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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

Anne McEnerny-Ogle, Mayor • Bart Hansen • Ty Stober • Erik Paulsen • Sarah J. Fox • Diana H. Perez • Kim D. Harless

March 3, 2025

Workshops: 4:30-6:00 p.m.

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

The City Council Meeting was held on 3/3/2025 at 4:30 PM in the Vancouver City Hall, Council Chambers 415 West 6th Street, Vancouver, WA 98660.

Workshops were conducted in person in the Council Chambers of City Hall. 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, or www.facebook.com/VancouverUS.

View the CVTV video recording, including presentations and discussion, for workshops at: https://www.cvtv.org/vid_link/37197?startStreamAt=0&stopStreamAt=5229

2025-2029 Vancouver Commute Trip Reduction Plan
(Approximately 45 minutes)

Olivia Kahn, Transportation Demand Management Coordinator, Rebecca Kennedy, Deputy Commmunity Development Director, Kate Drennan, Transportation Planning Program Manager, olivia.kahn@cityofvancouver.us, rebecca.kennedy@cityofvancouver.us, kate.drennan@cityofvancouver.us

Staff led Council through a discussion of the 2025-2029 Vancouver Commute Trip Reduction Plan.

Safe Stay Program
(Approximately 45 minutes, to immediately follow the previous workshop)

Jamie Spinelli, Homeless Response Manager, jamie.spinelli@cityofvancouver.us

Staff led Council through a discussion of the Safe Stay Program.

Council Dinner / Administrative Updates (6:00 - 6:30 PM)

Regular Council Meeting

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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/37199?startStreamAt=0&stopStreamAt=2018

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 Paulsen, Councilmember Stober, Councilmember Hansen, Mayor McEnerny-Ogle*

Absent: *None*

Approval of Minutes

Minutes - February 24, 2025

Motion by Councilmember Fox, seconded by Councilmember Stober, and Yes: 6, No: 0, Abstaining: 1, to approve the February 24, 2025, meeting minutes. Councilmember Hansen abstained.

Proclamations

Women's History Month

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Mayor McEnerny-Ogle read and presented a proclamation to Tracey Reilly Kelly and Jo Waddell from the League of Women Voters Clark County, proclaiming March 2025, as Women's History Month.

Red Cross Month

Mayor McEnerny-Ogle read and presented a proclamation to Michelle Prosser and Mousumi Hazra, Board Members of the Red Cross Southwest Washington, proclaiming March 2025, as Red Cross Month.

Music in Our Schools Month

Mayor McEnerny-Ogle read and presented a proclamation to Jessicah Wager, Board President of the Southwest Washington Wind Symphony, proclaiming March 2025, as Music in Our Schools Month.

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*
- *Kimberlee Goheen Elbon, La Center, WA*

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 3 and 5 for discussion.

Motion by Councilmember Hansen, seconded by Councilmember Perez, and

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Yes: 7, No: 0, Abstaining: 0, to approve Items 1, 2, 4 and 6-11 on the Consent agenda.

Motion by Councilmember Stober, seconded by Councilmember Harless, and Yes: 7, No: 0, Abstaining: 0, to approve Item 3 on the Consent agenda.

Motion by Councilmember Fox, seconded by Councilmember Hansen, and Yes: 7, No: 0, Abstaining: 0, to approve Item 5 on the Consent agenda.

1. Construction Acceptance - NW Daniels St. (W. 34th to 39th St.) Water Main Replacement - ITB 24-40

Staff Report: 044-25

Request: On Monday, March 3, 2025, accept the facilities as constructed by Halme Excavating, Inc., of Battle Ground, Washington and authorize the release of the contractor's retainage, subject to receipt of all documentation by law.

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

Motion approved the request.

2. Contract Award – Agreement Between City of Vancouver and LSW Architects for Fire Station 8 Design – RFQ 50-24

Staff Report: 045-25

Request: On Monday, March 3, 2025, authorize the City Manager, or designee, to enter into a Professional Services Agreement with LSW Architects for design services for Fire Station 8 for $1,306,972.24.

John Kearns, Capital Projects Project Manager,
Kevin.Kearns@cityofvancouver.us

Motion approved the request.

3. Contract Amendment – Legal Services Regarding PFAS Contamination - C-101309

Staff Report: 046-25

Request: On Monday, March 3, 2025, authorize the City Manager, or designee, to request an amended engagement letter for contract C-101309 with Marten Law of Seattle, Washington to allow for representation on all

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PFAS contamination issues, and to increase the total contract amount up to $500,000.

Kris Olinger, Utility Engineering Program Manager, kris.olinger@cityofvancouver.us

Motion approved the request.

4. C-TRAN Interlocal Agreements – Transit Signal Priority and Property Acquisitions - Hwy 99 Bus Rapid Transit Corridor

Staff Report: 047-25

Request: On Monday, March 3, 2025, authorize the City Manager to finalize and execute two interlocal agreements between C-TRAN and the City of Vancouver for (1) Transit Signal Priority system installation and operation, and (2) for minor property acquisitions related to the Hwy 99 Bus Rapid Transit station development.

Chris Christofferson, Traffic Engineering Manager, chris.christofferson@cityofvancouver.us

Motion approved the request.

5. 2025 Department of Health Prehospital Trauma Grant

Staff Report: 048-25

Request: On Monday, March 3, 2025, authorize the City Manager, or designee, to approve the 2025 Department of Health Prehospital Trauma Grant and to purchase STOP THE BLEED® kits for trauma management.

Michelle Bresee, Senior Management Analyst, Robert Milano, Division Fire Chief, michelle.bresee@cityofvancouver.us, Robert.Milano@cityofvancouver.us

Motion approved the request.

6. 2023 and 2024 State Homeland Security Program Grants (SHSP)

Staff Report: 049-25

Request: On Monday, March 3, 2025, authorize the City Manager, or designee, to approve the 2023 and 2024 SHSP Grants, which will be used for:

- Metro Explosive Disposal Unit (MEDU) equipment for VPD

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- Regional training for VFD

Michelle Bresee, Senior Management Analyst, Thomas O'Connor, Division Fire Chief, michelle.bresee@cityofvancouver.us, thomas.oconnor@cityofvancouver.us

Motion approved the request.

7. 2025 Firehouse Subs Public Safety Foundation Grant

Staff Report: 050-25

Request: On Monday, March 3, 2025, authorize the City Manager, or designee, to approve the 2025 Firehouse Subs Public Safety Foundation Grant, for the procurement of radio equipment for Vancouver Fire Department.

Michelle Bresee, Senior Management Analyst, Scott Willis, Division Fire Chief, michelle.bresee@cityofvancouver.us, Scott.Willis@cityofvancouver.us

Motion approved the request.

8. Downtown Redevelopment Authority Board Appointment

Request: On Monday, March 3, 2025, appoint Deborah McCracken to a midterm position on the Downtown Redevelopment Board, with a term beginning immediately and expiring December 31, 2028.

Subcommittee 2

Motion approved the request.

9. Salary Review Commission Appointment

Request: On Monday, Monday, March 3, 2025, appoint Jesika Williams to a full-term on the Salary Review Commission, with a term beginning February 24, 2025, and expiring February 23, 2029.

Mayor McEnerny-Ogle

Motion approved the request.

10. Vancouver Housing Authority Appointment

Request: On Monday, Monday, March 3, 2025, reappoint Carol Collier to a full-term on the Vancouver Housing Authority Board, with a term beginning immediately, and expiring February 11, 2030.

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Mayor McEnerny-Ogle

Motion approved the request.

11. Approval of Claim Vouchers

Request: Approve claim vouchers for March 3, 2025.

Motion approved claim vouchers in the amount of $3,433,141.26.

Communications

A. From the Council

B. From the Mayor

C. From the City Manager

Adjournment

7:02 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: Kari Hotchkiss
To: City Council
Subject: Downtown parking changes on weekends
Date: Wednesday, February 26, 2025 9:48:25 AM

You don't often get email from [redacted] Learn why this is important

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Hi City Council,
My name is Kari Jackson and I live in Uptown Vancouver, attend church in downtown Vancouver, and have previously lived in downtown Vancouver. I was made aware of the council approved changes to downtown parking via the Colombian this morning and have some concerns.

The first is overall. While I understand the desire and even income for changing weekends away from being free to park, it should remain in consideration that most of the people coming into downtown on the weekends drive to get to where they want to go, they don't use the bus. And that isn't going to change until the whole county, which spans from rural country to mixed suburbs, adjusts its infrastructure. So, please consider this in your planning for availability of parking.

The second thing is most churches who meet on Sundays in downtown, many of whom's members are older and have more difficulty walking, don't have church owned parking lots nearby. The older members also don't always have downloaded QR codes and readers on their phones or email addresses to plug into parking kitty. I myself refuse to use qr readers at restaurants as it's just another thing to do isolated on my phone rather than just ask for a menu and talk with my spouse. So, if you could please have regular pay meters for those who are out of town or do not want another app whether because they are only staying once for dinner or just don't want another app that would be appreciated. When I was living downtown I would have walked.

The third thing is I read that pricing would go up every hour. While I appreciate this for dining- that two hours is a good amount of time to eat- If I say parked near my church for service on a Sunday and then walked down to farmer's market, played with my kid at the playground, and finished with lunch at a local restaurant, I would like to know that participating in the community in this way would not be penalized. We just built a wonderful new playground for kids to play on and that assumes there is time to play on it.

The fourth thing is regarding shuttles and not cars.
Frankly, unless you have a shuttle that will deliver me to my location all winter and spring while it pours down rain, I'm not going to take a shuttle so that I can walk three or four blocks or more in the rain when I can take my car.

The last part is from permit parking in past experience. When I lived downtown there wasn't enough parking in the parking garage for the building in which I lived, so I parked on the street for a year and a half. Removing the ability to get a permit isn't justice for the people who live in downtown. They already contend with the people visiting and taking all the parking spaces on weekends. They should be given a way to park their own cars near their

own homes.

Thank you for considering my thoughts as a regular user of downtown parking.

Sincerely,
Kari Jackson

From: City of Vancouver, WA
To: City Council
Subject: Submission: Contact City Council
Date: Sunday, March 2, 2025 3:52:31 PM

Contact the City Council

Name

Lois McIntosh

Email

[redacted]

Phone

5037840800

Address

[redacted]
Vancouver 98682
United States
Map It

Subject

Share an Opinion of a City project or Initiative

Choose Recipient

All the Council

Message

I read the proposed change to downtown parking. I would like to comment on the proposal.
I live in east Vancouver with very limited access to mass transit. My friends and I only come downtown occasionally ;one of the main reasons is lack of parking sufficiently close to destinations. We used to go to the new Waterfront area which we like, but parking became quite an issue. One does not want to walk 15 blocks to get to a restaurant or event. Maybe that is why there is only 61% filled. The rest of the parking spaces are too far away. Maybe another parking lot is a good idea.

From: Wynn Grcich
To: City Council
Subject: Watch "Abortion Pill Active Chemicals Found in US Drinking Water: Study" on YouTube
Date: Thursday, February 27, 2025 10:18:45 PM

You don't often get email from [redacted]. Learn why this is important

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

https://youtu.be/Fm6-DD8xzHQ?si=4ARIA2cM0BXDVN5O. PLEASE SEND TO COUNCIL MEMBERS AND PUT ON PUBLIC RECORD. PLEASE CONFIRM THAT YOU DID. THANKS FROM WYNN

From: Wynn Grcich
To: Rebecca Messinger
Cc: City Council
Subject: Watch "Yale Scientists CONFIRM mRNA Shots Cause "Post-Vaccination Syndrome"! w/ Dr. Ram Yogendra" on YouTube
Date: Sunday, March 2, 2025 3:25:32 PM

You don't often get email from [redacted]. Learn why this is important

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

https://youtu.be/xVRQ6swpES0?si=DZiAVghQGqQDJ-bW. Please send to council members and MELNICK. Put on public record and confirm that you did. Dr.Melnick will be staring his bird flu jabs soon. Thanks from Wynn

From: Wynn Grcich
To: Rebecca Messinger; City Council
Subject: School lockdowns
Date: Sunday, March 2, 2025 6:41:05 PM

You don't often get email from [redacted]. Learn why this is important

CAUTION: This email originated from outside of the City of Vancouver. Do not click links or open attachments unless you recognize the sender and know the content is safe.

https://t.me/gatewaypunditofficial/44197. Please send to council members and MELNICK. Put on public record and confirm that you did. We don't want this to happen again with the next plandemic. Thanks from Wynn

Esteemed council members. My name is Danielle Jokela.

Several weeks ago, Councilmember Kim Harless issued a message to the community. Her message resonated with me deeply and my friends and I felt led to reiterate her message to you, the Council. Today, I will read a portion of her statement.

I have a message for the community:

As we are all aware, there is a dictatorship being brewed at the federal level.

An oligarchy of the rich and powerful to further funnel control, wealth, and freedom from The People to a very few.

The wealth gap between the top and everyone else is at historic levels.

When we talk locally about deficits, I can't help but be angry.

We recently went through a very difficult budget cycle.

Our $43 million dollar deficit is what some at the top make in a single day, plus change.

Everything the city does: the police, the fire, the parks, the community centers, the roads, the affordable housing, the soon to be shelter, paying wages for the amazing staff we have at the city, and so much more.

In a little over a month, one billionaire adds enough wealth to their individual coffers to cover our entire budget for a year.

Yet we are criticized for having a deficit.

As individuals, we are blamed for a lack of funds for our rent, our mortgages, our groceries.

It seems there is plenty to go around, but it isn't shared.

What kind of monster holds so much wealth when the lives of everyone around them could be better.

In Native culture, you show your wealth by how much you give and share, not by how much you hoard for yourself.

Shame on our new governor for changing Inslee's plan to balance the budget with a wealth tax by replacing it with further cuts.

Cuts including a delay in expansion of access to childcare and early learning programs for low-income families.

In a state with one of the most regressive tax systems in a nation of historic wealth disparity, it is appropriate to tax wealth.

In the interest of time, I, Danielle, am going to pause, and will ask my friend Nickeia Hunter to continue Councilmember Harless' remarks with the time she is allotted.

(Read in 2 min. 25 seconds)

Thank you, Danielle. Councilmembers, my name is Nickeia Hunter, and I will resume reading Ms. Harless' remarks where Danielle left off.

Since the presidential inauguration, there have been threats by the new administration towards local government officials such as Councilmember Harless, and to you as her colleagues, to comply with the federal executive branch's immigration enforcement initiatives, under threat of prosecution.

Nothing obligates local law enforcement to coordinate with federal law enforcement.

The federal government, not local law enforcement, is responsible for enforcing federal immigration laws.

Our policies at the city that police officers cannot be used for immigration enforcement, and that they do not ask about immigration status adheres to our community values.

These policies also demonstrate that we will not comply with the use of our limited city tax dollars being illegally used by the federal government.

Further, I will do anything in my power to ensure our city is safe for all our people as more federal overreach attempts occur, which they will.

With that, I, Nickeia, will pause, and pass the mic to my friend Monica Zazueta Tabor to close out Councilmember Harless' remarks. Thank you.

(Read in 1 min. 30 seconds)

Yolanda

Thank you, Nickeia. Councilmembers, my name is Monica Zazueta Tabor, and I will finish reading Harless' message to the community.

~~with~~ which my core energy resonates with

For thousands of years, people have traveled and traded throughout Turtle Island and South America.

My ancestors, and the ancestors of those who identify as Hispanic, Latino, Mexican, Chicano, South or Central American are the Aztecan and Mayan people who still exist today, and historically traveled and traded throughout this land long before there was any US border.

These people are Indigenous to the lands of the United States.

This new administration isn't set on removing "illegal aliens", it is deporting people who are native to the Americas that have an ancestral right to be here as Creator intended.

Since before the US declared independence from England, it was a core value of the colonizers to remove the native people from their lands.

The Declaration of Independence calls the native people merciless savages.

The roots of injustice in the US are written for the entire world to read.

A text held in the highest regard in our country.

It comes as no surprise that there are reports of people with Tribal citizenship being detained and harassed by ICE.

Compliance with a colonizing system of suppression and systematic genocide is still not enough to protect our Tribal communities from harm and harassment from the government.

It seems to be that if you are brown, you are guilty until proven innocent, just as our founding fathers intended.

But don't feel defeated.

I know I am not.

For many people, including myself, when we are pushed, we push back.

You, me, and every person that hears this has the capacity to do good and to make a difference.

We are each only one individual, but collectively, we are a threat to autocracy and neoliberalism.

Growing a garden and sharing food is rebellion.

Helping your neighbor free of charge is a revolution.

Cultivating joy and friendship with those around you is resistance.

Know your rights, and understand how our rights are being targeted.

Learn about topics such as bystander intervention, de-escalation techniques, and rapid emergency response.

Keep in mind that over two-thirds (68%) of eligible voters nationwide did NOT vote for this new administration.

In Washington State, it's even higher at over three quarters (75.6%).

This flurry of executive orders is meant to disarm you, to make you feel small and useless.

But the truth is that you and me together, we are powerful.

That concludes Councilmember Harless' remarks. Thank you for your time.

(Read in 2 min, 45 secs)

remember we are all interconnected and we need each other.

a task would have kept many from proceeding, Yiamouyiannis persisted and eventually compiled and sorted all the data, triple checking all entries. Upon doing so, Yiamouyiannis found that the DMFT rates of children living in fluoridated communities their whole lives differed little, if any, from the DMFT rates of children living their whole lives in (DN)ridated communities. Such a finding brought into serious question the claims made by the dental community about the supposed benefits of fluoridation.

For this, and all of his many day in, day out efforts helping citizens' groups throughout the country, we will miss Dr. John Yiamouyiannis, a man truly ahead of his time.

Tags: flouridation (https://fluoridealert.org/tag/flouridation/), flouride (https://fluoridealert.org/tag/flouride/), Fluoridation (https://fluoridealert.org/tag/fluoridation/), fluoride (https://fluoridealert.org/tag/fluoride/)

RELATED VIDEOS:

Mr. Fluoride (Get the F Out of Our Water) Battle Hymn (https://fluoridealert.org/fan-tv/mr-fluoride/)

RELATED ARTICLES:

Fluoridation: Worsening the Lead Crisis in Flint, and Beyond

Print-Friendly Copy of Report Press Release: Fluoride in Water Worsens U.S. Lead Crisis Introduction Over the past few weeks, the nation has watched in horror at the lead poisoning crisis unfolding in Flint, Michigan. The details from Flint have been shocking: tap water so corrosive it caused lead levels in some homes to meet

(https://fluoridealert.org/articles/fluoridation_flint_l

RELATED STUDIES:

Fluoride & IQ: 76 Studies

Note: See the Updated list of fluoride IQ studies at https://fluoridealert.org/researchers/fluoride-iq-studies/the-fluoride-iq-studies/ • As of July 18, 2022, a total of 85 human studies have investigated the relationship between fluoride and human intelligence. • Of these investigations, 76 studies have reported that elevated fluoride exposure is associated with reduced IQ in humans. • The studies

(https://fluoridealert.org/studies/brain01/)

Fluoride's Effect on Fetal Brain

The human placenta does not prevent the passage of fluoride from a pregnant mother's bloodstream to the fetus. As a result, a fetus can be harmed by fluoride ingested pregnancy. Based on research from China, the fetal brain is one of the organs susceptible to fluoride poisoning. As highlighted by the excerpts

(https://fluoridealert.org/studies/brain05_/)

Fluoride: Developmental Neurotoxicity.

Developmental Neurotoxicity There has been a tremendous amount of research done on the association of exposure to fluoride with developmental neurotoxicity. There are over 60 studies reporting reduced IQ in children and several on the impaired learning/memory in animals. And there are studies which link fluoride to Attention Deficit Hyperactivity Disorder. Teaching

(https://fluoridealert.org/studies/brain03_/)

RELATED MISCELLANEOUS CONTENT:

Email Exchange with FDA re: Fluoride Supplements

Email exchange regarding FDA's reasons for not approving fluoride supplements.

(https://fluoridealert.org/content/fda-emails/)

Source of Fluoride:	Water
Water Fluoride Levels:	High F area=5.55±0.41 mg/L Medium F area=2.01±0.009 mg/L
Urine Fluoride Levels:	High F area = 6.13±0.67 mg/L Medium F area = 2.30±0.28 mg/L
Confounding Factors:	(1) The study included only those children who were life-long residents of the areas. respective location. (2) The areas have similar nutritional status and both have middle class socioeconomic status (although Sachana is slightly poorer). (3) Iodized salt is used in both areas.
Type of IQ Test	Questionnaire prepared by Prof. JH Shah; standardized on the Gujarati population with 97% reliability rate in relation to the Stanford-Binet Intelligence Scale
Results:	(A) Average IQ is lower in High-F area (91.72±1.13) than in Low-F area (104.44+1.23), p<0.001. (B) High F area has 28.09% of children with IQ below normal (over twice the percentage found in lower F area).
Conclusion:	"In agreement with other studies elsewhere, these findings indicate that children drinking high F water are at risk for impaired development of intelligence."

