CITY OF Vancouver WASHINGTON

City Council Meeting Minutes

Vancouver City Hall | Council Chambers | 415 W. 6th St.
PO Box 1995 | Vancouver, WA 98668-1995
cityofvancouver.us

April 14, 2025

Council Dinner / Executive Session Re: Real Estate Negotiations and Potential Litigation (5:30 - 6:30 PM)

Mayor McEnerny-Ogle announced the Council would be entering into executive session from 5:30-6:00 p.m. to discuss Real Estate Negotiations and Potential Litigation.

Councilmember Hansen joined the Executive Session remotely.

Regular Council Meeting

6:30 PM
Vancouver City Hall - Council Chambers - 415 W 6th Street, Vancouver WA

This meeting was conducted as a hybrid meeting with in person and remote viewing and participation over video conference utilizing a GoToMeeting platform. Members of the public were invited to view the meeting in person, via the live broadcast on www.cvtv.org and CVTV cable channels 23 or HD 323, or on the City's Facebook page, www.facebook.com/VancouverUS. Public access and testimony on Consent Agenda items and under the Community Forum were also facilitated in person and via the GoToMeeting conference call.

Vancouver City Council meeting minutes are a record of the action taken by Council. To view the CVTV video recording, including presentations, testimony and discussion, for this meeting please visit:
https://www.cvtv.org/vid_link/37317?startStreamAt=0&stopStreamAt=4655

Electronic audio recording of City Council meetings are kept on file in the office of the City Clerk for a period of six years.

Pledge of Allegiance

Call to Order and Roll Call

The regular meeting of the Vancouver City Council was called to order at 6:30 p.m. by Mayor McEnerny-Ogle. This meeting was conducted as a hybrid meeting, including

both in person and remotely over video conference.

Present: *Councilmember Harless, Councilmember Perez, Councilmember Fox, Councilmember Stober, Councilmember Hansen, Mayor McEnerny-Ogle*

Absent: *Councilmember Paulsen*

Motion by Councilmember Stober, seconded by Councilmember Fox, and Yes: 0, No: 0, Abstaining: 0, to excuse Councilmember Paulsen from the Council meeting. Absent from vote: Councilmember Paulsen.

Councilmember Hansen joined the meeting remotely.

Approval of Minutes

Minutes - April 7, 2025

Councilmember Fox asked to amend the minutes to include Councilmember Harless exiting the April 7, 2025, Council meeting before Items 8 and 9 were discussed by Council.

Motion by Councilmember Stober, seconded by Councilmember Perez, and Yes: 6, No: 0, Abstaining: 0, to approve the April 7, 2025, minutes as amended. Absent from vote: Councilmember Paulsen.

Proclamations

Autism Awareness Month

Mayor McEnerny-Ogle read and presented a proclamation to Karen Krejcha, Executive Director, Autism Empowerment, and Sumi Dyment, Lead for Autism Serves, Helping Hands, proclaiming April 2025, as Autism Awareness Month.

National Volunteer Week

Mayor McEnerny-Ogle read and presented a proclamation to Sherry Braga, Volunteer Coordinator Fort Vancouver Regional Library, proclaiming April 21-26, 2025, as National Volunteer Week.

Community Communication

This is the place on the agenda where the public is invited to speak to Council regarding any matter on the Agenda not already scheduled for Public Hearing. (Separate instructions are provided for offering testimony on Public Hearing when applicable.) This includes the option to testify about Workshops. Members of the public addressing Council are requested to give their name and city of residence for the audio

record. Speakers are to limit their testimony to a total of three minutes for all items combined.

Mayor McEnerny-Ogle opened Community Communication and received testimony from the following community members regarding any matter on the agenda not scheduled for a Public Hearing:

- *Carmen DeLeon, Vancouver*

There being no further testimony, Mayor McEnerny-Ogle closed Community Communication.

Consent Agenda
The following items will be passed by a single motion to approve all listed actions and resolutions. There will be no discussion on these items unless requested by Council. If discussion is requested, the item will be moved from the Consent Agenda and considered separately – after the motion has been made and passed to approve the remaining items.

Council pulled items 1, 2, 7, 9, 11 and 13 for discussion.

Councilmember Harless recused herself from Item 11.

Motion by Councilmember Perez, seconded by Councilmember Fox, and Yes: 6, No: 0, Abstaining: 0, to approve Items 1-10 and 12-14 on the Consent agenda. Absent from vote: Councilmember Paulsen.

Motion by Councilmember Fox, seconded by Councilmember Stober, and Yes: 5, No: 0, Abstaining: 1, to Approve Item 11 on the Consent agenda. Absent from vote: Councilmember Paulsen. Councilmember Harless recused herself and abstained from the vote.

1. Construction Acceptance - Water Station 5 Reservoirs and Booster Station - ITB 21-28

Staff Report: 067-25

Request: On Monday, April 14, 2025, accept the facilities as constructed by Rotschy, Incorporated, (Rotschy) of Vancouver, Washington, and authorize release of the contractor's bond, subject to receipt of all documentation required by law.

Patrick Craney, Water Resource Engineer,
patrick.craney@cityofvancouver.us

Motion approved the request.

2. Construction Acceptance - 2024 Joint Agency Road Preservation Project - ITB 24-23

Staff Report: 068-25

Request: On Monday, April 14, 2025, accept the 2024 Joint Agency Road Preservation Project as constructed by One Way Trigger of Sacramento, California at the amended contract amount of $1,027,540.85, and authorize release of bond, subject to receipt of all documentation required by law.

Charles Fell, Senior Civil Engineer, charles.fell@cityofvancouver.us

Motion approved the request.

3. Construction Acceptance - 2024 East Curb Ramps Project - ITB 24-19

Staff Report: 069-25

Request: On Monday, April 14, 2025, accept the 2024 East Curb Ramps project as constructed by Advanced Excavating Specialists LLC of Kelso, Washington, and authorize release of bond, subject to receipt of all documentation required by law.

Charles Fell, Senior Civil Engineer, charles.fell@cityofvancouver.us

Motion approved the request.

4. Construction Acceptance and Release of Retainage - 2024 Crack Sealing and Mastic Repair Project - ITB 24-26

Staff Report: 070-25

Request: On Monday, April 14, 2025, accept the 2024 Crack Sealing and Mastic Repair Project as constructed by BCV Inc. of Wenatchee, Washington, and authorize release of the retainage in the amount of $19,219.63, subject to receipt of all documentation required by law.

Charles Fell, Senior Civil Engineer, charles.fell@cityofvancouver.us

Motion approved the request.

5. Construction Acceptance and Release of Retainage - 2024 Joint Agency Slurry Seal Project - ITB 24-22

Staff Report: 071-25

Request: On Monday, April 14, 2025, accept the 2024 Joint Agency Slurry Seal Project as constructed by Blackline Inc., of Vancouver, Washington, and authorize release of retainage in the amount of $18,925.05, subject to receipt of all documentation required by law.

Charles Fell, Senior Civil Engineer, charles.fell@cityofvancouver.us

Motion approved the request.

6. Bid Award - Marine Park Wastewater Treatment Facility Influent Pumps 2 and 5 Replacement - ITB 25-09

Staff Report: 072-25

Request: On Monday, April 14, 2025, authorize the City Manager, or designee, to award and execute a construction contract and any required amendments with Western United Civil Group., of Yacolt, WA for Marine Park Wastewater Treatment Facility Influent Pumps 2 and 5 Replacement at the Marine Park Wastewater Treatment Facility at their bid price of $853,295, which includes Washington State sales tax.

Frank Dick, Wastewater Treatment Program Manager, frank.dick@cityofvancouver.us

Motion approved the request.

7. Bid Award - Fruit Valley Park Playground Replacement - ITB #25-15

Staff Report: 073-25

Request: On Monday, April 14, 2025, award a contract and authorize the City Manager, or designee, to execute the same to Allcon LLC, of Brush Prairie, Washington for construction of the Fruit Valley Park playground replacement project for the bid amount of $734,815.26 including Washington State sales tax.

Terry Snyder, Park Development Manager, Terry.Snyder@cityofvancouver.us

Motion approved the request.

8. Contract - Increase the Purchasing Threshold on the Contract with Peterson Machinery - C-101549

Staff Report: 074-25

Request: On Monday, April 14, 2025, approve the Pederson Machinery agreement amendment to increase the contract threshold to $426,991 for the purchase of a Caterpillar mini excavator and authorize the City Manager, or designee, to execute the contract amendment.

Jacob Mahan, Senior Management Analyst, jacob.mahan@cityofvancouver.us

Motion approved the request.

9. Agreement Amendment - Approval of the Kuni Foundation to Fund an Accessible Playground at Fruit Valley Park

Staff Report: 075-25

Request: On Monday, April 14, 2025, authorize the City Manager, or designee, to approve the Kuni Foundation agreement amendment to increase the amount to $1,200,000 for the development of the Elizabeth Austin Playground at Fruit Valley Park.

David Perlick, Director of Parks, Recreation and Cultural Services, Terry Snyder, Park Development Manager, david.perlick@cityofvancouver.us, Terry.Snyder@cityofvancouver.us

Motion approved the request.

10. Lease Agreement between City of Vancouver and KPFF, Inc

Staff Report: 076-25

Request: On Monday, April 14, 2025, ratify the attached Lease Agreement between City of Vancouver and KPFF, Inc. for office space located at 415 W. 6th Street, Suite 605 and authorize the City Manager, or designee, to execute associated document(s).

Linda Carlson, Property Management Specialist, linda.carlson@cityofvancouver.us

Motion approved the request.

11. Waterfront Gateway Affordable Parcel Purchase and Sale Agreement

Staff Report: 060-25

Request: On Monday, April 7, 2025, approve the City's conveyance of the Parcel pursuant to the Waterfront Gateway Land Disposition and Development Agreement ("Development Agreement") and through the Purchase and Sale Agreement ("PSA"). Authorize the City Manager, or designee, to

issue and execute the PSA in substantially the form attached and execute all other documents and related agreements necessary to implement the PSA.

Chim Chune Ko, Principal Project Manager, ChimChune.Ko@cityofvancouver.us

Motion approved the request.

12. Interlocal Agreement - City of Vancouver and Clark County Corrections

Staff Report: 077-25

Request: On Monday, April 14, 2025, authorize the City Manager, or designee, to finalize and execute an Interlocal Agreement with Clark County Correction Services for offender restitution crew labor/maintenance services.

Michael Cero, Operations Superintendent, michael.cero@cityofvancouver.us

Motion approved the request.

13. Grant to Provide Training Services through the Million Coaches Challenge Grant Program

Staff Report: 078-25

Request: On Monday, April 14, 2025, approve a grant for $1,750 plus in-kind training services from the National Recreation and Park Association (NRPA) Million Coaches Challenge Grant program.

David Perlick, Director of Parks, Recreation and Cultural Services, david.perlick@cityofvancouver.us

Motion approved the request.

14. Approval of Claim Vouchers

Request: Approve claim vouchers for April 14, 2025.

Motion approved claim vouchers in the amount of $3,733,038.58.

Public Hearings

The following item(s) are scheduled for public hearing. Members of the public addressing Council are requested to give their name and city of residence for the audio record. Unless otherwise announced by the Presiding Officer, speakers are to limit their testimony to three minutes for each public hearing.

15. Section 30 Development Code Changes

AN ORDINANCE amending chapter 20.690 Vancouver Municipal Code (VMC) to expand the land use development choices for Section 30 property owners that entered into pre-annexation development agreements (PADAs) with Clark County, which are now binding on the City of Vancouver (City); to provide clarity to other existing provisions; to provide for severability; and setting an effective date.

Staff Report: 066-25

Request: On Monday, April 14, 2025, upon second reading and a public hearing, approve the ordinance amending VMC 20.690 entitled "Section 30 Employment Center Plan District".

Chad Eiken, Community Development Director, Chim Chune Ko, Principal Project Manager, chad.eiken@cityofvancouver.us, ChimChune.Ko@cityofvancouver.us

Chad Eiken, Community Development Director, Chim Chune Ko, Principal Project Manager, provided an overview of the Section 30 Development Code Changes.

Council discussed the item briefly with staff.

Mayor McEnerny-Ogle opened the public hearing and received testimony from the following community members:

- *Kimberlee Goheen Elbon, La Center, WA*

There being no further testimony, Mayor McEnerny-Ogle closed the public hearing.

Motion by Councilmember Fox, seconded by Councilmember Perez, and Yes: 6, No: 0, Abstaining: 0, to approve Ordinance M- 4499. Absent from vote: Councilmember Paulsen.

Communications

A. From the Council

B. From the Mayor

C. From the City Manager

Adjournment

7:28 p.m.

DocuSigned by:
Anne McEnerny-Ogle
6C89D9089EC5424...

Anne McEnerny-Ogle, Mayor

Attest:

DocuSigned by:
Natasha Ramras
493E940414AE4BD...

Natasha Ramras, City Clerk

The written comments below are those of the submitter alone and are not representative of the views of CVTV or the City of Vancouver, its elected or appointed officials, or its employees.

From: Dollar, Sarah
To: Dollar, Sarah
Subject: FW: BREAKING: EPA and CDC Initiate Federal Action on Fluoridation
Date: Tuesday, April 8, 2025 12:18:08 PM

Testimony

Sarah Dollar | Executive Assistant to the City Council
Pronouns: She/Her/Hers
CITY OF VANCOUVER, WASHINGTON
City Manager's Office (CMO)
Primary (Cell): 360-624-2949 | **Desk:** 360-487-8641
www.cityofvancouver.us

From: Wynn Grcich <[redacted]>
Sent: Tuesday, April 8, 2025 11:54 AM
To: City Council <council@cityofvancouver.us>; Rebecca Messinger <[redacted]>
Subject: Fwd: BREAKING: EPA and CDC Initiate Federal Action on Fluoridation

Put on public record. Send to council members and Melnick. Confirm that you did

Thanks from Wynn

---------- Forwarded message ---------
From: **Wynn Grcich** <[redacted]>
Date: Tue, Apr 8, 2025, 11:53 AM
Subject: Fwd: BREAKING: EPA and CDC Initiate Federal Action on Fluoridation
To: [redacted]>

---------- Forwarded message ---------
From: **Fluoride Action Network** <[redacted]>
Date: Tue, Apr 8, 2025, 9:13 AM

Subject: BREAKING: EPA and CDC Initiate Federal Action on Fluoridation
To: [redacted]>

BREAKING:
EPA and CDC Initiate Federal Action on Fluoridation

Dear Wynn :

As the practice of water fluoridation currently faces unprecedented opposition and rejection at both the local and state levels following our recent victory in federal court and the publication of the National Toxicology Program's review of fluoride neurotoxicity, federal officials have now dealt it another major blow.

Last night, at a joint press conference held in Salt Lake City at the University of Utah, U.S. Health Secretary Robert F. Kennedy, Jr. and U.S. Environmental Protection Agency (EPA) Administrator Lee Zeldin highlighted their concerns about fluoridation and announced initial actions their respective agencies will take to address known and potential side-effects of the practice.

During his presentation, the HHS Secretary condemned fluoridation and called on state legislators to pass laws banning it, reflecting a major positive change within HHS leadership on this issue. He went on to say:

> "In the era of fluoridated toothpaste and mouthwash, it makes no sense to have fluoride in our water. The evidence against fluoride is overwhelming. In animal models and in human models we know that it causes IQ loss. Profound IQ loss. And it's dose-related. So the more fluoride you get, the higher the levels in your drinking water and your urine, the more likely it is you'll lose IQ, and also other neurological injuries like ADHD. Science indicates that it affects kidney health, it affects liver health, it causes hypothyroidism, and it causes osteoarthritis. Women who are more exposed have up to 50% more hip fractures than women who are unexposed. It causes fluorosis in between 40-80% of our kids. It makes no sense to have it in our water supply."

Secretary Kennedy officially announced that he will direct the Centers for Disease Control and Prevention (CDC) to take two immediate steps: 1) stop recommending fluoridation in communities nationwide, and 2) convene a community preventative services task force made up of independent health experts to study fluoridation and make new recommendations, which should include a new "optimal" level.

The current "optimal" level of 0.7 ppm is neither a law nor a regulation but only a recommendation that most states and municipalities choose to follow. Moreover, the CDC's prior endorsement of fluoridation and their recommendations have historically had a major influence on state and local decision makers during debates on whether to continue or ban the practice, so a change to CDC policy will have a significant and widespread effect as more elected officials can point to updated guidance to support the case for ending it.

As evidence of how seriously the new administration is taking the issue, they have already initiated action to stop the CDC's promotion of fluoridation. This past week, the CDC's Division of Oral Health, the main promoter of water fluoridation in the U.S. government, was completely dissolved. This was the CDC department that named fluoridation as "one of the top 10 public health achievements of the 21st Century." The Chief Dental Officer role was also eliminated, and 17% of staff were laid off at the National Institute of Dental and Craniofacial Research (NIDCR), another main promoter of water fluoridation.

After the HHS Secretary made his announcements, EPA Administrator Lee Zeldin spoke, sharing that Kennedy met with him as soon as he was confirmed, and the first priority they discussed was protecting the public from water fluoridation. He pointed out that the Safe Drinking Water Act (SDWA) requires the EPA to review each national primary drinking water regulation at least once every six years and revise them, if appropriate. This is the process that EPA uses to develop maximum contaminant levels (MCLs) and maximum contaminant level goals (MCLGs), which limit the levels of potentially harmful contaminants--such as fluoride--that water treatment operators can have in public water supplies. The current MCL for fluoride is 4.0 ppm and the MCLG is 2.0 ppm. While the EPA did publish a poorly conducted review of fluoride in July of 2024 that made no changes, it did include a note that regulations ought to be reassessed again once the federal court made a ruling and the NTP published their review, two events that have since occurred.

Zeldin announced that the EPA will use this process to "expeditiously review new scientific information on potential health risks of fluoride in drinking water," adding that "When this is completed, we will have an updated foundational scientific evaluation that will inform the agency's future steps," which will likely include a new MCL and MCLG.

Read EPA 's Press Release

Watch the full press conference below:

The Federal Lawsuit

An official response by the EPA to the federal court ruling was not provided during the press conference. The EPA under the previous administration filed a notice of intent to appeal but have yet to file an actual appeal or a brief justifying their position. The EPA has until this Friday (April 11th) to either file their appeal or file for an extension. Inaction will let the ruling stand and require the EPA to initiate the TSCA rulemaking process to eliminate the health hazard posed to children by fluoridation. It's important to note that even if the EPA does follow through with an appeal later this week, it can still be rescinded at any point by EPA officials.

It's our belief, based on our experience with the EPA, that while the ruling is bullet-proof and can stand up to appeal, the EPA has had a long-standing history of delaying any action on the issue of adequately regulating fluoridation, and their letter of intent to appeal is just an unscientific continuation of that policy. We've called on Zeldin and the new EPA administrators to let the ruling stand without appeal.

I also want to note that while the ruling gives the EPA the ability and justification to promulgate rules banning the use of fluoridation chemicals in public water supplies under the Toxic Substances Control Act (TSCA) and could justify Zeldin lowering the MCL unilaterally, the EPA's announced approach of using the SDWA to reassess fluoridation doesn't conflict with the court ruling. Instead, it offers a second avenue to potentially achieve the same result concurrently.

Stay tuned! We'll provide an update on the TSCA ruling once the Friday deadline arrives.

Why Didn't They Just Ban Fluoridation?

Just days before the election in November, Kennedy posted a message on Twitter stating that "on January 20, the Trump White House will advise all U.S. water systems to remove fluoride from public water." In that Tweet, he tagged FAN attorney Michael Connett and shared a link to Connett's interview with Jefferey Jaxen. This post was seen by at least 24 million people, and President Trump later confirmed to reporters that he would support such an advisory. However, this was misreported by media outlets that Kennedy and Trump would unilaterally ban fluoridation on day one, a promise they never made and a policy that FAN wouldn't support since executive orders carry little scientific weight or long-term influence and can so easily be overturned by future administrations. We've already won the fluoridation debate overwhelmingly with the science, so there's no benefit to politicizing the issue with federal mandates or dictates.

FAN tried to correct the media misstatements in many interviews, and our representatives reached out to the new administration, suggesting ways in which the federal government could move forward with a science-based approach that would produce a more permanent solution. This included, 1. EPA promulgating rules under TSCA based on our lawsuit victory, 2. ending the CDC's promotion of fluoridation, 3. HHS ending fluoridation grants and funding, 4. EPA using the 6-year review process to reassess the MCL for fluoridation, and 5. CDC changing their fluoridation recommendations and providing new advice to communities based on modern research rather than politics.

At this point, I want to note that FAN has always been and will continue to remain a non-partisan organization. We've also always been a single-issue organization. We don't take a position on any other issue or ideology; our goal is to end water fluoridation. That was our promise 25 years ago when FAN was founded, and that remains our promise today. We've also promised to do so grounded in science, bringing only the strongest, most credible research to the forefront of any discussion on fluoridation. We've worked to inform every presidential administration and their CDC/EPA/FDA administrators since FAN's inception, with now being no different.

For some years, RFK has been following FAN's work and has made it publicly known. He's shared our work in his social media posts, he's interviewed Michael Connett, and the nonprofit he founded, *Children's Health Defense*, has consistently reached out to FAN for information and quotes on fluoridation for their news coverage on the issue. He understands our issue, and we've worked with him just as we've worked with other environmental, civil rights, and community leaders such as Ralph Nader, Erin Brockovich, and Rev. Bernice King.

While January 20th passed without action from the Trump administration on fluoridation, now only two and a half months after that date:

1. The CDC is going to convene an independent task force to start the process that could and should lead to a new science-based advisory on fluoridation, as opposed to the current CDC advice based on politics and corrupted by dental-lobby influence.

2. The CDC is no longer going to promote fluoridation or recommend that communities practice it, and the CDC's primary lobbyists for fluoridation, the Oral Health Division and the NIDCR Chief Dental Director are now gone.

3. The EPA is going to use the 6-year review process under the SDWA to reassess the MCL/MCLG for fluoride.

4. The Secretary of HHS has called on state legislators and local decision makers to pass laws proh biting fluoridation.

So while I know supporters are eager to see a quick end to fluoridation, we're clearly seeing immediate action that keeps our movement on track to produce lasting change based on the most cred ble science and following the accepted federal processes to do so.

Does This Mean The Battle Is Over?

In short, no. If the EPA chooses to move forward with an appeal, we'll have to defend the ruling in court. If the EPA chooses instead to promulgate rules based on the ruling, FAN will need to provide public comment and serve as a watchdog throughout the process. As the EPA moves forward with the reassessment process, FAN will have to provide public comment and submit credible research for consideration. As the CDC convenes their task force, FAN will have to provide information and guidance to the committee. FAN will have to continue our work to ensure that hundreds of millions in taxpayer dollars is no longer spent by HHS on fluoridation infrastructure and pro-fluoridation public relations campaigns. And if HHS sends out an advisory to communities setting the "optimal" level at or near 0.0 ppm, we'll have to continue our work organizing and assisting campaigns at the state and local level to ban the practice. FAN will also continue to communicate with the new FDA/HHS/EPA administrators additional ways to adequately regulate fluoride to ensure that U.S. citizens are protected from overexposure.

So let us all take a moment to celebrate these major victories and pat ourselves on the back for the significant and meaningful progress we've all made together over the past 25 years. Then, it's time to prepare to work harder than ever to follow through on our promise to create a world safe from fluoride. We're almost there!

Sincerely,

Stuart Cooper
Executive Director
Fluoride Action Network

CLICK HERE to Support Our Work With A Tax Deductible Donation

Fluoride Action Network
North Sutton, New Hampshire
info@fluoridealert.org

Wynn Grcich - 4/14
Vancouver, WA

New American Jan 16, 2023

ORIGINS OF GREEN RELIGION

World-government shills plan to replace traditional religions with a new global eco-ethic, co-opting trusted world leaders to promote their depopulationist agenda.

AP Images

Globalist launchpad: UN Secretary-General Boutros Boutros-Ghali and conference organizers open the Earth Summit in Rio de Janeiro on June 3, 1992. Leaders from 178 countries and representatives of more than 1,000 nongovernmental organizations attended.

by William F. Jasper

The United Nations' 27th Conference of Parties (COP27), which took place November 6-20 in Sharm El Sheikh, Egypt, has been yet another predictable exhibition of political, corporate, and bureaucratic elites pushing global-warming hysteria, population control, global wealth redistribution, and world government. Also predictable was the globalists' hijacking of the world's religions to promote pagan eco-theology and the dystopian future envisioned in the Great Reset of the Davos billionaires club known as the World Economic Forum (WEF). This was all so predictable because we have seen it so many times before, and *The New American* has reported on it repeatedly and extensively over the past three decades.

On site at the recent COP27 summit in Egypt (November 14-18), *The New American's* Alex Newman reported on the ongoing globalist push to harness the moral authority of religious leaders to promote the radical UN agenda under the guise of "climate justice" and "climate reparations" and of saving the planet from the non-existent emergency of so-called man-made climate change (formerly known as global warming, until the warming alarmists found they were losing public trust with their exaggerated and false claims).

(To see videos of our live, on-site COP27 reporting from Sharm El Sheikh, go to https://thenewamerican.com/world-news/un/climate-conference/.)

Eyewitness to Earth Summit Lunacy

This writer was an eyewitness reporter in Rio de Janeiro for the 1992 UN Conference on Environment and Development (UNCED) — better known as the UN Earth Summit — from which the clamorous, clangorous climate-change cabal emerged. From start to finish, the Rio Earth Summit was suffused in pagan-pantheist-New Age "spirituality," and enshrined a new dogma of the "Sacred Earth" and "Divine Nature." I described this in detail in my reports from Rio and in my 1992 book *Global Tyranny...Step by Step: The United Nations and the Emerging New World Order*.

The following excerpt is one small example taken from that book, in the chapter titled "The New World Religion":

> In his opening address to the UNCED plenary session, Earth Summit Secretary-General Maurice Strong directed the world's attention to the Declaration of the Sacred Earth Gathering, which was part of the pre-Summit ceremonies. "[T]he changes in behavior and direction called for here," said Strong, "must be rooted in our deepest spiritual, moral and ethical values."
>
> According to the declaration, the ecological crisis, "transcends all national, religious, cultural, social, political, and economic boundaries.... The responsibility of each human being today is to choose between

William F. Jasper is a senior editor of The New American.

the force of darkness and the force of light. We must therefore transform our attitudes and values and adopt a renewed respect for the superior law of Divine Nature."

I noted further:

> On the eve of the opening of UNCED, a midnight-to-dawn homage to the "Female Planet" was held on Leme Beach. After dancing all night, the worshippers followed a Brazilian tribal high priestess to the water's edge where they offered flowers and fruits to "Iemanje, mae orixa, mother of the powers, queen of the seas," and then invoked the blessings of the sea goddess upon the summit's deliberations. At the first plenary session, Uri Marinov, Israel's Minister of the Environment, issued a New Ten Commandments on Environment and Development....
>
> The Union for Natural Environment Protection, an environmental group based in São Leopoldo, Brazil, declared the following about the work of the summit: "A world-wide citizens' movement is born around the UN system and will be in the years ahead a central focal point for the New World Order which Alice Bailey wrote about many decades ago and which is going to be politically free, socially fair, economically efficient and environmentally sustainable."

