronavirus

**Jan 11** - China reported its first death

**Jan 13** - First case outside China is confirmed

**Jan 20** - China's National Health Commission confirms human-to-human transmission

**Jan 23** - Wuhan locked down

**Jan 31** - WHO declared 'outbreak of international concern' as China admitted having thousands of cases

**Feb 23** - Italy reports cluster of cases in first major outbreak in the West

**May 29** - China claims virus did not originate in wet markets but in Chinese bats before it jumped to humans via an 'intermediary animal'

**July 31** - Chinese researcher admits some coronavirus experiments conducted in lower biosafety labs

**Dec 16** - WHO announces it will travel to Wuhan to probe origins of virus in January

**Jan 5, 2021** - China denies entry to WHO's investigatory team

**Feb 9** - WHO dismisses theory virus leaked from lab - backs China's claim it was imported from frozen meat

**Mar 28** - Former US national security officials says intel shows 'there was a

Kylie Jenner's beau Travis Scott performs for first time since Astroworld tragedy as he takes the microphone at star-studded pre-Oscars party in Los Angeles



Country singer Jeff Carson dies at 58: The crooner turned police officer passes away after suffering a heart attack



Secret best friends! Samuel L Jackson, 73, gets a hug from Denzel Washington, 67, as he receives honorary Oscar... 32 years after they co-starred in Mo' Better Blues



Shrink pores without drying out your skin: Beauty fans are using this ultra-hydrating toner instead of moisturizer for a dewy, glowing complexion - and there's 15% off for





direct order from Beijing to destroy all viral samples' at Wuhan lab

**New evidence**

**2012:** Six miners struck down with with a mysterious flu-like illness in Mojiang cave in Yunnan.

They were found to have been infected with the closest known relative to Covid, sharing 97% of its genes.

Samples RATG13 are sent to the Wuhan Institute of Virology to be studied.

**Sep 2019-** Blood samples are taken in a lung cancer screening trial in Italy which later test positive for coronavirus

**Oct -** Whistleblower Wei Jingsheng claims China deliberately spread Covid at The World Military Games in Wuhan in October, two months before the rest of the world knew about the virus

**Oct -** Xi Jinping's authoritarian regime tried desperately to shut down whistle-blowers like Mr Jingsheng. Any references made in social media about a new SARS virus or 'outbreak' were censored

**Oct-Dec -** Rise in 'flu and pneumonia' cases in northern Italy which could be linked to coronavirus

**Nov -** Whistleblower Mr Jingsheng claims he took his concerns about the military games to senior figures within the Trump administration but was ignored

**Nov -** Intelligence report passed to agencies in Washington claims three members of staff at the Wuhan Institute of Virology sought hospital treatment in November 2019 after experiencing symptoms consistent with Covid

**Nov -** Sewage samples taken in Florianópolis, Brazil, suggest virus was present

**Nov 10 -** Milanese woman has a skin biopsy, producing a sample which later shows signs of the virus

**Nov 17 -** Leaked documents suggest case detected in China on this date

**Dec -** Doctors in China, including Li Wenliang, report existence of new type of respiratory infection. But Chinese police arrested him and eight of his colleagues for questioning - instead of publicising reports and warning public

**Dec 1 -** Chinese researchers report an infection on this date in a peer-reviewed study, but it has not been acknowledged by Beijing

**Dec 18 -** Sewage samples taken in Milan and Turin suggest virus was circulating in the cities

**Dec 26 -** Samples analysed suggested a new type of SARS was circulating as early as December 26, but Wuhan was not locked down until January 22

**Jan 2020 -** Sewage samples from Barcelona suggest virus was in the city

**Jan 3 -** Covid-19 infections begin sweeping across other nations including the U.S. as the WHO labelled the outbreak a Public Health Emergency of International Concern

**May -** Scientists at a government lab in California concluded that Covid-19

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▶ Ashley Benson puts on a VERY risqué display in a busty see-through mini dress with gold embellishing at star-studded pre-Oscar party in LA



▶ David Beckham tests out robots with the Afghan Girls Robotics Team during trip to Qatar for Doha Forum amid controversy over '£150m' deal to be face of country's World Cup



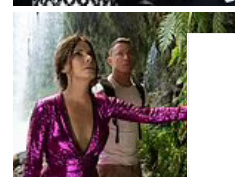
▶ Foo Fighters drummer Taylor Hawkins 'had ten different drugs in his system including heroin, marijuana, antidepressants and opioids' when he died in Colombia hotel



▶ Kristen Stewart sets pulses racing in diamond mini dress while Kate Beckinsale radiates elegance in a white satin



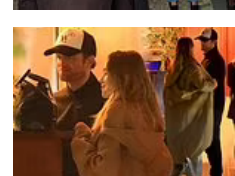
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▶ Hailey Bieber and Zendaya sizzle in black ensembles while Zoe Kravitz is chic in blue denim as they lead the stars at Saint Laurent pre-Oscars event in LA