IQ Study #26: Fan (2007) (http://www.fluoridealert.org/uploads/fan-2007.pdf)

Citation:	Fan Z, Dai H, Bai A, Li P, Ro L, Li G, Zhang C, Li X. (2007). **The effect of high fluoride exposure on the level of intelligence in children.** *Journal of Environmental Health* 24(10):802-03.
Location of study:	**CHINA.** Pucheng County, Shaanxi Province.
Size of study:	79 children (42 children in High F area; 37 children in low F area)
Age of Subjects:	7-14 years old
Source of Fluoride:	Water
Water Fluoride Levels:	– High F area=3.15 mg/L – Low F area=1.03 mg/L (water-improvement schemes implemented 14-18 years before study)
Urine Fluoride Levels:	– High F area group=2.89±1.97 mg/L (range: 1.14-6.09 mg/L); – Low F area group=1.78±0.46 mg/L (range: 1.33-2.35 mg/L) *(non-significant difference, likely because F is consumed from various sources other than water)*
Confounding Factors:	(1) The two areas have common habits and lifestyles in terms of cuisine, economy, culture, education, agricultural goods, etc.. (2) No chemical factories in area. (3) The area does not have an iodine deficiency problem.
Type of IQ Test	CRT-C2 intelligence module

IQ Study #28: Wang (2007) (http://www.fluoridealert.org/uploads/wang-2007.pdf)

Citation	Wang SX, Wang ZH, Cheng XT, Li J, Sang ZP, Zhang XD, Han LL, Qiao XY, Wu ZM, Wang ZQ. (2007). **Arsenic and fluoride exposure in drinking water: children's IQ and growth in Shanyin county, Shanxi province, China.** *Environmental Health Perspectives* 115(4):643-7.
Location of study:	CHINA. Shanyin County, Shanxi Province.
Size of study:	720 children: 21-196 per village (3 villages for each of the arsenic groups)
Age of Subjects:	8-12 years old
Source of Fluoride:	Water
Water Fluoride Levels:	High-Arsenic group = 0.9±0.5 mg/L Medium-Arsenic group = 1.7±1.1 mg/L High-Fluoride group = 8.3±1.9 mg/L Control group = 0.5±0.2 mg/L
Urine Fluoride levels:	High-Arsenic group = 1.0±1.7 mg/L Medium-Arsenic group = 2.8±1.9 mg/L High-Fluoride group = 5.1±2.0 mg/L Control group = 1.5±1.6 mg/L
Confounding Factors:	(1) Arsenic used as variable. Similar manganese levels in water for all groups. (2) All groups lived in rural areas with similar geographic and cultural conditions and a comparable level of socioeconomic development (years of parental education, average income, years of exposure). (3) All children currently attending school.
Type of IQ Test	CRT-RC (Combined Raven's Test for Rural China)
Results:	– Average IQ in high-arsenic area (95.1±16.6) is significantly lower than IQ in control area (104.8±14.7). $p < 0.05$ – The average IQ in high-fluoride area (100.5±15.8) is also significantly lower than average IQ in control area (104.8±14.7). $p < 0.05$ – Significantly more children with IQ lower than 70 (mental retardation) in high-F area (4%), medium-arsenic area (3.3%), and high-arsenic area (8.3%) as compared to control (0%).
Conclusion:	"This study indicates that exposure to fluoride in drinking water is associated with neurotoxic effects in children."

IQ Study #27: Trivedi (2007) (http://www.fluoridealert.org/uploads/trivedi-2007.pdf)

Citation:	Trivedi TMH, 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.
Location of study:	**INDIA.** *High F area: Sachana, Sanand district, Gujarat; Medium F area: Chandlodia, Ahmedabad.*
Size of study:	190 children (89 in high F area; 101 in medium F area)
Age of Subjects:	12-13 years old

Results:	– IQ decreased with increasing F level in urine ($p < 0.01$) – IQ was significantly reduced among children with severe fluorosis as compared to children without fluorosis ($p < 0.05$) – A trend (albeit not statistically significant) for IQ to decrease with increasing severity of dental fluorosis (NS) and with increasing severity of the region's fluoride poisoning
Conclusion:	"High exposure to fluoride most definitely has an adverse effect on the development of intelligence in children, in particular on the capability of abstract inference."

IQ Study #29: Rocha-Amador (2007) (http://fluoridealert.org/wp-content/uploads/rocha_amador-2007.pdf)

Citation:	Rocha-Amador D, Navarro ME, Carrizales L, Morales R, Calderón J. (2007). **Decreased intelligence in children and exposure to fluoride and arsenic in drinking water.** *Cadernos de Saude Publica* 23(Suppl 4):S579-87.
Location of study:	**MEXICO.** Durango State, Mexico & San Luis Potosi State.
Size of study:	132 children
Age of Subjects:	6 to 10 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels	Lowest F village: 0.8±1.4 mg/L Middle F village: 5.2±0.9 mg/L Highest F village: 9.4±0.9 mg/L
Urine Fluoride Levels	Lowest F village: 1.8±1.5 mg/L Middle F village: 6.0±1.6 mg/L Highest F village: 5.5±3.3 mg/L
Confounding Factors:	(1) A multiple regression analysis was used that controlled for blood lead levels, socioeconomic status, mother's education, height-for-age (an index of malnutrition), and transferrin saturation. (2) Each child's water fluoride level, and urine fluoride level, levels were individually determined. (3) The test examiner was blinded as to the children's fluoride exposure.
IQ Test:	Wechsler Intelligence Scale for Children–Revised Mexican Version (WISC-RM)
Results:	(1) Both fluoride in urine, and fluoride in water, were significantly correlated with IQ, and this *correlation remained significant after* controlling for lead exposure, socioeconomic status, mother's education, malnutrition, and transferrin. (2) Fluoride's effect on IQ was larger than the effect from arsenic.
Conclusion:	"We found that exposure to F in urine was associated with reduced Performance, Verbal and Full IQ scores before and after adjusting for confounders. The same pattern was observed for models with F in water as the exposure variable. . . . The individual effect of F in urine indicated that for each mg increase of F in urine a decrease of 1.7 points in Full IQ might be expected."

Location of Study:	**INDIA.** Nalgonda District, Andhra Pradesh.
Size of Study:	1000 children
Age of Subjects:	13-15 years old
Source of Fluoride:	Water
Water Fluoride Levels:	Four areas were studied: <0.7 mg/L; 0.7-1.2 mg/L; 1.2-4.0 mg/L; >4 mg/L
Type of IQ Test:	Raven's standard progressive matrices
Results:	"Number of intellectually impaired children were gradually increased with the increase in fluoride concentration in the drinking water."
Conclusion:	"Findings of this study suggest that overall IQ levels in children's exposed to high fluoride level were significantly lower than the low fluoride areas."

IQ Study #30: Li (2009) (http://fluoridealert.org/wp-content/uploads/li-200911.pdf)

Citation:	Li F, Chen X, Huang R, Xie Y. (2009). **The impact of endemic fluorosis caused by the burning of coal on the development of intelligence in children.** *Journal of Environmental Health* 26(4):838-40.
Location of study:	CHINA. Xinhua County, Hunan Province.
Size of study:	80 children total: 20 children from "mild" fluorosis area, 20 from "medium" fluorosis area, 20 from "severe" fluorosis area, and 20 from non-fluorosis area.
Age of Subjects:	8-12 years old
Source of Fluoride:	Coal burning
Fluoride exposure levels:	Urine F (by region): severe = 2.34+1.13 mg/L medium = 1.67+0.66 mg/L mild = 1.24+0.43 mg/L control = 0.96+0.52 mg/L Urine F (by dental fluorosis type): severe = 2.66+1.09 mg/L medium = 2.01+0.80 mg/L mild = 1.64+0.68 mg/L very mild = 1.17+0.48 mg/L suspected = 1.09+0.36 mg/L no fluorosis = 0.87+0.23 mg/L.
Confounding Factors:	(1) All children were born and raised in the respective areas. (2) Children were excluded if they had been diagnosed with physical deformation, developmental disorders, delayed mental development, emotional/behavioral obstacles or challenges, or other forms of mental disorders.
Type of IQ Test	CRT-RC (Combined Raven's Test for Rural China)

Confounding Factors:	(1) Children included were continuous residents of study villages since birth; drinking water from same public water supply (1 per village); (2) attended same high school (1 per village). (3) Children with history of trauma or injury to head; affected by congenital or acquired neurological disorders, psychological disorders were excluded.
Type of IQ Test	Raven's Standard Progressive Matrices Test
Results:	63.2% of children in high F area had IQ less than 90, versus 47.7% of children in low F village. (p=0.06).
Conclusion:	"Though there was a trend in our study towards lower IQ in a greater number of children from high F village than in the low F village, probably the small sample size of the present study failed to establish a statistically significant difference."

IQ Study #32: Shivaprakash (2011) (http://fluoridealert.org/studytracker/17873/)

Citation:	Shivaprakash PK, Ohri K, Noorani H. (2011). **Relation between dental fluorosis and intelligence quotient in school children of Bagalkot district.** *J Indian Soc Pedod Prev Dent.* 29(2):117-20.
Location of study:	**INDIA.** Bagalkot district, Karnataka state.
Size of study:	160 children
Age of Subjects:	7-11 years old
Source of Fluoride:	Water
Water Fluoride Levels:	high F village = 2.5-3.5 mg/L low F village = < 0.5 mg/L
Confounding Factors:	(1) Children included in study had normal birth history, were permanent residents in the region of study, had no history of trauma to the head, no history of chronic illness, not on medication. (2) Villages have similar culture, standard of living, and lifestyle habits.
Type of IQ Test	Raven's Colored Progressive Matrices Test
Results:	(A) Children with dental fluorosis had lower IQ (66.63±18.09) than those without dental fluorosis (76.36±20.84), $p < 0.05$. (B) Children with mild dental fluorosis had lower IQ (66.73) than those without dental fluorosis (75.89), $p < 0.05$.
Conclusion:	"Previous studies had indicated toward decreased Intelligence in children exposed to high levels of fluoride and our study also confirmed such an effect."

IQ Study #31: Sudhir (2009) (http://fluoridealert.org/studytracker/21090/)

Citation:	Sudhir KM, Chandu GN, Prashant GM, Subba Reddy VV. (2009). **Effect of fluoride exposure on intelligence quotient (IQ) among 13-15 year old school children of known endemic area of fluorosis, Nalgonda District, Andhra Pradesh.** *Journal of the Indian Association of Public Health Dentistry* 13:88-94.

Conclusion:	"In conclusion, our study suggested that low levels of fluoride exposure in drinking water had negative effects on children's intelligence and dental health and confirmed the dose-response relationships between urine fluoride and IQ scores as well as dental fluorosis."

IQ Study #34: Poureslami (2011) (http://fluoridealert.org/studytracker/17871/)

Citation:	Poureslami HR, Horri A, Khoramian S, Garrusi B. (2011). **Intelligence quotient of 7 to 9 year-old children from an area with high fluoride in drinking water.** *Journal of Dentistry and Oral Hygiene* 3(4):61-64.
Location of study:	**IRAN.** Kerman Province; Koohbanan (high-F) and Baft (low-F).
Size of study:	120 children: 60 children per city
Age of Subjects:	7-9 years old
Source of Fluoride:	Water
Water Fluoride levels:	High-F = 2.38 mg/L Low-F = 0.41 mg/L
Confounding Factors:	(1) Exclusion criteria: genetic, congenital, or acquired diseases related to the nervous system, past or present. (2) Inclusion criteria (high-F village): signs of grade III TSIDF (total surface index of Dental Fluorosis) or more. (3) Inclusion criteria (low-F village): similar physical and mental health criteria adopted, but children lacked any sign of Dental Fluorosis. (4) Both towns at high altitude.
Type of IQ Test	Raven's Progressive Matrices Intelligence Test (Persian version)
Results:	Average IQ of High F group (91.37+16.63) is significantly lower than average IQ of Low-F group (97.80±15.95), $p < 0.05$.
Conclusion:	"Based on the findings, chronic exposure to high levels of fluoride can be one of the factors that influence intellectual development."

IQ Study #33: Eswar (2011) (http://fluoridealert.org/studytracker/23295/)

Citation:	Eswar P, Nagesh L, Devaraj CG. (2011). **Intelligent quotients of 12-14 year old school children in a high and low fluoride village in India.** *Fluoride* 44:168-72.
Location of study:	**INDIA.** Ajjihalli (low F) and Holesirigere (high F) villages, Davangere district, Karnataka.
Size of study:	133 children total (low F village=65; high F village=68)
Age of Subjects:	12-14 years old
Source of Fluoride:	Water
Water Fluoride levels:	High F village=2.45 mg/L Low F village =0.29 mg/L

Confounding Factors:	(1) No significant differences in urinary lead, arsenic, or iodine levels between the four groups. (2) No significant differences in gender ratio, socio-economic status, SES, parental education, height/age ratio, and weight/height ratio. (3) Children were excluded if they were not lifelong resident of area, if they had changed their water source since birth, or if they had history of congenital or acquired neurological disease and/or head injury.
IQ Test:	Raven's Standard Progressive Matrices
Results:	"Reduction in intelligence was observed with an increased water fluoride level (*P* 0.000). The urinary fluoride level was a significant predictor for intelligence (*P* 0.000)."
Conclusion:	"This study indicates that exposure to fluoride is associated with reduced intelligence in children. We have found a significant inverse relationship between intelligence and the water fluoride level, and intelligence and the urinary fluoride level. After adjusting for confounders, urinary fluoride was the significant predictor for intelligence."

IQ Study #35: Ding (2011)
(http://fluoridealert.org/studytracker/17870/)

Citation:	Ding Y, Yanhui G, Sun H, Han H, Wang W, Ji X, Liu X, Sun D. (2011). **The relationships between low levels of urine fluoride on children's intelligence, dental fluorosis in endemic fluorosis areas in Hulunbuir, Inner Mongolia, China.** *Journal of Hazardous Materials* 186(2-3):1942-46.
Location of study:	**CHINA**. Hulunbuir, Inner Mongolia.
Size of study:	331 children from four sites
Age of Subjects:	7-14 years old
Source of Fluoride:	Water
Water Fluoride Levels:	Mianduhe town=0.28+0.03 mg/L Nan district=0.79+0.33 mg/L Donghu district=1.78+0.60 mg/L Zhalainuoer county=1.82+1.00 mg/
Urine Fluoride Levels:	No dental fluorosis = 0.80+0.55 mg/L Questionable fluorosis = 1.13+0.73 mg/L Very mild fluorosis = 1.11+0.74 mg/L Mild fluorosis = 1.31+0.78 mg/L Moderate fluorosis =1.46+0.79 mg/L.
Confounding Factors:	(1) Sites selected to match social and natural factors like economic situation, educational standard, and geological environments. (2) Schools had similar teaching quality. (3) Sites are not exposed to known neurotoxins (e.g. arsenic) in drinking water, nor are they endemic areas for iodine deficiency disorders. (4) Five children who had not lived in these areas at least 1 year were excluded.
IQ Test:	CRT-RC3 (Combined Raven's Test for Rural China)
Results:	Children's IQ was inversely related to urinary fluoride content, (p<0.0001). Each increase in 1 mg/L of urine F was associated with 0.59 point decrease in IQ (p=0.0226).

IQ Study #37: Seraj (2012) (http://fluoridealert.org/studytracker/17864/)

Citation	Seraj B, Shahrabi M, Shadfar M, Ahmadi R, Fallahzadeh M, Eslamlu HF, Kharazifard MJ. (2012). **Effect of high water fluoride concentration on the intellectual development of children in Makoo/Iran.** *Journal of Dentistry, Tehran University of Medical Sciences* 9(3): 221-29.
Location of Study:	**IRAN.** Makoo.
Size of Study:	293 children (91 children in control village; 106 children in medium F village; 96 children in high F village)
Age of Subjects:	6 to 11 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	Control = 0.8+0.3 ppm Medium fluoride = 3.1+0.9 ppm High fluoride = 5.2+1.1 ppm
Confounding Factors:	Age, gender, child's educational level, mother's educational level, father's educational level, fluorosis intensity, iodine level in water, lead level in water.
IQ Test:	Raven's Color Progressive Matrices (RCPM)
Results:	"The mean IQ scores decreased from 97.77±16.91 for the normal fluoride group to 89.03±12.99 for the medium fluoride group and to 88.58±16.01 for the high fluoride group (P=0.001)."
Conclusion:	"Since all potentially confounding factors were adjusted, the difference in IQ scores may reveal the potential effect of high fluoride exposure on the intellectual development of children."

IQ Study #36: Saxena (2012) (http://fluoridealert.org/studytracker/14808/)

Citation:	Saxena S, Sahay A, Goel P. (2012). **Effect of fluoride exposure on the intelligence of school children in Madhya Pradesh, India.** *Journal of Neurosciences in Rural Practice* 3(2):144-49.
Location of Study:	**INDIA.** Madhya Pradesh.
Size of Study:	173 children (120 children in three high-F areas and 53 children from a control group)
Age of Subjects:	School children in the 5th & 6th grades
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	Group 1 = >4.5 ppm Group 2 = 3.1-4.5 ppm Group 3 = 1.5-3.0 ppm Control = <1.5 ppm
Urine Fluoride Levels:	Group 1 = 7.01±1.02 Group 2 = 4.85±0.50 Group 3 = 3.28±0.48 Control = 2.25±0.28

Results:	"The IQ of the 19 children in the high-F region was lower (mean±SD: 81.21±16.17), than that of the 20 children in the low-F region (mean±SD: 104.25±20.73, p=0.0004). In the high-F region, 57.8% had scores indicating mental retardation (IQ <70) or borderline intelligence (IQ 70–79), while this figure was only 10% in the low–F region."
Conclusions:	"The study found that children residing in a region with a high drinking water F level had lower IQs compared to children living in a low drinking water F region (p<0.001). The differences could not be attributed to confounding educational, economic, social, cultural, and general demographic factors."

IQ Study #38: Trivedi (2012)
(http://fluoridealert.org/studytracker/18631/)

Citation:	Trivedi MH, Sangai NP, Patel RS, Payak M, Vyas SJ. (2012). **Assessment of groundwater quality with special reference to fluoride and its impact on IQ of schoolchildren in six villages of the Mundra Region, Kachchh, Gujurat, India.** *Fluoride* 45(4):377-83.
Location of Study:	**INDIA.** Gujurat.
Size of Study:	84 children (34 from high-fluoride villages, 50 children from control village)
Age of Subjects:	6th and 7th grade students
Source of Fluoride:	Water
Water Fluoride Levels:	High Fluoride = 2.3 ± 0.87 mg/L Control = 0.83 ± 0.38 mg/L
Urine Fluoride Levels:	High Fluoride = 2.69 ± 0.92 mg/L Control = 0.42 ± 0.23
Confounding Factors:	Same socioeconomic status (E on an A-E scale); same attendance status at school (regular students attending more than 80% of classes)
Type of IQ Test:	Questionnaire prepared by Prof. JH Shah; standardized on the Gujarati population with 97% reliability rate in relation to the Stanford-Binet Intelligence Scale
Results:	"The average IQ score of the 34 students drinking the high F water was significantly lower (p?0.05) than among the 50 students drinking the low F water."
Conclusions:	"the present investigation concludes that the three villages of Chhasara, Gundala, and Mundra, are F-contaminated villages. Because of high F concentrations in the [groundwater], children in these villages have greater exposure to F that may lead in to low IQ as compared to the nearby villages of Baroi, Zarpara, and Pragpar, which have low F in their [groundwater]."

Conclusion:	"Chronic exposure to high levels of fluoride in water was observed to be associated with lower intelligence quotient."

IQ Study #40: Singh (2013) (http://fluoridealert.org/studytracker/19734/)

Citation:	Singh VP, Chauhan DS, Tripathi S, Kumar S, Gaur V, Tiwari M, Tomar A. (2014). **A correlation between serum vitamin, acetylcholinesterase activity and IQ in children with excessive endemic fluoride exposure in Rajasthan, India.** *European Academic Journal* 2(4):5857-5869.
Location of Study:	**INDIA.** Jaipur, Rajasthan.
Size of Study:	42 children (70 from high-fluoride area; 72 from control area)
Age of Subjects:	9 to 14 year olds
Source of Fluoride:	Water
Levels of Fluoride in Water:	High Fluoride = 6.8 mg/L Control area = <1.03 mg/L
Confounding Factors:	"The subjects were similar in living conditions, parental literacy, socioeconomic status, and health history. Moreover, age and sex matched controls were selected from the [low-fluoride area]."
Type of IQ Test:	Raven's Test
Conclusion:	"We observed reduced AChE activity in [the high fluoride area] which may be directly correlate[d] with the reduced intelligence score of the subjects."