The Alice Bailey referred to above by the UN acolytes is the infamous Luciferian occultist-theosophist, publisher of *Lucifer* magazine, and an avid proponent of the United Nations. Her pagan-New Age vision for a New World Order aligned closely with the apparent designs of the globalist elites, as demonstrated by the UN Earth Charter and Ark of Hope; the 2017 World Government Summit in the United Arab Emirates (with UN, WEF, and CFR elites meeting under the Arch of Ba'al, the demonic ancient Phoenician-Carthaginian god that demanded child sacrifice); the bizarre and diabolical ceremony of European Union elites for the grand opening of Switzerland's Gotthard Base Tunnel; the opening of the 2010 UN climate summit in Cancun with Christiana Figueres, who was then the UN climate boss, offering a prayer to Ixchel, the Mayan goddess associated with war, human sacrifice, and cannibalism; and the World Economic Forum's launch of its Young Global Leaders Druid Collective.

And those are but a few examples of the many that could be offered to illustrate this disturbing trend amongst the occult oligarchy that seeks to "transform" the world spiritually in a direction that leads to the infernal abyss.

Earth Charter: Gorbachev's Holy Writ

Ten years after the 1992 Earth Summit, the UN reprised its Rio extravaganza at the 2002 World Summit on Sustainable Development (WSSD, also known as Earth Summit II or Rio+10) in Johannesburg, South Africa, unveiling the Earth Charter, the new "global ethic" crafted by Mikhail Gorbachev and Maurice Strong, assisted by a "Commission of Eminent Persons." Among the 23 "eminent" commissioners aiding this subversive endeavor were Leonardo Boff, a leading voice of Marxist liberation theology; Steven Rockefeller, a radical environmentalist, New Age philosopher, and scion of the uber-wealthy Rockefeller clan; Shridath Ramphal of the Commission on Global Governance; Federico Mayor Zaragoza, member of the Club of Rome, former director-general of UNESCO, and a co-chair of Mikhail Gorbachev's State of the World Forum.

Reporting on the Johannesburg summit we noted in a 2002 article titled "The New World Religion":

> According to the Charter, humanity must undergo a global "change of mind and heart." And the UN's all-wise seers visualize themselves as the lead change agents for this global undertaking. The Earth Charter Initiative, however, candidly admits that it intends to recruit your children as change agents, as well. "We seek to increase the participation of young people in utilizing the Earth Charter as a guideline in their work as active agents of change," says the Earth Charter Initiative website. They have been doing precisely that, and will be accelerating their program throughout the world — including in school in your neighborhood. The U.S. Conference of Mayors is but one of hundreds of organizations, schools, municipalities, and other entities that have signed on as supporters of

AP Images

The would-be gods: Billionaire Maurice Strong and Mikhail Gorbachev at the 1997 UN Rio-Plus-Five Conference in Rio de Janeiro. Along with Steven Rockefeller, they drafted the UN Earth Charter.

declaration of a new "global ethic" for the world.

"My hope is that this charter will be a kind of Ten Commandments, a 'Sermon on the Mount,' that provides a guide for human behavior toward the environment in the next century and beyond," said co-author of the document Mikhail Gorbachev. Interesting, is it not, that the globalist hierarchy would entrust to the late Comrade Gorbachev, a self-professed atheist-materialist-communist, the task of playing God and coming up with a new Decalogue to replace the one written in stone by the finger of (the real) God and the Eight Beatitudes by our Lord Jesus Christ? Popular media-driven perceptions to the contrary, Gorbachev never gave up his atheist-materialist-communist beliefs. After all, the bloody-handed former dictator unequivocally stated, "I am a Communist, a convinced Communist! For some that may be a fantasy. But for me it is my main goal." Furthermore, he explained his materialist/pantheist "theology" in these terms: "I believe in the cosmos. All of us are linked to the cosmos. So, nature is my god." He restated this "Nature is my god/Cosmos is my god" personal creed in various interviews and public statements, and it is proudly posted on the website of Green Cross International, which he founded.

Gorbachev's main Earth Charter co-author Maurice Strong was more emphatic than Gorbachev, stating, "The real goal of the Earth Charter is that it will in fact become like the Ten Commandments." Like Gorbachev, Strong suffered no lack of hubris when it came to assuming divine wisdom to correct the supposed deficiencies in the biblical pronouncements of the Almighty. Like Klaus Schwab, Prince/King Charles, Bill Gates, George Soros, Mark Zuckerberg, and the rest of the megalomaniacal, luxury-loving plutocrats of the World Economic Forum, the late Maurice Strong was an unconvincing "environmentalist." Although he railed against carbon footprints, air conditioning, fossil fuels, meat consumption, and private automobiles, the Canadian billionaire owned multiple estates (including the massive Baca Grande Ranch in Colorado sitting atop an enormous aquifer) and lived the typical Davos jet-setting lifestyle. He owed much of his fortune to boosts from David Rockefeller and Edmund de Rothschild. And, like Rockefeller, Rothschild, Soros, Gates, and so many other "capitalists," he was cozy with the totalitarian communist regime in Beijing. (Note: His cousin, communist propagandist Anna Louise Strong, befriended Bolshevik leaders Lenin and Trotsky and was an important mouthpiece for Mao Tse-tung and Zhou En-lai in China.) Maurice Strong spent much of his time during the last years of his life (he died in 2015) at his luxury residence in Communist China, where he wrangled business deals and hobnobbed with Chinese Communist Party princelings and panjandrums.

AP Images

Gaia, of thee we sing: Children indoctrinated in eco-babble are used as propaganda props at most UN confabs, including the 2002 World Summit on Sustainable Development in Johannesburg, with youngsters shown here singing beneath Mother Earth.

Although Strong went to his eternal reward seven years ago, Gorbachev shuffled off this mortal coil only this past August. It is not likely that the huzzahs and eulogies of "the great and the good" here on this earthly realm impressed the Divine Judge when they stood before Him. It likely did not go well for them. The Lord God is a jealous God (Exodus 20:5) and is not one to brook impostors peddling a syncretic pseudo-gospel as a spiritual cover for their own political empowerment.

The globalist "transformation," as put forth in the Great Reset — resetting all humanity economically, politically, biologically, socially, morally, and spiritually — requires buy-in from a whole lot of people. This is why the would-be world rulers have expended so much capital and energy on creating, seducing, bribing, bullying, and extorting thought leaders and influencers to promote their subversive globalist schemes.

Using Churches to Spread the Gospel of Marx

Since the vast majority (roughly 85 percent, according to the Pew Research Center) of Earth's inhabitants identify as religious, a crucial part of the globalist cabal's strategy involves co-opting trusted religious leaders to promote their agenda. Thus the aggressive recruitment of "mainstream" Christian, Jewish, Muslim, Hindu, and Buddhist leaders over the past several decades. The National Council of Churches (NCC) and World Council of Churches (WCC) have long been the leading forces in promoting globalist and communist objectives among Protestant member churches. Prominent communist churchmen such as "social gospel" populizer Reverend Harry F. Ward (identified as a Soviet agent by former top communists Manning Johnson, Leonard Patterson, Zach Ko-

Since the vast majority (roughly 85 percent, according to the Pew Research Center) of Earth's inhabitants identify as religious, a crucial part of the globalist cabal's strategy involves co-opting trusted religious leaders to promote their agenda.

mfeder, and Benjamin Gitlow) played key roles in leading NCC/WCC churches down the Marxist path. The revelations of Soviet KGB archivist Vasili Mitrokhin in 1999 (*The Sword and the Shield: The Mitrokhin Archive and the Secret History of the KGB*) confirmed the long-held and well-founded suspicions of knowledgeable WCC observers that Metropolitan Nikodim Rotov of the Russian Orthodox Church, a WCC president, was a KGB agent assigned to subvert Christian churches and lead them in support of socialist and environmentalist causes. Mitrokhin also identified at least four additional high-level WCC officials as KGB agents. Bulgarian historian Momchil Metodiev added to this in 2010 with his meticulously researched book (*Between Faith and Compromise*), which utilized the archives of the communist Bulgarian intelligence (junior partners of the Soviet KGB). Among the important disclosures by Metodiev is the confirmation that Bulgarian WCC official Todor Sabev was a longtime communist agent. Sabev held high WCC posts for decades, including WCC deputy general secretary and special WCC representative to the Vatican for Orthodox-Catholic unity.

Members of the WCC include Eastern Orthodox, Pentecostal, Anglican, Methodist, Presbyterian, Lutheran, Mennonite, Moravian, and Baptist World Alliance churches. At COP27, the WCC held a special "side event" with its partners (ACT Alliance, All Africa Conference of Churches, Brahma Kumaris World Spiritual University, Bread for the World, and Lutheran World Federation) to double down on its calls for "climate justice" and funding for "adaptation" and "loss and damages" (euphemisms for "climate reparations," i.e., wealth redistribution from U.S. and EU taxpayers to UN globocrats, international organizations, and Third World kleptocrats).

"COP 27 is a critical occasion for governments to together re-envision, develop, commit to and implement a roadmap towards a fossil fuel-free, post-growth, equitable and sustainable tomorrow, and to tackle the greatest existential challenge to life on the planet," the WCC said. The WCC executive committee also urged a "loss and damage financing facility to compensate communities and countries on the frontline of climate impacts and to support their efforts in building resi ience." Of course, true resiliency require affordable, reliable energy, something th renewables (solar and wind) have prove they won't deliver. The WCC oppos tion to coal, oil, natural gas, hydro, an nuclear energy guarantee poverty, priva tion, hunger — and even starvation — fc the world's poor they claim to be helpin

Like the WCC, the National Council c Churches tilts reliably to the left and e> pends a great deal of its influence preachin *against* "the Christian Right" and *for* "re productive rights" (i.e., abortion), LGBT rights, "inter-religious dialogue," radica environmentalism, and other liberal-le hobby horses. Besides working hand i hand with communist organizations an front groups, the NCC is funded not s much by its church congregations as by th usual leftist-globalist tax-exempt founda tions: Rockefeller, Ford, Tides, Kellog Knight, et al.

Wikipedia/Dutch National Archives

Red wolf in sheep's clothing: Soviet KGB agent Metropolitan Nikodim Rotov was made a top prelate of the Russian Orthodox Church with the assignment of subverting Christianity. He became a president of the World Council of Churches and a key Kremlin agent inside the Vatican.

Pope Francis Gives Blessing to UN-Globalist Agenda

The Roman Catholic Churc is by far the largest Christia church to remain outside th World Council of Churche However, in recent decades th Vatican has worked more closel with the WCC, as well as othe "ecumenical" organization promoting inter-religious unity Because the pope of the Roma Catholic Church speaks wit unique moral authority — inas much as he is the most widel recognized and respected spiri tual leader and speaks for th largest Christian denominatio — both the communists an the globalists have worked as siduously to infiltrate and sub vert the Catholic Church, fror the local parishes and diocesa seminaries all the way up to th highest levels of the Vatican. D Bella Dodd in the 1950s an Vasili Mitrokhin in the 1990s ar among the top ex-communist who have testified concernin the alarming Soviet penetratio of the Church.

Recent popes, going back t

the Second Vatican Council (1962-1965), have weakened the Church's stance against communism and socialism while showing ever-greater affinity for the communist-dominated United Nations and a general drift toward the globalist agenda. However, the pontificate of Pope Francis has amounted to nothing less than a wholesale revolution within the Catholic Church, openly embracing communist leaders and communist-socialist causes and causing enormous scandal and confusion with myriad heretical actions and statements that blatantly contradict Church doctrine and dogma.

Cardinal Gerhard Muller, former prefect of the Congregation for the Doctrine of the Faith, the Vatican's oldest department of the Roman Curia, has gone so far as to call Francis' ongoing Synod on Synodality "a hostile takeover of the Church of Jesus Christ" that is aimed at "the destruction of the Catholic Church." "And we must resist it like the old heretics of the Arianism," he said.

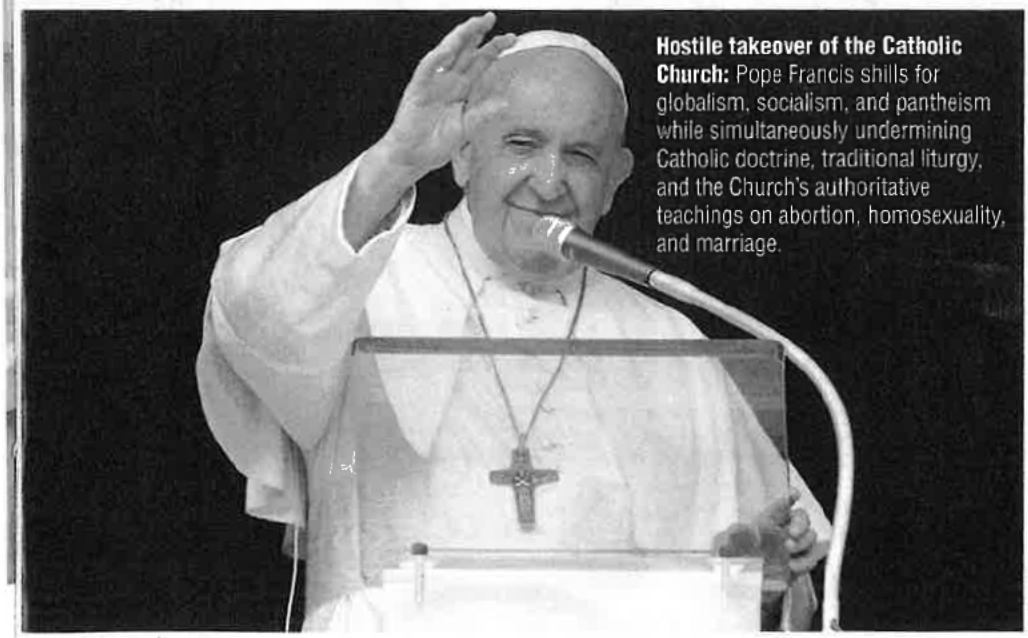
In addition to repeatedly undermining — by word and action — Church teaching on the sin of homosexual acts, Francis has undermined Church teaching on marriage; supported pro-abortion "Catholic" politicians (Joe Biden, Nancy Pelosi, Emmanuel Macron, and Justin Trudeau, to name a few); removed or demoted stalwart traditionalist and conservative prelates and replaced them with radical bishops and cardinals; suppressed the traditional Latin Mass while promoting pagan/pantheist worship; appointed notoriously pro-abortion, pro-euthanasia, and pro-LGBTQ non-Catholics (and even atheist anti-Catholics) to the Pontifical Academy for Life and the Pontifical Academy for Social Sciences; agreed to allow the Chinese Communist Party to appoint communist "bishops"; and refused to meet with or support the heroic, 90-year-old Cardinal Joseph Zen while he was persecuted by the CCP.

These and other unprecedented scandals too numerous to mention here have caused Catholic cardinals, bishops, priests, and prominent lay people to declare themselves in resistance to Pope Francis' auto-demolition of the Church. Among Pope Francis's many heterodox obsessions is his fanatical preoccupation with the supposed "existential crisis" of global warming. At the beginning of COP27, Vatican Secretary of State Cardinal Pietro Parolin delivered Pope Francis' message of support for the UN's 2015 Paris Agreement and the UN's Framework Convention on Climate Change. "Climate change will not wait for us," Cardinal Parolin said on behalf of the pontiff. "Our world is now far too interdependent and cannot permit itself to be structured into unsustainable isolated blocks of countries. This is a time for international and intergenerational solidarity." Secretary Parolin reminded the COP27 attendees and the world audience that in 2020 Pope Francis had made a commitment to net zero emissions before 2050. In that video message to the UN virtual Climate Ambition Summit marking the fifth anniversary of the Paris Agreement, he promised that the "Holy See is committed to promoting education in integral ecology."

The term "integral ecology," which appeared 10 times in the pope's 2015 encyclical *Laudato Si*, appears to mean lifelong indoctrination in radical environmentalism disguised as Christian theology. The title *Laudato Si* ("Praise to You") is an Italian phrase taken from St. Francis of Assisi's "Canticle of the Sun" praising God for his gifts of creation. Although defenders of *Laudato Si* point out that it is sprinkled with statements condemning abortion and defending core Catholic teachings, there is no question that its central message is aimed at dramatically shifting Catholic theology to the left and placing a papal imprimatur on radical green activism. This has been made perfectly clear with the pope's subsequent actions, statements, and appointments, including the launching of the Laudato Si Movement, an international network of hundreds of Catholic organizations mobilized to "care for our common home and achieve climate and ecological justice."

The leftward tilt of *Laudato Si* is not surprising considering the major input provided by atheists, pantheists, Marxists, and globalists such as UN factotum (and George Soros minion) Jeffrey Sachs, UN climate propagandist and climate computer-model worshipper Hans Joachim Schellnhuber, and Brazilian ex-priest and Liberation Theology zealot Leonardo Boff, to name but a few.

Most disturbing of *Laudato Si's* messages is its call for world government to deal with the "crises" of climate change, pollution, migration, poverty, wealth distribution, war, and other "global problems." In his claim that these crises and problems show "there is urgent need of a true world political authority," Pope Francis demonstrates that he is in step with the globalist-communist Great Reset of the World Economic Forum, by which Klaus Schwab, Bill Gates, George Soros, Xi Jinping, and other WEF oligarchs intend to play God and remake the world in their own image. ■



Hostile takeover of the Catholic Church: Pope Francis shills for globalism, socialism, and pantheism while simultaneously undermining Catholic doctrine, traditional liturgy, and the Church's authoritative teachings on abortion, homosexuality, and marriage.

AP Images

On top of all that, the masses are being lobotomized with mercury in flu shots (yes, there's still mercury in vaccines), aluminum in foods, and toxic TV programming that assaults the mind with fake news like "the Russians stole the election" or "carbon dioxide is bad for plants."

The capacity to remember is being "zapped" away, so that no one can remember what happened just a few months ago

Where individuals were once intelligent, self-reliant and had functioning memories and logical thinking, the masses are now stupid, entirely dependent and have no memories whatsoever. The average American can't even remember the news headlines from six months ago, which is why the corporate-controlled media can **flip the narrative every few months** and no one seems to notice. For example, remember when CNN and the Democrats all claimed that illegals crossing the border was a "fabricated crisis" invented by Trump? A few months later, they flipped the script and claimed it was a huge crisis and that "children are being held in concentration camps at the border." So which is it?

Remember when Barack Obama, in 2016, claimed it would be impossible for a foreign power to influence U.S. elections because our election process was so decentralized? He said that when everybody was sure Hillary Clinton would win. After she lost, the media flipped the script and now absurdly claimed the Russians somehow *altered votes in all 50 states* when there isn't a single shred of evidence to support such a bizarre notion. Had Hillary won, the media would have called any hint of "election meddling" a baseless conspiracy theory.

The mass dumbing down is deliberate... and dangerous. In fact, it's how globalists control populations. **Intelligent citizens are the enemy of authoritarian regimes**. The people can never be allowed to think for themselves, or they might realize that the government is largely a fraud that's run by pedophiles, murderers and crooks. (Read MindControl.news for more articles on this very point.)

Watch my 5-minute video report to hear the rest of this story. It's available exclusively on Brighteon.com, since YouTube, Facebook and Twitter have all banned any information that would encourage people to think for themselves:

Brighteon.com/6057415411001

Industrial accident leaks brine into bay

Spill along shoreline dumps 18,000 gallons near Newark Barge Canal

ASSOCIATED PRESS

NEWARK — For the third time in three years, an industrial salt evaporation company spilled thousands of gallons of toxic brine along the eastern shoreline of San Francisco Bay.

The latest spill — 18,000 gallons of brine — occurred Wednesday near the Newark Barge Canal close to Cargill Salt's facilities when workers opened a valve on the bottom of a rail car believed to be empty.

It wasn't immediately clear if any wildlife was harmed.

Water quality samples have been sent to a state lab.

"It was clearly an accident," said Cargill spokeswoman Lori Johnson. "It happened very quickly and we reported it very quickly to all of the authorities."

Cargill had similar accidents in 2002 and 2004. The incidents have raised concerns among environmentalists.

Cargill produces salt in evaporation ponds that's used to de-ice roads and for food and medical uses.

Argus June 5, 2005

e-mail: KWATI@SBCGLOBAL.net

Dr. Winn Parker Ph.D. (MT)
P.O. Box 864
Millbrae, California 94030

Thurs. April 5, 2005 Chronicle

SATURDAY, FEBRUARY 12, 2005

San Francisco Chronicle

OAKLAND

Source of leak into estuary found

Officials have found the source of a pipeline leak that spilled at least 500 gallons of jet fuel into the Oakland Estuary, authorities said Friday.

The breach was the result of a 50-inch-long scrape along a 12-inch-diameter pipe belonging to Kinder Morgan Energy Partners, said company spokesman Jerry Engelhardt.

Workers found the damaged section under Middle Harbor Road in the Port of Oakland about 2,000 feet from Berth 62, Engelhardt said.

The jet fuel leaked into the estuary on Feb. 4. The pipe was damaged from "previous excavation work performed by a third party," said Gene Braithwaite, Kinder Morgan's director of operations for the northern region.

— *Henry K. Lee*

LOS ANGELES

Firm fined $25 million for ocean dumping

A Panamanian shipping line pleaded guilty Monday to more than two dozen counts of illegal dumping around the United States and was ordered to pay $25 million in one of the largest fines ever imposed on a company that deliberately polluted the ocean.

Evergreen International, one of the world's largest shipping lines, concealed the discharge of waste oil, obstructed Coast Guard inspections and altered records over a three-year period ending in 2001, federal officials said. The company entered its plea in U.S. District Court in Los Angeles to 24 felony counts and one misdemeanor.

U.S. attorneys from five jurisdictions affected by the pollution — Los Angeles, Seattle, Portland, Ore., Newark, N.J., and Charleston, S.C. — hailed the plea agreement as a major victory in the fight against shipping companies trying to skirt the law.

"We take these crimes very seriously, and if they won't police themselves, we will do it for them," Christopher Christie, U.S. attorney for the District of New Jersey, said on a dock across from Evergreen's shipping yard in San Pedro (Los Angeles County). "You can't lie to the federal government with impunity and get away with it."

U.S. District Judge Terry J. Hatter Jr. ordered Evergreen to pay the five districts $15 million, which they will split equally. The remaining money will be given to environmental community service projects in each area.

— *Associated Press*

Cryptosporidium and Giardia

Cryptosporidium and Giardia are parasitic microbes found in most surface water supplies and can pose a potential health threat. If ingested, either may produce symptoms of diarrhea, stomach cramps, upset stomach, and slight fever. Some people are more vulnerable, especially those with compromised immune systems. The SFPUC tests regularly for Cryptosporidium and Giardia in both source and treated water supplies. Both were occasionally found at very low levels in the SFPUC's water in 2004.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants, including Cryptosporidium and Giardia. The presence of small amounts of contaminants does not necessarily indicate that the water poses a health risk. More information about contaminants and potential health effects may be obtained by calling the USEPA Safe Drinking Water Hotline at (800) 426-4791.

Pacifica water news letter June 2005

Panel fears mercury lost in Bay

■ Refineries handle 3,700 pounds of substance yearly, but no one can account for where it goes, regulators say

By Paul Rogers
MEDIANEWS STAFF

Hundreds of pounds of mercury from Bay Area oil refineries are unaccounted for and could be flowing into San Francisco Bay every year, poisoning fish and threatening public health, state water regulators said Monday.

Until now, old mercury mines in the hills of San Jose and the Sierra Nevada were considered the Bay's main sources of mercury — a neurotoxin that builds up in fish and can cause brain damage in children. But new research by the San Francisco Bay Regional Water Quality Control Board has concluded that roughly 3,700 pounds of mercury a year is coming into the five Bay Area refineries in crude oil — and nobody can account for where it goes after the oil is refined into gasoline.

On Thursday, staff members of the regional water board plan to order all five Bay Area refineries to measure the mercury concentrations in their crude oil and account for where it goes — in the air, in waste water and in solid waste sludge — or face fines of $1,000 a day.

"In our mind there still is a mystery. We're trying to connect the dots and understand where mercury in crude oil ends up," said Bruce Wolfe, executive officer of the board.

Environmentalists think much of the mercury may be escaping as air pollution up the refineries' smokestacks, then washing into the Bay when it rains. If that is the case, scientific understanding of the source of mercury pollution — the most serious toxic contaminant in the Bay — would be turned on its head.

"This is huge," said Sejal Choksi, program director for San Francisco Baykeeper, an environmental group. "We might be looking at the main cause of the mercury problem in the Bay."

The 3,700 pounds of mercury that water board officials now estimate to be entering the refineries in crude oil every year is more than all other sources of mercury combined that flow annually in the Bay. That totals about 2,698 pounds a year.

See MERCURY, Page 17

Mercury

FROM PAGE 1

The 3,700 pounds represents more than 15 times the amount estimated to be leaching from the old Almaden Quicksilver Mines near San Jose.

The five refineries affected are Chevron, Conoco Phillips, Shell, Tesoro and Valero in Contra Costa and Solano counties. Every day, they refine roughly 760,000 barrels of oil into gasoline.

In 2005, the regional water board, a state agency in Oakland whose members are appointed by Gov. Arnold Schwarzenegger, ordered the refineries to complete a study by May 31, 2007, of how much mercury is in their air emissions. The oil companies told the board on Feb. 19, however, that they would not be finished with the study until 2009.

Tupper Hull, a spokesman for the Western States Petroleum Association, said the refineries are working to learn how much — if any — of the mercury in crude oil ends up in the Bay.

"We're going to know the answer to that when the air study is completed," Hull said. "It's really not useful to speculate until we have the data. We are in the process of getting the data."

Mercury is a naturally occurring metal that is harmful to fish, wildlife and humans in high concentrations. It does not degrade in the environment.

Young children and pregnant women are most at risk from its effects, particularly for birth defects. For children, long-term exposure to mercury can impair physical coordination, decrease brain function and even cause mental retardation. In adults, it can impair hearing and speech, blur vision and damage the kidneys.

Around the Bay Area, government signs warn that it is unsafe to eat fish because of mercury poisoning. Health officials long have been concerned about immigrant communities and the lowest-income residents who eat fish from the Bay as a staple of their diets.

Until now, the main sources of mercury in the Bay are thought to have been long-closed mines in the Sierra Nevada and Almaden Hills — which gave the San Jose Mercury News it name. Mercury from those mines was used to separate gold from the ore during the Gold Rush.

Along with the mines, other mercury sources include consumer products such as thermometers — and even smog coal burning in China that drifts across the Pacific Ocean.

"The Bay is currently very polluted with mercury," Choksi said. "The mercury problem is so bad that fish in the Bay are unsafe to eat. We really need to get to the bottom of figuring out what is causing the problem."

Hull said the air study is behind schedule because "it was found to be a much more difficult and technologically challenging project" than originally thought.

"We have worked collaboratively with the water board up to this point to fully understand mercury discharges from the refineries," he said. "Once this air study is completed, we will have a very good and clear picture of the refineries' discharges into the Bay."

The board's new order this week will give the refineries until Oct. 31, 2008, to complete their studies. But it requires much more than the old order. It mandates that they test their oil for mercury, test air emissions, waste water emissions and solid waste.

In a report that will be presented to the water board Wednesday, Wolfe and other water board staff members note that the oil Bay Area refineries use has higher mercury concentrations than oil from other areas.

Most oil has mercury levels of 10 parts per billion. But oil from the San Joaquin Valley, where 40 percent of the crude oil used by the Bay Area refiners comes from, has mercury levels of 80 to 30,000 parts per billion, they concluded. Using a conservative number, 100 parts per billion, the water board concluded that the oil contains 3,747 pounds of mercury.