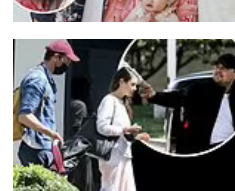
▶ Robert Pattinson and Suki Waterhouse put on a loved-up display as model tenderly touches actor's chest on romantic evening out



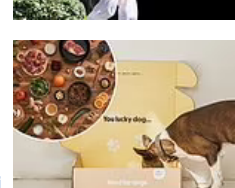
▶ Ashley Tisdale celebrates daughter Jupiter turning one with an out-of-this-world birthday party with Lea Michele, Austin Butler and Kaia Gerber



**EXCLUSIVE** Mila Kunis bumps fists with Leonardo DiCaprio as she and husband Ashton Kutcher run into the A-listers at private jet terminal



▶ Looking for a healthy but hassle-free dog food? Try this human-grade air-dried dog food that's full of real and clean ingredients like blueberries and broccoli



may have escaped from a facility in Wuhan

**July** - WHO chief Tedros Adhanom Ghebreyesus said China failed share vital raw data during their investigation in Wuhan. China rebuffed those claims

**June 2021:** Leading US virus expert Dr Anthony Fauci was warned Covid may have been engineered in a lab, emails publicly released reveal.

**August:** The world's first Covid-19 patient may have been infected by a bat while working for a Wuhan lab in **China**, WHO chief Dr Peter Embarek said

**August:** A damning report by Republicans in the US claims coronavirus leaked from the Wuhan Institute of Virology, shortly after the facility tried to improve air safety and waste treatment systems

The report also cited 'ample evidence' that lab scientists were working to modify coronaviruses to infect humans and such manipulation could be hidden.

**October:** US intelligence review into origins of pandemic does not reach a judgement on whether the virus emerged via animal-to-human transmission or a lab leak.

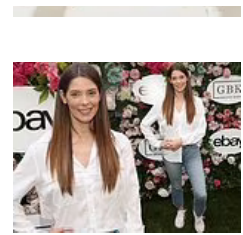
Chinese officials branded the report 'political and false'.

**January 2022:** Leaked emails from top UK scientist Sir Jeremy Farrar showed he admitted in February 2020 that it was a 'likely explanation' that the virus could be man-made. But he went on to brand the theory a 'conspiracy'.

**February:** Sir Farrar is called to be interviewed under oath at the US Congress. Officials want him to explain why he shifted away from the lab leak theory.

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▶ Ashley Greene radiates beauty days after announcing her first pregnancy ... as she attends the eBay & GBK Brand Bar pre-Oscar Luxury Lounge at the Beverly Wilshire



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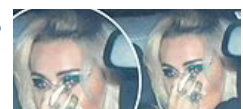
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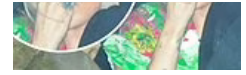


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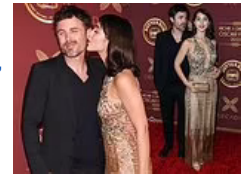
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after she dedicated her set to Foo Fighters drummer Taylor Hawkins in the wake of his shocking death



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Julianne Hough layers up in a stylish patterned black-and-white overcoat while taking a solo stroll in New York City

Gordon Ramsay holds hands with his stylish daughter Holly, 22, at the Saudi Arabian Grand Prix... after he caused controversy by saying he 'can't stand' Cornish people

Gwen Stefani looks cool in head-to-toe camouflage while at her son Zuma's baseball game with husband Blake Shelton in LA

Victoria's Secret model Taylor Hill goes braless in racy blazer dress as she joins hunky fiancé Daniel Fryer at glamorous Armani event

The Duchess of Cornwall has 'found her style' in recent years despite never 'trying to look glamorous', long-term couturier and hairstylist claim

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[Real deal](#), New york, 1 month ago

Stay away from the jab. Get yourself a shoebox full of d c zinc quercetin and horse you know what. Just be ready to treat early upon first symptoms. Follow a protocol from flccc mccullough or zelenko. No to the jab.

Click to rate 236 21

[Trepolpen](#), Cave, Pitcairn, 1 month ago

Not a big surprise to those of us who did some serious research and recognized that there was something seriously wrong going on.

Click to rate 267 12

[EmployeeOffice](#), Sea, United States, 1 month ago

Is this why the Moderna vaccine is more effective then Pfizer

Click to rate 90 23

[Biggly](#), Kuching, 1 month ago

No, all the vaccines produce the same spike, with this extremely unusual and very long sequence, which for some reason this article downplays. This is like guessing the 19 digit combination of a lock. It's incredibly rare anywhere in nature, utterly unknown in any virus - but just happens to be in the unusual part of the virus, which just happens to be the same part of the virus the vaccines make? And note the real, original use, was to create cancer to study cancer treatments.

Click to rate 98 2

[News4menow](#), Salt Lake City, United States, 1 month ago

I have a bridge to sell you. And it just so happened that it naturally occurred a block and a 1/2 away from a biotech level 4 covered lab... You need to check your level of sheep DNA...

Click to rate 120 8

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