IQ Study #39: Karimzade (2014) (http://fluoridealert.org/studytracker/19349/)

Citation:	Karimzade S, Aghaei M, Mahvi AH. (2014). **Investigation of intelligence quotient in 9-12-year-old children exposed to high- and low-drinking water fluoride in West Azerbaijan province, Iran.** *Fluoride* 47(1):9-14.
Location of Study:	**IRAN.** Poldashi and Piranshahr, West Azerbaijan province.
Size of Study:	39 male children (19 from high-fluoride area; 20 from control area)
Age of Subjects:	9 to 12 year olds
Source of Fluoride:	Water
Water Fluoride Levels:	High Fluoride = 3.94 mg/L Control = 0.25 mg/L
Confounding Factors:	No significant differences were found in the potential confounding factors of educational, economic, social, cultural, and general demographic characteristics between the high- and low-F regions.
Type of IQ Test:	Iranian version of the Raymond B Cattell test

IQ Study #42: Wei (2014) (http://fluoridealert.org/studytracker/23338/)

Citation:	Wei N, Li Y, Deng J; Xu S, Guan Z. (2014). **The effects of comprehensive control measures on intelligence of school-age children in coal-burning-borne endemic fluorosis areas.** *Chinese Journal of Endemiology* 33(3):320-22.
Location of Study:	**CHINA.** Bijie City, Guizhou Province.
Size of Study:	741 children (104 children from low-fluoride area; 298 children from an endemic fluorosis area with long-term defluoridation measures; 339 children from endemic fluorosis area with short-term defluoridation measures).
Age of Subjects:	8-12 years old
Source of Fluoride:	Coal
Urinary Fluoride Levels:	Control: 1.34 ± 0.64 mg/L; Long-term defluoridation: 2.33 ± 0.18 mg/L; Short-term defluoridation: 3.03 ± 0.16) mgL.
Results:	"Above average IQ of children in the control group was 97.1% (101/104),which was significantly higher than that of long and short treatment groups; after a lengthy treatment, mental retardation detection rate was significantly lower in the low-age group,8-10 year-old children(x^2 =7.542,$P < 0.01$). Urinary fluoride content was negatively correlated with the level of IQ (r =-0.553,$P < 0.01$)."
Conclusion:	"The intelligence development of children in coal-burning-borne endemic fluorosis area is significantly delayed. After a certain period of comprehensive treatment,the decreased level of cognition is inhibited and the mental retardation in the low-age group is improved."

IQ Study #41: Nagarajappa (2013) (http://fluoridealert.org/studytracker/23335/)

Citation:	Nagarajappa R, Pujara P, Sharda AJ, Asawa K, Tak M, Aapaliya P, Bhanushali N. (2013). **Comparative assessment of intelligence quotient among children living in high and low fluoride areas of Kutch, India: a pilot study.** *Iranian Journal of Public Health* 2(8): 813–818.
Location of Study:	**INDIA.** Kutch District, Gujarat.
Size of Study:	*100 children (50 children from high-fluoride* area; 50 children from control area)
Age of Subjects:	8-10 years old
Source of Fluoride:	Water
Water Fluoride Levels:	High Fluoride: 2.4 to 3.5 mg/L; Control: 0.5mg/L.
Type of IQ Test:	Seguin Form Board Test
Results:	"Mean scores for average, shortest and total timing category were found to be significantly higher ($P<0.05$) among children living in Mundra (30.45±4.97) than those living in Bhuj (23.20±6.21). Mean differences at 95% confidence interval for these timings were found to be 7.24, 7.28 and 21.78 respectively."

Serum Fluoride Levels:	High = 0.18 ± 0.11 mg/L Control = 0.06 ± 0.03 mg/L
Type of IQ Test:	Combined Raven's Test for Rural China (CRT-RC)
Confounding Factors:	"Covariates included the indicator variables for age, gender, educational levels of parents (primary and below, junior high school, senior high school, and above), and continuous variables for drinking water fluoride (mg/l) and levels of thyroid hormones (T3, T4, and TSH)."
Results:	"[T]he present work demonstrated that the IQ scores of children exposed to high fluoride drinking water were significantly lower than those who lived in control area . . . . [O]ur findings further showed that, across the full range of serum and urinary fluoride, children's IQ decreased gradually with the increase of fluoride contents in serum and urine, in a dose-dependent manner."
Conclusion:	"In summary, our data suggest that the intelligence of children is affected by the COMT gene polymorphism and, in particular, this SNP plays a role in modifying the effect of fluoride exposure on cognition. Children with COMT reference allele had a higher risk for cognitive impairments after fluoride exposure. Additionally, proteomics analysis represents early specific markers of developmental fluoride neurotoxicity. Hence, our findings provide certain basis for clarifying the mechanisms and identifying molecular targets of pharmacological interventions for potential delayed therapy."

IQ Study #43: Bai (2014) (http://fluoridealert.org/studytracker/19413/)

Citation:	Bai Z, Li Y, Fan Z, Li X, Li P. (2014) **Investigation and analysis of the development of intelligence levels and growth of children in areas suffering fluorine and arsenic toxicity from pollution from burning coal.** *Chinese Journal of Endemiology* 33(2):160-163.
Location of Study:	**CHINA.** Shaanxi Province.
Size of Study:	303 children (120 children from high-fluoride area; 95 from mid-fluoride area, 98 from low-fluoride area)
Age of Subjects:	8 to 12 years old
Source of Fluoride	Coal burning
Urine Fluoride Levels:	"The median urinary fluoride levels for children 8–12 years old in the areas of significant, minor and no morbidity were, respectively, 1.96, 0.81 and 0.54 mg/L."
Results:	"The children's urinary fluoride and urinary arsenic levels versus intelligence [quotients] were both negatively correlated (r=-0.560, -0.353, all P<0.05)."
Conclusion	"Exposures to fluorine and arsenic are deleterious to the development of intelligence and the development of growth in children"

Confounding Factors:	"In this rural community, social differences are limited. The parents or guardians completed a questionnaire on demographic and personal characteristics including the child's sex, age at testing, parity, illnesses before age 3, past medical history of the child and caretakers, parental or guardian age, education and occupational histories, and residential history, and household income. It is known that iron deficiency can impair motor and mental developments in children, iron concentration was therefore considered as a covariate. These potential confounders were used for adjustment in the statistical analysis." "Among possible confounders, both arsenic and lead are known to be low in drinking water in the area."
Type of Cognitive Tests:	WRAML, WISC-R, WRAVMA
Results:	"Results of our pilot study showed that moderate and severe dental fluorosis was significantly associated with deficits in WISC-R digit span. Children with moderate or severe dental fluorosis scored significantly lower in total and backward digit span tests than thosewith normal or questionable fluorosis. These results suggest a deficit in working memory. Scores on other tests did not show significant relationships with indices of fluoride exposure."
Conclusion:	"Results of our field study raise a concern about the safety of elevated systemic exposure to fluoride from high concentrations in the drinking water.While topical fluoride treatment confers benefits of reducing caries incidence, the systemic exposure should not be so high as to impair children's neurodevelopment especially during the highly vulnerable windows of brain development in utero and during infancy and childhood and may result in permanent brain injury. We are planning a larger scale study to better understand the dose–effect relationships for fluoride's developmental neurotoxicity in order to characterize the appropriate means of avoiding neurotoxic risks while securing oral health benefits."

IQ Study #44: Zhang (2015) (http://fluoridealert.org/studytracker/21075/)

Citation:	Zhang S, Zhang X, Liu H, Qu W, Guan Z, Zeng Q, Jiang C, Gao H, Zhang C, Lei R, Xia T, Wang Z, Yang L, Chen Y, Wu X, Cui Y, Yu L, Wang A. (2015). **Modifying Effect of COMT Gene Polymorphism and a Predictive Role for Proteomics Analysis in Children's Intelligence in Endemic Fluorosis Area in Tianjin, China.** *Toxicological Sciences* 144(2):238-45. April.
Location of Study:	**CHINA.** Tianjin City.
Size of Study:	180 children (96 from control area; 84 from "high fluoride" area)
Age of Subjects:	Avg = 11 years old
Source of Fluoride:	Water
Water Fluoride Levels:	High = 1.4 mg/L Control = 0.63 mg/L
Urine Fluoride Levels:	High = 2.4 ± 1.01 mg/L Control = 1.10 ± 0.67 mg/L

IQ Study #46: Kundu (2015) (http://fluoridealert.org/studytracker/22508/)

Citation	Kundu H, Basavaraj P, Singla A, Gupta R, Singh K, Jain S. (2015). **Effect of fluoride in drinking water on children's intelligence in high and low fluoride areas of Delhi.** *Journal of the Indian Association of Public Health Dentistry* 13(2):116-121. April-June.
Location of Study:	**INDIA.** Delhi.
Size of Study:	200 school children: 100 from low F area and 100 from high F area.
Age of Subjects:	8-12 years of age. Equal numbers of male and female children were included in the study.
Source of Fluoride:	Water
Type of Cognitive Tests:	Ravens Standardized Progressive Matrices Test
Results:	"Comparison of mean IQ of children in both high (76.20 ± 19.10) and low F (85.80 ± 18.85) areas showed a significant difference (P = 0.013). Multiple regression analysis between child IQ and all other independent variables revealed that mother's diet during pregnancy (P = 0.001) along with F in drinking water (P = 0.017) were the independent variables with the greatest explanatory power for child IQ variance (r^2 = 0.417) without interaction with other variables."
Conclusion:	"Fluoride in the drinking water was significantly related with the IQ of children. Along with fluoride, mother's diet during pregnancy was also found to be significantly related with IQ of children."

IQ Study #45: Choi (2015) (http://fluoridealert.org/studytracker/20589/)

Citation:	Choi AL, Zhang Y, Sun G, Bellinger D, Wang K, Yang XJ, Li JS, Zheng Q, Fu Y, Grandjean P. (2015). **Association of lifetime exposure to fluoride and cognitive functions in Chinese children: A pilot study.** *Neurotoxicology & Teratology* 47:96-101.
Location of Study:	**CHINA.** Southern Sichuan Province.
Size of Study:	51 children from elevated fluoride area
Age of Subjects:	Avg = 7.1 years old
Source of Fluoride:	Water
Urine Fluoride Levels:	Mean = 1.64 mg/L; Range = 0.22 to 5.84 mg/L
Water Fluoride Levels:	Mean = 2.2 mg/L; Range = 1.0 to 4.07 mg/L

Source of Fluoride:	Water
Results:	"In this study, on comparison of children at two locations according to IQ grades [Table/Fig-4], majority of the children (74.8%) living in low fluoride area had an IQ grade 2 (definitely above the average in intellectual capacity). None of the children from the low fluoride area had an IQ grade 4 and 5 (definitely below average and intellectually impaired). On the other hand, majority of children (58.1%) from high fluoride area fall under IQ grade 3 (intellectually average). None of the children from high fluoride area had an IQ grade 1 (intellectually superior). This difference in IQ grades of children amongst the two areas was found to be statistically significant ($p<0.001$)."[I]t is clearly evident that with increase in the grade of fluorosis, a trend of increase in the IQ grade (decrease in intellectual capacity) was observed indicating a strong correlation between fluorosis grade and IQ grade (Spearman's p=0.766)."
Conclusion:	"The data from this research may support the hypothesis that excess fluoride in drinking water has toxic effects on the nervous system."

IQ Study #47: Sebastian (2015)
(http://fluoridealert.org/studytracker/23058/)

Citation:	Sebastian ST, Sunitha S. 2015. **A cross-sectional study to assess the intelligence quotient (IQ) of school going children aged 10-12 years in villages of Mysore district, India with different fluoride levels.** *Journal of the Indian Society of Pedodontics and Preventive Dentistry* 33(4):307-11.
Location of Study:	**INDIA.** *Mysore district.*
Size of Study:	405 schoolchildren (135 children from high fluoride area; 135 children from "normal" fluoride area; 135 chidren from "low" fluoride area)
Age of Subjects:	10-12 years old
Source of Fluoride:	Water
Water Fluoride Levels:	High-fluoride: 2.2 mg/L; "Normal" Fluoride: 1.2 mg/L; "Low" Fluoride: 0.4 mg/L
Type of IQ Test:	Raven's colored Progressive Matrices Test
Results:	"In bivariate analysis, significant relationships were found between water fluoride levels and Intelligence Quotient of school children ($P < 0.05$). In the high fluoride village, the proportion of children with IQ below 90, i.e. below average IQ was larger compared to normal and low fluoride village. Age, gender, parent education level and family income had no significant association with IQ."
Conclusion:	"School children residing in area with higher than normal water fluoride level demonstrated more impaired development of intelligence when compared to school children residing in areas with normal and low water fluoride levels."

Results:	A significant inverse relationship was found between the fluoride concentration in drinking water and IQ (r value = -0.204; $P < 0.000$). It was observed that IQ level was negatively correlated with fluoride concentration in drinking water.
Conclusions:	It is concluded that IQ level was negatively correlated with fluoride level in drinking water. Factors that might affect children's IQ need to be considered, and it is necessary to devise solutions for preventing the harmful effects of excessive intake of fluoride ion to the body.
Funding:	No financial support or sponsorship.

IQ Study #49: Mondal (2016)
(http://fluoridealert.org/studytracker/22507/)

Citation:	Mondal D, Dutta G, Gupta S. 2016. **Inferring the fluoride hydrogeochemistry and effect of consuming fluoride-contaminated drinking water on human health in some endemic areas of Birbhum district, West Bengal.** *Environmental Geochemistry & Health* 38(2):557-76.
Location of Study:	**INDIA.** Birbhum district.
Size of Study:	40 children (20 from endemic fluorosis area; 20 from control area)
Age of Subjects:	10 to 14 years old
Source of Fluoride:	Water
Water Fluoride Levels:	"Mean F concentration in the study area varies from 0.32 to 13.29 mg/L."
Type of IQ Test:	Raven Standard Theoretical Intelligence Test
Results:	"This study indicates that students exposed to high F (children of Junidpur and Nowapara) show an average IQ of 21.17 ± 6.77 in comparison with low-F exposed students (children of Bilaspur, Mohula, Bhalian) having an average IQ of 26.41 ± 10.46. . . . Statistical analysis (Z test) demonstrates that there is a significant (Z = 2.59) difference in IQ among the high- and low-F area student."
Conclusion	"[S]tudents of the study area have less IQ than students of non-contaminated area, demonstrating that consumption of F also has a major role with the intellectual development of children."

IQ Study #48: Khan (2015)
(http://fluoridealert.org/studytracker/23336/)

Citation:	Khan SA, Singh RK, Navit S, Chadha D, Johri N, Navit P, Sharma A, Bahuguna R. 2015. **Relationship between dental fluorosis and intelligence quotient of school going children in and around Lucknow district: a cross-sectional study.** *Journal of Clinical & Diagnostic Research* 9(11):ZC10-15.
Location of Study:	**INDIA.** Lucknow district.
Size of Study:	429 schoolchildren
Age of Subjects:	6-12 years old

IQ Study #51: (Das-2016 (http://fluoridealert.org/studytracker/25929/))

Citation:	Das K, Mondal NK. 2016. **Dental fluorosis and urinary fluoride concentration as a reflection of fluoride exposure and its impact on IQ level and BMI of children of Laxmisagar, Simlapal Block of Bankura District, W.B., India.** *Environmental Monitoring & Assessment* 188(4):218.
Location of Study:	**INDIA.** West Bengal.
Size of Study:	149 schoolchildren
Age of Subjects:	6 to 18
Source of Fluoride:	Water
Water Fluoride Level:	Average = 2.1 mg/L (S.D. = 1.64 mg/L)
Type of IQ Test:	Combined Raven's Test for RuralChina (CRT-RC)
Results:	"IQ has anegative significant correlation with dental fluorosis (r=0.253,P<0.01). Dental fluorosis acts as an indicator of decreasing level of IQ. As fluorosis is a consequence of fluoride exposure, so IQ has a negative significant correlation with exposure dose (r =0.343, P<0.01) which was considered as a fluoride input source." "IQ values were plotted against the urinary fluoride concentration and it was found that they have a significant negative correlation (r=0.751, P<0.01)."
Conclusion	"[C]hildren residing in areas with higher than normal water fluoride level demonstrated more impaired development of intelligence and moderate [dental fluorosis]. Millions of children including adults around the world are affected by higher level of fluoride concentration through their drinking water and are therefore potentially at risk. It is concluded that for the benefit of the future generation, urgent attention should be paid on this substantial public health problem."

IQ Study #50: (Aravind-2016) (http://fluoridealert.org/studytracker/35876/)

Citation:	Aravind A, Dhanya RS, Narayan A, Sam G, Adarsh VJ, Kiran M. 2016. **Effect of fluoridated water on intelligence in 10-12-year-old school children.** *Journal of International Society of Preventive & Community Dentistry* 6 (Suppl 3), S237-S242.
Location of Study:	Schools: Virajpet (low fluoride level < 1.2 ppm), Banavara (Medium fluoride level 1.2-2 ppm), and Mastihalli (High fluoride levels > 3 ppm).
Size of Study:	96 children from each of the three fluoride water levels above, for a total of 288.
Age of Subjects:	10–12 years
Source of Fluoride:	Drinking water
Type of IQ Test:	Raven's Standard Progressive Matrices was conducted on each child in the study sample.

Source of Fluoride:	The study was performed in an endemic hydrofuorosis area. According to the authors: 'in Mexico F in water remains as the main source of F exposure. In endemic hydrofuorosis areas of Mexico only non-fluorinated salt is distributed according to the NOM-040-SSA1-1993."
Water Fluoride Level:	F levels in tap water mean concentrations for each trimester were: 2.6 ±1.1 mg/l, 3.1 ±1.1 mg/l and 3.7 ±1.0 mg/l respectively. It is worthy to note that over 81.5% of the samples of tap water were above 1.5 mg/l (NOM-127- SSA1-1994) with the highest value of 12.5 mg/. 33.8% of women reported drink tap water and 78.4% use it for cooking. The practice of use tap water for drink or cooking is crucial because exposure to F could be increased when the infant change to bottle feeding and starts solid foods. Regarding, bottled water it is important to mention that we have analyzed several brands of this water and 65% of the samples exceeded the 0.7 mg/l value (NOM-041-SSA1-1993) and 22.9% had values over 1.5 mg/l (NOM-127-SSA1-1994) data not shown.
Type of IQ Test:	"Neurodevelopment was assessed with the Bayley Scales of Infant Development II (BSDI-II) (Bayley, 1993). This test has good reliability and validity; it is applied to evaluate developmental delay in children between 3 months to 5 years in Mexico by the SSA (CNPSS, 2013). The Mental Development Index scale (MDI) of the Bayley test evaluate aspects of functioning such as eye-hand coordination, manipulation, understanding of object relation, imitation and early language development whereas the Psycho-motor Development Index (PDI) scale assesses gross motor development... To standardize the raw scores for children who were born prematurely, the number of months of prematurity was subtracted from their chronological age. The scores below 85 points indicated a possible developmental delay."
Results:	In this study near to 60% of the children consumed contaminated water and the prevalence of children with IQ below 90 points was 25% in the control group (F urine 1.5 mg/g creatinine) in comparison with the 58% of children in the exposed group (F urine >5 mg/g creatinine) (OR = 4.1, CI 95% 1.3–13.2) (data unpublished). Only 66.2% of the babies were at term. "We found higher levels of F in urine across trimester in premature compared with full term 2.4 vs 1.6 mg/l (1st); 2.3 vs 1.8 mg/l (2nd); and 4.1 vs 2.8 mg/l (3rd) (data not shown)
Conclusions:	"After adjusting for potential confounding factors (gestational age, age of child, marginalization index and type of water for consumption), the MDI [Mental Development Index] showed an inverse association with F levels in maternal urine for the first (b = -19.05, $p = 0.04$) and second trimester (b = -19.34, $p = 0.01$). Our data suggests that cognitive alterations in children born from exposed mothers to F could start in early prenatal stages of life.
Funding for study:	The authors acknowledge the financial support of this research by CONACYT with number 181577, FONSEC 2012 and the University of Guanajuato through DAIP support with number FO-DAI-05, 2013. The present work was carried out during the first period of the first author postdoctoral training (fellowship number 239404).

Location of Study:	**MEXICO.** Participants from the Early Life Exposures in Mexico to Environmental Toxicants (ELEMENT) project.
Size of Study:	299 mother–child pairs, of whom 287 and 211 had data for the General Cognitive Index and IQ analyses, respectively.
Age of Subjects:	Tests of cognitive function in the offspring at age 4 and 6–12 years.
Source of Fluoride:	Fluoridated salt (at 250?ppm) and to varying degrees of naturally occurring fluoride in drinking water.
Water Fluoride Level:	Natural water fluoride levels in Mexico City may range from 0.15 to 1.38 mg/L
Type of IQ Test:	"At age 4 y, neurocognitive outcomes were measured using a standardized version of McCarthy Scales of Children's Abilities. For children 6–12 y old a Spanish-version of the Wechsler Abbreviated Scale of Intelligence."
Results:	"In multivariate models we found that an increase in maternal urine fluoride of 0.5mg/L (approximately the IQR) predicted 3.15 (95% CI: 5.42, 0.87) and 2.50 (95% CI 4.12, 0.59) lower offspring GCI and IQ scores, respectively."
Conclusions:	"In this study, higher prenatal fluoride exposure, in the general range of exposures reported for other general population samples of pregnant women and nonpregnant adults, was associated with lower scores on tests of cognitive function in the offspring at age 4 and 6–12 y."
Funding for study:	This study was supported by the U.S. National Institutes of Health (NIH; grants R01ES021446 and R01-ES007821); the National Institute of Environmental Health Sciences/the U.S. Environmental Protection Agency (NIEHS/EPA; grant P01ES022844), the NIEHS (grant P42-ES05947 and NIEHS Center Grant P30ES017885), and by the National Institute of Public Health/Ministry of Health of Mexico. The American British Cowdray Hospital provided facilities used for this research.