Water board staff members know that about 1,000 pounds of that goes to hazardous waste landfills out of the Bay Area as sludge when the refineries perform maintenance. The fate of rest is a mystery.

"We're saying it looks like this might be more significant than we thought before," Wolfe said. "We want a better understanding."

Copy + Pass on

US007279327B2

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

(10) **Patent No.: US 7,279,327 B2**
(45) **Date of Patent: Oct. 9, 2007**

(54) **METHODS FOR PRODUCING RECOMBINANT CORONAVIRUS**

(75) Inventors: **Kristopher M. Curtis**, Chapel Hill, NC (US); **Boyd Yount**, Hillsborough, NC (US); **Ralph S. Baric**, Haw River, NC (US)

(73) Assignee: **The University of North Carolina at Chapel Hill**, Chapel Hill, NC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 33 days.

(21) Appl. No.: **10/474,962**

(22) PCT Filed: **Apr. 19, 2002**

(86) PCT No.: **PCT/US02/12453**

§ 371 (c)(1),
(2), (4) Date: **May 25, 2004**

(87) PCT Pub. No.: **WO02/086068**

PCT Pub. Date: **Oct. 31, 2002**

(65) **Prior Publication Data**

US 2004/0235132 A1 Nov. 25, 2004

Related U.S. Application Data

(60) Provisional application No. 60/285,320, filed on Apr. 20, 2001, provisional application No. 60/285,318, filed on Apr. 20, 2001.

(51) **Int. Cl.**
C12N 15/85 (2006.01)
C12N 15/63 (2006.01)

(52) **U.S. Cl.** **435/325**; 435/320.1; 424/221.1

(58) **Field of Classification Search** 435/320.1, 435/325

See application file for complete search history.

(56) **References Cited**

OTHER PUBLICATIONS

Godeke et al. J. Virol. 2000, vol. 74, pp. 1566-1571.*

Izeta et al. J. Virol. Feb. 1999, vol. 73, No. 2, pp. 1535-1545.*

Fisher et al. J. Virol. 1997, vol. 71, No. 7, pp. 5148-5160.*

Goldeke, G.A., *Assembly of Spike into Coronavirus Particles is Mediated by the Carboxy-Terminal Domain of the Spike Protein*, J. Virol., Feb. 2000, vol. 74, No. 3:1566-1517.

Yount, B., *Strategy for Systematic Assembly of Large RNA and DNA Genomes: Transmissible Gastroentritis Virus Model*, J. Virol., Nov. 2000, vol. 74, No. 22:10600-10611.

Curtis, K.M., *Heterologous Gene Expression from Transmissible Gastroenteritis Virus Replicon Particles*, J.Virol., Feb. 2002, vol. 76, No. 3:1422-1434.

Ortego, J., *Generation of a Replication-Competent, Propagation-Defecient Virus Vector based on the Transmissible Gastroenteritis Coronavirus Genome*, J. Virol., Nov. 2002, vol. 76, No. 22: 11518-11529.

International Search Report, PCT/US02/12453, Mar. 13, 2003.

Baudoux et al. "Coronavirus Pseudoparticles Formed with Recombinant M and E Proteins Induce Alpha Interferon Synthesis by Leukocytes" *Journal of Virology* 72(11):8636-8643 (1998).

Bos et al. "The Production of Recombinant Infectious DI-Particles of a Murine Coronavirus in the Absence of Helper Virus" *Virology* 218:52-60 (1996).

de Haan et al. "Coronavirus Particle Assembly: Primary Structure Requirements of the Membrane Protein" *Journal of Virology* 72(8):6838-6850 (1998).

Fuerst et al. "Eukaryotic transient-expression system based on recombinant vaccinia virus that synthesizes bacteriophage T7 RNA polymerase" *Proc. Natl. Acad. Sci. USA* 83:8122-8126 (1986).

Vennema et al. "Intracellular Transport of Recombinant Coronavirus Spike Proteins: Implications for Virus Assembly" *Journal of Virology* 64(1):339-346 (1990).

Vennema et al. "Nucleocapsid-independent assembly of coronavirus-like particles by co-expression of viral envelope protein genes" *The EMBO Journal* 15(8):2020-2028 (1996).

Pushko et al. "Replicon-Helper Systems from Attenuated Venezuelan Equine Encephalitis Virus: Expression of Heterologous Genes in Vitro and Immunization against Heterologous Pathogens in Vivo" *Virology* 239:389-401 (1997).

Schutz-Cherry et al. "Influenza (A/HK/156/97) Hemagglutinin Expressed by an Alphavirus Replicon System Protects Chickens against Lethal Infection with Hong Kong-Origin H5N1 Viruses" *Virology* 279:55-59 (2000).

Hevey et al. "Marburg Virus Vaccines Based upon Alphavirus Replicons Protect Guinea Pigs and Nonhuman Primates" 251:28-37 (1998).

Percy et al. "A Poliovirus Replicon Containing the Chloramphenicol Acetyltransferase Gene Can Be Used To Study the Replication and Encapsidation of Poliovirus RNA" *Journal of Virology* 66(8):5040-5046 (1992).

(Continued)

Primary Examiner—Bruce R. Campell
Assistant Examiner—Bao Qun Li
(74) *Attorney, Agent, or Firm*—Myers, Bigel, Sibley & Sajovec, P.A.

(57) **ABSTRACT**

A helper cell for producing an infectious, replication defective, *coronavirus* (or more generally nidovirus) particle cell comprises (a) a nidovirus permissive cell; (b) a nidovirus replicon RNA comprising the nidovirus packaging signal and a heterologous RNA sequence, wherein the replicon RNA further lacks a sequence encoding at least one nidovirus structural protein; and (c) at least one separate helper RNA encoding the at least one structural protein absent from the replicon RNA, the helper RNA(s) lacking the nidovirus packaging signal. The combined expression of the replicon RNA and the helper RNA in the nidovirus permissive cell produces an assembled nidovirus particle which comprises the heterologous RNA sequence, is able to infect a cell, and is unable to complete viral replication in the absence of the helper RNA due to the absence of the structural protein coding sequence in the packaged replicon. Compositions for use in making such helper cells, along with viral particles produced from such cells, compositions of such viral particles, and methods of making and using such viral particles, are also disclosed.

14 Claims, 11 Drawing Sheets

US007220852B1

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

(10) **Patent No.: US 7,220,852 B1**
(45) **Date of Patent: May 22, 2007**

(54) **CORONAVIRUS ISOLATED FROM HUMANS**

(75) Inventors: **Paul A. Rota**, Decatur, GA (US); **Larry J. Anderson**, Atlanta, GA (US); **William J. Bellini**, Lilburn, GA (US); **Cara Carthel Burns**, Avondale Estates, GA (US); **Raymond Campagnoli**, Decatur, GA (US); **Qi Chen**, Marietta, GA (US); **James A. Comer**, Decatur, GA (US); **Shannon L. Emery**, Lusaka (ZM); **Dean D. Erdman**, Decatur, GA (US); **Cynthia S. Goldsmith**, Lilburn, GA (US); **Charles D. Humphrey**, Lilburn, GA (US); **Joseph P. Icenogle**, Atlanta, GA (US); **Thomas G. Kslazek**, Lilburn, GA (US); **Stephan S. Monroe**, Decatur, GA (US); **William Allan Nix**, Bethlehem, GA (US); **M. Steven Oberste**, Lilburn, GA (US); **Teresa C. T. Peret**, Atlanta, GA (US); **Pierre E. Rollin**, Lilburn, GA (US); **Mark A. Pallansch**, Lilburn, GA (US); **Anthony Sanchez**, Lilburn, GA (US); **Suxiang Tong**, Alpharetta, GA (US); **Sherif R. Zaki**, Atlanta, GA (US)

(73) Assignee: **The United States of America as represented by the Secretary of the Department of Health and Human Services, Centers for Disease Control and Prevention**, Washington, DC (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.: **10/822,904**

(22) Filed: **Apr. 12, 2004**

Related U.S. Application Data

(60) Provisional application No. 60/465,927, filed on Apr. 25, 2003.

(51) **Int. Cl.**
C12N 15/50 (2006.01)
C12N 7/00 (2006.01)

(52) **U.S. Cl.** **536/23.72**; 435/235.1

(58) **Field of Classification Search** 536/23.72; 514/44; 435/235.1, 320.1

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2005/0181357 A1 * 8/2005 Peiris et al. 435/5

FOREIGN PATENT DOCUMENTS

WO WO 2004/085633 * 10/2004
WO WO 2004/092360 * 10/2004

OTHER PUBLICATIONS

GenBank Accession No. AY274119, "SARS Coronavirus Tor2, complete genome," version AY274119.1, Apr. 14, 2003.*
GenBank Accession No. AY278487, "SARS coronavirus BJ02, partial genome," version AY278487.1, Apr. 21, 2003.*
Genbank Accession No. AY278554, "SARS coronavirus CUHK-W1, complete genome," version AY278554.1, Apr. 18, 2003.*
GenBank Accession No. AY278491, "SARS Coronavirus HKU-39849, complete genome," version AY278491.1, Apr. 18, 2003.*
SARS-associated Coronavirus. Genomic Sequence Availability. [online] [retreived on Aug. 8, 2005]. Retreived from the Internet <URL: http://www.bcgsc.ca/bioinfo/SARS>.*
GenBank Accession No. AY274119, Apr. 14, 2003.
GenBank Accession No. AY278741, Apr. 21, 2003.
"Update: Outbreak of Severe Acute Respiratory Syndrome—Worldwide, 2003," *MMWR Weekly* 52:241-248 (2003).
Emery et al., "Real-Time Reverse Transcription-Polymerase Chain Reaction Assay for SARS-Associated Coronavirus," *Emerg. Infect. Diseases* 10:311-316 (2004).
Goldsmith et al., "Ultrastructural Characterization of SARS Coronavirus," *Emerg. Infect. Diseases* 10:320-326 (2004).
Ksiazek et al., "A Novel Coronavirus Associated with Severe Acute Respiratory Syndrome," *N. Eng. J. Med.* 348:1953-1966 (2003).
Luo and Luo, "Initial SARS Coronavirus Genome Sequence Analysis Using a Bioinformatics Platform," *2nd Asia-Pacific Bioinformatics Conference (APBC2004)*, Dunedin, New Zealand (2004).
Marra et al., "The Genome Sequence of the SARS-Associated Coronavirus," *Science* 300:1393-1404 (2003).
Supplementary Online Material for Marra et al. <<www.sciencemag.org/cgi/content/full/1085953/DC1>>.
Rota et al., "Characterization of a Novel Coronavirus Associated with Severe Acute Respiratory Syndrome," *Science* 300:1394-1399 (2003).
Supplementary Online Material for Rota et al. <<www.sciencemag.org/cgi/content/full/1085952/DC1>>.

* cited by examiner

Primary Examiner—Mary E. Mosher
(74) *Attorney, Agent, or Firm*—Klarquist Sparkman LLP

(57) **ABSTRACT**

Disclosed herein is a newly isolated human coronavirus (SARS-CoV), the causative agent of severe acute respiratory syndrome (SARS). Also provided are the nucleic acid sequence of the SARS-CoV genome and the amino acid sequences of the SARS-CoV open reading frames, as well as methods of using these molecules to detect a SARS-CoV and detect infections therewith. Immune stimulatory compositions are also provided, along with methods of their use.

1 Claim, 7 Drawing Sheets

US007151163B2

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

(10) **Patent No.: US 7,151,163 B2**
(45) **Date of Patent: Dec. 19, 2006**

(54) **ANTIVIRAL AGENTS FOR THE TREATMENT, CONTROL AND PREVENTION OF INFECTIONS BY CORONAVIRUSES**

(75) Inventors: **John W. Erickson**, Potomac, MD (US); **Abelardo Silva**, Ellicott City, MD (US)

(73) Assignee: **Sequoia Pharmaceuticals, Inc.**, Gaithersburg, MD (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.: **10/833,304**

(22) Filed: **Apr. 28, 2004**

(65) **Prior Publication Data**

US 2006/0258577 A1 Nov. 16, 2006

Related U.S. Application Data

(60) Provisional application No. 60/466,432, filed on Apr. 30, 2003, provisional application No. 60/465,782, filed on Apr. 28, 2003.

(51) **Int. Cl.**

C07K 14/165	(2006.01)
C07K 17/00	(2006.01)
A61K 39/215	(2006.01)
A61K 39/385	(2006.01)

(52) **U.S. Cl.** **530/363**; 514/12; 424/186.1; 424/196.11; 424/221.1; 424/192.1

(58) **Field of Classification Search** 514/12–16, 514/2; 530/324–329, 363, 402; 424/186.1, 424/196.11, 221.1, 192.1

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,431,194	A	3/1969	Bartok et al.	
4,080,397	A	3/1978	Derr et al.	
5,378,348	A	1/1995	Davis et al.	
5,888,376	A	3/1999	Wittenbrink et al.	
6,436,278	B1	8/2002	Bennazzi et al.	
2004/0071709	A1 *	4/2004	Rottier et al.	424/159.1
2004/0180380	A1 *	9/2004	Lee et al.	435/7.1
2004/0229219	A1 *	11/2004	Gallaher et al.	435/5

FOREIGN PATENT DOCUMENTS

EP	323092	A2	7/1989
EP	583836	A1	2/1994
WO	WO 01/34186	*	5/2001

OTHER PUBLICATIONS

Osborn et al. Journal of Pharmacology and Experimental Therapeutics 303(2): 540-548, 2002.*
Liu et al (Lancet 363:938-947, Mar. 20, 2004).*
Kliger et al (BMC Microbiology 3:20, Sep. 21, 2003). [online] [retreived on May 18, 2005] Retreived from the Internet <http://www.biomedcentral.com/1471-2180/3/20>.*
Gustchina et al (J. Med. Chem. 48:3036-3044, 2005).*
Veiga et al (BBA 1760:55-61, 2006).*
Lip et al (Journal of Virology 80:941-950, 2006).*

* cited by examiner

Primary Examiner—Mary E. Mosher
(74) *Attorney, Agent, or Firm*—Proskauer Rose LLP

(57) **ABSTRACT**

The invention provides compositions and methods that are useful for preventing and treating a coronavirus infection in a subject. More specifically, the invention provides peptides and conjugates and pharmaceutical compositions containing those peptides and conjugates that block fusion of a coronavirus, such as the SARS virus, to a target cell. This blocking mechanism prevents or treats a coronavirus infection, such as a SARS infection, in a subject, such as a human subject.

8 Claims, 2 Drawing Sheets

US007776521B1

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

(10) **Patent No.: US 7,776,521 B1**
(45) **Date of Patent: Aug. 17, 2010**

(54) **CORONAVIRUS ISOLATED FROM HUMANS**

(75) Inventors: **Paul A. Rota**, Decatur, GA (US); **Larry J. Anderson**, Atlanta, GA (US); **William J. Bellini**, Lilburn, GA (US); **Michael D. Bowen**, Decatur, GA (US); **Cara Carthel Burns**, Avondale Estates, GA (US); **Raymond Campagnoli**, Decatur, GA (US); **Qi Chen**, Marietta, GA (US); **James A. Comer**, Decatur, GA (US); **Byron T. Cook**, Augusta, GA (US); **Shannon L. Emery**, Lusaka (ZM); **Dean D. Erdman**, Decatur, GA (US); **Cynthia S. Goldsmith**, Lilburn, GA (US); **Jeanette Guarner**, Decatur, GA (US); **Charles D. Humphrey**, Lilburn, GA (US); **Joseph P. Icenogle**, Atlanta, GA (US); **Thomas G. Ksiazek**, Lilburn, GA (US); **Richard F. Meyer**, Roswell, GA (US); **Stephan S. Monroe**, Decatur, GA (US); **William Allan Nix**, Bethlehem, GA (US); **M. Steven Oberste**, Lilburn, GA (US); **Christopher D. Paddock**, Atlanta, GA (US); **Teresa C. T. Peret**, Atlanta, GA (US); **Pierre E. Rollin**, Lilburn, GA (US); **Mark A. Pallansch**, Lilburn, GA (US); **Anthony Sanchez**, Lilburn, GA (US); **Wun-Ju Shieh**, Norcross, GA (US); **Suxiang Tong**, Alpharetta, GA (US); **Sherif R. Zaki**, Atlanta, GA (US)

(73) Assignee: **The United States of America as represented by the Secretary of the Department of Health and Human Services, Centers for Disease Control and Prevention**, Washington, DC (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 96 days.

(21) Appl. No.: **11/748,359**

(22) Filed: **May 14, 2007**

Related U.S. Application Data

(62) Division of application No. 10/822,904, filed on Apr. 12, 2004, now Pat. No. 7,220,852.

(60) Provisional application No. 60/465,927, filed on Apr. 25, 2003.

(51) **Int. Cl.**

C12Q 1/70	(2006.01)
C07H 21/00	(2006.01)
C12N 15/50	(2006.01)

(52) **U.S. Cl.** **435/5**; 536/24.32; 536/24.33

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

2005/0181357 A1* 8/2005 Peiris et al. 435/5

FOREIGN PATENT DOCUMENTS

WO WO 2004/092360 10/2004

OTHER PUBLICATIONS

Ksiazek et al (New England Journal of Medicine 348:1953-1966, published online Apr. 10, 2003).*
Gut et al (Journal of Virological Methods 77:37-46, 1999).*
Neilan et al (Nucleic Acids Research 25:2938-9, 1997).*
Peiris et al (Lancet, 361:1319-1325, published online Apr. 8, 2003).*
Genbank Accession No. AY274119.1 GI:29826276 (Apr. 14, 2003).*
SARS-associated Coronavirus. Genomic Sequence Availability. [online] [retreived on Aug. 8, 2005]. Retreived from the Internet <URL: http://www.bcgsc.ca/bioinfo/SARS>.*
"Update: Outbreak of Severe Acute Respiratory Syndrome—Worldwide, 2003," *MMWR Weekly* 52:241-248, 2003.
Emery et al., "Real-Time Reverse Transcription-Polymerase Chain Reaction Assay for SARS-Associated Coronavirus," *Emerg. Infect. Diseases* 10:311-316, 2004.
Goldsmith et al., "Ultrastructural Characterization of SARS Coronavirus," *Emerg. Infect. Diseases* 10:320-326, 2004.
Ksiazek et al., "A Novel Coronavirus Associated with Severe Acute Respiratory Syndrome," *N. Engl. J. Med.* 348:1953-1966, 2003.
Luo and Luo, "Initial SARS Coronavirus Genome Sequence Analysis Using a Bioinformatics Platform," *2nd Asia-Pacific Bioinformatics Conference (APBC2004)*, Dunedin, New Zealand, 2004.
Marra et al., "The Genome Sequence of the SARS-Associated Coronavirus," *Science* 300:1393-1404, 2003.
Supplementary Online Material for Marra et al., www.sciencemag.org/cgi/content/full/1085953/DC1, (2003).
Rota et al., "Characterization of a Novel Coronavirus Associated with Severe Acute Respiratory Syndrome," *Science* 300:1394-1399, 2003.
Supplementary Online Material for Rota et al., www.sciencemag.org/cgi/content/full/1085953/DC1, (2003).
GenBank Accession No. AY274119, Apr. 14, 2003.
GenBank Accession No. AY278741, Apr. 21, 2003.
GenBank Accession No. AY278554.1, Apr. 18, 2003.
GenBank Accession No. AY278491.1, Apr. 18, 2003.
GenBank Accession No. AY278487, Apr. 21, 2003.

* cited by examiner

Primary Examiner—Mary E Mosher
(74) *Attorney, Agent, or Firm*—Klarquist Sparkman, LLP

(57) **ABSTRACT**

Disclosed herein is a newly isolated human coronavirus (SARS-CoV), the causative agent of severe acute respiratory syndrome (SARS). Also provided are the nucleic acid sequence of the SARS-CoV genome and the amino acid sequences of the SARS-CoV open reading frames, as well as methods of using these molecules to detect a SARS-CoV and detect infections therewith. Immune stimulatory compositions are also provided, along with methods of their use.

7 Claims, 7 Drawing Sheets

US009193780B2

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

(10) **Patent No.: US 9,193,780 B2**
(45) **Date of Patent: Nov. 24, 2015**

(54) **AMINO ACID SEQUENCES DIRECTED AGAINST ENVELOPE PROTEINS OF A VIRUS AND POLYPEPTIDES COMPRISING THE SAME FOR THE TREATMENT OF VIRAL DISEASES**

(75) Inventors: **Anna Hultberg**, Vleuten (NL); **Bram Maassen**, De Bilt (NL); **Peter Vanlandschoot**, Bellem (BE); **Erik Depla**, Destelbergen (BE); **Catelijne Stortelers**, Ghent (BE); **Cornelis Theodorus Verrips**, Besse sur Issole (FR); **Steven Van Gucht**, Denderleeuw (BE); **Jose Melero**, Madrid (ES); **Michael John Scott Saunders**, Brussels (BE); **Johannes Joseph Wilhelmus De Haard**, Oudelande (NL); **Robert Anthony Weiss**, London (GB); **Nigel J. Temperton**, Tonbridge (GB); **Xavier Saelens**, Ypres (BE); **Bert Schepens**, Drongen (BE); **Alexander Szyrold**, Ghent (BE); **Michael Marie Harmsen**, AM Weesp (NL)

(73) Assignee: **Ablynx N.V.**, Zwijnaarde (BE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 1310 days.

(21) Appl. No.: **12/996,074**

(22) PCT Filed: **Jun. 5, 2009**

(86) PCT No.: **PCT/EP2009/056975**

§ 371 (c)(1),
(2), (4) Date: **Mar. 17, 2011**

(87) PCT Pub. No.: **WO2009/147248**

PCT Pub. Date: **Dec. 10, 2009**

(65) **Prior Publication Data**

US 2011/0182897 A1 Jul. 28, 2011

Related U.S. Application Data

(60) Provisional application No. 61/059,055, filed on Jun. 5, 2008, provisional application No. 61/092,991, filed on Aug. 29, 2008, provisional application No. 61/139,130, filed on Dec. 19, 2008, provisional application No. 61/144,653, filed on Jan. 14, 2009, provisional application No. 61/172,914, filed on Apr. 27, 2009, provisional application No. 61/174,108, filed on Apr. 30, 2009.

(51) **Int. Cl.**

A61K 39/395	(2006.01)
C07K 2/00	(2006.01)
C07K 14/00	(2006.01)
C07K 16/00	(2006.01)
C07H 21/00	(2006.01)
C12N 5/10	(2006.01)
A61K 38/16	(2006.01)
C12P 21/02	(2006.01)
A61P 31/12	(2006.01)
A61P 37/02	(2006.01)
C07K 16/10	(2006.01)
A61K 39/00	(2006.01)

(52) **U.S. Cl.**
CPC *C07K 16/10* (2013.01); *C07K 16/1009* (2013.01); *C07K 16/1018* (2013.01); *C07K 16/1027* (2013.01); *A61K 2039/505* (2013.01); *A61K 2039/507* (2013.01); *C07K 2316/96* (2013.01); *C07K 2317/22* (2013.01); *C07K 2317/24* (2013.01); *C07K 2317/55* (2013.01); *C07K 2317/565* (2013.01); *C07K 2317/569* (2013.01); *C07K 2317/92* (2013.01); *C07K 2319/00* (2013.01)

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,818,216	B2 *	11/2004	Young et al.	424/159.1
2006/0013824	A1	1/2006	Scallon	
2006/0083683	A1 *	4/2006	Hsei et al.	424/1.49
2008/0085277	A1	4/2008	Cho et al.	
2011/0182897	A1 *	7/2011	Hultberg et al.	424/134.1
2012/0128569	A1	5/2012	Depla et al.	
2012/0301469	A1	11/2012	Depla et al.	

FOREIGN PATENT DOCUMENTS

EP	2 096 121	A1	9/2009
WO	WO 96/40252	A1	12/1996
WO	WO 98/19704	A1	5/1998
WO	WO 00/65057	A1	11/2000
WO	WO 00/69462	A1	11/2000
WO	WO 03/051912	A2	6/2003
WO	WO 03/105894	A1	12/2003
WO	WO 2004/003019	A2	1/2004
WO	WO 2005/079479	A2	9/2005
WO	WO 2006/034292	A2	3/2006

(Continued)

OTHER PUBLICATIONS

Vincke et al. (Journal of Biological Chemistry. 2009; 284: 3273-3284).*
Deschacht et al. (Journal of Immunology. 2010; 184: 5696-5704).*
Rudikoff et al. (PNAS. 1982; 79: 1979-1983.*
Kashmiri et al. (Methods. 2005; 36:25-34).*

(Continued)

Primary Examiner — Shanon A Foley
(74) *Attorney, Agent, or Firm* — Wolf, Greenfield & Sacks, P.C.

(57) **ABSTRACT**

The present invention relates in part to amino acid sequences that are directed against and/or that can specifically bind to an envelope protein of a virus, as well as to compounds or constructs, and in particular proteins and polypeptides, that comprise or essentially consist of one or more such amino acid sequences.

19 Claims, 105 Drawing Sheets

(12) **United States Patent**
Benenato

(10) **Patent No.: US 10,266,485 B2**
(45) **Date of Patent: *Apr. 23, 2019**

(54) **COMPOUNDS AND COMPOSITIONS FOR INTRACELLULAR DELIVERY OF THERAPEUTIC AGENTS**

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

(72) Inventor: **Kerry E. Benenato**, Sudbury, 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.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **16/005,286**

(22) Filed: **Jun. 11, 2018**

(65) **Prior Publication Data**

US 2018/0273467 A1 Sep. 27, 2018

Related U.S. Application Data

(63) Continuation of application No. 15/846,084, filed on Dec. 18, 2017, which is a continuation of application (Continued)

(51) **Int. Cl.**

A61K 48/00	(2006.01)
A61K 9/127	(2006.01)
C07C 229/12	(2006.01)
C07C 271/20	(2006.01)
C07C 279/12	(2006.01)
C07C 279/28	(2006.01)
C07C 279/32	(2006.01)
C07D 233/72	(2006.01)
C07D 249/04	(2006.01)
C07D 263/20	(2006.01)
C07D 265/33	(2006.01)
C07D 271/06	(2006.01)
C07D 271/10	(2006.01)
C07D 207/27	(2006.01)
C07D 277/38	(2006.01)
C07C 275/14	(2006.01)
C07C 279/24	(2006.01)
C07C 311/05	(2006.01)
C07C 229/16	(2006.01)

(Continued)

(52) **U.S. Cl.**

CPC ***C07C 229/12*** (2013.01); ***A61K 9/0019*** (2013.01); ***A61K 9/0043*** (2013.01); ***A61K 9/0073*** (2013.01); ***A61K 9/127*** (2013.01); ***A61K 9/1272*** (2013.01); ***A61K 9/1617*** (2013.01); ***A61K 9/1641*** (2013.01); ***A61K 9/5123*** (2013.01); ***A61K 9/5146*** (2013.01); ***A61K 31/7105*** (2013.01); ***A61K 38/1725*** (2013.01); ***A61K 38/1816*** (2013.01); ***A61K 47/543*** (2017.08); ***A61K 47/6911*** (2017.08); ***A61K 48/005*** (2013.01); ***A61K 48/0033*** (2013.01); ***C07C 227/16*** (2013.01); ***C07C 227/18*** (2013.01); ***C07C 229/16*** (2013.01); ***C07C 233/36*** (2013.01); ***C07C 235/10*** (2013.01); ***C07C 255/24*** (2013.01); ***C07C 271/20*** (2013.01); ***C07C 275/14*** (2013.01); ***C07C 279/12*** (2013.01); ***C07C 279/24*** (2013.01); ***C07C 279/28*** (2013.01); ***C07C 279/32*** (2013.01); ***C07C 311/05*** (2013.01); ***C07C 335/08*** (2013.01); ***C07D 207/27*** (2013.01); ***C07D 233/72*** (2013.01); ***C07D 249/04*** (2013.01); ***C07D 263/20*** (2013.01); ***C07D 265/33*** (2013.01); ***C07D 271/06*** (2013.01); ***C07D 271/10*** (2013.01); ***C07D 277/38*** (2013.01); ***C07F 9/091*** (2013.01); ***C07K 14/505*** (2013.01); ***A61K 9/1271*** (2013.01); ***A61K 48/00*** (2013.01); *C07C 2601/02* (2017.05); *C07C 2601/04* (2017.05); *C07C 2601/14* (2017.05); *C07C 2601/18* (2017.05)

(58) **Field of Classification Search**

CPC A61K 39/00; A61K 51/08; C07K 14/81; C07H 21/00

USPC 424/9.1; 435/91.1, 91.31, 458; 514/44; 536/23.1, 24.5

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,872,171 A 3/1975 Cronin et al.
4,957,735 A 9/1990 Huang
(Continued)

FOREIGN PATENT DOCUMENTS

AU 652831 B2 9/1994
CN 102068701 A 5/2011
(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 15/846,084.*
(Continued)

Primary Examiner — Jane J Zara
(74) *Attorney, Agent, or Firm* — Cooley LLP; Heidi A. Erlacher; Christine C. Pemberton

(57) **ABSTRACT**

The disclosure features novel lipids and compositions involving the same. Nanoparticle compositions include a novel lipid as well as additional lipids such as phospholipids, structural lipids, and PEG lipids. Nanoparticle compositions further including therapeutic and/or prophylactics such as RNA are useful in the delivery of therapeutic and/or prophylactics to mammalian cells or organs to, for example, regulate polypeptide, protein, or gene expression.