IQ Study #52: (Valdez Jiménez-2017 (http://fluoridealert.org/studytracker/27898/))

Citation:	Valdez Jiménez L, López Guzmán OD, Cervantes Flores M, Costilla-Salazar R, Calderón Hernández J, Alcaraz Contreras Y, Rocha-Amador DO. 2017. **In utero exposure to fluoride and cognitive development delay in infants.** *Neurotoxicology* Mar;59:65-70.
Location of Study:	**MEXICO.** Durango City and Lagos de Moreno, Jalisco. Both are endemic hydro-fluorosis areas.
Size of Study:	"65 mother-infant pairs recruited from 2013 to 2014. Inclusion criteria were: 12 weeks of gestation, with no history of thyroid disease, without clinically diagnosed diabetes, and a minimum 5 years of residence in the study area."
Age of Subjects:	"The average age of children assessed was 8 months (3–15 months) and almost 70% were girls." The average age of the mothers was 22.4 ±4.0.

Type of IQ Test:	We examined the dose-response effects of low-to-moderate fluoride exposure on dental fluorosis (DF) and intelligence quotient (IQ), and evaluated the potential relationships between DF grades and intelligence levels using piecewise linear regression and multiple logistic regression, respectively.IQ scores were measured using the second edition of Combined Raven's Test–The Rural in China (CRT-RC2) (Liu et al., 2009) for children aged 7 to 13 years. The CRT-RC2 is a validated test for basic cognitive abilities, and has been widely adopted in China after modifications, as it is non-verbal and less affected by language, and cultural and ethnic differences (Sun et al., 2015). Dean's fluorosis index (WHO criteria) (Molina-Frechero et al., 2015) was used to estimate the prevalence and severity of DF. Each participant was examined by two qualified and independent experts, who had rich experience on examination of dental fluorosis... The final diagnosis was made only when judgments from the two experts were in agreement; if not, a third expert would join in and offer suggestion. For repeatability, 10% of participants were double checked and the Kappa value was 0.82.
Results:	The adjusted odds ratios (ORs) of DF were 2.24 (95% *confidence interval [CI]*: 2.02 to 2.48) for every 0.1 mg/L increment in the water fluoride concentration in the range of 0.80 to 1.50 mg/L, and 2.61 (95% CI: 2.32 to 2.93) for every 0.5 mg/L increment in the urinary fluoride level up to 1.80 mg/L. Every 0.5 mg/L increment in the water fluoride level was associated with a reduction of 4.29 in the IQ score (95% CI: -8.09 to -0.48) in the range of 3.40 to 3.90 mg/L, and a decreased probability of developing excellent intelligence (IQ ?130, OR = 0.60, 95% CI: 0.47 to 0.77) in the range of 0.20-1.40 mg/L, respectively. Every 0.5 mg/L increment in the urinary fluoride level was related to a decrease of 2.67 in the IQ scores (95% CI: -4.67 to -0.68) between 1.60 mg/L to 2.50 mg/L. Excellent intelligence decreased by 51% in children with higher urinary fluoride, and by 30% with each degree increment of DF.
Conclusions:	In conclusion, chronic exposure to excessive fluoride, even at a moderate level, was inversely associated with children's dental health and intelligence scores, especially excellent intelligence performance, with threshold and saturation effects observed in the dose-response relationships. Additionally, DF severity is positively associated with the loss of high intelligence, and may be useful for the identification of individuals with the loss of excellent intelligence. Thus, it is important to monitor water quality, and supply fluoride-free drinking water to safeguard children's health.
Funding for Study:	This study was supported by the State Key Program of National Natural Science of China (Grant No. 81430076) and the Fundamental Research Funds for the Central Universities (HUST 2015ZDTD052 and HUST 2016YXMS221).

IQ Study #53: (Bashash-2017 (https://ehp.niehs.nih.gov/ehp655/))

Citation:	Bashash M, Thomas D, Hu H, Martinez-Mier EA, Sanchez BN, Basu N, Peterson KE, Ettinger AS, Wright R, Zhang Z, Liu Y, Schnaas L, Mercado-García A, Téllez-Rojo MM, Hernández-Avila M. 2017. **Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico.** *Environmental Health Perspectives*, Sept 19;125(9):097017.

Source of Fluoride:	Drinking water
Water Fluoride Level:	Charora (Group A) had low fluoride (0.60 ppm) village, Farah (Group B) had medium fluoride level (1.70 ppm), and Raya (Group C) had the highest concentration of fluoride in water used for consumption (4.99 ppm).
Type of IQ Test:	SPM Test by John C Raven (1998)
Results:	Appraisal of the IQ levels among the three groups (low-, medium-, and high-fluoride areas) showed a statistically significant difference ($P = 0.05$). None of the children in the low-fluoride region were intellectually compromised when compared to 15 (20%) in the high-fluoride region and 4 (5.3%) in the medium-fluoride areas [Table 1]. In addition, no subject in the low fluoride area had below average IQ in contrast to 35 (46.7%) in the high and 10 (13.3%) in the medium-fluoride areas. Similarly, no one in medium and high fluoride area had either above average or superior IQ when compared to 38 (55.1%) and 9 (13%) children having above average and superior IQ in low-fluoride area, respectively. None of the children in the low-fluoride region had dental fluorosis as compared to 8 (10.7%), 45 (60.0%), and 22 (29.3%) children in the high-fluoride area who had mild, moderate, and severe dental fluorosis, respectively.
Conclusions:	Concentration of Fluoride in the ingested water was significantly associated with the IQ of children. Outcome measures revealed that exposure to higher levels of F determined by dental fluorosis status of child inferred higher IQ deficit.
Funding for Study:	There was no financial support nor sponsorship for this study.

IQ Study #54: (Yu-2018 (http://fluoridealert.org/studytracker/31316/))

Citation:	Yu X, Chen J, Li Y, Liu H, et al. (2018). **Threshold effects of moderately excessive fluoride exposure on children's health: A potential association between dental fluorosis and loss of excellent intelligence.** *Environment International*, Jun 2; 118:116-124.
Location of Study:	**CHINA.** In endemic and non-endemic fluorosis areas in Tianjin.
Size of Study:	2,886 resident children
Age of Subjects:	7 to 13 years
Source of Fluoride:	Drinking water
Water Fluoride Level:	The water fluoride concentration ranged from 0.20 mg/L to 1.00 mg/L, with a mean value of 0.50 ± 0.27 mg/L in the normal fluoride exposure group, and from 1.10 mg/L to 3.90 mg/L, with a mean value of 2.00 ± 0.75 mg/L in the high-fluoride exposure group (Table 1).

Location of Study:	**CHINA.** Cichong Elementary School in the coal burning-related endemic fluorosis area of Liupanshui City in Guizhou Province; and Minzu Elementary School of Guian District's Dangwu Township, a non-coal burning area, as the control group
Size of Study:	284 children: 167 were from the endemic area and 117 were the control.
Age of Subjects:	8 – 12 years
Source of Fluoride:	Coal Burning-Related Endemic Fluorosis Areas
Water Fluoride Level:	NA
Type of IQ Test:	Raven's Standard Progressive Matrices (RSPM)
Results:	we found that except for the intelligence levels of 12-year-old children in the control area being higher than that of those in the endemic area, there were no statistically significant differences among any of the other age groups. The differences of intelligence level among children in the endemic area with different dental fluorosis severities also showed no statistical significance. However, there was a negative correlation between age and intelligence level in children of the endemic area, which is in direct opposition to the usual situation of the intellectual development of school-aged children in general. The reason for this is that the dental fluorosis patients in our investigation were mainly concentrated in the suspected fluorosis group, and patients with other levels of severity only made up 50% of the total number of patients, with only six child patients with moderate dental fluorosis and no child patients with severe clinical fluorosis. The degree of fluorosis severity in the patients included in this investigation was not high, so a dosage-effect relationship might not have been able to be formed. In addition, the factors that influence the intelligence level of children are multivariate, and the mechanisms are complex, with fluorosis possibly only being one of many factors.
Conclusions:	The intelligence of the 12-year-old group in the endemic area was lower than that of the control area, with the difference having statistical significance (Z = 3.244, P = 0.001).
Funding for Study:	No mention

IQ Study #55: (Razdan-2017 (http://fluoridealert.org/studytracker/34517/))

Citation:	Razdan P, Patthi B, Kumar JK, Agnihotri N, Chaudhan P, Prasad M. (2017). **Effect of fluoride concentration in drinking water on intelligence quotient of 12–14-year-old children in Mathura District: A cross-sectional study.** *Journal of International Society of Preventive & Community Dentistry* 7(5):252-258.
Location of Study:	**INDIA.** Mathura district, Uttar Pradesh.
Size of Study:	219: 75 from low F area, 75 medium F area, and 69 from high F area. Identical numbers of male and female children were included.
Age of Subjects:	12-14 year olds

IQ STUDY #57: (Chang-2017 (http://fluoridealert.org/studytracker/34506/))

Citation	Chang A, Shi Y, Sun H, Zhang L. 2017. Analysis on the Effect of Coal-Burning Fluorosis on the Physical Development and Intelligence Development of Newborns Delivered by Pregnant Women with Coal-Burning Fluorosis (http://fluoridealert.org/studytracker/34506/). *Chinese Journal of Control of Endemic Diseases* 32(8):872-873.
Location of Study:	**CHINA**: mothers in coal-burning fluorosis areas compared to control
Size of Study:	118 newborns
Age of Subjects:	68 newborns to 12 months of age
Source of Fluoride:	Coal-burning fluorosis areas
Water Fluoride Level:	NA
Type of IQ Test:	Mental development index (MDI) and psychomotor development index (PDI) (assessed using the Standardized Scale for the Intelligence Development of Children formulated by the Children Development Center of China [CDCC])
Results:	The body weight, body length, head circumference, chest circumference, upper arm circumference and top arm length of newborns in the observation group were all significantly lower than those in the control group, and their differences were statistically significant ($P < 0.05$). At 3, 6, 9 and 12 months after birth, the grades of body weight development and body-length development of infants in the control group were significantly higher than those in the observation group ($P < 0.05$); both the MDI and the PDI of infants in the observation group were significantly lower than those in the control group ($P < 0.05$). The present study paid special attention on the stay of mother during pregnancy, source of drinking water since conception, the socioeconomic status of all the three villages which were same in both endemic and control areas.
Conclusions:	Comparison of the mental development index (MDI) and psychomotor development index (PDI) (assessed using the Standardized Scale for the Intelligence Development of Children formulated by the Children Development Center of China [CDCC]) of newborns in the two groups at 3, 6, 9 and 12 months after birth showed that both the MDI and the PDI in the observation group were significantly lower than those in the control group ($P< 0.05$), which suggests that maternal fluorosis have a significant impact on the intelligence development of newborns.

IQ Study #56: (Jin-2017 (http://fluoridealert.org/studytracker/34513/))

Citation:	Jin T, Wang Z, Wei Y, Wu Y, Han T, Zhang H. (2017). **Investigation of Intelligence Levels of Children of 8 to 12 Years of Age in Coal Burning-Related Endemic Fluorosis Areas.** *Journal of Environment and Health* 34(3):229-231.

Funding for study:	The Department of Research, Ministry of Higher Education and Scientific Research, Sudan.

IQ Study #58: (Pang-2018 (http://fluoridealert.org/studytracker/34516/))

Citation:	Pang H, Yu L, Lai X, Chen Q. 2018. **Relation Between Intelligence and COMT Gene Polymorphism in Children Aged 8-12 in the Endemic Fluorosis Area and Non-Endemic Fluorosis Area.** *Chinese Journal of Control of Endemic Diseases* 32(2):151-152. Study in Chinese translated into English.
Location of Study:	**CHINA.** The areas for population sampling were divided into a non-endemic fluorosis area where the prevalence of dental fluorosis in local children aged 8-12 is less than 30%, and an endemic fluorosis area where the prevalence of dental fluorosis in local children aged 8-12 is greater than 30%.
Size of Study:	268 children: 134 children each from endemic fluorosis area and non-endemic fluorosis areas.
Age of Subjects:	8 -12 years of age
Source of Fluoride:	Endemic fluorosis area and non-endemic fluorosis areas.
Water Fluoride Level:	NA
Type of IQ Test:	Combined Raven's Test (CRT)
Results:	This study found that in COMT gene polymorphism, there was no difference between children in the endemic fluorosis area and those in the non-endemic fluorosis area ($P > 0.05$). It was found that alleles of the COMT gene were codominantly inherited, and the activity of different genotypes of the COMT gene expressed in vivo was somewhat different. This study also found that there were great differences in terms of the level of intelligence between children with Val/Val or Met/Val and children with Met/Met, and such differences were statistically significant ($P < 0.05$): children with the highly active COMT Val/Val genotype had significantly higher intelligence than those with the Met/Met COMT genotype or the Met/Val COMT genotype, and intelligence in children with any of the three genotypes in the endemic fluorosis area was lower than that in the non-endemic fluorosis area, indicating that the highly active COMT Val/Val genotype has a protective effect on children's intelligence development.
Conclusions:	This study found that there was a great difference in the level of intelligence between children in the endemic fluorosis area and those in the non-endemic fluorosis area and such difference was statistically significant ($P < 0.05$). The rate of mental retardation (IQ < 69) in children in the endemic fluorosis area was significantly higher than that in the non-endemic fluorosis area, and the difference was statistically significant ($P < 0.05$).
Funding for Study:	No mention

Funding for Study:	No source identified.

IQ Study #59: (Mustafa-2018 (http://fluoridealert.org/wp-content/uploads/mustafa-2018.pdf))

Citation:	Mustafa DE, Younis UM, Elhag SA. (2018). **The relationship between the fluoride levels in drinking water and the schooling performance of children in rural areas of Khartoum State, Sudan.** *Fluoride* 51(2):102–113.
Location of Study:	**SUDAN.** 16 rural areas in Khartoum state. These villages depend on groundwater as the main source of drinking water because of the lack of a central water supply. The main activities in these villages are agriculture and animal breeding. The villages lack any industrial and mining activities and are located away from high traffic roads.
Size of Study:	775 primary students, 315 boys and 460 girls from 27 schools.
Age of Subjects:	NA
Source of Fluoride:	Ground water
Water Fluoride Level:	The range for the F level was 0.14–2.07 mg/L in the dry season and0.01–1.34 mg/L in the rainy season (Table 1). Although the F level not extremely high, frequent water drinking may occur due to several factors such as the rural human activities, arid conditions, and high temperatures. In addition, food products also contribute to the F intake as the people in these areas consume their own crops. These crops may possibly accumulate F to considerable levels.
Type of IQ Test:	Using the Khartoum Ministry of Education's method, the schooling performance for the boys' and girls' primary schools in the 16 areas where the F samples were taken and were assessed by calculating the average score and high score prevalence… Generally, the schooling performance in these rural areas was poor compared to urban areas. There were also significant dropout rates in these rural areas, which could reflect even lower schooling performances.
Results:	Negative correlation coefficients were found for the average score for all the subjects and for the overall score, with the result being statistically significant in five out of the eight subjects and in the overall score (Tables 4 and 5). … significant correlations undoubtedly exit between the drinking water F level and the schooling performances in all the subjects except for one, technology, which might be due to the nature of the subject.
Conclusions:	In summary, the results of this study suggest that there may be an association between the fluoride level in drinking water and the schooling performance of children. This result may be applicable to children in other areas with conditions similar to those of the study areas. Consequently, the upper permissible drinking water fluoride level needs to be revised downwards to minimize the effect of fluoride on children neurodevelopment

Type of IQ Test:	The Draw-A-Person (DAP) test is a valuable instrument for the assessment of IQ, not only because it is easy to administer, but also for its multiple uses [25]. The children's drawings reflect their intellectual development, not just their visual-motor skills, therefore DAP test is useful for assessing children IQ between the age of 4 and 13 [26].
Results:	In this study there's a highly significant decrease in average IQ level in group of children with high fluoride level more than 1.5 mg /dL than the group of children with low fluoride level less than 1.5 mg /dL with the mean IQ was (96.25 ± 19.63) and (103.11 ± 28.00) for both groups respectively with p value ($p<0.001$), the graphical representation of the observation is shown in Figure 2.
Conclusions:	A real relationship between fluoride exposure and intelligence with the average IQ of high fluoride group was lower than those with lower fluoride level.
Funding for Study:	No source identified.

IQ Study #60: (Induswe-2018 (http://fluoridealert.org/wp-content/uploads/2018_Induswe.pdf))

Citation:	Induswe B, Opinya G, Khasakhala LI, Owino R. 2018. **The Auditory Working Memory of 13-15-Year-Old Adolescents Using Water with Varying Fluoride Concentrations from Selected Public Primary Schools in North Kajiado Sub County.** *American Journal of Medicine and Medical Sciences*, Jan; 8(0):274-290.
Location of Study:	**KENYA.** Kajiado North Subcounty in North Kajiado in the Great rift valley.
Size of Study:	269 school children; 178 (66.2%) female; 91 (33.8%) male.
Age of Subjects:	13-15 years
Source of Fluoride:	Drinking water
Water Fluoride Level:	15 (5.58%) had F level between 0-0.5mg/l; 52 (19.33%) had F level between 0.6-0.8 mg/l;38 (14.12%) had F between 0.9-1 mg/l; 41 (15.24%) had F level between 1.1-1.8 mg/l; 44 (16.36%) had F between 1.9-2.5 mg/l; 79 (29.37%) had F above 2.5mg/l.
Type of IQ Test:	Wechsler intelligence scale for Children V (WISC-V) subtest
Results:	A comparison of the AWM (Auditory Working Memory) of children from low (105.40±23.6) and high (99.52±23.2) fluoride schools and medium with high fluoride school had significant differences. The AWM for the children whose household water had low fluoride had higher AWMi 122.58±19.9 compared to those whose household had high fluoride in the with ANOVA F (2, 266) = 17.968, p?.0001 and Tukey HSD for low and medium (m=-5.919, se=3.146, p=.145, low and high fluoride, (m=-18.559. se=3.124, p?.001; medium and high (m=-12.640, se= 3.32, p?.001 at 95% CL.
Conclusions:	In conclusion, low fluoride in the water seemed to enhance the AWM (Auditory Working Memory). However, the AWM declined with an increase in the fluoride concentration in water.

Results:	the relationship between urine fluoride levels and IQ scores was significant after adjusting for child age, mother's education, family member smoking, stress, and anger. Urine fluoride was inversely associated with IQ. DRD2 Taq 1A polymorphism was not related to IQ in children exposed to high fluoride. Urine fluoride had a stronger association with IQ in children with TT genotype. The threshold of urine fluoride affecting IQ in children with TT genotype existed.
Conclusions:	Strengths of our study include using urine fluoride as an internal exposure index and thus minimizing the measurement error of exposure, adjusting up to 30 potential confounding covariates including child age and gene polymorphismin regressing IQ on urine fluoride in children, and careful modeling with applications of cross-validation, boolstrap techniques, and sensitivity analysis. In the overall participants, by LOWESS, the IQ decreased in a roughly linear manner as the log-urine fluoride increased (Fig. 1A). The authors also determined a safety threshold of urine fluoride on intelligence impairment in the subgroup TT as 1.73 mg/L urine fluoride with a 95% CI of (1.51 mg/L, 1.97 mg/L).
Funding for Study:	This work was supported by the National Nature Science Foundation of China (Grant nos. 81573107 and 81372934), Scientific and Technological Project of Tianjin Medicine in 2014 (Grant no. 14KG120) and Scientific and Technological Project of Tianjin Centers for Disease Control and Prevention (Grant no. CDCKY1501).