27 Claims, 11 Drawing Sheets

Specification includes a Sequence Listing.

US010442756B2

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

(10) **Patent No.: US 10,442,756 B2**
(45) **Date of Patent: *Oct. 15, 2019**

(54) **COMPOUNDS AND COMPOSITIONS FOR INTRACELLULAR DELIVERY OF THERAPEUTIC AGENTS**

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

(72) Inventors: **Kerry E. Benenato**, Cambridge, MA (US); **Mark Cornebise**, Cambridge, 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.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **15/846,084**

(22) Filed: **Dec. 18, 2017**

(65) **Prior Publication Data**

US 2018/0201572 A1 Jul. 19, 2018

Related U.S. Application Data

(63) Continuation of application No. 15/476,253, filed on Mar. 31, 2017, now Pat. No. 9,868,691, which is a continuation of application No. PCT/US2016/052352, filed on Sep. 16, 2016.
(Continued)

(51) **Int. Cl.**

C07C 229/12	(2006.01)
A61K 9/127	(2006.01)
C07C 271/20	(2006.01)
C07C 279/12	(2006.01)
C07C 279/28	(2006.01)
C07C 279/32	(2006.01)
C07D 233/72	(2006.01)
C07D 249/04	(2006.01)
C07D 263/20	(2006.01)
C07D 265/33	(2006.01)
C07D 271/06	(2006.01)
C07D 271/10	(2006.01)
C07D 207/27	(2006.01)
C07D 277/38	(2006.01)
C07C 275/14	(2006.01)
C07C 279/24	(2006.01)
C07C 311/05	(2006.01)
C07C 229/16	(2006.01)

(Continued)

(52) **U.S. Cl.**
CPC ***C07C 229/12*** (2013.01); ***A61K 9/0019*** (2013.01); ***A61K 9/0043*** (2013.01); ***A61K 9/0073*** (2013.01); ***A61K 9/127*** (2013.01); ***A61K 9/1272*** (2013.01); ***A61K 9/1617*** (2013.01); ***A61K 9/1641*** (2013.01); ***A61K 9/5123*** (2013.01); ***A61K 9/5146*** (2013.01); ***A61K 31/7105*** (2013.01); ***A61K 38/1725*** (2013.01); ***A61K 38/1816*** (2013.01); ***A61K 47/543*** (2017.08); ***A61K 47/6911*** (2017.08); ***A61K 48/005*** (2013.01); ***A61K 48/0033*** (2013.01); ***C07C 227/16*** (2013.01); ***C07C 227/18*** (2013.01); ***C07C 229/16*** (2013.01); ***C07C 233/36*** (2013.01); ***C07C 233/72*** (2013.01); ***C07C 235/10*** (2013.01); ***C07C 255/24*** (2013.01); ***C07C 263/20*** (2013.01); ***C07C 271/20*** (2013.01); ***C07C 275/14*** (2013.01); ***C07C 279/12*** (2013.01); ***C07C 279/24*** (2013.01); ***C07C 279/28*** (2013.01); ***C07C 279/32*** (2013.01); ***C07C 311/05*** (2013.01); ***C07C 335/08*** (2013.01); ***C07D 207/27*** (2013.01); ***C07D 249/04*** (2013.01); ***C07D 265/33*** (2013.01); ***C07D 271/06*** (2013.01); ***C07D 271/10*** (2013.01); ***C07D 277/38*** (2013.01); ***C07F 9/091*** (2013.01); ***C07K 14/505*** (2013.01); ***A61K 9/1271*** (2013.01); ***A61K 48/00*** (2013.01); *C07C 2601/02* (2017.05); *C07C 2601/04* (2017.05); *C07C 2601/14* (2017.05); *C07C 2601/18* (2017.05)

(58) **Field of Classification Search**
CPC A61K 45/00; A61K 47/543; A61K 48/00; A61K 48/0033; A61K 9/127
USPC 424/9.1; 435/455; 438; 536/23.1
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,872,171 A 3/1975 Henry et al.
4,957,735 A 9/1990 Huang
(Continued)

FOREIGN PATENT DOCUMENTS

AU 652831 B2 9/1994
CN 102068701 A 5/2011
(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 16/005,286 (dated 2018).*
(Continued)

Primary Examiner — Jane J Zara
(74) *Attorney, Agent, or Firm* — Cooley LLP; Heidi A. Erlacher; Christine C. Pemberton

(57) **ABSTRACT**

The disclosure features novel lipids and compositions involving the same. Nanoparticle compositions include a novel lipid as well as additional lipids such as phospholipids, structural lipids, and PEG lipids. Nanoparticle compositions further including therapeutic and/or prophylactics such as RNA are useful in the delivery of therapeutic and/or prophylactics to mammalian cells or organs to, for example, regulate polypeptide, protein, or gene expression.

24 Claims, 11 Drawing Sheets

Specification includes a Sequence Listing.

US010577403B2

(12) **United States Patent**
De Fougerolles et al.

(10) **Patent No.: US 10,577,403 B2**
(45) **Date of Patent: *Mar. 3, 2020**

(54) **MODIFIED POLYNUCLEOTIDES FOR THE PRODUCTION OF SECRETED PROTEINS**

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

(72) Inventors: **Antonin De Fougerolles**, Waterloo (BE); **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.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: 16/438,735

(22) Filed: Jun. 12, 2019

(65) **Prior Publication Data**

US 2019/0315824 A1 Oct. 17, 2019

Related U.S. Application Data

(63) Continuation of application No. 14/987,328, filed on Jan. 4, 2016, now Pat. No. 10,385,106, which is a (Continued)

(51) **Int. Cl.**

A61K 48/00	(2006.01)
A61K 38/17	(2006.01)
A61K 47/54	(2017.01)
A61K 9/127	(2006.01)
C07K 14/535	(2006.01)
A61K 31/7088	(2006.01)
A61K 38/48	(2006.01)
C07K 14/745	(2006.01)
C07K 16/28	(2006.01)
C07K 16/32	(2006.01)
C12N 9/02	(2006.01)
C12N 9/64	(2006.01)
A61K 38/19	(2006.01)
A61K 38/21	(2006.01)
A61K 38/36	(2006.01)
A61K 38/44	(2006.01)
A61K 39/395	(2006.01)
C07K 14/475	(2006.01)
C07K 14/505	(2006.01)
C07K 14/525	(2006.01)
C07K 14/56	(2006.01)
C07K 14/565	(2006.01)
C07K 14/75	(2006.01)
A61K 47/10	(2017.01)
A61K 38/18	(2006.01)

(Continued)

(52) **U.S. Cl.**

CPC *C07K 14/535* (2013.01); *A61K 9/1271* (2013.01); *A61K 9/1272* (2013.01); *A61K 9/1277* (2013.01); *A61K 9/14* (2013.01); *A61K 9/5031* (2013.01); *A61K 31/7088* (2013.01); *A61K 38/1767* (2013.01); *A61K 38/1816* (2013.01); *A61K 38/1866* (2013.01); *A61K 38/191* (2013.01); *A61K 38/193* (2013.01); *A61K 38/212* (2013.01); *A61K 38/215* (2013.01); *A61K 38/36* (2013.01); *A61K 38/363* (2013.01); *A61K 38/44* (2013.01); *A61K 38/4833* (2013.01); *A61K 38/4846* (2013.01); *A61K 39/3955* (2013.01); *A61K 47/10* (2013.01); *A61K 47/54* (2017.08); *A61K 47/542* (2017.08); *A61K 48/0033* (2013.01); *A61K 48/0066* (2013.01); *A61K 48/0075* (2013.01); *C07K 14/47* (2013.01); *C07K 14/475* (2013.01); *C07K 14/505* (2013.01); *C07K 14/525* (2013.01); *C07K 14/56* (2013.01); *C07K 14/565* (2013.01); *C07K 14/745* (2013.01); *C07K 14/75* (2013.01); *C07K 16/2887* (2013.01); *C07K 16/32* (2013.01); *C07K 19/00* (2013.01); *C12N 9/0069* (2013.01); *C12N 9/644* (2013.01); *C12N 15/85* (2013.01); *C12N 15/88* (2013.01); *C12Y 113/12007* (2013.01); *C12Y 304/21005* (2013.01); *C12Y 304/21022* (2013.01); *A61K 9/0019* (2013.01); *A61K 48/00* (2013.01); *C12N 2840/00* (2013.01)

(58) **Field of Classification Search**

CPC C07H 21/02; C12N 15/67; C12N 15/11

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

5,489,677	A	2/1996	Sanghvi et al.
5,591,722	A	1/1997	Montgomery et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2028849	A1	9/1991
CA	2473135	A1	6/2003

(Continued)

OTHER PUBLICATIONS

Anderson et al., "Incorporation of pseudouridine into mRNA enhances translation by diminishing PKR activation," Nucleic Acids Res. 38(17):5884-92 (2010).

(Continued)

Primary Examiner — Antonio Galisteo Gonzalez
(74) *Attorney, Agent, or Firm* — Clark & Elbing LLP

(57) **ABSTRACT**

The invention relates to compositions and methods for the preparation, manufacture and therapeutic use of polynucleotides, primary transcripts and mmRNA molecules.

16 Claims, 14 Drawing Sheets

Specification includes a Sequence Listing.

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

(10) **Patent No.: US 10,702,600 B1**
(45) **Date of Patent: Jul. 7, 2020**

(54) **BETACORONAVIRUS MRNA VACCINE**

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

(72) Inventors: **Giuseppe Ciaramella**, Sudbury, MA (US); **Sunny Himansu**, Winchester, 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.: **16/805,587**

(22) Filed: **Feb. 28, 2020**

Related U.S. Application Data

(63) Continuation of application No. 16/368,270, filed on Mar. 28, 2019, which is a continuation of application No. 16/040,981, filed on Jul. 20, 2018, now Pat. No. 10,272,150, which is a continuation of application No. 15/674,599, filed on Aug. 11, 2017, now Pat. No. 10,064,934, which is a continuation of application No. PCT/US2016/058327, filed on Oct. 21, 2016.

(60) Provisional application No. 62/247,362, filed on Oct. 28, 2015, provisional application No. 62/247,394, filed on Oct. 28, 2015, provisional application No. 62/247,483, filed on Oct. 28, 2015, provisional application No. 62/247,297, filed on Oct. 28, 2015, provisional application No. 62/244,802, filed on Oct. 22, 2015, provisional application No. 62/244,946, filed on Oct. 22, 2015, provisional application No. 62/244,813, filed on Oct. 22, 2015, provisional application No. 62/244,837, filed on Oct. 22, 2015, provisional application No. 62/245,031, filed on Oct. 22, 2015.

(51) **Int. Cl.**

A61P 11/00	(2006.01)
A61K 39/12	(2006.01)
A61K 39/215	(2006.01)
A61K 39/155	(2006.01)
C07K 16/10	(2006.01)
A61K 39/00	(2006.01)

(52) **U.S. Cl.**
CPC ***A61K 39/155*** (2013.01); ***A61K 39/12*** (2013.01); ***A61K 39/215*** (2013.01); ***A61P 11/00*** (2018.01); ***C07K 16/10*** (2013.01); ***C07K 16/1027*** (2013.01); *A61K 2039/53* (2013.01); *A61K 2039/55511* (2013.01); *A61K 2039/55555* (2013.01); *A61K 2039/6018* (2013.01); *A61K 2039/70* (2013.01); *C07K 2317/76* (2013.01); *C12N 2760/18034* (2013.01); *C12N 2760/18334* (2013.01); *C12N 2760/18434* (2013.01); *C12N 2760/18534* (2013.01); *C12N 2760/18634* (2013.01); *C12N 2770/20034* (2013.01); *Y02A 50/381* (2018.01); *Y02A 50/39* (2018.01)

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

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,906,092	A	9/1975	Hilleman et al.
4,790,987	A	12/1988	Compans et al.
5,169,628	A	12/1992	Wathen
5,427,782	A	6/1995	Compans et al.
6,225,091	B1	5/2001	Klein et al.
6,500,419	B1	12/2002	Hone et al.
6,514,948	B1	2/2003	Raz et al.
7,001,890	B1	2/2006	Wagner et al.
7,208,161	B1	4/2007	Murphy et al.
7,449,324	B2	11/2008	Fouchier et al.
7,531,342	B2	5/2009	Fouchier et al.
7,671,186	B2	3/2010	Klein et al.
7,704,720	B2	4/2010	Tang et al.
8,217,016	B2	7/2012	Hoerr et al.
8,252,289	B2	8/2012	Elecuit et al.
8,710,200	B2	4/2014	Schrum et al.
8,722,341	B2	5/2014	Fouchier et al.
8,734,853	B2	5/2014	Sood et al.
8,754,062	B2	6/2014	De Fougerolles et al.
8,822,663	B2	9/2014	Schrum et al.
8,841,433	B2	9/2014	Fouchier et al.
8,889,146	B2	11/2014	Blais et al.
8,927,206	B2	1/2015	De Jong et al.
8,999,380	B2	4/2015	Bancel et al.
9,192,661	B2	11/2015	Jain et al.
9,221,891	B2	12/2015	Bancel et al.
9,283,287	B2	3/2016	Bancel et al.
9,303,079	B2	4/2016	Bancel et al.
9,376,726	B2	6/2016	Fouchier et al.
9,464,124	B2	10/2016	Bancel et al.
9,512,456	B2	12/2016	Wang et al.
9,567,653	B2	2/2017	Fouchier et al.
9,597,380	B2	3/2017	Chakraborty et al.

(Continued)

FOREIGN PATENT DOCUMENTS

CA	2473135	6/2003
EP	1026253	8/2000

(Continued)

OTHER PUBLICATIONS

U.S. Appl. No. 16/036,318, filed Jul. 16, 2018, Ciaramella et al.

(Continued)

Primary Examiner — Nicole Kinsey White
(74) *Attorney, Agent, or Firm* — Wolf, Greenfield & Sacks, P.C.

(57) **ABSTRACT**

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

26 Claims, 24 Drawing Sheets

Specification includes a Sequence Listing.

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 3 172 319 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
20.11.2019 Bulletin 2019/47

(21) Application number: **15750093.5**

(22) Date of filing: **23.07.2015**

(51) Int Cl.:
C12N 7/04 *(2006.01)* ***C07K 14/165*** *(2006.01)*
A61K 39/00 *(2006.01)* ***A61K 39/215*** *(2006.01)*

(86) International application number:
PCT/GB2015/052124

(87) International publication number:
WO 2016/012793 (28.01.2016 Gazette 2016/04)

(54) CORONAVIRUS

CORONAVIRUS

CORONAVIRUS

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **23.07.2014 GB 201413020**

(43) Date of publication of application:
31.05.2017 Bulletin 2017/22

(73) Proprietor: **The Pirbright Institute**
Pirbright
Woking
Surrey GU24 0NF (GB)

(72) Inventors:
- **BICKERTON, Erica**
  Woking
  Surrey GU24 0NF (GB)
- **KEEP, Sarah**
  Woking
  Surrey GU24 0NF (GB)
- **BRITTON, Paul**
  Devon EX16 8NN (GB)

(74) Representative: **D Young & Co LLP**
120 Holborn
London EC1N 2DY (GB)

(56) References cited:
WO-A1-2011/004146 **WO-A2-2004/092360**
WO-A2-2005/049814

- **V. D. MENACHERY ET AL: "Attenuation and Restoration of Severe Acute Respiratory Syndrome Coronavirus Mutant Lacking 2'-O-Methyltransferase Activity", JOURNAL OF VIROLOGY, vol. 88, no. 8, 29 January 2014 (2014-01-29), pages 4251-4264, XP055215583, ISSN: 0022-538X, DOI: 10.1128/JVI.03571-13**
- **Anonymous: "EM_STD:KF377577", , 30 October 2013 (2013-10-30), XP55216202, Retrieved from the Internet: URL:http://ibis/exam/dbfetch.jsp?id=EM_STD :KF377577 [retrieved on 2015-09-25]**
- **PAUL BRITTON ET AL: "Modification of the avian coronavirus infectious bronchitis virus for vaccine development", BIOENGINEERED, vol. 3, no. 2, 1 March 2012 (2012-03-01), pages 114-119, XP055215793, ISSN: 2165-5979, DOI: 10.4161/bbug.18983**
- **MARIA ARMESTO ET AL: "A Recombinant Avian Infectious Bronchitis Virus Expressing a Heterologous Spike Gene Belonging to the 4/91 Serotype", PLOS ONE, vol. 6, no. 8, 30 August 2011 (2011-08-30) , page e24352, XP055215311, DOI: 10.1371/journal.pone.0024352**
- **MARIA ARMESTO ET AL: "The Replicase Gene of Avian Coronavirus Infectious Bronchitis Virus Is a Determinant of Pathogenicity", PLOS ONE, vol. 4, no. 10, 9 October 2009 (2009-10-09), page e7384, XP055215449, DOI: 10.1371/journal.pone.0007384 cited in the application**

EP 3 172 319 B1

Printed by Jouve, 75001 PARIS (FR)

(Cont. next page)

(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 898 067 B1

(12) EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:
15.01.2020 Bulletin 2020/03

(21) Application number: **13801769.4**

(22) Date of filing: **23.09.2013**

(51) Int Cl.:
C12N 7/00 *(2006.01)* ***C07K 14/005*** *(2006.01)*
A61K 39/215 *(2006.01)*

(86) International application number:
PCT/IB2013/058772

(87) International publication number:
WO 2014/045254 (27.03.2014 Gazette 2014/13)

(54) HUMAN BETACORONAVIRUS LINEAGE C AND IDENTIFICATION OF N-TERMINAL DIPEPTIDYL PEPTIDASE AS ITS VIRUS RECEPTOR

MENSCHLICHE BETACORONAVIRUS-LINIE C UND IDENTIFIZIERUNG VON N-TERMINALER DIPEPTIDYLPEPTIDASE ALS VIRUSREZEPTOR DAVON

LIGNÉE C DE CORONAVIRUS BÊTA HUMAINS ET IDENTIFICATION DE LA PEPTIDASE DIPEPTIDYLIQUE N-TERMINALE EN TANT QUE RÉCEPTEUR VIRAL

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(30) Priority: **23.09.2012 US 201261704531 P**
26.11.2012 US 201261730027 P
04.06.2013 US 201361831070 P

(43) Date of publication of application:
29.07.2015 Bulletin 2015/31

(73) Proprietors:
- **Erasmus University Medical Center Rotterdam**
3015 GE Rotterdam (NL)
- **Dr. Soliman AbdulKhader Fakeeh Hospital Company**
Jeddah (SA)

(72) Inventors:
- **HAAGMANS, Bartholomeus, Leonardus**
NL-3015 GE Rotterdam (NL)
- **BESTEBROER, Theodorus, Marinus**
NL-3015 GE Rotterdam (NL)
- **VAN BOHEEMEN, Sander**
NL-3015 GE Rotterdam (NL)
- **FOUCHIER, Ronaldus, Adrianus, Maria**
NL-3015 GE Rotterdam (NL)
- **OSTERHAUS, Albertus, Dominicus, Marcellinus, Erasmus**
NL-3015 GE Rotterdam (NL)
- **ZAKI, Ali, Moh**
NL-3015 GE Rotterdam (NL)
- **RAJ, Victor, Stalin**
NL-3015 GE Rotterdam (NL)
- **BOSCH, Berend, Jan**
NL-3015 GE Rotterdam (NL)

(74) Representative: **V.O.**
P.O. Box 87930
2508 DH Den Haag (NL)

(56) References cited:
WO-A1-2013/164476

- **Zaki A M: "Novel Coronavirus - Saudi Arabia: Human Isolate", ProMED-mail, Archive Number: 20120920.1302733, 20 September 2012 (2012-09-20), page 1, XP055128128, Retrieved from the Internet: URL:http://www.promedmail.org/direct.php?id=20120920.1302733 [retrieved on 2014-07-10]**
- **DATABASE EMBL [Online] 28 September 2012 (2012-09-28), "Human betacoronavirus 2c EMC/2012, complete genome.", XP002727344, retrieved from EBI accession no. EM_STD:JX869059 Database accession no. JX869059**

EP 2 898 067 B1

Printed by Jouve, 75001 PARIS (FR)

(Cont. next page)

Ethylene oxide

Safety Data Sheet P-4798

This SDS conforms to U.S. Code of Federal Regulations 29 CFR 1910.1200, Hazard Communication.

Issue date: 01/01/1982 Revision date: 07/27/2021 Supersedes: 10/24/2016 Version: 1.0

SECTION: 1. Product and company identification

1.1. Product identifier

Substance name	:	Ethylene oxide
Chemical name	:	Ethylene oxide
CAS-No.	:	75-21-8
Other means of identification	:	Dihydrooxirine, dimethylene oxide, ethene oxide, epoxyethane, oxane, oxacyclopropane, oxidoethane, oxiran, oxirane, 1,2 epoxyethane

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture : Industrial use; Use as directed.

1.3. Details of the supplier of the safety data sheet

Linde Inc.
10 Riverview Drive
Danbury, CT 06810-6268 - USA

1.4. Emergency telephone number

Emergency number : Onsite Emergency: 1-800-645-4633

CHEMTREC, 24hr/day 7days/week
— Within USA: 1-800-424-9300, Outside USA: 001-703-527-3887
(collect calls accepted, Contract 17729)

SECTION 2: Hazard identification

2.1. Classification of the substance or mixture

GHS US classification

Flam. Gas 1	H220
Press. Gas (Liq.)	H280
Acute Tox. 3 (Inhalation:gas)	H331
Skin Irrit. 2	H315
Eye Irrit. 2A	H319
Skin Sens. 1B	H317
Muta. 1B	H340
Carc. 1A	H350
Repr. 1A	H360
STOT RE 1	H372

2.2. Label elements

GHS US labeling

Hazard pictograms (GHS US) :

GHS02 GHS04 GHS06 GHS07 GHS08

Signal word (GHS US) : Danger

Hazard statements (GHS US) :
H220 - EXTREMELY FLAMMABLE GAS
H280 - CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
H315+H320 - CAUSES SKIN AND EYE IRRITATION
H319 - CAUSES SERIOUS EYE IRRITATION
H317 - MAY CAUSE AN ALLERGIC SKIN REACTION
H331 - TOXIC IF INHALED
H335 - MAY CAUSE RESPIRATORY IRRITATION
H340 - May cause genetic defects

* used on nasal swabs for COVID19 tests

Children's Health Defense

May 16, 2021

Division of Dockets Management
Department of Health and Human Services
Food and Drug Administration
Acting Commissioner Janet Woodcock, M.D.
5630 Fishers Lane, Room 1061
Rockville, MD 20852

Dear Acting Commissioner Woodcock:

Enclosed is a Citizen Petition filed on behalf of Children's Health Defense by Meryl Nass, M.D., Scientific Advisory Board member, and Robert F. Kennedy, Jr., Board Chair and Chief Litigation Counsel, requesting that the FDA revoke Emergency Use Authorizations for existing COVID vaccines and refrain from approving and licensing them.

Dr. Nass and Mr. Kennedy look forward to your timely review of this petition. They are available to answer questions and to provide any additional relevant information.

Sincerely yours,

Mary Holland
President and General Counsel
(845) 445-7807
mary.holland@childrenshealthdefense.org

VIA ELECTRONIC FILING

May 16, 2021

Division of Dockets Management
Department of Health and Human Services
Food and Drug Administration
5630 Fishers Lane, Room 1061
Rockville, MD 20852

UNITED STATES DEPARTMENT OF HEALTH AND HUMAN SERVICES AND THE FOOD AND DRUG ADMINISTRATION

PETITION FOR ADMINISTRATIVE ACTION REGARDING COVID-19 VACCINES	Docket No. _____

CITIZEN PETITION

On behalf of Children's Health Defense, the undersigned submit this petition under 21 C.F.R. § 10.20, § 10.30, § 50.23, § 600 – 680, § 601.2; 10 U.S.C. § 1107(f), § 1107a; 21 U.S.C. § 355(i)(4), § 360bbb-3; 42 U.S. Code § 247d; § 564 of the Federal Food, Drug, and Cosmetic Act (FDCA); the Public Readiness and Emergency Preparedness Act; the Public Health Service Act, and § 553(e) of the Administrative Procedures Act.

We request the Acting Commissioner of the Food and Drugs Administration (FDA) to issue, amend, revoke, or refrain from taking the administrative actions listed below regarding emergency use authorizations (EUAs), current and future new drug applications (NDAs), and biologics license applications (BLAs) for all COVID vaccines.

I. ACTIONS REQUESTED

1. FDA should revoke all EUAs and refrain from approving any future EUA, NDA or BLA for any COVID vaccine for all demographic groups because the current risks of serious adverse events or deaths outweigh the benefits, and because existing, approved drugs provide highly effective prophylaxis and treatment against COVID, mooting the EUAs.

2. Given the extremely low risk of severe COVID illness in children, FDA should immediately refrain from allowing minors to participate in COVID vaccine trials, refrain from amending EUAs to include children, and immediately revoke all EUAs that permit vaccination of children under 16 for the Pfizer vaccine and under 18 for other COVID vaccines.

3. FDA should immediately revoke tacit approval that pregnant women may receive any EUA or licensed COVID vaccines and immediately issue public guidance to that effect.

4. FDA should immediately amend its existing guidance for the use of the chloroquine drugs, ivermectin, and any other drugs demonstrated to be safe and effective against COVID, to comport with current scientific evidence of safety and efficacy at currently used doses and immediately issue notifications to all stakeholders of this change.

5. The FDA should issue guidance to the Secretary of the Defense and the President not to grant an unprecedented Presidential waiver of prior consent regarding COVID vaccines for Servicemembers under 10 U.S.C. § 1107(f) or 10 U.S.C. § 1107a.

6. The FDA should issue guidance to all stakeholders in digital and written formats to affirm that all citizens have the option to accept or refuse administration of investigational COVID vaccines without adverse work, educational or other non-health related consequences, under 21 U.S.C. § 360bbb-3(e)(1)(a)(ii)(III) [1] and the informed consent requirements of the Nuremberg Code.[2]

7. Pending revocation of COVID vaccine EUAs, FDA should issue guidance that all marketing and promotion of COVID vaccines must refrain from labeling them "safe and effective," as such statements violate 21 U.S.C. § 360bbb-3.

II. STATEMENT OF GROUNDS

A. Safety

8. Vaccine Adverse Event Reporting System (VAERS) data reveal unprecedented levels of deaths and other adverse events since the FDA issued Emergency Use Authorizations (EUAs) for three COVID vaccines. As of May 10, 2021, VAERS reported 4,434 deaths of people who received at least one COVID vaccination.[3]

9. FDA and CDC have not responded to these data by issuing any warnings or restricting the use of these vaccines. Furthermore, the VAERS database is the only safety database to which the public has access. The government withholds extensive safety information from the public despite having at least ten additional data sources and expert consultants to analyze these data, according to Nancy Messonier, MD, the Director of the National Center for Immunization and Respiratory Diseases.[4] Examples include databases from the Centers for Medicare and

---

[1] 21 U.S.C. § 360bbb-3, Authorization for medical products for use in emergencies, https://www.govinfo.gov/content/pkg/USCODE-2011-title21/pdf/USCODE-2011-title21-chap9-subchapV-partE-sec360bbb-3.pdf.

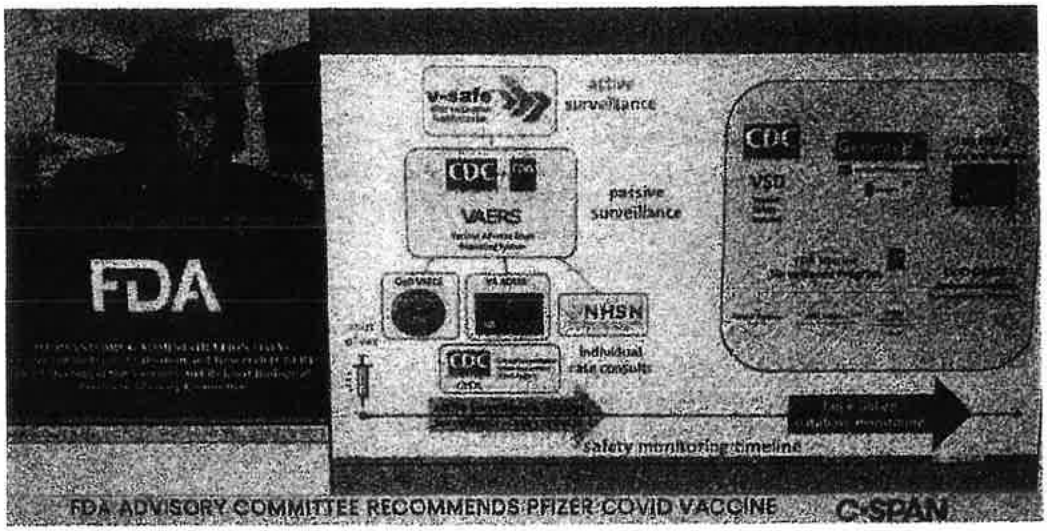
[2] Nuremburg Code, BRITISH MEDICAL JOURNAL, No. 7070, Volume 313, p. 1448 (Dec. 7, 1996), https://media.tghn.org/medialibrary/2011/04/BMJ_No_7070_Volume_313_The_Nuremberg_Code.pdf.

[3] VAERS Vaccine Adverse Event Reporting System data, available at https://vaers.hhs.gov/.

[4] FDA meeting on COVID 19 and Emergency Use Authorization, Part 1 (Video), Dec. 10, 2020, available at https://www.c-span.org/video/?507053-1/fda-meeting-covid-19-vaccine-emergency-authorization-part-1.

Medicaid, the Veterans Administration, the Defense Department (DMSS), the Vaccine Safety Datalink and the "Genesis" database, which is operated in cooperation with the National Institutes of Health and Brown University and includes 250 long-term care facilities and 35,000 residents.

10. Dr. Messonier told the FDA and its Vaccines and Related Biological Products Advisory Committee (VRBPAC) on December 10, 2020 that it had 11 systems that would evaluate COVID vaccine safety. Five systems would be active at the start of the vaccine program, and an additional six systems would become active over ensuing weeks. She said that the VAERS system was being enhanced for long-term care facilities, and added, "Hopefully you'll understand how robust these systems are." Below is the graphic she presented to the VRBPAC and the public on December 10, 2020.



11. The CDC website, updated on May 11, 2021 states, "These vaccines have undergone and will continue to undergo the most intensive safety monitoring in U.S. history. This monitoring includes using both established and new safety monitoring systems to make sure that COVID-19 vaccines are safe."[5]

12. The CDC website states that "CDC and FDA physicians review each case report of death as soon as notified and CDC requests medical records to further assess reports."[6] By contrast, a CDC official told a reporter for *The Daily Beast* that it lacks a "good way to track deaths that occur after vaccination in real time." Furthermore, CDC told the reporter, "there are no current plans to include vaccination data in the current CDC Covid-19 mortality analysis."[7]

---

[5] CDC, *Safety of COVID-19 Vaccines* (updated May 11, 2021), https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/safety-of-vaccines.html.

[6] CDC, *Selected Adverse Events Reported after COVID-19 Vaccination* (updated May 11, 2021), https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/adverse-events.html.

[7] Erin Banco, *White House asks CDC to study how many have died after COVID vaccine shots*,

13. Children's Health Defense asked CDC for information on post-vaccination deaths and injuries in early March 2021 and has yet to receive a response.[8]

14. Normally, licensed biologics manufacturers review adverse event reports pursuant to 21 C.F.R. § 600.80, while to date the CDC and the manufacturers appear to dispute most causal links to COVID vaccines. Any COVID vaccine license applicant "assumes responsibility for compliance with the applicable product and establishment standards" according to 21 C.F.R. § 600.3.[9] CDC asserts that a "review of available clinical information, including death certificates, autopsy, and medical records has not established a causal link to COVID-19 vaccines," yet recent assessments acknowledge "a plausible causal relationship between the J&J/Janssen COVID-19 vaccine and a rare and serious adverse event—blood clots with low platelets—which has caused deaths."[10] Denmark, among other nations, has banned the EUA J&J/Janssen COVID vaccine, stating, "the benefits of using the COVID-19 vaccine from J&J do not outweigh the risk of causing possible adverse effect in those who receive the vaccine."[11]

15. CDC calculated rates of adverse effects for anaphylaxis post-vaccination improperly, using VAERS reports as the numerator, even though CDC officials have acknowledged "it is not possible to use VAERS data to calculate how often an adverse event occurs in a population."[12] When Massachusetts General-Brigham hospitals evaluated the rate of anaphylaxis in employees post COVID vaccination, they found anaphylaxis rates approximately 50-100 times greater than the rates CDC calculated using VAERS data. (Pfizer rate 2.7/10,000 vaccinees and Moderna rate 2.3/10,000 vaccinees).[13] Anaphylaxis after vaccination has led to deaths. If this degree of underestimation holds true for other adverse events using the VAERS database, then the safety of COVID vaccines is considerably worse than it currently appears. This rate could be verified by querying the ten databases whose results have been hidden from the

---

DAILY BEAST (Jan. 28, 2021), https://www.thedailybeast.com/white-house-asks-cdc-to-study-how-many-have-died-after-covid-vaccine-shots.

[8] Megan Redshaw, *64 Days and Counting — Why Won't the CDC Answer Our Questions?* THE DEFENDER (May 11, 2021), https://childrenshealthdefense.org/defender/64-days-why-wont-cdc-answer-questions/.

[9] Code of Federal Regulations Title 21 § 600.3, https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/cfrsearch.cfm?fr=600.3.

[10] CDC, *Selected Adverse Events Reported after COVID-19 Vaccination* (updated May 11, 2021), https://www.cdc.gov/coronavirus/2019-ncov/vaccines/safety/adverse-events.html.

[11] Vincent West, *Denmark ditches J&J COVID-19 shots from vaccination programme*, REUTERS (May 3, 2021), https://www.reuters.com/world/europe/denmark-excludes-jj-shot-vaccine-programme-local-media-reports-2021-05-03/.

[12] CDC, Vaccine Adverse Event Reporting System (VAERS), https://www.cdc.gov/vaccinesafety/ensuringsafety/monitoring/vaers/index.html.

[13] Blumenthal K. G., Robinson L. B., Camargo C. A., et al., *Acute Allergic Reactions to mRNA COVID-19 Vaccines*. JAMA, Vol. 325, No. 15, pp. 1562–1565 (Mar. 8, 2021), https://jamanetwork.com/journals/jama/fullarticle/2777417.

public.

16. Other problems with vaccine safety assessment may exist because of inadequate animal toxicology and pharmacokinetic studies of COVID vaccines. Animal experiments failed to measure the quantity, duration and organ distribution of spike protein production. The animal experiments, incomprehensibly, failed to inject the actual vaccine to be tested during certain pharmacokinetic and toxicology tests. For example, in study 2.6.5.5B, only 2 of the 4 lipid nanoparticle (LNP) components were labeled and injected into rats, and their distribution and persistence in many organs were assessed at animal necropsy, from 15 minutes to 48 hours post-injection. For most organs, at 48 hours the amount of the two LNP components in each organ was still increasing. Thus, the ultimate distribution and persistence of the LNPs are unknown. And we have no information regarding duration and persistence of the mRNA or spike protein production in organs based on this study.[14]

17. A surrogate for mRNA (coding for spike protein) was an entirely different mRNA (coding for luciferase) in LNP injected into mice. In study 2.6.5.5A, bioluminescence was measured in liver through 9 days as a surrogate measure, while no attempt was made to evaluate the presence of spike protein in animal tissues, including in the brains of the experimental animals.[15] These surprising omissions have significant potential safety implications.

18. Given that only 1 to 13% of adverse reactions have been reported to the FDA and CDC via the VAERS passive reporting system, according to Lazarus et al., the high number of adverse events and deaths following COVID vaccines is alarming.[16] While the Pfizer vaccine has now been used for five months and administered to more than 60 million Americans, FDA has issued no new guidance about the vaccine based on these troubling data, apart from expanding its use in children.

19. The FDA must be aware that the only avenue for an injured party to claim benefits as a result of a COVID vaccine injury is the Countermeasures Injury Compensation Program (CICP).[17] The CICP requires petitioners to prove that the COVID vaccine caused their injuries; the program has an extremely short statute of limitations of one year. If the FDA, working with

---

[14] Study 2.6.5.5.B Pharmacokinetics: Organ Distribution. SARS-CoV-2 mRNA Vaccine (English Portion) (BNT162, PF-07302048), pp. 15-18, https://www.pmda.go.jp/drugs/2021/P20210212001/.

[15] *Id.*

[16] *See* Lazarus et al., *Electronic Support for Public Health-Vaccine Adverse Event Reporting System*, AGENCY FOR HEALTHCARE RESEARCH AND QUALITY, DEPT. OF HEALTH AND HUMAN SERVICES (Sept. 30, 2010), https://digital.ahrq.gov/ahrq-funded-projects/electronic-support-public-health-vaccine-adverse-event-reporting-system; Shimabukuro et al., *Safety monitoring in the Vaccine Adverse Event Reporting System (VAERS)*, VACCINE (Nov. 4, 2015), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4632204/; S. Rosenthal and R. Chen, *The reporting sensitivities of two passive surveillance systems for vaccine adverse events*, AM J PUBLIC HEALTH (Dec. 1995), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1615747/.

[17] Health and Human Services Administration, *Countermeasures Injury Compensation Program (CICP)*, https://www.hrsa.gov/cicp.

the vaccine manufacturers, does not compile and publish an accurate list of adverse reactions, which is required for licensing, then these petitioners will have virtually no opportunity to prove injury or receive compensation.

B. Effectiveness

20. As with safety data on COVID vaccines, effectiveness data continue to evolve. Recently CDC acknowledged "vaccine breakthrough cases" where vaccinated subjects fall ill and potentially transmit the virus. CDC acknowledges that a "small percentage of people who are fully vaccinated against COVID-19 will still get sick and some may be hospitalized or die from COVID-19. It's also possible that some fully vaccinated people might have infections, but not have symptoms (asymptomatic infections)."[18]

21. As of April 26, 2021, CDC reported over 9,000 "breakthrough cases" and 132 COVID-caused deaths among vaccinated people.[19] CDC tracks reports of breakthrough cases via the National Notifiable Diseases Surveillance System (NNDSS)[20] and has recently stopped reporting breakthrough cases absent death or hospitalization.[21] The British government has also identified efficacy problems stating, "The resurgence in both hospitalisations and deaths is dominated by those that have received two doses of the vaccine, comprising around 60% and 70% of the wave respectively."[22]

22. The U.K. data modelers attribute these rates to the high level of vaccine uptake in the most at-risk elderly age group.[23] Overall, the U.K. believes "evidence shows vaccines are ***sufficiently*** effective in reducing hospitalisations and deaths in those vaccinated."[24] The U.K. caveat "sufficiently" is significant compared to the unqualified "effective" label that the FDA currently permits to be communicated to the public.

---

[18] CDC, *What You Should Know About the Possibility of COVID-19 Illness After Vaccination*; (updated April 21, 2021), https://www.cdc.gov/coronavirus/2019-ncov/vaccines/effectiveness/why-measure-effectiveness/breakthrough-cases.html.

[19] CDC, *COVID-19 Breakthrough Case Investigations and Reporting* (updated April 30, 2021), https://www.cdc.gov/vaccines/covid-19/health-departments/breakthrough-cases.html.

[20] CDC, *National Notifiable Diseases Surveillance System* (*NNDSS*), https://wwwn.cdc.gov/nndss/.

[21] CDC, *COVID-19 Breakthrough Case Investigations and Reporting* (April 30, 2021), https://www.cdc.gov/vaccines/covid-19/health-departments/breakthrough-cases.html.

[22] *SPI-M-O: Summary of further modelling of easing restrictions – Roadmap Step 2*, p. 10 (Mar. 31, 2021), https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/975909/S1182_SPI-M-O_Summary_of_modelling_of_easing_roadmap_step_2_restrictions.pdf.

[23] *Id.*

[24] GOV.UK; *COVID-19 Response-Spring 2021* (*Summary*) (Feb. 22, 2021), https://www.gov.uk/government/publications/covid-19-response-spring-2021/covid-19-response-spring-2021-summary.

C. Misbranding as "Safe, Effective and FDA Approved"

23. Recently the FDA sent a warning letter "RE: Unapproved and Misbranded Products Related to Coronavirus Disease 2019 (COVID-19)."[25] FDA warned that labeling COVID therapies as Safe, Effective or FDA Approved when they are not proven to be so by FDA standards violates § 505(a) of the FDCA, 21 U.S.C. § 355(a). The same standard should apply to COVID vaccines, as any such products are misbranded drugs and violate § 502 of the FDCA and 21 U.S.C. § 352.

24. The introduction or delivery for introduction of any such product into interstate commerce is prohibited under § 301(a) and (d) of the FDCA and 21 U.S.C. § 331(a) and (d). The FDA specifically warned a vendor: "We advise you to review your websites, product labels, and other labeling and promotional materials to ensure that you are not misleadingly representing your products as *safe and effective* for a COVID-19-related use for which they have *not been approved* by FDA and that you do not make claims that misbrand the products in violation of the FD&C Act."

25. FDA must ensure against misrepresenting COVID vaccine products as "safe and effective" when FDA has not so designated them. FDA's description of COVID vaccines pursuant to § 564(d)(3) of the Act states: "based on the totality of scientific evidence available to FDA…it is reasonable to believe that Pfizer-BioNTech COVID-19 Vaccine *may be effective* in preventing COVID-19 when used in accordance with this Scope of Authorization (Section II), pursuant to Section 564(c)(2)(A) of the Act." The FDA language on effectiveness provides a qualification similar to the above-mentioned U.K. regulatory language. FDA's precise technical language to manufacturers does not match its unequivocal "effective" claims on official government websites, including that of the CDC, as illustrated below.[26]

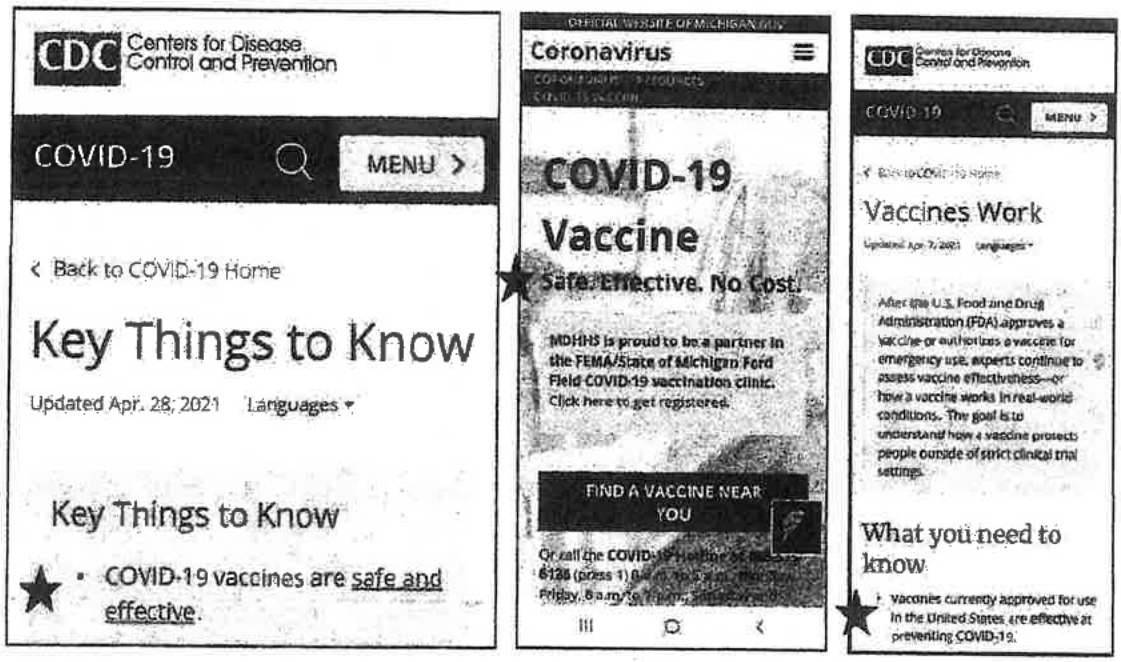
---

[25] FDA, *Warning Letter to Mercola.com, LLC* (Feb. 18, 2021), https://www.fda.gov/inspections-compliance-enforcement-and-criminal-investigations/warning-letters/mercolacom-llc-607133-02182021.

[26] CDC, *Key things to know about COVID-19 vaccines* (May 10, 2021), https://www.cdc.gov/coronavirus/2019-ncov/vaccines/keythingstoknow.html;

CDC, *Safety of COVID-19 vaccines* (udated May 11, 2021), https://www.cdc.gov/coronavirus/2019- ncov/vaccines/safety/safety-of-vaccines.html;

FDA, *Letter to Pfizer* (May 10, 2021), https://www.fda.gov/media/144412/download.



D. EUA revocation, additional EUAs, and off-label use clarification for COVID therapies

26. On February 4, 2020 the Secretary of the Department of Health and Human Services (HHS) determined that there is a public health emergency that has a significant potential to affect national security or the health and security of United States citizens living abroad and that involves the virus that causes Coronavirus Disease (COVID-19). Based on this determination, the Secretary on March 27, 2020 declared that circumstances justify emergency use of drugs and biological products during the COVID-19 pandemic pursuant to § 564 of the FDCA (21 U.S.C. § 360bbb-3).

27. Since December 2020, several manufacturers have received EUAs for COVID vaccines. One of the criteria for these authorizations, beyond the existence of an emergency, is that there are "no adequate, approved, and available alternatives."[27] Many medical professionals and elected officials have objected to the inconsistent handling of EUAs for alternative treatments. Dr. Peter McCullough testified to the Texas Senate on March 10, 2021 that an 85% lower mortality rate from COVID would have been possible if government agencies had publicly recommended

[27] FDA, *Emergency Use Authorization* (updated May 11, 2021), https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization;

FDA, *FAQs on Emergency Use Authorizations (EUAs) for Medical Devices During the COVID-19 Pandemic* (updated April 23, 2021), https://www.fda.gov/medical-devices/coronavirus-disease-2019-covid-19-emergency-use-authorizations-medical-devices/faqs-emergency-use-authorizations-euas-medical-devices-during-covid-19-pandemic.

early treatments.[28] Now that COVID cases and deaths are decreasing because many if not most Americans are immune, the relative benefit of COVID vaccines has diminished.[29]

28. Three U.S. Senators asked the FDA to clarify why it revoked the previously granted EUAs for hydroxychloroquine (HCQ) and chloroquine (CQ) and under what authority it regulates the practice of medicine. The Senators also asked what authority states have to regulate the prescribing and dispensing of drugs.[30] FDA issued and revoked EUAs for HCQ and CQ donated to the Strategic National Stockpile in a way that confused medical professionals, resulting in their reluctance to prescribe the drugs, including those not under EUA. FDA improperly recommended against the use of chloroquine drugs in outpatients, and against early treatment, which is when these antiviral drugs are likely to be effective. FDA appears to have collaborated with officials in dozens of states and even with certain pharmaceutical and pharmacy companies to restrict the prescribing and dispensing of chloroquine drugs against COVID. These unprecedented actions require explanation. The FDA must immediately revoke its recommendations for the limited use and withholding of these drugs during a life-threatening pandemic and must publicize its revocation widely.

29. Medical professionals also question FDA's approval of Investigational New Drug (IND) human trials performed by the University of Pittsburg (REMAP-COVID)[31] and the University of Philadelphia (PATCH)[32] using knowingly borderline lethal doses of HCQ in humans. There were more deaths in the HCQ arm than in the control arm of the REMAP-COVID study and in the other two large multicenter studies, the Solidarity and Recovery studies, that used excessive doses. The PATCH study ended after enrolling only 5 subjects.

30. In other FDA guidance regarding the chloroquine drugs, FDA made the misleading claim that "Hospitalized patients were likely to have greater prospect of benefit (compared to

---

[28] Dr. Peter McCullough's testimony to the Texas Senate HHS Committee (Mar. 10, 2021), https://www.youtube.com/watch?v=QAHi3lX3oGM.

[29] Dr. Peter McCullough et al., *SARS-CoV-2 mass vaccination: Urgent questions on vaccine safety 2 that demand answers from international health agencies, regulatory 3 authorities, governments and vaccine developers* (May 8, 2021), https://www.andrewbostom.org/wp-content/uploads/2021/05/Bruno-et-al.-Vaccine-Safety-Urgent-Manuscript-Preprint-May-8-2021.pdf.

[30] Senators Ted Cruz, Mike Lee, Ron Johnson, *Letter to FDA Commissioner Stephen Hahn* (Aug. 18, 2020), https://www.hsgac.senate.gov/imo/media/doc/2020-08-18%20RHJ%20Letter%20to%20FDA%20on%20HCQ%20+%20CQ.pdf.

[31] UNIVERSITY OF PITTSBURG, Department of Critical Care, *UPMC Leads Global Efforts to Fast-track COVID-19 Therapies*, https://www.ccm.pitt.edu/node/1110.

[32] *Penn Launches Trial to Evaluate Hydroxychloroquine to Treat, Prevent COVID-19*, PENN MEDICINE NEWS (April 3, 2020), https://www.pennmedicine.org/news/news-releases/2020/april/penn-launches-trial-to-evaluate-hydroxychloroquine-to-treat-prevent-covid19;

The PATCH Trial (Prevention And Treatment of COVID-19 With Hydroxychloroquine) (PATCH), CLINICALTRIALS.GOV (updated Dec. 10, 2020), https://clinicaltrials.gov/ct2/show/NCT04329923.

ambulatory patients with mild illness)," and that chloroquine drugs have a "slow onset of action." In its justification for restricting the use of chloroquine drugs, FDA also opined that "it is no longer reasonable to believe that oral formulations of HCQ and CQ may be effective in treating COVID-19, nor is it reasonable to believe that the known and potential benefits of these products outweigh their known and potential risks."[33]

31. These claims fly in the face of substantial evidence of positive effects of the drugs when used early in the disease at usual, approved, therapeutic doses. FDA has chosen to ignore the many trials that were properly conducted. The FDA buttresses its contention of the dangers of these drugs based in part on the FDA-approved trial and other trials that administered excessive, non-therapeutic doses of HCQ and resulted in more deaths in the treated group than the placebo group.

32. Similarly, FDA exhibited bias regarding the effective and safe use of ivermectin for prophylactic use of COVID. In March 2021, the agency stated: "The FDA has not reviewed data to support use of ivermectin in COVID-19 patients to treat or to prevent COVID-19; however, some initial research is underway."[34] Yet already on April 10, 2020, FDA had issued a public warning against the use of ivermectin because, it claimed, Americans were purchasing over the counter (OTC) veterinary ivermectin as a COVID treatment.[35] Research from Australia had been published online a week earlier, on April 3, 2020, supporting use of ivermectin for COVID based on in vitro studies.[36]

33. Thus, FDA was aware at least 13 months ago that Americans were using ivermectin to treat and prevent COVID. How could FDA not have reviewed data on ivermectin during an entire year after it was informed about this use? That was a year during which dozens of studies about the drug's use were available as publications or preprints for both prophylaxis and treatment; during which there was a Senate hearing on the drug; and during which half a million Americans died from the disease, who had not been treated with effective medications because of FDA guidance.

34. Furthermore, ivermectin has been used OTC for COVID in many countries and regions with excellent reported treatment success. The drug's safety has been established with at

---

[33] FDA Letter revoking EUA for Hydroxychloroquine (Jun. 15, 2020), https://www.fda.gov/media/138945/download.

[34] FDA, *Why You Should Not Use Ivermectin to Treat or Prevent COVID-19* (updated May 10, 2021), https://www.fda.gov/consumers/consumer-updates/why-you-should-not-use-ivermectin-treat-or-prevent-covid-19.

[35] FDA Letter to Stakeholders, *Do Not Use Ivermectin Intended for Animals as Treatment for COVID-19 in Humans* (April 10 2020), https://www.fda.gov/animal-veterinary/product-safety-information/fda-letter-stakeholders-do-not-use-ivermectin-intended-animals-treatment-covid-19-humans.

[36] Leon Caly, Julian D. Druce, *The FDA-approved drug ivermectin inhibits the replication of SARS-CoV-2 in vitro*, ANTIVIRAL RESEARCH, vol. 178, 104787 (Jun. 2020), https://reader.elsevier.com/reader/sd/pii/S0166354220302011.

least a billion doses used, and the drug is on the World Health Organization's list of essential drugs.