IQ Study #61: (El Sehmawy-2018 (http://fluoridealert.org/wp-content/uploads/2018_Sehmawy.pdf))

Citation:	El Sehmawy AAEW, Hammouda SM, Ibrahim GE, Barghash SS, Elamir RY. 2018. **Relationship between Drinking Water Fluoride and Intelligence Quotient in Egyptian School Children.** *Occupational Medicine & Health Affairs,* Aug 13: 6:3.
Location of Study:	**EGYPT.** Beheira Governorate. Two different towns (urban) and four village (rural), the towns are Italy Elbaroud Center and two villages that belong to it, the second town is Shubra Khit Center and two villages that belong to it.
Size of Study:	1,000 children, 495 (49.5%) female and 405 (50.5%) male
Age of Subjects:	4.6 – 11 years old
Source of Fluoride:	Drinking water
Water Fluoride Level:	1.903 ± 1.06 mg/L; 0.330-0.377 mg/L . *the mean arsenic and cadmium levels in tap drinking water was (0.005 ± 0.004 mg/L) and (0.002 ±0.001 mg/L) for arsenic and cadmium respectively which are below the recommended WHO and the Egyptian level for all.*

Results:	Data on Maternal urinary fluoride (MUF_{SG}) concentrations, IQ scores, and complete covariates were available for 512 mother-child pairs; data on maternal fluoride intake and children's IQ were available for 400 of 601mother-child pairs. Women living in areas with fluoridated tap water (n = 141) compared with nonfluoridated water (n = 228) had significantly higher mean (SD) MUF_{SG} concentration. A 1-mg/L increase in MUF_{SG} was associated with a 4.49-point lower IQ score (95% CI, -8.38 to -0.60) in boys, but there was no statistically significant association with IQ scores in girls (B= 2.40; 95% CI, -2.53 to 7.33). A 1-mg higher daily intake of fluoride among pregnant women was associated with a 3.66 lower IQ score (95% CI, -7.16 to -0.14) in boys and girls. Children had mean (SD) Full Scale IQ scores of 107.16 (13.26), range 52-143, with girls showing significantly higher mean (SD) scores than boys: 109.56 (11.96) vs 104.61(14.09); P= .001. There was a significant interaction (P= .02) between child sex and MUF_{SG} (6.89; 95% CI, 0.96-12.82) indicating a differential association between boys and girls.
Conclusions:	"In this study, maternal exposure to higher levels of fluoride during pregnancy was associated with lower IQ scores in children aged 3 to 4 years. These findings indicate the possible need to reduce fluoride intake during pregnancy."
Funding for Study:	This study was funded by a grant from the U.S. National Institute of Environmental Health Sciences (grant R21ES027044). The Maternal-Infant Research on Environment Chemicals Study (from which the women were chosen) was supported by the Chemicals Management Plan at Health Canada, the Ontario Ministry of the Environment, and the Canadian Institutes for Health Research.

IQ Study #62: (Cui-2018 (http://fluoridealert.org/studytracker/32139/))

Citation:	Cui Y, Zhang B, Ma J, Wang Y, Zhao L, Hou C, Yu J, Zhao Y, Zhang Z, Nie J, Gao T, Zhou G, Liu H. 2018. **Dopamine receptor D2 gene polymorphism, urine fluoride, and intelligence impairment of children in China: A school-based cross-sectional study.** *Ecotoxicology and Environmental Safety*, Sept 11;165:270-277.
Location of Study:	**CHINA.** Tianjin. Four schools in both historical endemic and non-endemic areas of fluorosis.
Size of Study:	323 children. Urine fluoride levels and age-specific IQ scores in children were measured at the enrollment.
Age of Subjects:	7–12 years old.
Source of Fluoride:	Drinking water
Water Fluoride Level:	Endemic fluorosis area = 1.52–2.49 mg/L. Nonendemic fluorosis area 0.20–1.00 mg/L.
Type of IQ Test:	Combined Raven's Test – The Rural in China (CRT-RC) method, which is based on the Raven's Standard Progressive Matrices (SPM) and the Color Progressive Matrices (CPM) and was widely adopted in China with modifications.

Results:	Fluoride exposure was inversely related to IQ scores for water fluoride and for urinary fluoride. The study detected a significant modification effect by TSH on the association between urinary fluoride and IQ scores, without mediation by THs. Adjusted estimates (95% *CI*) for the associations between fluoride exposure and IQ scores were a decrease of 1.587) points (95% *CI:* 2.607, 0.568, *P*= 0.002) and 1.214 points (95% *CI:* 1.987, 0.442), *P* = 0.002) in every 1mg/L increase of water and urinary fluoride concentration, respectively (Table 4). The similar relationship between IQ scores and fluoride exposure were observed in boys and girls, respectively. However, the modification effects by gender were not significant (Table 4).
Conclusions:	The study suggests low-moderate fluoride exposure is associated with alterations in childhood thyroid function that may modify the association between fluoride and intelligence. In the current work, results demonstrated clearly that, across the full range of water and urinary fluoride concentrations and using a measure to focus on children's IQ scores, higher fluoride levels were associated with lower IQ scores.
Funding for Study:	This work was supported by grants from the State Key Program of National Natural Science of China (Grant No. 81430076), the National Natural Science Foundation of China (Grants No. 81502785 and No. 81773388) and the Fundamental Research Funds for the Central Universities (HUST 2016YXMS221 and HUST 2015ZDTD052).

IQ Study #63 (Green-2019 (http://fluoridealert.org/wp-content/uploads/green-2019.pdf))

Citation:	Green R, Lanphear B, Hornung R, Flora D, Martinez-Mier EA, Neufeld R, Ayotte P, Muckle G, Till C. 2019. **Association Between Maternal Fluoride ExposureDuring Pregnancy and IQ Scores in Offspring in Canada.** *JAMA Pediatrics*. Published August 19.
Location of Study:	**CANADA.** 6 major cities.
Size of Study:	512 mother-child pairs
Age of Subjects:	Between the ages 3 and 4 years at testing
Source of Fluoride:	Self-reported maternal daily fluoride intake from water and beverage consumption available for 400 pregnant women. the design of our study compares water fluoride level and IQ score
Water Fluoride Level:	0.7 mg/L in fluoridated communities
Type of IQ Test:	Wechsler Preschool and Primary Scale of Intelligence, ThirdEdition. Full Scale IQ (FSIQ), a measure of global intellectual functioning, was the primary outcome. We also assessed verbal IQ (VIQ), representing verbal reasoning and comprehension, and performance IQ (PIQ), representing nonverbal reasoning, spatial processing, and visual-motor skills.

Funding for Study:	This study was funded by a grant from the U.S. National Institute of Environmental Health Sciences (NIEHS) (grant #R21ES027044). The MIREC Study [from which the women were chosen] was supported by the Chemicals Management Plan at Health Canada, the Ontario Ministry of the Environment, and the Canadian Institutes for Health Research (grant #MOP-81285).

IQ Study #64 (Wang 2019 (http://fluoridealert.org/studytracker/35644/))

Citation:	Wang M, Liu L, Li H, LI Y, Liu H, Hou C, Zeng Q, Li P, Zhao Q, Dong L, Zhou G, Yu X, Liu L, Guan Q, Zhang S, Wang A. 2019. **Thyroid function, intelligence, and low-moderate fluoride exposure among Chinese school-age children**. *Environment International* 134:105229. [Epub ahead of print].
Location of Study:	From endemic and non-endemic fluorosis areas in Tianjin, China.
Size of Study:	571 children randomly selected from endemic and non-endemic fluorosis areas in Tianjin. Children who were not long- term residents of the area were eliminated. Further, children who had congenital or acquired diseases affecting intelligence, or a history of cerebral trauma and neurological disorders, or those with a positive screening test history (like hepatitis B virus infection, Treponema palladium infection and Down's syndrome) and adverse exposures (smoking and drinking) during maternal pregnancy were excluded from the analyses.
Age of Subjects:	7–13 years
Source of Fluoride:	Drinking water
Water Fluoride Level:	About half of the children are in the district where water fluoride concentrations were within the Standards for Drinking Water Quality in China of 1 mg/L, while the other half had significantly higher fluoride concentrations than the screening guideline of 1 mg/L. The water fluoride concentration ranged from 0.20 mg/L to 3.9 mg/L, with a mean value of 1.39 ± 1.01 mg/L.
Urinary fluoride levels:	The mean (±SD) urinary fluoride was 1.28 ± 1.3 mg/L, with the range from 0.01 mg/L to 5.54 mg/L.
Thyroid hormone levels	The median THs levels in the serum were 1.33 ng/mL for TT_3, 6.8 g/dL for TT_4, 3.28 pg/mL for FT_3, 1.12 ng/dL for FT_4, and 2.28 uIU/mL for TSH.
Type of IQ Test:	A Combined Raven's Test for Rural China (CRT-RC2) was taken to evaluate the IQ of each child. Additionally, we utilized logistic regression model to examine the associations between fluoride, THs (Thyroid hormones) and different levels of intelligence, in which the IQ scores were categorized into five degrees as follows: marginal (70–89), normal (90–109), high normal (110–119), superior (120–129) and excellent (130), and the normal group was assigned as the control. Moreover, multivariate linear regression models were constructed to assess the associations between quartiles of water fluoride or urinary fluoride and THs and IQ scores, as well as associations between quartiles of THs and IQ scores. Trends tests were assessed by using the median value in each quartile as a continuous variable in the linear regression models

IQ Study #65 (Till 2020 (http://fluoridealert.org/wp-content/uploads/till-2019.pdf))

Citation	Till C, Green R, Flora D, Hornung R, Martinez-Miller EA, Blazer M, Farmus L, Ayotte P, Muckle G, Lanphear B. 2020. **Fluoride exposue from infant formula and child IQ in a Canadian birth cohort**. *Environment International* 134:105315. (Published in November 2019)
Location of Study:	In fluoridated and non-fluoridated cities in Canada.
Size of Study:	398 mother-child pairs
Age of Subjects:	Fetus and Infants up to 3-4 year-olds
Source of Fluoride:	Fluoride in drinking water for (1) Fetal fluoride exposure and (2) breast-fed versus formula-fed from both fluoridated and non-fluoridated cities.
Water Fluoride Level:	Thirty-eight percent of mother-child pairs lived in fluoridated communities, with the optimal fluoride level of 0.7 mg/L.
Urinary fluoride:	The authors "used maternal urinary fluoride (MUF) adjusted for specific gravity as a proxy of fetal fluoride exposure. MUF, which was derived by averaging three spot samples collected across all three trimesters of pregnancy".
Type of IQ Test:	Wechsler Primary and Preschool Scale of Intelligence-III at 3–4 years. Outcomes included Full Scale IQ (FSIQ), a measure of global intellectual functioning, Verbal IQ (VIQ), a measure of verbal reasoning, and Performance IQ (PIQ), a measure of non-verbal reasoning and visual-motor coordination skills.
Results:	Thirty-eight percent of mother-child dyads [pairs] lived in fluoridated communities. An increase of 0.5 mg/L in water fluoride concentration (approximately equaling the difference between fluoridated and non-fluoridated regions) corresponded to a 9.3- and 6.2-point decrement in Performance IQ among formula-fed (95% CI: -13.77, -4.76) and breast-fed children (95% CI: -10.45, -1.94). The association between water fluoride concentration and Performance IQ remained significant after controlling for fetal fluoride exposure among formula-fed (B = -7.93, 95% CI: -12.84, -3.01) and breastfed children (B = -6.30, 95% CI: -10.92, -1.68). A 0.5 mg increase in fluoride intake from infant formula *corresponded to an 8.8-point decrement in* Performance IQ (95% CI: -14.18, -3.34) and this association remained significant after controlling for fetal fluoride exposure (B = -7.62, 95% CI: -13.64, -1.60).
Conclusions:	In summary, fluoride intake among infants younger than 6 months may exceed the tolerable upper limits if they are fed exclusively with formula reconstitued with fluoridated tap water. After adjusting for fetal exposure, we found that fluoride exposure during infancy predicts diminished non-verbal intelligence in children. In the absence of any benefit from fluoride consumption in the first six months, it is prudent to limit fluoride exposure by using non-fluoridated water or water with lower fluoride content as a formula diluent.

Water Fluoride Level:	An aside. "By comparing the previous investigations conducted in Guizhou Province, the level of fluorosis and IQ for children helped by the government of Guizhou Province showed improvement [31]. In China, except for Guizhou, the survey data of other regions showed that the IQ level in children drinking water in fluorosis areas after treatment of defluorination of water also showed significant improvement, especially the levels of severe IQ [38, 39]."
Type of IQ Test:	Wechsler Intelligence Scale for Children Revised in China (WISC-CR)
Results:	To explore the relationship between total intelligence quotient (**IQ**), verbal intelligence quotient (**VIQ**), performance intelligence quotient (**PIQ**) VIQ, which is the manifestation of learning memory, language understanding, and language thinking ability. The results showed that VIQ in children of fluorosis group was impaired and the common sense and other items demonstrated statistically significant difference. In the scale, common sense was **reduced by 1.2 times**, with the smallest reduction degree. Similarly, arithmetic and vocabulary were **reduced by nearly 2 times**, while understanding was **reduced by nearly 3 times.** The test for common sense includes general knowledge. The more interest and curiosity present, the more knowledge can be obtained. The common sense of children with fluorosis showed declination, and this might be related to the brain organic damage caused by early fluorine intake, resulting in children's lack of interest in things and less general knowledge... In the children's vocabulary, calculation and similarities were **decreased by nearly 2 times**, indicating that their overall knowledge content and processing ability were weak... Compared with common sense test, influence by culture and education is less, and the comprehensive understanding level of children with dental fluorosis is **most significantly reduced, i.e., by about three times.** This clearly reflects the damage of fluoride on children's language development, vocabulary learning, and other comprehensive understanding abilities. The impairment of VIQ shows that the **IQ impairment in children with fluorosis** mainly loses the ability of learning language, forming concept, abstract thinking, analysis, and generalization [24, 25, 37]. The results showed no significant difference between fluorosis group and control group ($P > 0.05$). Statistical significance was observed in the test of building blocks and decoding in the dental fluorosis group ($P < 0.05$), but not in other items ($P > 0.05$).
Conclusions:	"In conclusion, we believe that reducing fluoride intake with the assistance of the government can reduce fluorosis as well as the severity of intellectual impairment caused by fluorosis. Fluorosis in children can cause IQ impairment, especially the VIQ that is represented by language learning and vocabulary comprehension. During the period of fluorosis in children, language learning, vocabulary, and other interventions should be enhanced to improve the ability to acquire complementary skills."
Funding:	This work was financed by grants from the Natural Science Foundation of China (81460483).

Results:	… eligible children were divided into four groups: only prenatal excessive fluoride exposure group (PFG), only childhood excessive fluoride exposure group (CFG), both prenatal and childhood excessive fluoride exposure group (BFG), control group (CG). For all participants, we observed that a decrease of 4.965 points in children's IQ scores was associated with each 1.0 mg/L increase in the CUF concentration of ≥ 1.7 mg/L. A cross-sectional study found that moderate fluoride exposure was inversely correlated with children's IQ scores, and suggested a UF threshold of 1.6 mg/L for intelligence damage [15]. The reason for the difference between the two thresholds may be that we adjusted the UF concentration by UCr. We further found that every 1.0 mg/L increment in the CUF concentration of ≥ 2.1 mg/L was related to a reduction of 11.4 points of children's IQ scores in prenatal control group. These results suggested that excessive fluoride exposure in childhood was negatively associated with children's IQ scores.
Conclusions:	Our study examined the association between excessive fluoride exposure in prenatal and childhood periods and the intelligence of school-age children. We found that prenatal excessive fluoride exposure could cause lower IQ scores, especially the decreased odds of developing excellent intelligence. Meanwhile, a negative association between fluoride exposure and children's IQ scores was observed in children without prenatal exposure.
Funding:	This study was supported by the Natural Science Foundation of China (81972981, 81673116), Henan Department of Science and Technology, China (162300410272) and Zhengzhou University (2020ZZUKCSZ008). The sponsors were not involved in research design, information collection, data analysis, or paper writing.

IQ Study #66 (Lou 2020 (http://fluoridealert.org/studytracker/37042/))

Citation:	Lou D, Luo Y, Liu J, Zheng D, Ma R, Chen F, Yu Y, Guan Z. 2020. **Refinement Impairments of Verbal-Performance Intelligent Quotient in Children Exposed to Fluoride Produced by Coal Burning.** *Biological Trace Element Research*. May 3.
Location of Study:	in coal-burning fluorosis area of Dafang County, Guizhou Province, China
Size of Study:	99 children. 55 in dental fluorosis group (none with moderate or severe dental fluorosis, but all with mild) and 44 students without dental fluorosis.
Age of Subjects:	8–12 years
Source of Fluoride:	"This area belongs to the alpine region, and the winter rainfall days from December to March accounted for 80%, causing heavy moisture. Thus, traditionally, people use cooking stoves with indoor smoke by burning the coal to bake food and to keep warm their bodies, causing ingestion of smoke through the respiratory tract. The volatilized fluorine released by burning coal is inhaled by humans through the air, or the baked food that adsorbs the burning coal is ingested by humans, leading to fluorosis. Thus, it is referred to as coal-burning pollution fluorosis"

IQ Study #67 (Xu 2020 (http://fluoridealert.org/studytracker/38280/))

Citation	Xu K, An N, Huang H, Duan L, Ma J, Ding J, He T, Zhu J, Li Z, Cheng X, Zhou G, Ba Y. 2020. **Fluoride exposure and intelligence in school-age children: evidence from different windows of exposure susceptibility.** *BMC Public Health* 20:1657. November 4.
Location of Study:	Tongxu County, Kaifeng, Henan Province
Size of Study:	633 local children
Age of Subjects:	7–13 years
Source of Fluoride:	we selected Tongxu County, Kaifeng, Henan Province, a typical drinking-water-born fluorosis area, as the research region (no industrial sources of neurotoxic environmental pollutants such as arsenic, lead, mercury, etc.) to assess the association between excessive fluoride exposure in prenatal or childhood periods and children's intelligence.
Water Fluoride Level:	it was very difficult to obtain UF concentrations data from a pregnant mother, thus, we used the fluoride level in local drinking water during mother's pregnancy. This is because fluoride level in drinking water is highly correlated with UF level [33]. On point, all the mothers in the study were local residents, and local drinking water fluoride level in the village could well represent maternal fluoride exposure level.
Urine Fluoride Levels:	The concentrations of urinary fluoride (UF) and urinary creatinine (UCr) were determined by fluoride ion-selective electrode assay and a creatinine assay kit (picric acid method), respectively. According to whether the mother was exposed to excessive fluoride (the fluoride concentration in drinking water > 1.0 mg/L, GB5749–2006) during pregnancy, the children were divided into two groups: prenatal excessive fluoride exposure group (PF), and prenatal control group (PC). Moreover, according to whether the children's UF concentration exceeded the national standard (*UF concentration* > 1.4 mg/L, WS/T 256–2005), children were divided into childhood excessive fluoride exposure group and childhood control group.
Type of IQ Test:	IQ score was assessed using the second revision of the Combined Raven's Test-The Rural in China (CRT-RC2).

Special Note:	**From Chris Neurath (http://fluoridealert.org/content/bulletin_2-16-23-new-study-finds-fluoride-reduces-iq/):** *This "paper reports effect sizes as 'IQ points per unit of logarithm of urine fluoride concentration'. These units have been converted to express the effect size for a 1 mg/L increase in urine fluoride concentration from 0.5 to 1.5 mg/L which covers the range of exposures found in the majority of the study children. The paper does not specify whether base 10 or base e (natural) logarithms were used and FAN received no response to inquiries to the authors on this question. However, other papers on fluoride and IQ by some of the same authors have used natural logarithms so we have assumed the same for this paper when converting effect sizes to more easily understood units."
Funding:	This work was supported by the National Natural Science Foundation of China (Grant No. 81573107, 81372934).

IQ Study #68 (Prabhakar-2020 (https://fluoridealert.org/studytracker/41439/))

Note: This study was available on PubMed in January 2022

Citation:	Prabhakar A, Abdulkhayarkutty K, Cheruvallil SV, Sudhakaran P. 2020. **Effect of Endemic Fluorosis on Cognitive Function of School Children in Alappuzha District, Kerala: A Cross Sectional Study.** *Annals of Indian Academy of Neurology*. 24(5):715-720. November 6.
Location of Study:	Alappuzha district, Kerala, India
Size of Study:	120 children
Age of Subjects:	8-10 years
Source of Fluoride:	Drinking water
Water Fluoride Level:	"All the 60 children had urine fluoride level > 1 mg/mL and drinking water fluoride level >1 ppm."
Urine Fluoride Levels:	"All the 60 children had urine fluoride level > 1 mg/mL and drinking water fluoride level >1 ppm."
Type of IQ Test:	Raven's Standard Progressive Matrices and MISIC digit span subtest were used to assess the cognitive function
Results:	"There were 60 children each in fluorosis and control groups. The mean age of the children was 8.95 ± 0.50. Only 15% of the children with fluorosis scored Grade I and II Raven's SPM grades (Intellectually superior/above the average) versus 30% in the control group. None of the children without fluorosis scored Grade V (intellectually impaired) category versus 20% in the fluorosis group. The mean digit span was significantly higher in the control group. A strong positive correlation between severity of dental fluorosis and Raven's SPM grades was found (Spearman's correlation coefficient = 0.740)."
Conclusions:	"Fluorosis is associated with impaired cognition in children. There is a positive correlation between severity of dental fluorosis and the grade of cognitive impairment."

IQ Study #69 (Zhao 2021 (https://default.salsalabs.org/T654d616f-0d76-4c4c-a2c5-cf22eb38c4d5/a3c3edfe-8f0b-4914-9520-28bccee43a71))

Citation:	Zhao L, Yu C, Lv J, Cui Y, Wang Y, Hou C, Yu J, Guo B, Liu H, Li L. 2021. Fluoride exposure, dopamine relative gene polymorphism and intelligence: A cross-sectional study in China (http://fluoridealert.org/studytracker/38611/?eType=EmailBlastContent&eId=803c997c-c597-4b1f-942b-ce15d84adf37). *Ecotoxicology and Environmental Safety* 209:111826. [Epub ahead of print].
Location of Study:	Endemic and non-endemic fluorosis areas in Tianjin, China
Size of Study:	567 children
Age of Subjects:	6–11 years old
Water Fluoride Level:	"We used urinary fluoride to represent the fluoride exposure from drinking water, which ignored the bias of short-term fluoride intake from diet."
Urine Fluoride Levels:	Child urine fluoride levels of 1.5 mg/L were estimated to have a -6.5 IQ points* loss compared to children with urine fluoride levels of 0.5 mg/L. (See Special Note by Chris Neurqth below)
Type of IQ Test:	The Combined Raven's Test (modified in China)
Results:	This was a cross-sectional study to explore the role of DA [dopamine] relative genes in the health effect of low-moderate fluoride exposure in drinking water. According to the authors, "Our study has several strengths. So far as we know, this is the first epidemiological study to uncover the effect modification of DAT1 and MAOA gene polymorphism in the relationship between fluoride exposure and IQ, and the first study to analyze the high-dimensional interaction among fluoride exposure and the four DA relative genes. Our findings suggest a novel clue for the neuro-toxicological mechanism of fluoride."
Conclusions:	"Our study suggests DA [dopamine] relative genes may modify the association between fluoride and intelligence, and a potential interaction among fluoride exposure and DA relative genes on IQ.... In the present study, we found that fluoride exposure is inversely related to children's IQ scores, while DA related genes polymorphism (ANKK1 Taq1A, COMT Val 158 Met, DAT1 40 bp VNTR and MAOA uVNTR) may show modifying effects on the association between urinary fluoride and IQ scores. UF, ANKK1 Taq1A, COMT Val 158 Met and MAOA uVNTR showed a high-dimensional interaction on IQ... We further examined the roles of DA related genes in the relationship between fluoride exposure and found that the linear association performed differently in COMT and ANKK1 genotype subgroups..."

Results:	"In the mixed-effects longitudinal model, we observed a statistically significant negative association between dietary fluoride intake in pregnancy and cognitive score (averaged across both time points) in boys, but not girls (interaction p value = 0.07) (Table 4). Specifically, a 0.5 mg increase in dietary fluoride intake during the third trimester and across pregnancy (i.e. trimesters 2 and 3) was associated with a 3.10-point (95% CI: -5.67, -0.53) and 3.46-point (95% CI: -6.23, -0.70) lower cognitive score in boys, respectively. Although the effect estimates were in the expected direction, maternal fluoride intake was not significantly associated with language or motor scores, nor was there a significant fluoride intake by sex interaction for these outcomes. The adjusted margin effects and 95% confidence intervals of the cognitive scores according to fluoride intake in pregnancy and sex are presented in Figure 1.'
Conclusions:	"In this prospective cohort study, higher exposure to fluoride from food and beverage consumption in pregnancy was associated with reduced cognitive outcome, but not with language and motor outcome in male offspring over the first two years of life. Given the ubiquity of fluoride in food and beverages, it will be important to develop recommendations for how vulnerable populations, such as pregnant women, may limit dietary fluoride intake to minimize potential adverse health risks of the unborn fetus."
Funding:	This research was funded by the National Institutes of Health (NIH)/National Institute of Environmental Health Science (NIEHS)(grant numbers: P30ES023515, R01ES014930, R01ES021357, R24ES028522, R21ES027044).

IQ Study #70 (Yu 2021 (http://fluoridealert.org/studytracker/39755/))

Citation:	Yu X, Xia L, Zhang S, Zhou G, Li Y, Liu H, Hou C, Zhao Q, Dong L, Cui Y, Zeng Q, Wang A, Liu L. 2021. Fluoride exposure and children's intelligence: Gene-environment interaction based on SNP-set, gene and pathway anal (http://fluoridealert.org/studytracker/39755/)ysis, using a case-control design based on a cross-sectional study. *Environment International* 155:106681.
Location of Study:	The rural areas of Baodi district, Tianjin, China. The study areas were divided into historical high fluoride areas and normal fluoride areas. None of the study sites was exposed to excessive neurotoxins including lead, arsenic and mercury, or in the endemic areas of iodine deficiency based on the surveillance data from the local CDC
Size of Study:	952 resident children
Age of Subjects:	7 to 13 years old
Water Fluoride:	0.70 mg/L (0.40–1.00) to 1.00 mg/L (0.50–1.90)

IQ Study #10: Xu (1994) (http://www.fluoridealert.org/uploads/xu-1994.pdf)

Citation	Xu Y, Lu C, Zhang X. (1994). **The effect of fluorine on the level of intelligence in children.** *Endemic Diseases Bulletin* 9(2):83-84.
Location of study:	**CHINA.** Shandong Province.
Size of study:	330 children (8 groups of 21-97 children categorized based on fluoride and iodine content of water)
Age of Subjects:	8-14 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	– High Fluoride/High Iodine = 3.9 mg/L – High Fluoride/Low Iodine = 2.0 mg/L – High Fluoride = 1.8 mg/L – Low Fluoride = 0.38-0.5 mg/L – Control Area = 0.8 mg/L
Confounding Factors:	(1) Water iodine level used as variable. (2) Child's pre-school education history was determined. (3) Parent's literacy was determined.
Type of IQ Test	Blent-Siman
Results:	(A) Children in areas with high-fluoride and low-iodine have significantly lower IQs than children in areas with high-fluoride and high-iodine, $p < 0.01$. (B) More children have low IQ (< 69) in areas with High F/High I (10.53%), High F only (7.32%), and High F/Low I (12.82%) than in control group (1.61%)
Conclusion:	"The number of children whose level of intelligence is lower is significantly increased in regions of high fluoride/iodine, regions of high fluoride only, regions of high fluoride/low iodine, against their respective comparative groups. . . . This could be demonstrative of the fact that fluoride acts to increase the toxicity and worsen the occurrence of thyroid swelling."

IQ Study #9: Li (1994) (http://www.fluoridealert.org/uploads/li-1994.pdf)

Citation:	Li Y, Li X, Wei S. (1994). **Effects of high fluoride intake on child mental work capacity: Preliminary investigation into the mechanisms involved.** *Journal of West China University of Medical Sciences* 25(2):188-91 (republished in *Fluoride* 2008; 41:331-35).
Location of study:	**CHINA.** Sichuan Province.
Size of study:	158 children from two neighboring townships (107 children with various degrees of dental fluorosis; 51 children with no dental fluorosis)
Age of Subjects:	12-13 years old
Source of Fluoride Exposure:	Food contaminated by coal smoke
Fluoride Content of Grain:	– Children with no dental fluorosis = 0.5 mg/kg- Children with dental fluorosis (HiF1) = 4.7 mg/kg- Children with dental fluorosis (HiF2) = 5.2 mg/kg- Children with dental fluorosis (HiF3) = 31.6 mg/kg

Confounding Factors:	(1) The areas have similar levels of fluoride in water (0.3 mg/L) and air (0.02-0.51 mg/m3) and similar levels of zinc in soil. (2) The areas townships have similar economic and cultural status, lifestyle, dietary habits, basic constituents of food. (3) Age, gender, and grade level of the children are kept "as constant as possible." (4) Children with acute or chronic diseases not related to fluoride were excluded from study.
Type of IQ Test	Mental Work Capacity determined by number of letters found (NLF), rate of error (RE), index of mental capacity (IMC), short-term memory capacity (SMC), visual reaction time (RT).
Results:	(A) Children with dental fluorosis in mid-exposure group (HiF2) have reduced short-term mental capacity ($p<0.05$), reduced mental capacity index ($p < 0.01$), and reduced NLF scores ($p<0.01$) as compared to children with no fluorosis and children with lower exposure. (B) Children with dental fluorosis in high-exposure group (HiF3) have reduced short-term mental capacity ($p<0.01$), reduced mental capacity index ($p < 0.01$), and reduced NLF scores ($p<0.01$) as compared children with no fluorosis and children with low exposure.
Conclusion:	"As shown in this study, the mental work capacity (MWC) of the two groups of children with grade 3 dental fluorosis was lower than the two groups with no dental fluorosis. . . . This indicates that early, long-term exposure to excess fluoride causes deficits in memory, attention, and reaction time, but 12–13 year-old children with only recent exposure show no major effects. Studies [on human fetuses] have already shown that the developing brain is one of the ripest targets for disruption by fluoride poisoning. Given that before six years of age the human brain is in its fastest stage of development, and that around seven and eight basic structural development is completed, therefore the brain is most vulnerable to damage from excess fluoride intake before this age."

IQ Study #8: Yang (1994) (http://www.fluoridealert.org/uploads/yang-1994.pdf)

Citation:	Yang Y, Wang X, Guo X, Hu P. (1994). **The effects of high levels of fluoride and iodine on intellectual ability and the metabolism of fluoride and iodine.** *Chinese Journal of Epidemiology* 15(4):296-98 (republished in *Fluoride* 2008; 41:336-339).
Location of study:	**CHINA.** Shandong Province.
Size of study:	60 children (30 from high-F village, 30 from Low-F village)
Age of Subjects:	8-14 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	High F/High Iodine area = 2.97 mg/L Control area = 0.5 mg/L
Urine Fluoride Levels:	High F/High Iodine area = 2.08 ± 1.03 mg/L Control area = 0.82 ± 0.56 mg/L
Type of IQ Test	Chinese Comparative Scale of Intelligence Test

Results:	(A) Children in high F/high iodine area have lower IQ (76.67+7.75) than those in low F area (81.67+11.97), although the difference is not statistically significant.(B) Greater percentage of children have moderately low IQ (≤79) in High F/High Iodine area (76.67%) than in control area (36.67%), p<0.01.
Conclusion:	"An excess of fluoride and a lack of iodine in the same environment has been shown to have a marked effect on child intellectual development, causing a more significant intellectual deficit than lack of iodine alone."

IQ Study #7: An (1992) (http://www.fluoridealert.org/uploads/an-1992.pdf)

Citation:	An J, Mei S, Liu A, Fu Y, Wang Q, Hu L, Ma L. (1992). **The effects of high fluoride on the level of intelligence of primary and secondary students.** *Chinese Journal of Control of Endemic Diseases* 7(2):93-94.
Location of study:	**CHINA.** Xingshunxi Town, Guyang County, Inner Mongolia (4 neighboring villages with high fluoride centered around Wubu Ziyao village and 6 neighboring villages with lower fluoride centered around Hada Heshao Village).
Size of study:	242 children (121 children from high-F villages and 121 children from the low-F villages)
Age of Subjects:	7-16 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	High-F villages = 2.1±7.6 mg/L Control villages = 0.6±1.0 mg/L
Confounding Factors:	(1) Dental fluorosis rates were determined in both areas (90.9% in High-F area vs. 21.5% in Low-F area). (B) Both areas are in the countryside, are 15 km from each other, and share the same Han ethnicity. (C) The geography, culture, education, living standard, and social economic conditions are "very similar."
IQ Test:	Wechsler Intelligence Scale for Children
Results:	(A) Children in the High-F villages have significantly lower IQs at each age group studied: 7-10 ($p < 0.02$); 11-13 ($p < 0.01$); 14-16 ($p < 0.03$); 7-16 ($p < 0.01$). (B) Significantly more children in High-F villages have "critical state" IQ, $p < 0.01$. (C) When children within the High-F villages are stratified into highest-F (5.2-7.6 mg/L), and lowest-F levels (2.1-3.2 mg/L), the children in the higher-F areas had significantly lower IQ than the lower-F areas ($p < 0.05$).
Conclusion	"The results show that the level of intelligence of primary and secondary students from the high fluoride area and that of primary and secondary students from the non-high fluoride area had very significant differences, proving that high fluoride has adverse effects on the mental development of students. The higher the water fluoride is, the lower the level of IQ."

IQ Study #6: Lin (1991) (http://www.fluoridealert.org/uploads/lin-1991.pdf)

Citation	Lin FF, Aihaiti, Zhao HX, Lin J, Jiang JY, Malmaiti, and Aiken. (1991). **The relationship of a low-iodine and high-fluoride environment to subclinical cretinism in Xinjiang.** *Endemic Disease Bulletin* 6(2):62-67 (republished in *Iodine Deficiency Disorder Newsletter* Vol. 7(3):24-25).
Location of study:	**CHINA.** Hetian prefecture, Xinjiang.
Size of study:	749 children (250 children in High-F/Low Iodine area; 256 children in Low-F/Low-Iodine area; and 243 children in Low F/Low Iodine area)
Age of Subjects:	7-14 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	High F/Low Iodine = 0.88 mg/L Low F/Low Iodine = 0.34 mg/L Control area = n/a
Urine Fluoride Levels:	High F/Low Iodine = 2.56 mg/L Low F/Low Iodine = 1.34-1.61 mg/L Control area = 1.6 mg/L
Confounding Factors:	(1) Lower socioeconomic status in all areas. (2) Areas have similar nationalities, habits, customs, and income.
IQ Test:	CRT-RC (Combined Raven's Test for Rural China)
Results:	Children from the High F/Low Iodine area have significantly lower IQs (IQ=71) than children from the Low F/Low Iodine area (IQ=77-79; $p<0.05$), and control area (IQ=96); $p<0.01$).
Conclusion:	"The significant differences in IQ among these regions suggests that fluoride can exacerbate central nervous lesions and somatic developmental disturbance caused by iodine deficiency."

IQ Study #5: Guo (1991) (http://www.fluoridealert.org/uploads/guo-1991.pdf)

Citation:	Guo X, Wang R, Cheng C, Wei W, Tang L, Wang Q, Tang D, Liu G, He G, Li S. (1991). **A preliminary investigation of the IQs of 7-13 year old children from an area with coal burning-related fluoride poisoning.** *Chinese Journal of Endemiology* 10(2):98-100 (republished in *Fluoride* 2008; 41(2):125–28).
Location of study:	**CHINA.** Xinshao County, Hunan Province.
Size of study:	121 children (60 children with mild to severe fluorosis from an endemic area where coal is used as a fuel source; 61 children from a non-endemic area where wood is used as a fuel source)
Age of Subjects:	7 to 13 years old
Source of Fluoride Exposure:	Coal burning (Fluoride levels in water < 0.5 mg/l in both areas)
Blood Fluoride Levels:	Endemic area=0.1483±0.0473 mg/L Non-endemic area=0.1044±0.0652 mg/L ($p<0.01$)

Confounding Factors:	The two areas are neighboring townships with "very similar" economies, cultures, living standards, lifestyles, public health, and education.
IQ Test:	Chinese Binet IQ Test
Results:	(A) Children from endemic fluorosis area have lower average IQ (76.7) than children in non-endemic area (81.4), $p<0.05$. (B) A greater percentage (30%) of children in endemic area have low IQ (≤ 69) than in non-endemic area (11.5%), $p<0.05$.
Conclusion:	"In summary, although diminished intellectual ability can result from a multitude of factors (both innate and acquired) that influence neural development and cell division in the cerebrum, the comparison conducted in this study of two areas where the other environment factors are basically the same shows clear differences in IQ, and it [is] probable that this difference is due to a high fluoride environment."

IQ Study #4: Chen (1991) (http://www.fluoridealert.org/wp-content/uploads/chen-1991.pdf)

Citation:	Chen Y, Han F, Zhou Z, Zhang H, Jiao X, Zhang S, Huang M, Chang T, Dong Y. (1991). **Research on the intellectual development of children in high fluoride areas.** *Chinese Journal of Control of Endemic Diseases* 6(Suppl):99-100 (republished in *Fluoride* 2008; 41:120–24).
Location of study:	Linyi County, Shanxi Province, China
Size of study:	**CHINA.** 640 children (320 children from High-F village; 320 children from Lower-F village)
Age of Subjects:	7 to 14 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	High-F village = 4.55 mg/L Lower-F village = 0.89 mg/L
Confounding Factors:	The occupations, culture, standard of living, lifestyle habits, access to health and transportation facilities are "essentially the same" between the two areas.
IQ Test:	Rural version of Chinese Standardized Raven Test
Results:	Average IQ of children in High-F village (100.24 ± 14.52) significantly lower than children in lower-F village (104.03 ± 14.96), $p<0.01$.
Conclusion:	"The results of this study indicate that there is significant difference between the intellectual ability of the 7–14 year old children from the [fluorosis] endemic area and those of the control, and moreover that the average IQ of the children from the endemic area is clearly lower."

IQ Study #3: Sun (1991) (http://www.fluoridealert.org/uploads/sun-1991.pdf)

Citation	Sun M, et al. (1991). **Using drawing tests to measure intelligence in children from areas impacted by combined Al-F endemic toxicosis (Shuicheng, Guizhou).** *Journal of Guiyang Medical College* 16(3):204-06.
Location of study:	**CHINA.** Guizhou Province: Liupanshui City (endemic fluorosis area) and Guiyang City (non-endemic area)
Size of study:	420 children (196 children from endemic fluorosis area; 224 children from non-endemic area)
Age of Subjects:	6.5-12 years old
Source of Fluoride Exposure:	N/A
Fluoride exposure levels:	N/A
Confounding factors:	(1) Majority of children of farmers. (2) Children with bone and joint deformities or nervous system symptoms were excluded from study.
IQ Test:	Drawing test for children (Japanese researcher's Shigeo Kobayashi's 50-point scoring method).
Results:	Children from endemic fluorosis area had lower IQ than those from non-endemic area at all ages except ≤7 ($p < 0.05$)
Excerpt:	"From these results, it can be concluded that excessive consumption of fluorine and aluminum in the early stage of development directly impacts the development of the human brain, which causes the delayed intellectual development seen in children living in the endemic areas."

IQ Study #2: Qin (1990) (http://www.fluoridealert.org/wp-content/uploads/qin-1990.pdf)

Citation:	Qin LS, Cui SY. (1990). **Using the Raven's standard progressive matrices to determine the effects of the level of fluoride in drinking water on the intellectual ability of school-age children.** *Chinese Journal of the Control of Endemic Diseases* 5(4):203-04 (republished in *Fluoride* 2008; 41:115–19).
Location of study:	**CHINA.** Jing County, Hubei Province.
Size of study:	447 children (141 children from High-F area; 159 children from "normal" F area; 147 children from low-F area)
Age of Subjects:	9 to 10.5 years old
Source of Fluoride Exposure:	Water
Water Fluoride Levels:	High F = 2.1-4.0 mg/L"Normal" F = 0.5-1.0 mg/LLow F = 0.1-0.2 mg/L
Confounding factors:	All children had grown up drinking well water in their home village.
IQ Test:	Raven's Standard Progressive Matrices

Results:	Children in High F (21.17%) and Low F (23.03%) areas had lower average IQ scores than children in normal F area (28.14%), p<0.01.
Conclusion:	"All of these finding serve to indicate that both high and low fluoride can affect the normal development and function of the cerebrum as well as the entire nervous system causing a decrease in intellectual ability."

IQ Study #1: Ren (1989) (http://www.fluoridealert.org/uploads/ren-1989.pdf)

Citation:	Ren D, Li K, Liu D. (1989). **A study of the intellectual ability of 8-14 year-old children in high fluoride, low iodine areas.** *Chinese Journal of Control of Endemic Diseases* 4(4):251 (republished in *Fluoride* 2008; 41:319-20).
Location of study:	**CHINA**, Shandong Province.
Size of study:	329 children (160 children in High F/low Iodine area: 169 children in Low-F/Low Iodine area)
Age of Subjects:	8 to 14 years old
Source of Fluoride Exposure:	Water
Fluoride exposure levels:	N/A
Confounding factors:	Both study groups had low iodine intake.
IQ Test:	Wechsler Intelligence Test
Results:	–Average IQ of children in the High Fluoride/Low Iodine group (IQ=64.8) significantly lower than the children in the Low Fluoride/Low Iodine group (IQ = 85.0), p<0.01.- The percentage of children with low IQ (<69) significantly greater in High F/Low Iodine group (40.6%) than in Low Fluoride/Low Iodine group (13.6%), p<0.01.
Conclusion:	"From the results it is evident that disrupted child intellectual development is among the effects on the human body from a harmful environment containing both high fluoride and low iodine, and this disruption is clearly much more serious than the effects of iodine deficiency alone."