35. Many medical professionals suspect FDA's feigned ignorance about the drug was a prerequisite to issuing EUAs for COVID vaccines, given the EUA requirement that no approved drug may be available for the same indication. Ivermectin and hydroxychloroquine, both of which have extremely long biological half lives, can be given infrequently as prophylaxis for COVID. Hydroxychloroquine or chloroquine are used weekly to prevent malaria, and they have been used in the same way to prevent COVID. Ivermectin can be used once or twice yearly to prevent river blindness (onchocerciasis), and it has been used weekly or bi-weekly to prevent COVID. Many clinical trials have documented the benefits of both drugs for COVID prevention. Yet FDA has remained silent about these benefits, even though the efficacy of these preventive treatments probably supercedes that of COVID vaccines.

36. This petition encourages FDA to expeditiously evaluate existing ivermectin research and issue accurate guidance for its use against COVID, e.g., where "18 randomized controlled treatment trials of ivermectin in COVID-19 have found large, statistically significant reductions in mortality, time to clinical recovery, and time to viral clearance."[37] Additional studies have found it highly effective for both pre- and post-exposure prophylaxis of COVID.[38]

37. Finally, reflecting on the FDA's regulatory history is helpful: A proven association between the 1976–1977 swine influenza vaccine and approximately 400 cases of Guillain–Barré syndrome halted that particular national vaccination campaign.[39] The reported deaths following

---

[37] P. Kory, G. Meduri et al., *Review of the Emerging Evidence Demonstrating the Efficacy of Ivermectin in the Prophylaxis and Treatment of COVID-19*, AMERICAN JOURNAL OF THERAPEUTICS (May-Jun 2021), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8088823/.

Ahmed, Sabeena et al., *A five-day course of ivermectin for the treatment of COVID-19 may reduce the duration of illness*, INTERNATIONAL JOURNAL OF INFECTIOUS DISEASES, vol. 103, pp. 214-216 (Feb. 2021), https://pubmed.ncbi.nlm.nih.gov/33278625/;

Jans D. A. and Wagstaff K. M., *The broad spectrum host-directed agent ivermectin as an antiviral for SARS-CoV-2*? BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 538, pp. 163-172 (2021), https://pubmed.ncbi.nlm.nih.gov/33341233/.

Formiga, Fabio Rocha et al., *Ivermectin: an award-winning drug with expected antiviral activity against COVID-19*, JOURNAL OF CONTROLLED RELEASE, vol. 329, pp. 758-761 (Jan. 2021), https://pubmed.ncbi.nlm.nih.gov/33038449/.

Bhowmick, Subhrojyoti et al., *Safety and Efficacy of Ivermectin and Doxycycline Monotherapy and in Combination in the Treatment of COVID-19: A Scoping Review*, DRUG SAFETY, pp. 1-10 (Apr. 16, 2021), https://pubmed.ncbi.nlm.nih.gov/33864232/.

[38] *Ivermectin for COVID-19: real-time meta analysis of 55 studies*, COVID ANALYSIS (version 81, May 15, 2021), https://ivmmeta.com/.

[39] *See* CDC, H1N1 Flu, FACT SHEET: GUILLAIN- BARRÉ SYNDROME (GBS) (Dec. 15, 2009), https://www.cdc.gov/h1n1flu/vaccination/factsheet_gbs.htm#:~:text=Getting%20GBS%20from%20a%20vaccination,got%20the%20swine%20flu%20vaccine.

that swine flu vaccination campaign, 30 out of 40-45 million vaccinees,[40] were insignificant compared to the current reported death toll of 4,434 due to COVID vaccines, Today's death rate is more than 50 times higher than that which ended the swine flu vaccine campaign.

38. Regarding the halted swine flu vaccine program, the CDC's *Emerging Infectious Diseases Journal* concluded, "In 1976, the federal government wisely opted to put protection of the public first."[41] FDA should learn from this past experience and again put protection of the public first. It is imperative that the FDA swiftly take action to authorize alternative treatments.

E. Children

39. According to the National Center for Health Statistics data as of May 5, 2021, 282 children have died "involving COVID," whereas over 560,000 Americans have died "involving COVID."[42] Three thousand children have been diagnosed with a multi-system inflammatory disorder, of whom about 1%, or approximately 30, have died. Thus the relative risk for children due to COVID is very low.

40. By contrast, recent VAERS reports include the deaths of several children following COVID vaccination.[43] Five of the child death reports footnoted below involve apparent cardiac related deaths, and two were infants. There is one reported death in a 15 year old after receiving the Pfizer BioNTech vaccine, and another reported death of a 15 year old after receiving a Moderna

---

[40] Rick Perlstein, *Gerald Ford Rushed Out a Vaccine. It Was a Fiasco*, THE NEW YORK TIMES (Sept. 2, 2020), https://www.nytimes.com/2020/09/02/opinion/coronavirus-vaccine-trump.html; Donald G. McNeil, Jr., *Don't Blame Flu Shots for All Ills, Officials Say*, THE NEW YORK TIMES (Sept 27, 2009), https://www.nytimes.com/2009/09/28/health/policy/28vaccine.html.

[41] Sencer D. J., Millar J., *Reflections on the 1976 Swine Flu Vaccination Program*, EMERGING INFECTIOUS DISEASES, Vol. 12, No. 1, pp. 29-33 (Jan. 2006), https://wwwnc.cdc.gov/eid/article/12/1/05-1007_article.

[42] CDC, *Weekly Updates by Select Demographic and Geographic Characteristics*, Provisional Death Counts for Coronavirus Disease 2019 (COVID-19) (updated May 12, 2021), https://www.cdc.gov/nchs/nvss/vsrr/covid_weekly/index.htm#SexAndAge.

[43] VAERS reports include:

A 1-year-old, https://medalerts.org/vaersdb/findfield.php?IDNUMBER=1261766&WAYBACKHISTORY=ON;

a 2-year-old, https://medalerts.org/vaersdb/findfield.php?IDNUMBER=1255745&WAYBACKHISTORY=ON;

two 15-year-olds, https://www.medalerts.org/vaersdb/findfield.php?IDNUMBER=1187918 and https://www.medalerts.org/vaersdb/findfield.php?IDNUMBER=1242573;

two 16-year-olds, https://www.medalerts.org/vaersdb/findfield.php?IDNUMBER=1225942;

a 17-year old, https://www.openvaers.com/openvaers/1199455;

and an infant, https://www.medalerts.org/vaersdb/findfield.php?IDNUMBER=1166062.

vaccine. Each child must have been enrolled in a clinical trial, since their ages would have precluded them getting the vaccine legally under the EUA. There were only about 1,000 children in the 12-15 year age group in the vaccine arm of Pfizer's trial and probably about the same number in the vaccine arm of Moderna's trial. Thus, the death rate following either vaccination in this age group, assuming these children were trial enrollees, is approximately 2 in 2,000 or 0.1%.

41. There are 74 million children in the United States. So far, 282 have died "involving Covid." Two hundred eighty-two in 74 million is a rate of 0.00038%. While many children may not have been exposed to COVID, CDC estimated that 22.2 million children aged 5-17 had had COVID and 127 had died, at the May 12, 2021 meeting of the Advisory Committee on Immunization Practices, or 0.00057%.[44] Available evidence strongly suggests that the vaccine is much more dangerous to children than the disease.

42. A recent opinion piece in the *British Medical Journal* noted that "the likelihood of severe outcomes or death associated with COVID-19 infection is very low for children, undermining the appropriateness of an emergency use authorization for child covid-19 vaccines."[45] The authors also suggested child vaccinations could strategically harm vaccination efforts and increase vaccine hesitancy.[46]

F. Servicemembers' Prior Consent

43. Certain citizens and elected officials have recently encouraged the President of the United States to waive U.S. Servicemembers' right to prior consent for COVID vaccines.[47] According to 10 U.S.C. §1107(f), only the President of the United States may order such a waiver if he determines, in writing, that obtaining consent is not in the national security interest. The intent of any waiver of consent must be related to a member's participation in a "particular military operation," as opposed to the broad sweep some are encouraging.

44. Such a waiver is only permissible when obtaining prior consent is infeasible or contrary to the best interests of the military member. Clearly, prior consent for current servicemembers is feasible for COVID vaccines.[48] Because the President's authority is contingent on the standards set forth in § 505(i)(4) of the FDCA and 21 U.S.C. § 355(i)(4), and since the chain of command requires consultation with HHS, the FDA may issue guidance to the President on this

---

[44] Helen Branswell, *CDC advisory group gives green light to Pfizer's Covid vaccine for adolscents*," STAT (May 12, 2021), https://www.statnews.com/2021/05/12/cdc-advisory-group-gives-green-light-to-pfizers-covid-vaccine-for-adolescents/.

[45] W. Pegden, V. Prasad, S. Baral, *Covid vaccines for children should not get emergency use authorization*, BMJ (May 7, 2021), https://blogs.bmj.com/bmj/2021/05/07/covid-vaccines-for-children-should-not-get-emergency-use-authorization/.

[46] *Id.*

[47] Jimmy Panetta, *Letter to President Biden* (Mar. 24, 2021), https://www.documentcloud.org/documents/20521870-panetta_dod-covid-vaccine-waiver.

[48] 21 U.S.C. § 50.23: Exception from general requirements, https://www.ecfr.gov/cgi-bin/text-idx?node=se21.1.50_123&rgn=div8.

matter.[49]

45. The specific law on EUA vaccines was codified in 10 U.S.C. § 1107a.[50] The § 1107a language is similar to § 1107(f) to ensure that troops are granted prior consent and have the "option to accept or refuse administration of a product." National leaders should continue to honor and respect servicemembers' rights. No President has ever waived servicemembers' prior consent under 10 U.S.C. § 1107(f) or 10 U.S.C. § 1107a, and FDA should advise that current circumstances do not warrant such drastic action.

G. Coercion and Compulsion

46. COVID vaccines are optional in accordance with 21 C.F.R. § 360bbb-3(e)(1)(a) as EUA products.[51] Yet throughout the United States, schools, businesses, government and industry are using coercive tactics to encourage, incentivize and compel COVID vaccination as a condition of employment, education and daily living. It is unlikely that most Americans would support such coercion if they were fully informed that COVID vaccines are for emergency use only, investigational, unapproved, and that individuals have the explicit right to refuse by law. Some states are considering or have approved legislation or executive action to bar vaccine mandates.[52] Some professional medical associations also have expressed opposition to these coercive tactics.[53]

47. Coercion and compulsory vaccination are inconsistent with the legal requirements to inform both healthcare workers administering EUA vaccines and vaccine recipients of the significant known and unknown benefits and risks of such use. Most importantly, the FDA must ensure all parties are aware of the "option to accept or refuse" administration of all EUA products and that alternatives are available. These disclosure requirements are entirely inconsistent with coercion, and government agencies should not publish information that violates the law. Information on the government websites of the Equal Employment Opportunity Commission

---

[49] *Id.*

[50] 10 U.S.C. § 1107a - Emergency use products, https://www.govinfo.gov/app/details/USCODE-2010-title10/USCODE-2010-title10-subtitleA-partII-chap55-sec1107a/summary.

[51] § 360bbb–3. Authorization for medical products for use in emergencies, https://www.govinfo.gov/content/pkg/USCODE-2011-title21/pdf/USCODE-2011-title21-chap9-subchapV-partE-sec360bbb-3.pdf.

[52] Pearson L., Brofsky J., et al., *50-state Update on Pending Legislation Pertaining to Employer-mandated Vaccination*, HUSCH BLACKWELL (updated April 20, 2021), https://www.huschblackwell.com/newsandinsights/50-state-update-on-pending-legislation-pertaining-to-employer-mandated-vaccinations.

[53] Dr. Paul M. Kempen, *Open Letter from Physicians to Universities: Allow Students Back Without COVID Vaccine Mandate*, ASSOCIATION OF AMERICAN PHYSICIANS AND SURGEONS (Apr. 24, 2021), https://aapsonline.org/open-letter-from-physicians-to-universities-reverse-covid-vaccine-mandates/.

(EEOC)[54] and the Occupational Safety and Health Administration (OSHA)[55] in fact ignore these federal disclosure requirements.

48. The armed forces' experience with the very first EUA vaccine mandate against anthrax is instructive.[56] The military now administers the anthrax vaccine on a voluntary basis with informed consent, but only after a federal court halted the mandatory anthrax vaccine program because the FDA had improperly issued a license.[57]

49. The only language in the EUA law, 21 U.S.C. § 360bbb-3(e)(1)(A)(ii)(I-III), that could possibly be construed to imply mandates is the term "consequences" in clause III. Both statutory analysis and legislative history suggest that it is far more likely that this term applies to health-related consequences only, i.e., medical risks and benefits, since that is the topic of that statute section and because it does not refer to punitive measures or consequences, such as termination of employment or education.[58]

50. Another hazard of coercive policies and broad liability for industry is reliance on subpar manufacturers. One of the COVID vaccine manufacturing subcontractors today, Emergent BioSolutions, is the same company, with the same President and Board Chairman, which the FDA cited under its previous name, BioPort, for numerous violations of Good Manufacturing Practices.[59] The image below, taken from an FDA form in 2000, shows the citation to BioPort for

---

[54] EEOC, *What You Should Know About COVID-19 and the ADA, the Rehabilitation Act, and Other EEOC Laws*, §§ K1 & K7 (updated Dec. 16, 2020), https://www.eeoc.gov/wysk/what-you-should-know-about-covid-19-and-ada-rehabilitation-act-and-other-eeo-laws.

[55] Jeff Yoders, *OSHA Imposes New Guidance For Employer-Required COVID-19 Vaccines*, ENR (May 3, 2021), https://www.enr.com/articles/51691-osha-imposes-new-guidance-for-employer-required-covid-19-vaccines.

[56] FDA, *Anthrax Vaccine Adsorbed (AVA) EUA –ARCHIVED INFORMATION*, https://www.fda.gov/emergency-preparedness-and-response/mcm-legal-regulatory-and-policy-framework/emergency-use-authorization-archived-information#anthrax.

[57] *Determination and Declaration Regarding Emergency Use of Anthrax Vaccine Adsorbed for Prevention of Inhalation Anthrax*, FEDERAL REGISTER (Feb. 2, 2005), https://www.federalregister.gov/documents/2005/02/02/05-2027/determination-and-declaration-regarding-emergency-use-of-anthrax- vaccine-adsorbed-for-prevention-of?fbclid=IwAR22J58y3SQ2tVoEUlNgZVU-PmRxoou0P05i9WqS4SUiOcj9HyaiUJ8Dvrg.

[58] Parasidis E., Kesselheim A. S., *Assessing The Legality Of Mandates For Vaccines Authorized Via An Emergency Use Authorization*, HEALTH AFFAIRS (Feb. 16, 2021), https://www.healthaffairs.org/do/10.1377/hblog20210212.410237/full/.

[59] Richard Luscombe, *Emergent chief sold $10m in stock before company ruined 15m Covid vaccines*, THE GUARDIAN (Apr. 26, 2021), https://www.theguardian.com/business/2021/apr/26/emergent-biosolutions-robert-kramer-stock-covid-vaccines-error.

deviations from acceptable manufacturing standards for vaccines.

DEPARTMENT OF HEALTH AND HUMAN SERVICES PUBLIC HEALTH SERVICE FOOD AND DRUG ADMINISTRATION	CBER/OCBQ 1401 Rockville Pike, HFM-604, Suite 200N Rockville, MD 20852 (301) 827-6191	
NAME OF INDIVIDUAL TO WHOM REPORT ISSUED TO: ROBERT G. KRAMER	PERIOD OF INSPECTION 10/10-26/00	C.F. NUMBER 1873886
TITLE OF INDIVIDUAL [illegible] CHIEF OPERATING OFFICER	TYPE OF ESTABLISHMENT INSPECTED Vaccine/Blood Products Manufacturer	
FIRM NAME BioPort Corporation	NAME OF FIRM, BRANCH OR UNIT INSPECTED same	
STREET ADDRESS 3500 N. Martin Luther King, Jr. Blvd.	STREET ADDRESS OF PREMISES INSPECTED same	
CITY AND STATE (Zip Code) Lansing, MI 48909	CITY AND STATE (Zip Code) same	
DURING THE INSPECTION OF YOUR FIRM WE OBSERVED:		
1. The design and construction of the filling suite (Rms 307, 308, 309), environmental monitoring, cleaning, and employee practices do not assure sterility of products filled in the suite, in that,		

51. Today, Emergent BioSolutions, despite apparent FDA oversight, shipped out unauthorized bulk COVID vaccine ingredients for finishing and filling. Emergent BioSolutions shipped those ingredients to another entity, and the shipments eventually reached buyers in at least four other countries, according to the *New York Times*.[60] The FDA halted distribution in the U.S. and cited quality deviations[61] that mirrored those that American servicemembers witnessed 20 years ago with the anthrax vaccine.[62] People need to be informed about these manufacturing deviation patterns given the importance and wide use of these products.

52. States may lawfully mandate certain vaccines. But that is not the case for investigational, unapproved EUA medical products. The preemption doctrine,[63] based on the Supremacy Clause of the U.S. Constitution, Article VI., § 2,[64] requires that the federal requirements for informed consent supersede state laws and regulations that may violate EUA provisions. The FDA should support, defend and enforce federal laws that govern biologics,

---

[60] Chris Hamby, *Baltimore Vaccine Plant's Troubles Ripple Across 3 Continents*, THE NEW YORK TIMES (May 6, 2021), https://www.nytimes.com/2021/05/06/world/baltimore-vaccine-countries.html.

[61] FDA, HHS, Form FDA 483, Inspectional Observations (Apr. 20, 2021), https://www.fda.gov/media/147762/download.

[62] Historic FDA Form 483 Deviation Report Documenting that "The manufacturing process for Anthrax Vaccine is not validated." https://nebula.wsimg.com/30662205620a26a4b21274dc49888891?AccessKeyId=0BA19F97E21CB8613CD7&disposition=0&alloworigin=1.

[63] *Preemption*, CORNELL LAW SCHOOL, Legal Information Institute, https://www.law.cornell.edu/wex/preemption.

[64] U.S. Const. art. VI., § 2 , "This Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding." https://www.archives.gov/founding-docs/constitution-transcript.

including EUA products. The option to refuse COVID vaccines is codified in federal law, and President Biden has affirmed this, saying, "I don't think it [vaccination against COVID] should be mandatory. I wouldn't demand it to be mandatory."[65]

H. Conclusion to Statement of Grounds

53. The FDA's mission is "protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products."[66] President Roosevelt's signing of the Federal Food, Drug, and Cosmetic Act (FDCA) closed many safety and efficacy loopholes and improved the landscape of consumer protection forever.[67] The 1962 Harris-Kefauver amendment[68] set in motion regulatory standards for biologics licensure that require proven efficacy, and the 1972 review sought to ensure proof of efficacy and no misbranding for biologics. These historic advances require reflection. The preamble to the 1972 review stated, "'The importance to the American public of safe and effective vaccines…and other biological products cannot be overstated."[69]

54. Biologics, as with all drugs and devices, must have adequate directions for use and be proven safe and effective before FDA approval and licensure. The FDA erred with the anthrax vaccine, and it took a Citizen Petition[70] and federal court decision to make the FDA comply with the FDCA.[71] At other times, the FDA has upheld its mission without prompting to make tough regulatory rulings, as the Supreme Court has acknowledged.[72] With this Petition, we look forward

---

[65] Julia Manchester, *Biden: Coronavirus vaccine should not be mandatory*, THE HILL (Apr. 12, 2021), https://thehill.com/homenews/campaign/528834-biden-coronavirus-vaccine-should-not-be-mandatory.

[66] FDA, *What We Do*; https://www.fda.gov/about-fda/what-we-do#mission.

[67] FDA, *80 Years of the Federal Food, Drug, and Cosmetic Act* (Nov. 7, 2018), https://www.fda.gov/about-fda/fda-history-exhibits/80-years-federal-food-drug-and-cosmetic-act.

[68] FDA, *Kefauver-Harris Amendments Revolutionized Drug Development* (Oct. 9, 2012), https://www.fda.gov/consumers/consumer-updates/kefauver-harris-amendments-revolutionized-drug-development.

[69] HHS, FDA, *Biological Products March 1936-March 1978*, Preamble, p. 56, 37 Fed. Reg. 16679.

[70] Citizen Petition, FDA Docket 01P-0471/CP1, https://img1.wsimg.com/blobby/go/4fa7f468-a250-4088-926e-3c56a998df1f/downloads/citizen%20petition%20ava%20rempfer%20dingle.pdf?ver=1620969217312, and Response thereto, https://downloads.regulations.gov/FDA-2001-P-0119-0003/attachment_1.pdf.

[71] *Doe # 1 v. Rumsfeld*, 297 F. Supp. 2d 119, 135; see par. F, reference to Citizen Petition, FDA docket 01p-0471, https://nebula.wsimg.com/2617051f041708e6b5335b6c885478d7?AccessKeyId=0BA19F97E21CB8613CD7&disposition=0&alloworigin=1.

[72] U.S. Reports: *Weinberger v. Hynson, Westcott & Dunning*, 412 U.S. 609 (1972), https://tile.loc.gov/storage- services/service/ll/usrep/usrep412/usrep412609/usrep412609.pdf.

to the FDA's appropriate, tough regulatory action to bring its COVID vaccine regulations and guidance into line with federal law.

55. Although EUA law is relatively recent, we ask the FDA to be ever cognizant of its longstanding, statutory mission and duty to protect the public health and to ensure that the American public receives only safe and effective vaccines. Most Americans are not aware of the strict compliance requirements for EUA COVID vaccines nor do they know that these biologics are "investigational" and "unapproved medical products."[73] They do not know that the FDA has not fully approved these vaccines as safe and effective under the FDCA. The reason Americans are unaware is because the FDA has failed to provide and enforce accurate public messaging. Reversing this trend is imperative; the FDA must comply with law.

56. Acting on this Citizen Petition will enhance the FDA's credibility with the public. Given the obvious safety, effectiveness, labeling and branding concerns over COVID vaccines detailed above, along with anticipated comments on this docket, we respectfully appeal to the FDA to implement the actions requested in this Petition.

III. ENVIRONMENTAL IMPACT

57. The undersigned hereby state that the relief requested in this Petition will have no environmental impact, and therefore an environmental assessment is not required under 21 C.F.R. §§ 25.30 and 25.31.

IV. ECONOMIC IMPACT

58. Economic impact information will be submitted upon request of the Acting Commissioner.

V. CERTIFICATION

59. The undersigned certify that, to their best knowledge and belief, this Petition includes all information and views on which the Petition relies, and that it includes representative data and information known to the Petitioners that are unfavorable to the Petition.

Respectfully submitted,

/s/ Meryl Nass
Meryl Nass, MD, Scientific Advisory Board Member

/s/ Robert F. Kennedy, Jr.
Robert F. Kennedy, Jr., Board Chair and Chief Litigation Counsel

---

[73] FDA, *Emergency Use Authorization for Vaccines explained* (updated Nov. 20, 2020), https://www.fda.gov/vaccines-blood-biologics/vaccines/emergency-use-authorization-vaccines-explained.

Patent Number: 7279327
This is a SARS-Cov-2 patent filed in April 2002 by researchers from University of North Carolina at Chapel Hill and also Ralph Baric for a "an infectious, replication defective, coronavirus particle, that specifically targets lung epithelial cells wherein said cell is a coronavirus permissive cell....." This virus was genetically modified to infect humans more effectively! The research and development of this research was funded by Dr. Anthony Fauci from the NIHI There were claims that this research was initiated to develop HIV vaccines using coronaviruses as vectors. However, the research deployed genetically modifying platforms to enhance the coronavirus to infect human cells using the ACE2 receptors.

Patent Number: 7220852
Patent filed in April 2003 by US CDC for the SARS-CoV and SARS-CoV-2 genome. (Note that US laws do not allow a naturally occurring virus to be patented.)

Patent Number: 46592703P and 776521 concerning the SARS-CoV-2 were classified by the CIA and masked in the last 24 hours! (These patents cover PC RCT testing platforms for SARS-CoV-2.)

Patent Number: 7151163
This patent was filed by Sequoia Pharmaceuticals, Inc. on 28th April 2003 for the antivirals to treat SARS-CoV and SARS-CoV-2. The company was later absorbed by Pfizer and Johnson + Johnson.

Patent Number: 9193780
Patent filed on 5th June 2008, but approved in 2015, by Ablynx Pharma (former Sequoia Pharmaceuticals) for the polybasic cleavage found on the SARS-CoV-2 genome that allows access to human cells via ACE2 receptors!

Another more than 73 patents were filed between 2003 to 2018 regarding various aspects of the SARS-CoV-2.

2003 Coronavirus Patent of Death

Thursday, 22 July 2021

Operation Disclosure | By David Lifschultz, *Contributing Writer*

Submitted on July 22, 2021

2003 CORONAVIRUS PATENT OF DEATH US46592703P

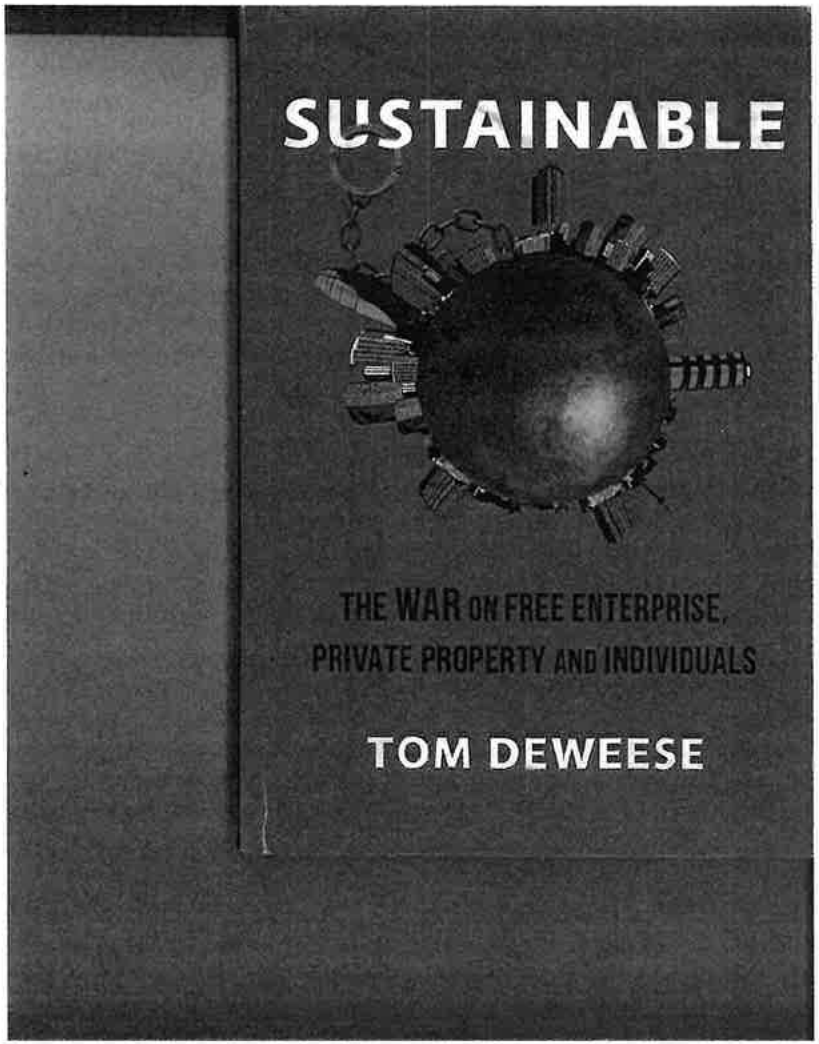
2008 PATENT US7776521 CONCEALS ALL INFORMATION RELATING TO PATENT US46592703P

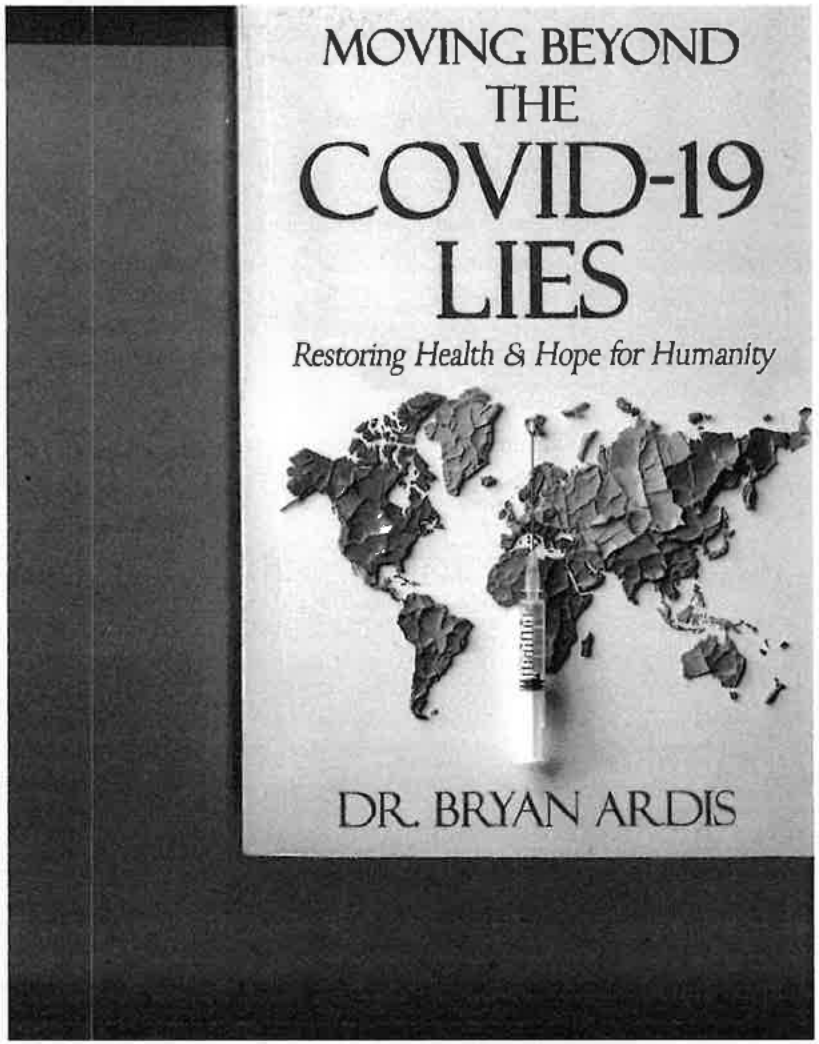
Compliments of the Lifschultz Organization founded in 1899

These patents represent according to Dr. David Martin a bioweapon. President Biden plans to inoculate all members of the US military with another bioweapon in the form of a genetic vaccine which is starting to kill and maim patients in large numbers as an antidote. This is discussed in more detail below.