Tags: Brain (https://fluoridealert.org/tag/brain-2/), Cognitive Function (https://fluoridealert.org/tag/cognitive-function/), IQ Score (https://fluoridealert.org/tag/intelligence/)

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Type of Exposure:	Coal burning
Urine Fluoride Levels:	High F group=1.352±0.457 mg/L (n=144) Lower F group=1.611±0.467 mg/L (n=35)
Confounding Factors:	(1) Both areas are free from iodine deficiency. (2) Both areas have similar standard of living, sanitation, culture, and availability of medical treatment.
Type of IQ Test	Raven's Standard Theoretical Intelligence Test, Chinese version
Results:	Children from high F (endemic) areas had lower IQ than those from lower F (control) area ($p<0.01$). Negative correlation between urine F and IQ ($p<0.01$).
Conclusion:	"High fluoride burden has a definite effect on the intellectual and physical development of children."

IQ Study #23: Xiang (2003a (http://www.fluorideresearch.org/362/files/FJ2003_v36_n2_p84-94.pdf)), Xiang, (2003b) (http://www.fluorideresearch.org/363/files/FJ2003_v36_n3_p198-199.pdf)

Citation:	– Xiang Q, et al. **(2003a).** Effect of fluoride in drinking water on children's intelligence. *Fluoride* 36: 84-94. – Xiang Q, et al. **(2003b).** Blood lead of children in Wamiao-Xinhuai intelligence study. *Fluoride* 36: 198-199.
Location of study:	**CHINA.** Sihong County, Jiangsu Province.
Size of study:	512 children (222 children in high-F village, 290 children in low-F village)
Age of Subjects:	8-13 years old
Type of Exposure:	Water
Water Fluoride Levels:	High F village=2.47+0.79 mg/L (range=0.57-4.50 mg/L) Low F village=0.36+0.15 mg/L (range=0.18-0.76 mg/L)In the high-F village, children were subdivided into the following five fluoride water levels:Group A<1.0 mg/L; Group B=1.0-1.9 mg/L; Group C=2.0-2.9 mg/L; Group D=3.0-3.9 mg/L; Group E>3.9 mg/L.
Urine Fluoride Levels:	High F village=3.47±1.95 mg/L Low F village=1.11±0.39 mg/L
Confounding Factors:	(1) The two villages have similar urine iodine levels ($p>0.3$), and blood lead levels ($p>0.48$). (2) Neither village has fluoride pollution from burning coal or other industrial sources. (3) None of the residents reported drinking brick tea. (4) Children who had been absent from either village for 2 years or longer, or who had a history of brain disease or head injury were excluded from study.
Type of IQ Test	CRT-RC (Combined Raven's Test for Rural China)

Results:	(A) Average IQ in High-F area (96.11 ± 12.00) is lower than Low-F area (98.41 ± 14.75), although difference is not statistically significant. (B) No child in High-F area has outstanding or excellent intelligence. The respective rates in the Low-F area are 2.7% and 5.4%, respectively.
Conclusion:	"Exposure to high levels of fluoride is likely to cause a certain level of harm to a child's level of intelligence."

IQ Study #25: Seraj (2006) (http://fluoridealert.org/studytracker/14783/)

Citation:	Seraj B, Shahrabi M, Falahzadeh M, Falahzadeh F, Akhondi N. (2006). **[Effect of highfluoride concentration in drinking water on children's intelligence]. [Study in Persian]** *Journal of Dental Medicine* 19(2):80-86.
Location of study:	**IRAN**
Size of study:	126 children (85 children from low-F village, 41 children from high-F village)
Age of Subjects:	Not provided in English abstract (full study is in Persian)
Source of Fluoride:	Water
Water Fluoride Levels:	High F village = 2.5 mg/L Low F village = 0.4 mg/L
Confounding Factors:	The history of illnesses affecting the nervous system, head trauma, birth weight (>2.5kg or ≤ 2.5kg), residental history, age and sex of children were investigated by questionnaires completed by the children's parents.
Type of IQ Test	Raven's
Results:	"In the high fluoride area the mean IQ of children (87.9±11) was significantly lower than in the low fluoride area (98.9±12.9) (P=0.025)."
Statistical significance	""Based on the findings of this study, exposure of children to high levels of fluoride may carry the risk of impaired development of intelligence."

IQ Study #24: Wang (2005) (http://www.fluorideresearch.org/414/files/FJ2008_v41_n4_p344-348.pdf)

Citation:	Wang S, Zhang H, Fan W, Fang S, Kang P, Chen X, Yu M. (2005). **The effects of endemic fluoride poisoning caused by coal burning on the physical development and intelligence of children.** *Journal of Applied Clinical Pediatrics* 20(9):897-898 (republished in *Fluoride* 2008; 41:344-348).
Location of study:	**CHINA.** *Zhijin County, Ghizhou Province.*
Size of study:	226 children (176 children in High F area, including 119 children with skeletal fluorosis and 57 children with only dental fluorosis; 50 children in low-F area without skeletal or dental fluorosis)
Age of Subjects:	7-12 years old

Wynn Grcich, Vancouver

Monday Aug 13, 2018

S.F Chronicle

Schools fail to use state's free lead tests

Two-thirds don't inspect water despite outreach

By Jill Tucker

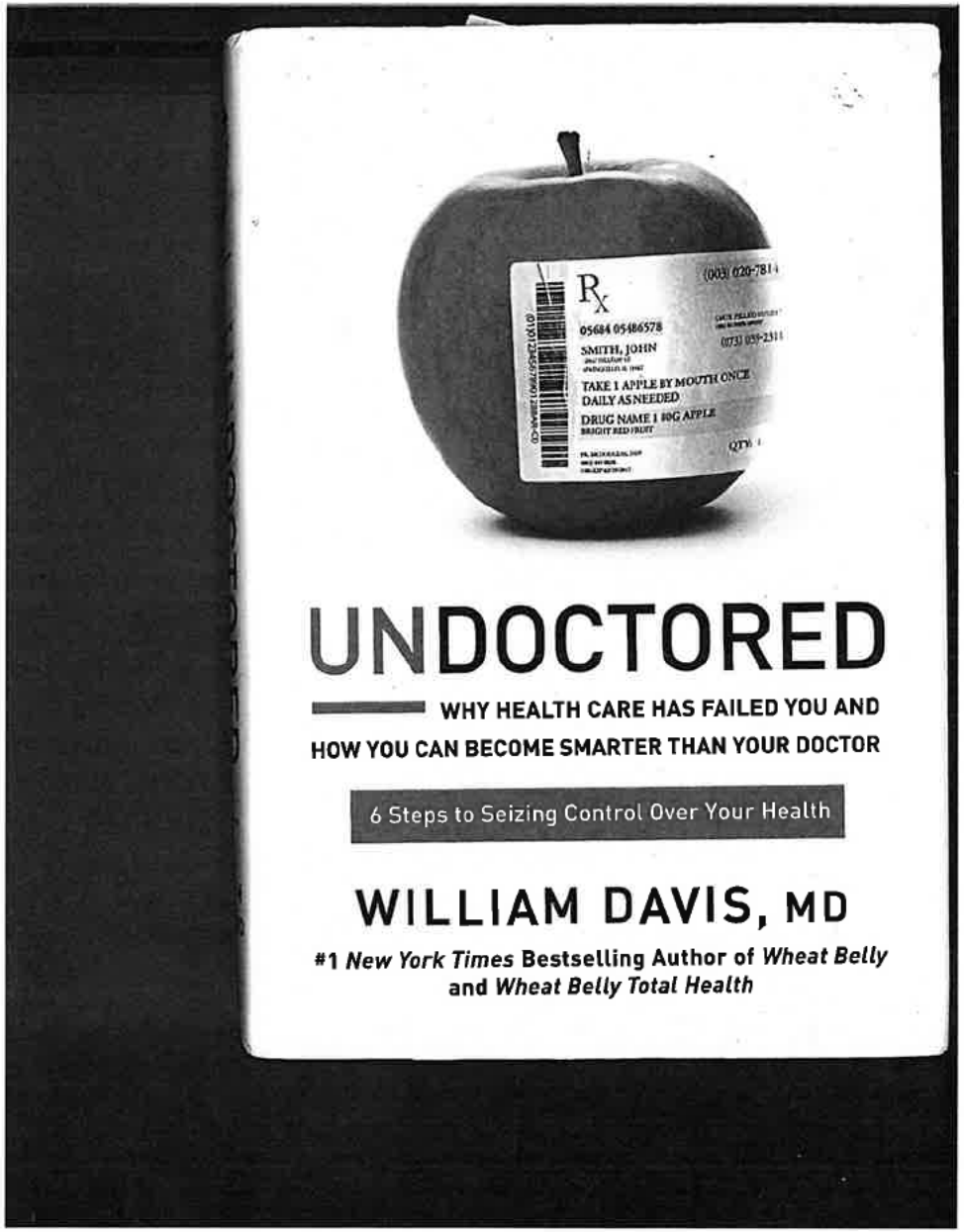
As students head back to class across California this month, many will sip water from school fountains or faucets that could contain high levels of lead.

That's because two-thirds of the state's 1,026 school districts have not taken advantage of a free state testing program to determine whether the toxic metal is coming out of the taps and, if so, whether it exceeds federal standards. Among the 330 districts that have started or completed testing, more than half identified at least one school where levels exceeded the federal standard, according to data submitted to the state by June 1.

The testing by local water utilities has been available to every public and private school in the state for more than 18 months. Exposure to high levels of lead can cause irreversible neurological and brain damage, including lowering a child's IQ.

"It is disappointing to see that a large number of districts have yet to take advantage of this pro-

Water continues on A6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WHY HEALTH CARE HAS FAILED YOU AND HOW YOU CAN BECOME SMARTER THAN YOUR DOCTOR
6 Steps to Seizing Control Over Your Health
WILLIAM DAVIS, MD
#1 New York Times Bestselling Author of Wheat Belly and Wheat Belly Total Health

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REGULAR COUNCIL MEETING

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

City Council Meeting Agenda
July 15, 2024

Pledge of Allegiance

Call to Order and Roll Call

Community Communications

2. **Bid Award - Sodium Fluoride Contract, per bid 24-33**
Staff Report: 130-24

Request: Award the bid amount of $841,338.00 ($2,580/ton) for purchase of Sodium Fluoride to the lowest bidder Newco Inc.

Brian Wilson, Operations Superintendent, 360-487-8275

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.

1. **Construction Acceptance - Water Station 7 Water Treatment Improvements**
Staff Report: 129-24

Cows Refused Inorganic Minerals

During my father's boyhood on a Virginia farm, his family raised dairy cattle. Salesmen would come to the farm to sell various kinds of feed. Dad remembers when his father purchased cattle food labeled "The Mighty Mineral Cattle Food". It was supposed to have lots of calcium, magnesium and other important minerals to help build strong cows that would produce extra milk. However, all of the minerals in this "mighty" cattle food were derived from powdered limestone and other inorganic sources: calcium carbonate and magnesium carbonate, etc. When this inorganic mineral formula was mixed with organic food, the cattle absolutely refused to eat the feed. Their innate dietary instincts prevented them from eating powdered limestone. All local farmers had the same experience. This worthless, inorganic mineral feed was taken off the market. *see www.mad-cow.org*

Beware of Dangerous Inorganic Minerals And Toxins in Our Drinking Water

As previously noted, chlorine, alum and other inorganic minerals such as calcium carbonate, magnesium carbonate and potassium carbonate are used to "purify" our drinking water. Keep in mind **the human body needs hydrogen and oxygen as a natural solvent in its internal chemistry.** Therefore our bodies need a constant supply of clean water. Where to get it? Even untreated, so-called "pure" water from springs, wells, etc. often contains some traces of inorganic minerals and toxic pollutants from industry, farms, fertilizers, etc.

This is the irony of Mother Nature: that this fluid – without which man can barely exist more than 72 hours before lapsing into a semi-comatose state – contains in most of its forms the exact inorganic chemicals which bring about the ultimate premature ageing of man and animals. Major aluminum companies want to pollute all our water with sodium fluoride, their deadly waste product they produce through aluminum processing.

Fluorine is a Deadly Poison

Millions upon millions of innocent people have been brainwashed by the aluminum companies to erroneously believe that adding sodium fluoride to our drinking water will reduce tooth decay in our children. Over 150 million Americans drink a daily dose of sodium fluoride in their water without knowing of it!

Fluorine, the gangster of the chemical underworld, made the deadly atomic bomb possible. The only scientific way to free the necessary quantities of fissionable Uranium 235, buried in the inert mass of its parent U-238, is to force uranium hexafluoride gas through many acres of porous barriers. The next part of the process gradually concentrates the elements, creating deadly "Hex", a deadly vicious hazard from radiation.

These 11 Associations, back in 1996 Stopped Endorsing Water Fluoridation

- *American Heart Assoc.*
- *American Academy of Allergy & Immunology*
- *American Cancer Society*
- *Chronic Fatigue Syndrome Action Network*
- *American Diabetes Assoc.*
- *National Institute of Law Municipal Officers*
- *American Chiropractic Assoc.*
- *American Civil Liberties Union*

Shocking Historical Fluoride Facts

- Adolf Hitler sought a means to make people docile and suggestible. He discovered that odorless sodium fluoride slowly poisons and makes dormant the small tissue in the brain's left rear occipital lobe that normally helps a person resist domination. Fluoride allows muscles to move one way, but not relax. In large doses fluoride can cause paralysis and death.
- Sodium fluoride is classified with arsenic and cyanide as a dangerous poison and is used in rat poison. Hydrogen fluoride is an industrial pollutant. It is illegal to sell or give away a fluoride pill of 1 mg. Fluoride slowly destroys the body's self-repair and rejuvenation capabilities causing premature ageing, bone damage and deformities.
- Fluoride increases the risk of hip fractures up to 41%. Fluoridation can cause tooth enamel mottling, poor health, mongolism in infants and increases the growth of cancer cells.

We must all demand safe, pure water!

The Fluoridation Fiasco*

- In recent years, fluoridation of our water supply has been shown not only ineffective in preventing tooth decay, but it poisons the body! How and why should public health policy and the American media live with and perpetuate this toxic sham?
- At first, industry could dispose of fluoride legally only in small amounts by selling it to insecticide and rat poison manufacturers. Then a commercial outlet was devised in the mid 1930s when a connection was made between a water supply bearing traces of natural fluoride and lower rates of tooth decay. Even after this connection was proven erroneous, it became a political, not a scientific issue! Many opponents originally started out as proponents, but changed their minds after closer looks at mounting evidence. They started viewing it as a capitalist-style con job of

More Fluoridation Fiasco Facts:

- The Sierra Club found in a study that people in unfluoridated developing nations have fewer dental caries than those living in industrialized nations. They concluded "fluoride is not essential to dental health."
- In British Columbia, only 11% of the population drinks fluoridated water, as opposed to 40-70% in other Canadian regions. Yet British Columbia has the lowest rate of tooth decay in Canada, with the lowest rates of dental caries occurring in areas of the province where the water is not fluoridated.
- In 1986-87, 39,000 school children between ages 5 and 17, living in 84 areas around the country, were studied. ⅓ of the places were fluoridated, ⅓ were partially fluoridated and ⅓ were not. Results showed no statistically significant differences in dental decay rates between fluoridated and unfluoridated cities.
- A World Health Organization survey reports a decline of dental decay in Western Europe, which is 98% unfluoridated. Europe's declining dental decay rates are equal to and sometimes lower than U.S. rates.
- A 1992 University of Arizona study yielded surprising results when they found that "the more fluoride a child drinks, the more cavities appear in the teeth."
- All the Native American Indian Reservations are now fluoridated by law. Children living on them have more incidences of dental decay and other oral health problems, caused by high sugar, refined foods, etc., than do children living in other U.S. communities!
- Most of Western Europe has rejected fluoridation on the grounds that it is unsafe! Sweden's Nobel Medical Institute recommended against fluoridation and the process was banned. The Netherlands outlawed the practice in 1976. France decided against it after consulting with its Pasteur Institute. West Germany, now Germany, rejected the practice because 1 ppm was dangerously "close to the dose at which long-term damage to the human body is to be expected."

By: Paul + Patricia Bragg

More Shocking Fluoride Updates!

Hip Fracture Rate Highest in U.S.
The fluoridation of our water is weakening our bones, slowly but surely.
– U.S. National Research Council and Townsend Letter for Doctors

Fluoride and Osteoporosis
Seniors living in areas with elevated fluoride levels in drinking water suffer up to 41% more hip fractures. In a study of 3,578 senior citizens, those who lived in areas with fluoridated water had a much greater risk of hip fractures.
– Journal of the American Medical Association

Fluoride and Bone Cancer
One study concluded that males under the age of 20 who live in areas with fluoridated water were six times more likely to suffer from bone cancer than males who don't. – New Jersey Department of Health

The Deadly Costs of Fluoridation
When a claimed 20% decrease in tooth decay is compared to a 600% increase in bone cancer or a 41% increase in hip fractures, when the cost of a tooth filling is compared to the cost of a hip fracture or cancer treatment, it is obvious that the human and economic costs of fluoridation are staggering.
– Health Action Network – www.hans.org

Fluoridated Water Increases Bone Cancer Risk
In a study conducted by the New Jersey Department of Health, young men who drank fluoridated water had a higher incidence of bone cancer. – The Record

Osteoporosis, Calcium and Fluoride
The National Institutes of Health (NIH) gathered a panel of "experts" to discuss the causes of the rising epidemic of bone fractures in the elderly. Although the evidence clearly shows that calcium supplements don't help, and just as clearly shows that fluoride is terrible for the bones, the NIH simply recommended an increase in the recommended daily allowance of calcium.
– The Fluoride Report

The Overwhelming Evidence that Fluoride Weakens Bones
Dr. John Lee showed that "...7 out of 10 recent studies show a clear correlation between bone fractures and water fluoridation. One of these studies involved 560,000 women over 65. The size of this study completely obliterates the few reports of small populations that showed no correlation."
– The Fluoride Report, September, 1994

Fluoride Actually Reduces Bone Strength, Instead of Increasing It!
In a five year study conducted to test fluoride as a treatment for osteoporosis, bone density was actually decreased 45%, therefore causing osteoporosis, rather than preventing it! The doses used were very close to the amount Americans take in over a fifty year span. – Bone, Vol. 15, 1994

How The EPA is Spending Your Tax Dollars
When Dr. Bill Marcus won back his job with the EPA after being fired for blowing the whistle on the cover-up of fluoride's hazards, the EPA refused to pay interest on his two years of lost wages. While the lawyers haggle, the whole

Water - The Shocking Truth That Can Save Your Life!

More Shocking Fluoride Updates . . .

Fluoridation Accidents Swept Under the Rug
Toxic spills of fluoride in drinking water have happened in several communities, but these were never publicized. Nausea, vomiting, diarrhea and even deaths occurred. – Townsend Letter for Doctors

Why Do Researchers Continue to Support Deadly Fluoridation?
Once accepted, scientific theories become very hard to debunk. Research done on the topic after a theory has been accepted becomes "a strenuous and devoted attempt to force nature into the conceptual boxes supplied by professional education."
– Thomas Kuhn, The Structure of Scientific Revolutions

Fluoride: Shocking Facts
Fluoride has never received FDA approval and wouldn't pass if it were subjected to the FDA's standards of safety and effectiveness. It's more toxic than lead by the EPA's standards and accumulates in the body. The maximum allowable lead in drinking water: 0.015 mg/liter; the maximum allowable for fluoride: 4.000 mg/liter. – Health Action Network – www.hans.org

Fluoridation: A Health Violation of Medical Ethics
Fluoride is a pharmacologically active substance unrelated to water purification. There is no possibility of obtaining individual informed consent for medication with this experimental drug when it is placed in a public water system. For these reasons, fluoridation violates the Nuremburg Code of medical ethics and human rights. – Health Action Network

Fluoride: Industrial Waste
The fluoride in your water is actually toxic waste left over after the manufacture of aluminum and chemical fertilizers.
– Dr. John Yiamouyiannis, *Fluoride, The Aging Factor*

Environmental Protection Agency Infighting
EPA toxicologists have long been asking that the standards for water fluoridation be revised, while EPA administrators continue to reject their warnings and have even disciplined employees who have spoken out. – The Pittsburgh Press

Fluoridation is Big Business
Despite the fact that it doesn't actually prevent tooth decay in children or adults, government officials still devote our tax dollars to fluoridation. Several other countries tried it and stopped when their research showed that the risks far outweighed the benefits. In this country, the big companies that make huge profits from selling this toxic waste material are so powerful that the facts are swept under the rug. – Let's Live! May 1996. This magazine, originally called California Health News, was started by Paul C. Bragg, who changed the name because, he said, "Everybody wants to – Let's Live!"

Mohawk Indians' Fluoride Tragedy
In the period from 1960 to 1975, a Mohawk Indian tribe in the Northeast U.S. was all but obliterated by fluoride contamination. Cows, fish and children all

Danger – Don't Drink Water Contaminated with Sodium Fluoride

Fluoride is one of the most potent poisons known to man. Selling this poison swells the bank accounts of the big companies who, in turn, often pay big dividends to their stockholders. This money is made by selling a waste by-product! All these industries had to do, using the media and powerful lobbies, was brainwash the public into accepting their false statements that fluoride added to their water would prevent tooth decay.