Dr David Martin Reveals who patented the corona virus

David Lifschultz
THE LIFSCHULTZ ORGANIZATION
DAVID@LIFSCHULTZORGANIZATION.COM





Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis

Anna L. Choi,[1] Guifan Sun,[2] Ying Zhang,[3] and Philippe Grandjean[1,4]

[1]Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts, USA; [2]School of Public Health, China Medical University, Shenyang, China; [3]School of Stomatology, China Medical University, Shenyang, China; [4]Institute of Public Health, University of Southern Denmark, Odense, Denmark

BACKGROUND: Although fluoride may cause neurotoxicity in animal models and acute fluoride poisoning causes neurotoxicity in adults, very little is known of its effects on children's neurodevelopment.

OBJECTIVE: We performed a systematic review and meta-analysis of published studies to investigate the effects of increased fluoride exposure and delayed neurobehavioral development.

METHODS: We searched the MEDLINE, EMBASE, Water Resources Abstracts, and TOXNET databases through 2011 for eligible studies. We also searched the China National Knowledge Infrastructure (CNKI) database, because many studies on fluoride neurotoxicity have been published in Chinese journals only. In total, we identified 27 eligible epidemiological studies with high and reference exposures, end points of IQ scores, or related cognitive function measures with means and variances for the two exposure groups. Using random-effects models, we estimated the standardized mean difference between exposed and reference groups across all studies. We conducted sensitivity analyses restricted to studies using the same outcome assessment and having drinking-water fluoride as the only exposure. We performed the Cochran test for heterogeneity between studies, Begg's funnel plot, and Egger test to assess publication bias, and conducted meta-regressions to explore sources of variation in mean differences among the studies.

RESULTS: The standardized weighted mean difference in IQ score between exposed and reference populations was −0.45 (95% confidence interval: −0.56, −0.35) using a random-effects model. Thus, children in high-fluoride areas had significantly lower IQ scores than those who lived in low-fluoride areas. Subgroup and sensitivity analyses also indicated inverse associations, although the substantial heterogeneity did not appear to decrease.

CONCLUSIONS: The results support the possibility of an adverse effect of high fluoride exposure on children's neurodevelopment. Future research should include detailed individual-level information on prenatal exposure, neurobehavioral performance, and covariates for adjustment.

KEY WORDS: fluoride, intelligence, neurotoxicity. *Environ Health Perspect* 120:1362–1368 (2012). http://dx.doi.org/10.1289/ehp.1104912 [Online 20 July 2012]

A recent report from the National Research Council (NRC 2006) concluded that adverse effects of high fluoride concentrations in drinking water may be of concern and that additional research is warranted. Fluoride may cause neurotoxicity in laboratory animals, including effects on learning and memory (Chioca et al. 2008; Mullenix et al. 1995). A recent experimental study where the rat hippocampal neurons were incubated with various concentrations (20 mg/L, 40 mg/L, and 80 mg/L) of sodium fluoride *in vitro* showed that fluoride neurotoxicity may target hippocampal neurons (Zhang M et al. 2008). Although acute fluoride poisoning may be neurotoxic to adults, most of the epidemiological information available on associations with children's neurodevelopment is from China, where fluoride generally occurs in drinking water as a natural contaminant, and the concentration depends on local geological conditions. In many rural communities in China, populations with high exposure to fluoride in local drinking-water sources may reside in close proximity to populations without high exposure (NRC 2006).

Opportunities for epidemiological studies depend on the existence of comparable population groups exposed to different levels of fluoride from drinking water. Such circumstances are difficult to find in many industrialized countries, because fluoride concentrations in community water are usually no higher than 1 mg/L, even when fluoride is added to water supplies as a public health measure to reduce tooth decay. Multiple epidemiological studies of developmental fluoride neurotoxicity were conducted in China because of the high fluoride concentrations that are substantially above 1 mg/L in well water in many rural communities, although microbiologically safe water has been accessible to many rural households as a result of the recent 5-year plan (2001–2005) by the Chinese government. It is projected that all rural residents will have access to safe public drinking water by 2020 (World Bank 2006). However, results of the published studies have not been widely disseminated. Four studies published in English (Li XS et al. 1995; Lu et al. 2000; Xiang et al. 2003; Zhao et al. 1996) were cited in a recent report from the NRC (2006), whereas the World Health Organization (2002) has considered only two (Li XS et al. 1995; Zhao et al. 1996) in its most recent monograph on fluoride.

Fluoride readily crosses the placenta (Agency for Toxic Substances and Disease Registry 2003). Fluoride exposure to the developing brain, which is much more susceptible to injury caused by toxicants than is the mature brain, may possibly lead to permanent damage (Grandjean and Landrigan 2006). In response to the recommendation of the NRC (2006), the U.S. Department of Health and Human Services (DHHS) and the U.S. EPA recently announced that DHHS is proposing to change the recommended level of fluoride in drinking water to 0.7 mg/L from the currently recommended range of 0.7–1.2 mg/L, and the U.S. EPA is reviewing the maximum amount of fluoride allowed in drinking water, which currently is set at 4.0 mg/L (U.S. EPA 2011).

To summarize the available literature, we performed a systematic review and meta-analysis of published studies on increased fluoride exposure in drinking water associated with neurodevelopmental delays. We specifically targeted studies carried out in rural China that have not been widely disseminated, thus complementing the studies that have been included in previous reviews and risk assessment reports.

Methods

Search strategy. We searched MEDLINE (National Library of Medicine, Bethesda, MD, USA; http://www.ncbi.nlm.nih.gov/pubmed), Embase (Elsevier B.V., Amsterdam, the Netherlands; http://www.embase.com), Water Resources Abstracts (Proquest, Ann Arbor, MI, USA; http://www.csa.com/factsheets/water-resources-set-c.php), and TOXNET (Toxicology Data Network; National Library of Medicine, Bethesda, MD, USA; http://toxnet.nlm.nih.gov) databases to identify studies of drinking-water fluoride and neurodevelopmental outcomes in children. In addition, we searched the China National Knowledge Infrastructure (CNKI; Beijing, China; http://www.cnki.net) database to identify studies published in Chinese journals only. Key

Address correspondence to A.L. Choi, Department of Environmental Health, Harvard School of Public Health, Landmark Center 3E, 401 Park Dr., Boston, MA 02215 USA. Telephone: (617) 384-8646. Fax: (617) 384-8994. E-mail: achoi@hsph.harvard.edu

Supplemental Material is available online (http://dx.doi.org/10.1289/ehp.1104912).

We thank V. Malik, Harvard School of Public Health, for the helpful advice on the meta-analysis methods.

This study was supported by internal institutional funds.

The authors declare they have no actual or potential competing financial interests.

Received 30 December 2011; accepted 20 July 2012.

words included combinations of "fluoride" or "drinking water fluoride," "children," "neurodevelopment" or "neurologic" or "intelligence" or "IQ." We also used references cited in the articles identified. We searched records for 1980–2011. Our literature search identified 39 studies, among which 36 (92.3%) were studies with high and reference exposure groups, and 3 (7.7%) studies were based on individual-level measure of exposures. The latter showed that dose-related deficits were found, but the studies were excluded because our meta-analysis focused on studies with the high- and low-exposure groups only. In addition, two studies were published twice, and the duplicates were excluded.

Inclusion criteria and data extraction. The criteria for inclusion of studies included studies with high and reference fluoride exposures, end points of IQ scores or other related cognitive function measures, presentation of a mean outcome measure, and associated measure of variance [95% confidence intervals (CIs) or SEs and numbers of participants]. Interpretations of statistical significance are based on an alpha level of 0.05. Information included for each study also included the first author, location of the study, year of publication, and numbers of participants in high-fluoride and low-fluoride areas. We noted and recorded the information on age and sex of children, and parental education and income if available.

Statistical analysis. We used STATA (version 11.0; StataCorp, College Station, TX, USA) and available commands (Stern 2009) for the meta-analyses. A standardized weighted mean difference (SMD) was computed using both fixed-effects and random-effects models. The fixed-effects model uses the Mantel–Haenszel method assuming homogeneity among the studies, whereas the random-effects model uses the DerSimonian and Laird method, incorporating both a within-study and an additive between-studies component of variance when there is between-study heterogeneity (Egger et al. 2001). The estimate of the between-study variation is incorporated into both the SE of the estimate of the common effect and the weight of individual studies, which was calculated as the inverse sum of the within and between study variance. We evaluated heterogeneity among studies using the I^2 statistic, which represents the percentage of total variation across all studies due to between-study heterogeneity (Higgins and Thompson 2002). We evaluated the potential for publication bias using Begg and Egger tests and visual inspection of a Begg funnel plot (Begg and Mazumdar 1994; Egger et al. 1997). We also conducted independent meta-regressions to estimate the contribution of study characteristics (mean age in years from the age range and year of publication in each study) to heterogeneity among the studies. The scoring standard for the Combined Raven's Test–The Rural edition in China (CRT-RC) test classifies scores of ≤ 69 and 70–79 as low and marginal intelligence, respectively (Wang D et al. 1989). We also used the random-effects models to estimate risk ratios for the association between fluoride exposure and a low/marginal versus normal Raven's test score among children in studies that used the CRT-RC test (Wang D et al. 1989). Scores indicating low and marginal intelligence (≤ 69 and 70–79, respectively) were combined as a single outcome due to small numbers of children in each outcome subgroup.

Results

Six of the 34 studies identified were excluded because of missing information on the number of subjects or the mean and variance of the outcome [see Figure 1 for a study selection flow chart and Supplemental Material, Table S1 (http://dx.doi.org/10.1289/ehp.1104912) for additional information on studies that were excluded from the analysis]. Another study (Trivedi et al. 2007) was excluded because SDs reported for the outcome parameter were questionably small (1.13 for the high-fluoride group, and 1.23 for the low-fluoride group) and the SMD (–10.8; 95% CI: –11.9, –9.6) was > 10 times lower than the second smallest SMD (–0.95; 95% CI: –1.16, –0.75) and 150 times lower than the largest SMD (0.07; 95% CI: –0.083, 0.22) reported for the other studies, which had relatively consistent SMD estimates. Inclusion of this study in the meta-analysis resulted with a much smaller pooled random-effects SMD estimate and a much larger I^2 (–0.63; 95% CI: –0.83, –0.44, I^2 94.1%) compared with the estimates that excluded this study (–0.45; 95% CI: –0.56, –0.34, I^2 80%) (see Supplemental Material, Figure S1). Characteristics of the 27 studies included are shown in Table 1 (An et al. 1992; Chen et al. 1991; Fan et al. 2007; Guo et al. 1991; Hong et al. 2001; Li FH et al. 2009; Li XH et al. 2010; Li XS 1995; Li Y et al. 1994; Li Y et al. 2003; Lin et al. 1991; Lu et al. 2000; Poureslami et al. 2011; Ren et al. 1989; Seraj et al. 2006; Sun et al. 1991; Wang G et al. 1996; Wang SH et al. 2001; Wang SX et al. 2007; Wang ZH et al. 2006; Xiang et al. 2003; Xu et al. 1994; Yang et al. 1994; Yao et al. 1996, 1997; Zhang JW et al. 1998; Zhao et al. 1996). Two of the studies included in the analysis were conducted in Iran (Poureslami et al. 2011; Seraj et al. 2006); the other study cohorts were populations from China. Two cohorts were exposed to fluoride from coal burning (Guo et al. 1991; Li XH et al. 2010); otherwise populations were exposed to fluoride through drinking water. The CRT-RC was used to measure the children's intelligence in 16 studies. Other intelligence measures included the Wechsler Intelligence tests (3 studies; An et al. 1992; Ren et al. 1989; Wang ZH et al. 1996), Binet IQ test (2 studies; Guo et al. 1991; Xu et al. 1994), Raven's test (2 studies; Poureslami et al. 2011; Seraj et al. 2006), Japan IQ test (2 studies; Sun et al. 1991; Zhang JW et al. 1998), Chinese comparative intelligence test (1 study; Yang et al. 1994), and the mental work capacity index (1 study; Li Y et al. 1994). Because each of the intelligence tests used is designed to measure general intelligence, we used data from all eligible studies to estimate the possible effects of fluoride exposure on general intelligence.

In addition, we conducted a sensitivity analysis restricted to studies that used similar tests to measure the outcome (specifically, the CRT-RC, Wechsler Intelligence test, Binet IQ test, or Raven's test), and an analysis restricted to studies that used the CRT-RC. We also performed an analysis that excluded studies with co-exposures including iodine and arsenic, or with non-drinking-water fluoride exposure from coal burning.

Pooled SMD estimates. Among the 27 studies, all but one study showed random-effect SMD estimates that indicated an inverse association, ranging from –0.95 (95% CI: –1.16, –0.75) to –0.10 (95% CI:

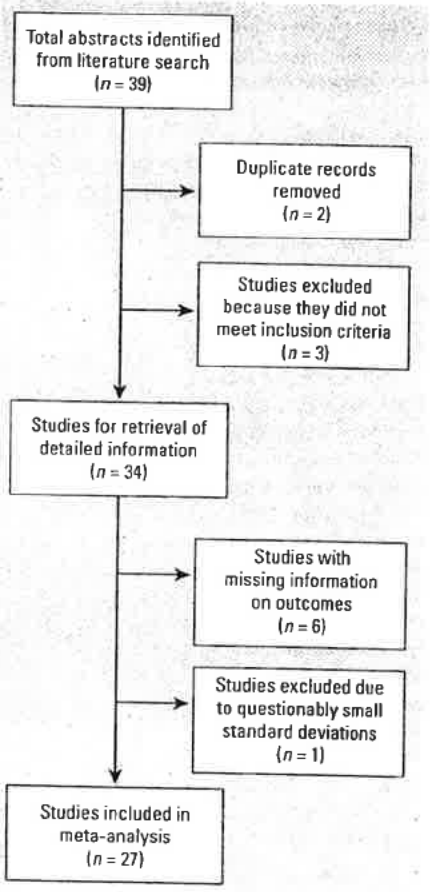


Figure 1. Flow diagram of the meta-analysis.

–0.25, 0.04) (Figure 2). The study with a positive association reported an SMD estimate of 0.07 (95% CI: –0.8, 0.22). Similar results were found with the fixed-effects SMD estimates. The fixed-effects pooled SMD estimate was –0.40 (95% CI: –0.44, –0.35), with a p-value < 0.001 for the test for homogeneity. The random-effects SMD estimate was –0.45 (95% CI: –0.56, –0.34) with an I^2 of 80% and homogeneity test p-value < 0.001 (Figure 2). Because of heterogeneity (excess variability) between study results, we used primarily the random-effects model for subsequent sensitivity analyses, which is generally considered to be the more conservative method (Egger et al. 2001). Among the restricted sets of intelligence tests, the SMD for the model with only CRT-RC tests and drinking-water exposure (and to a lesser extent the model with only CRT-RC tests) was lower than that for all studies combined, although the difference did not appear to be significant. Heterogeneity, however, remained at a similar magnitude when the analyses were restricted (Table 2).

Sources of heterogeneity. We performed meta-regression models to assess study characteristics as potential predictors of effect. Information on the child's sex and parental education were not reported in > 80% of the studies, and only 7% of the studies reported household income. These variables were therefore not included in the models. Among the two covariates, year of publication (0.02; 95% CI: 0.006, 0.03), but not mean age of the study children (–0.02; 95% CI: –0.094, 0.04), was a significant predictor in the model with all 27 studies included. I^2 residual 68.7% represented the proportion of residual between-study variation due to heterogeneity. From the adjusted R^2, 39.8% of between-study variance was explained by the two covariates. The overall test of the covariates was significant (p = 0.004).

When the model was restricted to the 16 studies that used the CRT-RC, the child's age (but not year of publication) was a significant predictor of the SMD. The R^2 of 65.6% of between-study variance was explained by the two covariates, and only 47.3% of the residual variation was attributable to heterogeneity. The overall test of both covariates in the model remained significant (p = 0.0053). On further restriction of the model to exclude the 7 studies with arsenic and iodine as coexposures and fluoride originating from coal burning (thus including only the 9 with fluoride exposure from drinking water), neither age nor year of publication was a significant predictor, and the overall test of covariates was less important (p = 0.062), in accordance with the similarity of intelligence test outcomes and the source of exposure in the studies included.

Table 1. Characteristics of epidemiological studies of fluoride exposure and children's cognitive outcomes.

Reference	Study location	No. in high-exposure group	No. in reference group	Age range (years)	Fluoride exposure		Outcome measure	Results
					Assessment	Range		
Ren et al. 1989	Shandong, China	160	169	8–14	High-/low-fluoride villages	Not specified	Wechsler Intelligence test[a]	Children in high-fluoride region had lower IQ scores
Chen et al. 1991	Shanxi, China	320	320	7–14	Drinking water	4.55 mg/L (high); 0.89 mg/L (reference)	CRT-RC[b]	The average IQ of children from high-fluoride area were lower than that of the reference area
Guo et al. 1991	Hunan, China	60	61	7–13	Fluoride in coal burning	118.1–1361.7 mg/kg (coal-burning area); Control area used wood	Chinese Binet[c]	Average IQ in fluoride coal-burning area was lower than that in the reference area
Lin et al. 1991	Xinjiang, China	33	86	7–14	Drinking water	0.88 mg/L (high); 0.34 mg/L (reference)	CRT-RC[b]	Children in the high-fluoride (low-iodine) area had lower IQ scores compared with the children from the reference fluoride (low-iodine) areas
Sún et al. 1991	Guiyang, China	196	224	6.5–12	Rate of fluorosis	Fluorosis: 98.36% (high); not specified (reference)	Japan IQ test[d]	Mean IQ was lower in all age groups except ≤ 7 years in the area with high fluoride and aluminum (limited to high-fluoride population only)
An et al. 1992	Inner Mongolia, China	121	121	7–16	Drinking water	2.1–7.6 mg/L (high); 0.6–1.0 mg/L (reference)	Wechsler Intelligence test[a]	IQ scores of children in high-fluoride areas were significantly lower than those of children living in reference fluoride area
Li Y et al. 1994	Sichuan, China	106	49	12–13	Burning of high-fluoride coal to cook grain in high-fluoride area	4.7–31.6 mg/kg (high); 0.5 mg/kg (reference)	Child mental work capacity	Early, prolonged high fluoride intake causes a decrease in the child's mental work capacity
Xu et al. 1994	Shandong, China	97	32	8–14	Drinking water	1.8 mg/L (high); 0.8 mg/L (reference)	Binet-Simon[e]	Children had lower IQ scores in high-fluoride area than those who lived in the reference area.
Yang et al. 1994	Shandong, China	30	30	8–14	Well water	2.97 mg/L (high); 0.5 mg/L (reference)	Chinese comparative intelligence test[f]	The average IQ scores was lower in children from high-fluoride and -iodine area than those from the reference area, but the results were not significant
Li XS et al. 1995	Guizhou, China	681	226	8–13	Urine, Dental Fluorosis Index	1.81–2.69 mg/L (high); 1.02 mg/L (reference); DFI 0.8–3.2 (high); DFI < 0.4 (reference)	CRT-RC[b]	Children living in fluorosis areas had lower IQ scores than children living in nonfluorosis areas
Wang G et al. 1996	Xinjiang, China	147	83	4–7	Drinking water	> 1.0–8.6 mg/L (high); 0.58–1.0 mg/L (reference)	Wechsler Intelligence test[a]	Average IQ score was lower in children in the high-fluoride group than those in the reference group
Yao et al. 1996	Liaoning, China	266	270	8–12	Drinking water	2–11mg/L (high); 1 mg/L (reference)	CRT-RC[b]	Average IQ scores of children residing in exposed fluoride areas were lower than those in the reference area
Zhao et al. 1996	Shanxi, China	160	160	7–14	Drinking water	4.12 mg/L (high); 0.91 mg/L (reference)	CRT-RC[b]	Children living in high-fluoride and -arsenic area had significantly lower IQ scores than those living in the reference fluoride (and no arsenic) area
Yao et al. 1997	Liaoning, China	188	314	7–14	Drinking water	2 mg/L (exposed); 0.4 mg/L (reference)	CRT-RC[b]	IQ scores of children in the high-fluoride area were lower than those of children in the reference area

Continued

Although official reports of lead concentrations in the study villages in China were not available, some studies reported high percentage (95–100%) of low lead exposure (less than the standard of 0.01 mg/L) in drinking-water samples in villages from several study provinces (Bi et al. 2010; Peng et al. 2008; Sun 2010).

Publication bias. A Begg's funnel plot with the SE of SMD from each study plotted against its corresponding SMD did not show clear evidence of asymmetry, although two studies with a large SE also reported relatively large effect estimates, which may be consistent with publication bias or heterogeneity (Figure 3). The plot appears symmetrical for studies with larger SE, but with substantial variation in SMD among the more precise studies, consistent with the heterogeneity observed among the studies included in the analysis. Begg ($p = 0.22$) and Egger ($p = 0.11$) tests did not indicate significant ($p < 0.05$) departures from symmetry.

Pooled risk ratios. The relative risk (RR) of a low/marginal score on the CRT-RC test (< 80) among children with high fluoride exposure compared with those with low exposure (16 studies total) was 1.93 (95% CI: 1.46, 2.55; I^2 58.5%). When the model was restricted to 9 studies that used the CRT-RC and included only drinking-water fluoride exposure (Chen et al. 1991; Fan et al. 2007; Li XH et al. 2010; Li XS et al. 1995; Li Y et al. 2003; Lu et al. 2000; Wang ZH et al. 2006; Yao et al. 1996, 1997), the estimate was similar (RR = 1.75; 95% CI: 1.16, 2.65; I^2 70.6%). Although fluoride exposure showed inverse associations with test scores, the available exposure information did not allow a formal dose–response analysis. However, dose-related differences in test scores occurred at a wide range of water-fluoride concentrations.

Discussion

Findings from our meta-analyses of 27 studies published over 22 years suggest an inverse association between high fluoride exposure and children's intelligence. Children who lived in areas with high fluoride exposure had lower IQ scores than those who lived in low-exposure or control areas. Our findings are consistent with an earlier review (Tang et al. 2008), although ours more systematically addressed study selection and exclusion information, and was more comprehensive in *a*) including 9 additional studies, *b*) performing meta-regression to estimate the contribution of study characteristics as sources of heterogeneity, and *c*) estimating pooled risk ratios for the association between fluoride exposure and a low/marginal Raven's test score.

As noted by the NRC committee (NRC 2006), assessments of fluoride safety have relied on incomplete information on potential

Table 1. Continued.

Reference	Study location	No. in high-exposure group	No. in reference group	Age range (years)	Fluoride exposure: Assessment	Fluoride exposure: Range	Outcome measure	Results
Zhang JW et al. 1998	Xinjiang, China	51	52	4–10	Drinking water	Not specified	Japan IQ Test[d]	Average IQ scores of children residing in high-fluoride and -arsenic area were lower than those who resided in the reference area
Lu et al. 2000	Tianjin, China	60	58	10–12	Drinking water	3.15 mg/L (high); 0.37 mg/L (reference)	CRT-RC[b]	Children in the high-fluoride area scored significantly lower IQ scores than those in the reference area
Hong et al. 2001	Shandong, China	85	32	8–14	Drinking water	2.90 mg/L (high); 0.75 mg/L (reference)	CRT-RC[b]	Average IQ scores were significantly lower in high-fluoride group (and -iodine) than the reference group
Wang SH et al. 2001	Shandong, China	30	30	8–12	Drinking water	2.97 mg/L (high); 0.5 mg/L (reference)	CRT-RC[b]	No significant difference in IQ scores of children in the high-fluoride/high-iodine and reference fluoride/low-iodine areas
Li Y et al. 2003	Inner Mongolia, China	720	236	6–13	Fluorosis	Endemic vs. control regions defined by the Chinese Geological Office	CRT-RC[b]	Average IQ of children in high-fluorosis area was lower than that in the reference area
Xiang et al. 2003	Jiangsu, China	222	290	8–13	Drinking water	0.57–4.5 mg/L (high); 0.18–0.76 mg/L (reference)	CRT-RC[b]	Mean IQ score was significantly lower in children who lived in the high-fluoride area than that of children in the reference exposure area (both areas also had arsenic exposure)
Seraj et al. 2006	Tehran, Iran	41	85	Not specified	Drinking water	2.5 mg/L (high); 0.4 mg/L (reference)	Raven[g]	The mean IQ of children in the high-fluoride area was significantly lower than that from the reference fluoride area
Wang ZH et al. 2006	Shanxi, China	202	166	8–12	Drinking water	5.54 ± 3.88 mg/L (high); 0.73 ± 0.28 mg/L (reference)	CRT-RC[b]	The IQ scores of children in the high-fluoride group were significantly lower than those in the reference group
Fan et al 2007	Shaanxi, China	42	37	7–14	Drinking water	1.14–6.09 mg/L (high); 1.33–2.35 mg/L (reference)	CRT-RC[b]	The average IQ scores of children residing in the high-fluoride area were lower than those of children residing in the reference area
Wang SX et al. 2007	Shanxi, China	253	196	8–12	Drinking water and urine	3.8–11.5 mg/L (water, high); 1.6–11 mg/L (urine, high); 0.2–1.1 mg/L (water, reference); 0.4–3.9 mg/L (urine, reference)	CRT-RC[b]	Mean IQ scores were significantly lower in the high-fluoride group than from the reference group in the fluoride/arsenic areas
Li et al. 2009	Hunan, China	60	20	8–12	Coal burning	1.24–2.34 mg/L (high); 0.962 mg/L (reference)	CRT-RC[b]	Mean IQ was lower in children in coal-burning areas compared to those in the reference group
Li FH et al. 2010	Henan, China	347	329	7–10	Drinking water	2.47 ± 0.75 mg/L (high)	CRT-RC[b]	No significant difference in IQ scores between children in the exposed and reference groups
Pouresfami et al. 2011	Iran	59	60	6–9	Drinking Water	2.38 mg/L (high); 0.41 mg/L (reference)	Raven[g]	Children in the high-fluoride group scored significantly lower than those in reference group

[a]Wechsler Intelligence Scale (Lin and Zhang 1986). [b]CRT-RC, Chinese Standardized Raven Test, rural version (Wang G et al. 1989). [c]Chinese Binet Test (Wu 1936). [d]Japan test (Zhang J et al. 1985). [e]Binet-Simon Test (Binet and Simon 1922). [f]Chinese comparative intelligence test (Wu 1983). [g]Raven test (Raven et al. 2003).

risks. In regard to developmental neurotoxicity, much information has in fact been published, although mainly as short reports in Chinese that have not been available to most expert committees. We carried out an extensive review that includes epidemiological studies carried out in China. Although most reports were fairly brief and complete information on covariates was not available, the results tended to support the potential for fluoride-mediated developmental neurotoxicity at relatively high levels of exposure in some studies. We did not find conclusive evidence of publication bias, although there was substantial heterogeneity among studies. Drinking water may contain other neurotoxicants, such as arsenic, but exclusion of studies including arsenic and iodine as co-exposures in a sensitivity analysis resulted in a lower estimate, although the difference was not significant. The exposed groups had access to drinking water with fluoride concentrations up to 11.5 mg/L (Wang SX et al. 2007); thus, in many cases concentrations were above the levels recommended (0.7–1.2 mg/L; DHHS) or allowed in public drinking water (4.0 mg/L; U.S. EPA) in the United States (U.S. EPA 2011). A recent cross-sectional study based on individual-level measure of exposures suggested that low levels of water fluoride (range, 0.24–2.84 mg/L) had significant negative associations with children's intelligence (Ding et al. 2011). This study was not included in our meta-analysis, which focused only on studies with exposed and reference groups, thereby precluding estimation of dose-related effects.

The results suggest that fluoride may be a developmental neurotoxicant that affects brain development at exposures much below those that can cause toxicity in adults (Grandjean 1982). For neurotoxicants such as lead and methylmercury, adverse effects are associated with blood concentrations as low as 10 nmol/L. Serum fluoride concentrations associated with high intakes from drinking water may exceed 1 mg/L, or 50 μmol/L—more than 1,000 times the levels of some other neurotoxicants that cause neurodevelopmental damage. Supporting the plausibility of our findings, rats exposed to 1 ppm (50 μmol/L) of water fluoride for 1 year showed morphological alterations in the brain and increased levels of aluminum in brain tissue compared with controls (Varner et al. 1998).

The estimated decrease in average IQ associated with fluoride exposure based on our analysis may seem small and may be within the measurement error of IQ testing. However, as research on other neurotoxicants has shown, a shift to the left of IQ distributions in a population will have substantial impacts, especially among those in the high and low ranges of the IQ distribution (Bellinger 2007).

Our review cannot be used to derive an exposure limit, because the actual exposures of the individual children are not known. Misclassification of children in both high- and low-exposure groups may have occurred if the children were drinking water from other sources (e.g., at school or in the field).

The published reports clearly represent independent studies and are not the result of duplicate publication of the same studies (we removed two duplicates). Several studies (Hong et al. 2001; Lin et al. 1991; Wang SH et al. 2001; Wang SX et al. 2007; Xiang et al. 2003; Zhao et al. 1996) report other exposures, such as iodine and arsenic, a neurotoxicant, but our sensitivity analyses showed similar associations between high fluoride exposure and the outcomes even after these studies were excluded. Large tracts of China

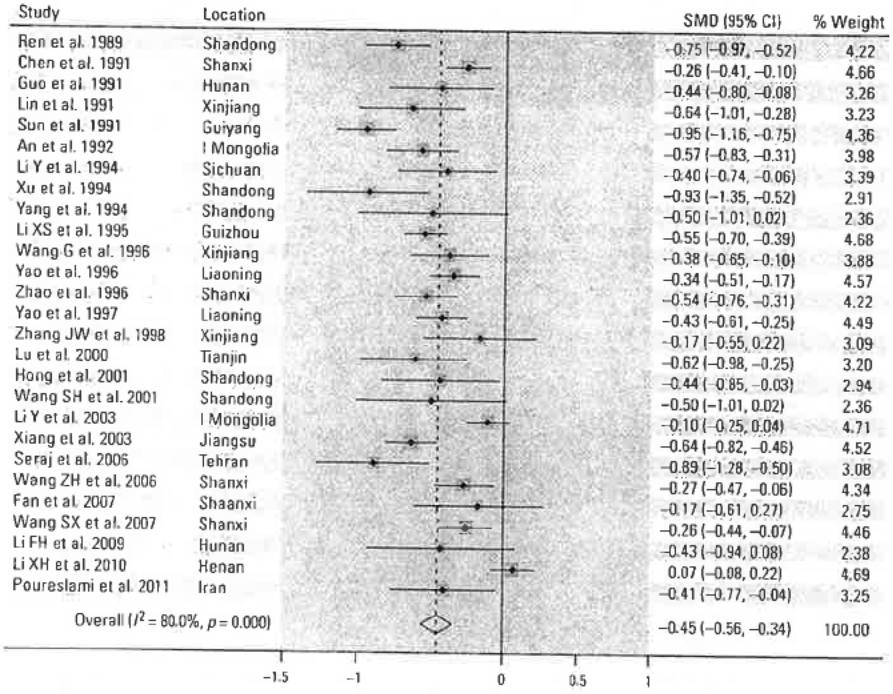


Figure 2. Random-effect standardized weighted mean difference (SMD) estimates and 95% CIs of child's intelligence score associated with high exposure to fluoride. SMs for individual studies are shown as solid diamonds (♦), and the pooled SMD is shown as an open diamond (◊). Horizontal lines represent 95% CIs for the study-specific SMDs.

Table 2. Sensitivity analyses of pooled random-effects standardized weighted mean difference (SMD) estimates of child's intelligence score with high exposure of fluoride.

Model	Available studies for analysis	SMD (95% CI)	I^2	p-Value test of heterogeneity
1. Exclude nonstandardized tests[a]	23	−0.44 (−0.54, −0.33)	77.6%	< 0.001
2. Exclude non–CRT-RC Tests[b]	16	−0.36 (−0.48, −0.25)	77.8%	< 0.001
3. Exclude studies with other exposures (iodine, arsenic)[c] or non-drinking-water fluoride exposure[d]	9	−0.29 (−0.44, −0.14)	81.8%	< 0.001

[a]Mental work capacity (Li Y et al. 1994); Japan IQ (Sun et al. 1991; Zhang JW et al. 1998); Chinese comparative scale of intelligence test (Yang et al. 1994). [b]Wechsler intelligence test (An et al. 1992; Ren et al. 1989; Wang G et al. 1996); Chinese Binet IQ (Guo et al. 1991); Raven (Poureslami et al. 2011; Seraj et al. 2006); Binet-Simon (Xu et al. 1994). [c]Iodine (Hong et al. 2001; Lin et al. 1991; Wang SH et al. 2001); arsenic (Wang SX et al. 2007; Xiang et al. 2003; Zhao et al. 1996; (Zhang JW et al. 1998 was already excluded, see note *a*)). [d]Fluoride from coal burning (Li FH et al. 2009 (Guo et al. 1991 and Li Y et al. 1994 were already excluded; see notes *a* and *b*)).

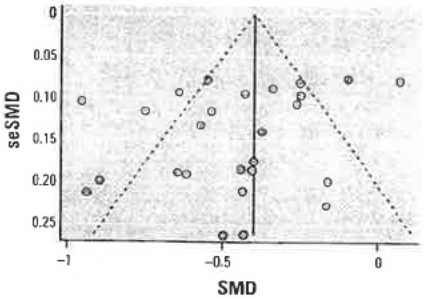


Figure 3. Begg's funnel plot showing individual studies included in the analysis according to random-effect standardized weighted mean difference (SMD) estimates (*x*-axis) and the SE (se) of each study-specific SMD (*y*-axis). The solid vertical line indicates the pooled SMD estimate for all studies combined and the dashed lines indicated pseudo 95% confidence limits around the pooled SMD estimate.

have superficial fluoride-rich minerals with little, if any, likelihood of contamination by other neurotoxicants that would be associated with fluoride concentrations in drinking water. From the geographic distribution of the studies, it seems unlikely that fluoride-attributed neurotoxicity could be attributable to other water contaminants.

Still, each of the articles reviewed had deficiencies, in some cases rather serious ones, that limit the conclusions that can be drawn. However, most deficiencies relate to the reporting of where key information was missing. The fact that some aspects of the study were not reported limits the extent to which the available reports allow a firm conclusion. Some methodological limitations were also noted. Most studies were cross-sectional, but this study design would seem appropriate in a stable population where water supplies and fluoride concentrations have remained unchanged for many years. The current water fluoride level likely also reflects past developmental exposures. In regard to the outcomes, the inverse association persisted between studies using different intelligence tests, although most studies did not report age adjustment of the cognitive test scores.

Fluoride has received much attention in China, where widespread dental fluorosis indicates the prevalence of high exposures. In 2008, the Ministry of Health reported that fluorosis was found in 28 provinces with 92 million residents (China News 2008). Although microbiologically safe, water supplies from small springs or mountain sources created pockets of increased exposures near or within areas of low exposures, thus representing exposure settings close to the ideal, because only the fluoride exposure would differ between nearby neighborhoods. Chinese researchers took advantage of this fact and published their findings, though mainly in Chinese journals and according to the standards of science at the time. This research dates back to the 1980s, but has not been widely cited at least in part because of limited access to Chinese journals.

In its review of fluoride, the NRC (2006) noted that the safety and the risks of fluoride at concentrations of 2–4 mg/L were incompletely documented. Our comprehensive review substantially extends the scope of research available for evaluation and analysis. Although the studies were generally of insufficient quality, the consistency of their findings adds support to existing evidence of fluoride-associated cognitive deficits, and suggests that potential developmental neurotoxicity of fluoride should be a high research priority. Although reports from the World Health Organization and national agencies have generally focused on beneficial effects of fluoride (Centers for Disease Control and Prevention 1999; Petersen and Lennon 2004), the NRC report examined the potential adverse effects of fluoride at 2–4 mg/L in drinking water and not the benefits or potential risks that may occur when fluoride is added to public water supplies at lower concentrations (0.7–1.2 mg/L) (NRC 2006).

In conclusion, our results support the possibility of adverse effects of fluoride exposures on children's neurodevelopment. Future research should formally evaluate dose–response relations based on individual-level measures of exposure over time, including more precise prenatal exposure assessment and more extensive standardized measures of neurobehavioral performance, in addition to improving assessment and control of potential confounders.

References

Agency for Toxic Substances and Disease Registry. 2003. Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluorine (Update). Available: http://www.atsdr.cdc.gov/toxprofiles/tp11.pdf [accessed 5 April 2010].

An JA, Mei SZ, Liu AP, Fu Y, Wang CF. 1992. Effect of high level of fluoride on children's intelligence [in Chinese]. Chin J Control Endem Dis 7(2):93–94.

Begg CB, Mazumdar M. 1994. Operating characteristics of a rank correlation test for publication bias. Biometrics 50:1088–1101.

Bellinger DC. 2007. Interpretation of small effect sizes in occupational and environmental neurotoxicity: individual versus population risk. Neurotoxicology 28:245–251.

Bi WJ, Zheng X, Lan TX. 2010. Analysis on test results of drinking water's quality in Jianan Railway Bureau from 2005–2009 [in Chinese]. Prev Med Trib 16(6):483–485.

Binet A, Simon T. 1922. The Measurement of the Mental Development of the Child (translated into Chinese by Jie FP). Shanghai:Commercial Press.

Centers for Disease Control and Prevention. 1999. Achievements in public health, 1990–1999: fluoridation of drinking water to prevent dental caries. MMWR 48(41):933–940.

Chen YX, Han F, Zhou Z, Zhang H, Jiao X, Zhang S, et al. 1991. Research on the intellectual development of children in high fluoride areas. Chin J Control Endem Dis 6(suppl):99–100. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

China News. 2008. Twenty-eight provinces were affected by fluorosis in China [in Chinese]. Available: http://news.qq.com/a/20081216/001707.htm [accessed 3 July 2012].

Chioca LR, Raupp IM, Da Cunha C, Losso EM, Andreatini R. 2008. Subchronic fluoride intake induces impairment in habituation and active avoidance tasks in rats. Eur J Pharmacol 579:196–201.

Ding Y, Gao Y, Sun H, Han H, Wang W, Ji X, et al. 2011. The relationships between low levels of urine fluoride on children's intelligence, dental fluorosis in endemic fluorosis area in Hulunbuir, Inner Mongolia, China. J Hazard Mater 186:1942–1946.

Egger M, Davey Smith G, Altman DG. 2001. Systematic Reviews in Health Care: Meta-Analysis in Context. London:BMJ Publishing.

Egger M, Davey Smith G, Schneider M, Minder C. 1997. Bias in meta-analysis detected by a simple, graphical test. BMJ 315:629–634.

Fan ZX, Dai HY, Bai AM, Li PO, Li T, LI GO, et al. 2007. Effect of high fluoride exposure in children's intelligence [in Chinese]. J Environ Health 24(10):802–803.

Grandjean P. 1982. Occupational fluorosis through 50 years: clinical and epidemiological experiences. Am J Ind Med 3(2):227–336.

Grandjean P, Landrigan P. 2006. Developmental neurotoxicity of industrial chemicals. Lancet 368(9553):2167–2178.

Guo XC, Wang R, Cheng C, Wei W, Tang L, Wang Q, et al. 1991. A preliminary exploration of IQ of 7–13 year old pupils in a fluorosis area with contamination from burning coal. Chin J Endemiol 10:98–100. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Higgins JP, Thompson SG. 2002. Quantifying heterogeneity in a meta-analysis. Stat Med 21:1539–1558.

Hong F, Cao Y, Yang D, Wang H. 2001. A study of fluorine effects on children's intelligence development under different environments. Chin Prim Health Care 15:56–57. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Li FH, Chen X, Huang RJ, Xie YP. 2009. Intelligence impact of children with endemic fluorosis caused by fluoride from coal burning [in Chinese]. J Environ Health 26(4):338–340.

Li XH, Hou GQ, Yu B, Yuan CS, Liu Y, Zhang L, et al. 2010. Investigation and analysis of children's intelligence and dental fluorosis in high fluoride area [in Chinese]. J Med Pest Control 26(3):230–231.

Li XS, Zhi JL, Gao RO. 1995. Effect of fluoride exposure on intelligence in children. Fluoride 28(4):189–192.

Li Y, Jing X, Chen D, Lin L, Wang Z. 2003. The effects of endemic fluoride poisoning on the intellectual development of children in Baotou. Chin J Public Health Manag 19(4):337–338. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Li Y, Li X, Wei S. 1994. Effect of excessive fluoride intake on mental work capacity of children and a preliminary study of its mechanism. J West China Univ Med Sci 25(2):188–191. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Lin C, Zhang H. 1986. Wechsler Children Intelligence Scale. Revised Edition in China. Beijing:Beijing Normal University Press.

Lin FF, Ai HT, Zhao HX, Lin J, Jhieng JY, Maimaiti, et al. 1991. High fluoride and low iodine environment and subclinical cretinism in Xinjiang [in Chinese]. Endem Dis Bull 6(2):62–67.

Lu Y, Sun ZR, Wu LN, Wang X, Lu W, Liu SS, et al. 2000. Effect of high-fluoride water on intelligence in children [in Chinese]. Fluoride 33(2):74–78.

Mullenix PJ, Denbesten PK, Schunior A, Kernan WJ. 1995. Neurotoxicity of sodium fluoride in rats. Neurotoxicol Teratol 17:169–177.

NRC (National Research Council). 2006. Fluoride in Drinking Water: A Scientific Review of EPA's Standards. Washington, DC:National Academies Press.

Peng YP, Zou J, Yang DF, Li XH, Wu K. 2008. Analysis of water quality from homemade wells in Leshan downtown during 2004–2006 [in Chinese]. J Occup Health Damage. 23(4):219–221.

Petersen PE, Lennon MA. 2004. Effective use of fluorides for the prevention of dental caries in the 21st century: the WHO approach. Community Dent Oral Epidem 32(5):319–321.

Poureslami HR, Horri A, Atash R. 2011. High fluoride exposure in drinking water: effect on children's IQ, one new report. Int J Pediatr Dent 21(suppl 1):47.

Raven J, Raven JC, Court JH. 2003. Manual for Raven's Progressive Matrices and Vocabulary Scales. San Antonio, TX:Harcourt Assessment.

Ren DL, Li K, Lin D. 1989. An investigation of intelligence development of children aged 8–14 years in high-fluoride and low-iodine areas. Chin J Control Endem Dis 4:251. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Seraj B, Shahrabi M, Falahzade M, Falahzade FP, Akhondi N. 2006. Effect of high fluoride concentration in drinking water on children's intelligence. J Dental Med 19(2):80–86. [abstract in English]. Available: http://journals.tums.ac.ir/upload_files/pdf/_/2530.pdf [accessed 24 August 2012].

Stern JAC. 2009. Meta-analysis in Stata: An Updated Collection from the Stata Journal. College Station, TX:Stata Press.

Sun LY. 2010. Survey of drinking water quality in Jintang County [in Chinese]. J Occup Health Damage 25(5):277–280.

Sun MM, Li SK, Wang YF, Li FS. 1991. Measurement of intelligence by drawing test among the children in the endemic area of Al-F combined toxicosis [in Chinese]. J Guiyang Med College 16(3):204–206.

Tang QQ, Du J, Ma HH, Jiang SJ, Zhou XJ. 2008. Fluoride and children's intelligence: a meta-analysis. Bio Trace Elem Res 126:115–120.

Trivedi MH, Verma RJ, Chinoy NJ, Patel RS, Sathawara NG. 2007. Effect of high fluoride water on intelligence of school children in India. Fluoride 40(3):178–183.

U.S. EPA. 2011. EPA and HHS Announce New Scientific Assessments and Actions on Fluoride: Agencies Working Together to Maintain Benefits of Preventing Tooth Decay while Preventing Excessive Exposure. Available: http://yosemite.epa.gov/opa/admpress.nsf/bd4379a92ceceeac8525735900400c27/86964af577c37ab285257811005a8417!Open Document [accessed 7 January 2011].

Varner JA, Jensen KF, Horvath W, Isaacson RL. 1998. Chronic administration of aluminum-fluoride or sodium-fluoride to rats in drinking water: alterations in neuronal and cerebrovascular integrity. Brain Res 784:284–298.

Wang D, Di M, Qian M. 1989. Chinese Standardized Raven Test, Rural Version. Tianjin, China:Tianjin Medical University.

Wang G, Yang D, Jia F, Wang H. 1996. Research on intelligence quotient of 4-7 year-old children in a district with a high level of fluoride. Endem Dis Bull 11:60–62. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Wang SH, Wang LF, Hu PY, Guo SW, Law SH. 2001. Effects of high iodine and high fluorine on children's intelligence and thyroid function [in Chinese]. Chin J Endemiol 20(4):288–290.

Wang SX, Wang ZH, Cheng XT, Li J, Sang ZP, Zhang XD, et al. 2007. Arsenic and fluoride exposure in drinking water: children's IQ and growth in Shanyin County, Shanxi Province, China. Environ Health Perspect 115:643–647.

Wang ZH, Wang SX, Zhang XD, Li J, Zheng XT, Hu CM, et al. 2006. Investigation of children's growth and development under long-term fluoride exposure [in Chinese; abstract in English]. Chin J Control Endem Dis 21(4):239–241.

World Bank. 2006. Water Quality Management: Policy and Institutional Considerations. Available: http://siteresources.worldbank.org/INTEAPREGTOPENVIRONMENT/Resources/China_WPM_final_lo_res.pdf [accessed 13 June 2012].

World Health Organization. 2002. Fluorides. Geneva:World Health Organization. Available: http://whqlibdoc.who.int/ehc/WHO_EHC_227.pdf [accessed 5 September 2012].

Wu TM. 1936. Second revision of Chinese-Binet Intelligence Test. Shanghai:Commercial Press (in Chinese).

Wu T. 1983. The Chinese Comparative Intelligence Test Guidebook. 3rd ed. Beijing:Beijing University Press.

Xiang Q, Liang Y, Chen L, Wang C, Chen B, Chen X, et al. 2003. Effect of fluoride in drinking water on children's intelligence. Fluoride 36(2):84–94.

Xu YL, Lu CS, Zhang XN. 1994. Effect of fluoride on children's intelligence [in Chinese]. Endem Dis Bull 2:83–84.

Yang Y, Wang X, Guo X, Hu P. 1994. Effects of high iodine and high fluorine on children's intelligence and the metabolism of iodine and fluorine. Chin J Pathol 15(5):296–298. Available: http://www.fluoridealert.org/chinese/ [accessed 20 August 2012].

Yao LM, Deng Y, Yang SY, Zhou JL, Wang SL, Cui JW. 1997. Comparison of children's health and intelligence between the fluorosis areas with and without altering water sources [in Chinese]. Lit Inf Prev Med 3(1):42–43.

Yao LM, Zhou JL, Wang SL, Cui KS, Lin FY. 1996. Analysis of TSH levels and intelligence of children residing in high fluorosis areas [in Chinese]. Lit Inf Prev Med 2(1):26–27.

Zhang J, Gung Y, Guo J. 1985. Children Intelligence Scale Handbook. Beijing:Captial Institute of Pediatrics Heatlh Research Office.

Zhang JW, Yao H, Chen Y. 1998. Effect of high level of fluoride and arsenic on children's intelligence [in Chinese]. Chin J Public Health 17(2):57.

Zhang M, Wang A, Xia T, He P. 2008. Effects of fluoride on DNA damage, S-phase cell-cycle arrest and the expression of NF-κB in primary cultured rat hippocampal neurons. Toxicol Lett 179:1–5.

Zhao LB, Liang GH, Zhang DN, Wu XR. 1996. Effect of a high fluoride water supply on children's intelligence. Fluoride 29(4):190–192.

Link for video:
https://www.bitchute.com/video/3b4A74o1KmS0/

.

Pilot Josh Yoder reports: "I'm being notified by passengers on a Southwest flight departing Las Vegas that the **captain became incapacitated soon after takeoff** this morning. He was removed from the flight deck and **replaced by a non Southwest pilot who was commuting on that flight**. This is now the **fifth pilot incapacitation** that I'm aware of in the past two weeks. I will post more details as they become available." (**click here**)

5th pilot incident this month...

March 13, 2023 – Emirates Flight EK205 MXP-JFK diverted due to pilot illness hour and a half [illegible] take-off (**click here**)

March 11, 2023 – United Airlines Flight 2007 GUA-ORD diverted due to "incapacitated pilot" who had chest pains

Retired FBI Agent Exposes Planned Unidentified Aerial Phenomena (UAP)/ UFO Invasion
March 24, 2023 8

Vaccine Injuries and Deaths Caught on Camera
September 27, 2021 2

Hospital Whistleblower Reports that Doctors & Hospitals do not Report Vaccine Injuries & Deaths
September 27, 2021 1

'Freedom Angels' Teach How to Organize against and Defeat Mandatory Vaccines in Schools
September 13, 2021 0

Los Angeles School System First in Nation to Require 2 Doses of Pfizer Vax for Students
September 12, 2021 1

(**click here**)

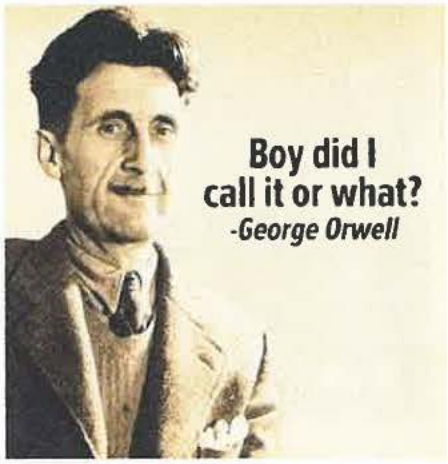
March ?, 2023 – British Airways pilot collapsed in Cairo hotel and died, was scheduled to fly Airbus A321 from Cairo to London (**click here**)

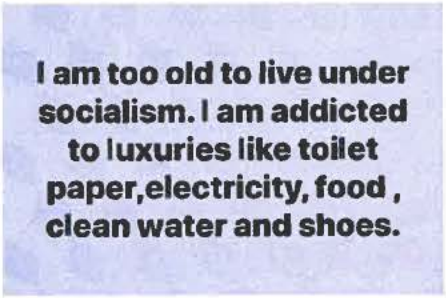
March, 3, 2023 – Virgin Australia VA-717 flight Adelaide to Perth was forced to make an emergency landing after First Officer suffered heart attack 30 min after departure. (**click here**)

Read full article here…

COVID VACCINES PILOTS VACCINE INJURY

COVID 19 on Trial





				from fertilizer and aluminum factories
Lead	zero	TT[8]; Action Level=0.015	Infants and children: Delays in physical or mental development; children could show slight deficits in attention span and learning abilities Adults: Kidney problems; high blood pressure	Corrosion of household plumbing systems; erosion of natural deposits
Mercury (inorganic)	0.002	0.002	Kidney damage	Erosion of natural deposits; discharge from refineries and factories; runoff from landfills and croplands
Nitrate (measured Nitrogen)	10	10	Infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Nitrite (measured Nitrogen)	1	1	Infants below the age of six months who drink water containing nitrite in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.	Runoff from fertilizer use; leaching from septic tanks, sewage; erosion of natural deposits
Selenium	0.05	0.05	Hair or fingernail loss; numbness in fingers or toes; circulatory problems	Discharge from petroleum refineries; erosion of natural deposits; discharge from mines
Thallium	0.0005	0.002	Hair loss; changes in blood; kidney, intestine, or liver problems	Leaching from ore-processing sites; discharge from electronics, glass, and drug factories

Organic Chemicals

Contaminant	MCLG[1] (mg/L)[2]	MCL or TT[1] (mg/L)[2]	Potential Health Effects from Ingestion of Water	Sources of Contaminant in Drinking Water
Acrylamide	zero	TT[9]	Nervous system or	Added to water during