Now the drinking water in most cities is being fluoridated due to the powerful organizations who are sponsoring this mass poisoning. In our opinion, many early deaths today are caused by premature damage to our arteries due to sodium fluoride, that also damages the heart, lungs, liver, brain and other vital organs!

Read and reread this book carefully! More than 85 combined years of research has gone into acquiring and compiling this vital information for your health.

Scientists around the world agree that the health of the world's waters will be one of the most important health environmental issues of this 21st century. – www.wyland.com *(see page 123)*

Who wants to return to the old days when food had a taste and water didn't and you couldn't even see the air you breathed? The realization of the deterioration of the environment and of problems of population, food, power and water, has been growing on us through a frightening total of isolated reports. Penguins accumulate DDT in Antarctica, the California redwood forests are going fast, there are power blackouts in major cities, lead enters the atmosphere from gasoline – contributing to smog, there is mercury in the rivers, radioactive waste and nerve gas are dumped into the oceans. Every newspaper and news magazine worldwide brings another bad situation to the reader's attention and there are crises everywhere. No matter what the real situation is, constant bombardment creates a feeling of hysteria and despair.
– *Water: The Web of Life* by Robert M. Garrels & Cynthia A. Hunt

In contemplating the nature of water I feel that it is the mother, the life of all material manifestation. It is the most flexible and yet the most solid, the most destructive but, next to air, the most necessary. No matter how much it is mixed with other substances, when we distill it, it is cleansed and purified into

We Live in a Sick, Sick World

We are independent researchers and health crusaders for the truth. We're loners. No one controls what we say. No organization dictates to us! We have no financial master to serve; therefore we can give you the plain, honest truth. We love inspiring and guiding you with our simple, easy-to-follow Bragg Healthy Lifestyle, so you can enjoy a long, vibrantly youthful life! We've spent our lives researching and studying human health. We've been trying to understand why people become sick, prematurely old, senile and die long before their time!

It's our conclusion that many make themselves sick and shorten their lives by consuming unhealthy toxic water and unhealthy foods! Plus, many use tobacco and also consume powerful stimulants such as alcohol, coffee, diet and sugared colas. They also eat high concentrations of refined white sugar and its products, refined white flour products such as white bread, pasta, white rice and salt and salted foods. They often overeat, mostly refined, devitalized, dead foods, dairy, meat and saturated fats! These are the killers that fill the arteries with waxy, clogging cholesterol (read Bragg Heart Book).

Foods can make or break your health. You can dig your grave with your knife, fork and spoon! Use Caution in what you eat and drink.

These bad, unhealthy habits – plus lack of exercise, sunlight and fresh air – add up to physical unfitness. 97% of people today are physically unfit and 65% are overweight! Most people eat such an unhealthy diet that they suffer from sickness and fatigue. They drag around all day and at night are forced to take sleeping pills to sleep. When awake, they take

We are a nation of pill takers. Every 24 hours between 50 and 75 tons of pain killers and other so-called remedies are consumed.

If we could look inside ourselves, we would also see the digestive tract performing miraculous changes to the foods and drinks we consume. We would see it transform salads, raw nuts, seeds, raw and cooked organic vegetables, fruits and other healthy foods into vital substances our bodies' cells need and can use. People who live on dead, devitalized diets would see how the body's chemistry labors to handle burgers, hot dogs, processed deli meats, high fat and sugar foods, ice cream, candy, colas and all other "fast food trash" that insults, sickens and clogs their digestive tracts and bodies!

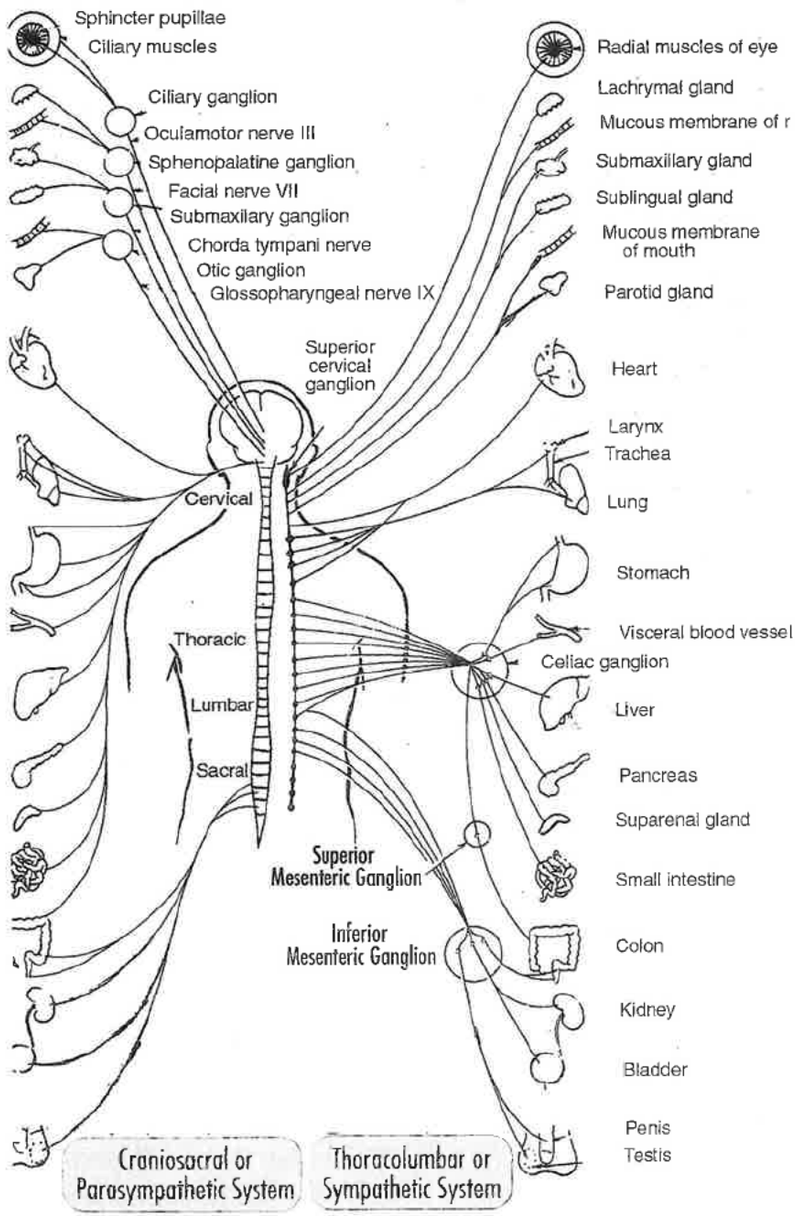
Nitrates and nitrites are harmful food additives.

If we could get a full view of the largest organ in the body, the liver, we would see how it struggles to handle alcohol, coffee, tea, cola, soft drinks and other unhealthy liquids. We would see the disastrous effects of the dangerous inorganic chemicals that are added to our drinking water by man. Also, Mother Nature can often do more harm than man by contaminating water with inorganic minerals such as calcium, magnesium and potassium carbonates and many other substances. Looking closely, we would see that the liver is hardening into stone.

Thousands of people die from a disease known as cirrhosis of the liver – fibrosis, which is a hardening caused by excessive formation of connective tissue followed by contraction of the liver. Both hard water's inorganic minerals and alcohol consumption hardens the liver. The world is recklessly consuming toxic alcohol products which is leading to grave health problems – please drinkers, beware and stop (see www.aa.org)!!!

The health journals all agree that the best and most wholesome part of the doughnut is the hole. The larger the hole, they say, the better the doughnut.

Autonomic Nervous System – The Body's Communication Network –



Autonomic Nervous System, showing its 2 divisions:

Most doctors assert that there is no known cure when hardening of the arteries takes place. New techniques have been developed to implant plastic arteries in place of the clogged arteries and veins of the heart and neck. There is expensive heart vascular surgery and other expensive surgical procedures for cleaning out the inorganic deposits of the larger arteries (U.S. spends over $150 billion yearly to try to remedy the affects of bad diet). But when you consider the extent of the entire pipe system of the human body, cleaning out a small amount could not accomplish a great deal. Miles of arteries, veins and capillaries would have to be cleansed of their inorganic crust to be effective. Read on – the solution to stop this hardening is living The Bragg Healthy Lifestyle, to keep your heart and body healthy!

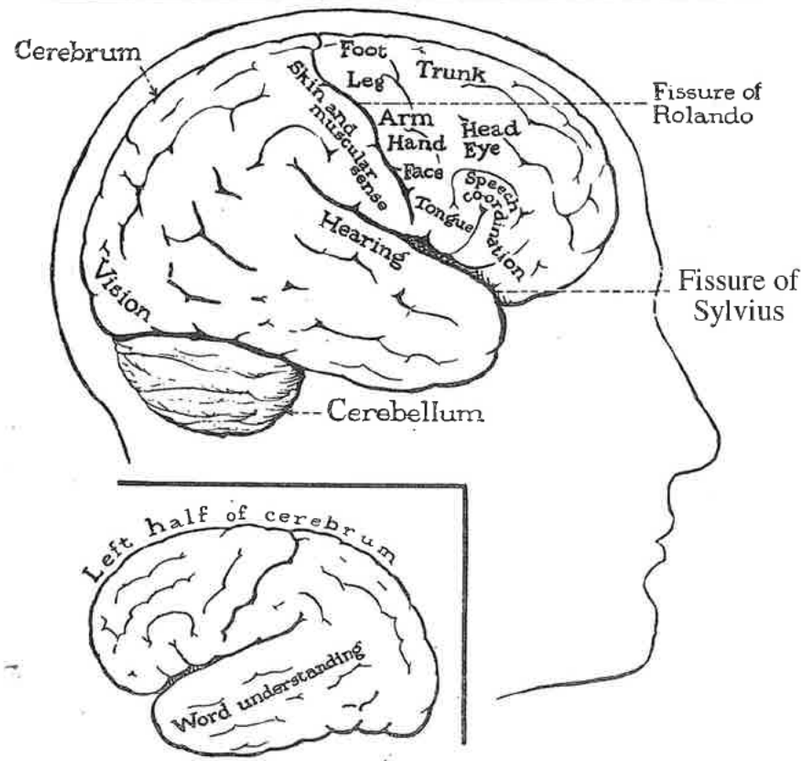
Brains Turned to Stone

The greatest damage done by inorganic minerals – plus waxy cholesterol and salt (sodium chloride) – is to the small arteries and other blood vessels of the brain. It also causes deterioration of the kidneys, liver, heart and other vital organs of the body. Essentially, premature ageing and senility are the brain turning into stone! Visit the large convalescent and rest homes and see with your own eyes the number of people who can no longer reason or think for themselves. Many of them cannot even recognize their own children and relatives!

Millions of people have lost all power of thinking! They often have no control over their eliminative organs and have to wear diapers. Many of them have to be hand fed. All the higher functions of the brain are gone. Their minds and eyes stare into empty space.

This is the way many end up! Millions are saved from this tragedy because they die before their body chemistry has time to turn their brains to stone. Hardening of the arteries and calcification of the blood vessels starts the day you are born, because from birth we begin taking inorganic minerals and chemicals into our bodies.

Miracle Functions of the Human Brain



No power on earth can restore the life of a brain hardened by inorganic minerals that has virtually turned to stone.
Don't let this happen to you! This condition is preventable!
Drink organic vegetable and fruit juices and safe, pure distilled water only.

Lack of water is the #1 trigger of daytime fatigue!

Paul Bragg's work on water and fasting is one of the great contributions to the Healing Wisdom and the Natural Health Movement in the world today. – Gabriel Cousens, M.D., Author of *Conscious Eating and Spiritual Nutrition*

There is only one water that is clean and that is steam distilled water. No other substance on our planet does so much to keep us healthy and get us well as this water does. – Dr. James Balch, M.D., Author of *Dietary Wellness*

Water is the Key to All Body Functions!

- Heart
- Circulation
- Muscles
- Metabolism
- Energy
- Glands

Are Biden's vaccine requirements legal?

yahoo!news

LAURA RAMIREZ-FELDMAN

September 20, 2021, 10:14 AM

Shortly after President Biden announced a new vaccine mandate to combat the recent COVID-19 surge driven by the Delta variant, some conservative governors vowed to file lawsuits challenging the plan. Some already have.

Last Tuesday, Arizon became the first state to sue the Biden Administration over COVID-19 vaccine mandates

In an address to the nation Sept. 9, Biden outlined his multistep "Out of the Pandemic" plan, which includes vaccine mandates that will affect about 100 million Americans — two-thirds of all workers. Under the plan, the federal government will require all federal executive branch workers, as well as all employees of federal contractors, to be vaccinated.

Previously, federal employees had the option to get vaccinated or undergo regular testing.

"If you want to work with the federal government and do business with us, get vaccinated," Biden said. "If you want to do business with the federal government, vaccinate your workforce."

This vaccine order will cover about 90 percent of approximately 4 million federal employees. However, it does not apply to non-executive-branch employees, such as members of Congress or judicial employees.

The question for many was whether such a mandate will stand up to legal challenges.

Robert Field, professor of law and public health at Drexel University, told Yahoo News that Biden's mandates for federal employees are "clearly constitutional" because "it is within the president's power to control the executive branch and the people who work for it."

The new proposal also requires anyone who works in a hospital, home health care environment or other medical facility that treats patients on Medicare and Medicaid to be vaccinated. This was already a requirement for health care workers in nursing homes that receive funding from the federal programs.

The decision will cover a total of 17 million healthcare workers. Field says Biden is also "on very clear footing" when it comes to this part of the new mandate, because federal agencies can set requirements for federal funding to ensure the safety of patients and staff.

The most controversial piece of the president's plan is his directing the Department of Labor to issue an emergency rule requiring private employers with 100 or more employees to ensure their workforce is vaccinated or tested on a weekly basis.

These employers will also be required to provide paid time off to workers who decide to get vaccinated, so they can recover in the event of experiencing any short-term side effects from the shot.

According to the president, the Department of Labor's Occupational Safety and Health Administration (OSHA), will be formulating and enforcing this new rule as an Emergency Temporary Standard (ETS).

Congress created OSHA in 1970 to ensure safe and healthful working conditions for workers by setting and enforcing such standards. The agency can enact these regulations and enforce them immediately if a "grave danger" to workers is present. For example, it issued an ETS for all health care workers in June, stating that "employee exposure to SARS-CoV-2, the virus that causes COVID-19, presents a grave danger to workers in health care settings."

Field says the president could expect to face some challenges in trying to implement these mandates for private employers, and he expects that OSHA's authority to issue emergency standards will be tested.

"Osha has only tried about 10 times in it's history" to issue these standards, Field says, and just six have gone into effect. "Almost half of them have, in fact, been struck down." However, the current state of the COVID-19 pandemic meets the criteria for a medical national emergency.

"The Biden administration has a pretty strong argument that a pandemic that's killed almost 700,000 Americans, and that is now killing almost 2,000 [Americans] a day, is a national emergency that qualifies under OSHA's authority," he said.

Another challenge the Biden administration will face will be whether OSHA, which is severely understaffed, will be able to enforce the new rule.

The agency, Field says, has always been understaffed, but under the Trump administration the number of workplace safety inspectors was reduced to the lowest level since the early 1970s.

OSHA now has an estimated 800 safety and compliance inspectors who will be tasked with covering more than 100,000 private-sector companies that will be affected by the new rule.

All the mandates include religious and medical exemptions. Employers in those cases must give workers a choice between showing proof of vaccination and undergoing regular testing.

"I think it's a bit of a misnomer to call it a vaccine mandate. ... It's an option," Field said. "You don't have to be vaccinated if you submit to weekly testing."

Read more from Yahoo News:

- Why the U.S. lags behind Europe on climate change goals 'by 10 or 15 years'

s to Biden's vaccine mandates unlikely to say

Sept. 10, 2021, 12:20 PM PDT

By Adam Edelman

Nearly two dozen Republican governors, as well as the GOP itself, have vowed to file lawsuits or take other actions to block President Joe Biden's newly announced vaccination mandates – but legal experts say they'll have a hard time successfully making their case in court.

Biden on Thursday issued two executive orders mandating vaccines for federal workers and contractors and also announced new requirements for large employers and health care providers that he said would affect around 100 million workers, more than two-thirds of the U.S. workforce. Following the announcement, Republicans across the country slammed the moves. South Dakota Gov. Kristie Noem tweeted that her state would "Stand up to defend freedom," adding, "@Joe Biden see you in court."

Georgia Gov. Brian Kemp tweeted he would "pursue every legal option available" to stop "this blatantly unlawful overreach," while Arizona Gov. Doug Ducey tweeted that the White House was "hammering down on private businesses and individual freedoms in an unprecedented and dangerous way" and that "we must and will push back."

— A sign during a protest against Covid-19 vaccination mandates in Lansing, Michi., on Aug. 6, 2021.
Matthew Hatcher / Bloomberg via Getty Images file

South Carolina Gov. Henry McMaster said in a statement that "Biden and the radical Democrats (have) thumbed their noses at the Constitution" and Oklahoma Gov. Kevin Stitt said, "as long as I am governor, there will be no government vaccine mandates in Oklahoma." Texas Gov. Greg Abbott tweeted he's already "working to halt this power grab."

Republican National Committee Chairwoman Ronna McDaniel called Biden's move "unconstitutional" and said the RNC will sue the administration.

Legal experts, however, said those lawsuits are most likely – but not certain – to fail, due to wide-ranging powers that the Constitution and decades of administrative law precedent have established.

Biden on Friday appeared to be spoiling for that fight, telling Republican governors to "have at it" and slamming Republican officials as being "cavalier with the health of their communities" when asked about criticism of the new vaccine requirements.

Generally speaking, public health powers are delegated to the states, experts said. But the Constitution also gives the federal government broad powers to regulate certain matters when it perceives that states and localities are not able to do so, or are doing so inadequately.

In this case, experts explained, Biden's mandates pass muster because he is filtering them through the lenses of workplace safety and through the Constitutional language of federal spending powers.

"President Biden is acting within the authority of the executive branch to impose rules and regulations – sometimes referred to as the regulatory state – and within the rule-making authority associated with a range of federal administrative agencies," said Juliet Sorensen, a professor at Northwestern University's Pritzker School of Law and an expert on health and human rights laws.

Biden's orders will largely be enforced by the Department of Labor, which includes the Occupational Safety and Hazard Administration, an arm of the executive branch with the authority to implement and oversee the orders, Sorensen said. OSHA's mission is to ensure safe workplace conditions around the country and therefore naturally extends to keeping workers safe from Covid, she added.

"The gravity of the pandemic and the fact that it's persisted without these mandates in place puts the president on solid ground, legally," she said.

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Congressional Hispanic Caucus Institute looks to boost young Latino leadership

The president also has the power to regulate spending power, which is relevant to Biden's mandate requiring employees working in health care facilities that receive Medicare or Medicaid reimbursement to be vaccinated, according to Sylvia A. Law, a professor emeritus at New York University's School of Law.

Through the Constitution, Congress has the explicit power to attach conditions to whatever money it's disbursing – including the hundreds of billions it spends each year on Medicare and

Medicaid. But the president and the executive branch have the constitutional power to dictate various elements of federal spending, especially when it comes to health care.

"Most of what exists in this space has pretty much been made up by the agencies and upheld in some cases, by the courts. We understand that the Congress paints in broad strokes and, simply put, much of the rest of it gets filled in by rules, regulations and court rulings," Law said.

"Under current law, it's clear that Biden has the power to do what he's done," she said.

But, as is the case with most legal arguments, the administration's case for mandates won't be impeccable, Law warned.

"A smart lawyer who doesn't agree with vaccine mandates will be able to make a 'pass-the-laugh-test' argument that it's not legal, and with the makeup of this current Supreme Court, it's hard to know how that would shake out," Law said.

Law said that some individuals may be able to claim exemptions based on religious or health grounds, but those concerns are unlikely to topple the mandates more broadly.

Sorensen said the strongest area to challenge the mandates for Republican officials and operatives lies in how the mandates would be enforced.

"If I'm a Republican governor, I'm looking closely at that language," she said.

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9

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Will Fauci Be Held Accountable for Lying to Congress?

Analysis by Dr. Joseph Mercola | Fact Checked

STORY AT-A-GLANCE

- Paul Thacker, a former investigator with the U.S. Senate, says Dr. Anthony Fauci lied to Congress when he claimed he's never funded gain-of-function research. This is a federal offense punishable by up to five years in prison, provided the false statements are materially relevant and knowingly false
- July 20, 2021, U.S. Sen. Rand Paul — who has grilled Fauci about his research funding in two separate hearings in 2021 — announced he would ask the DOJ for a criminal referral, as he's convinced Fauci made false statements to Congress
- One "smoking gun" is a research article written by Wuhan Institute of Virology (WIV) scientists. The paper acknowledges funding from the NIAID/NIH, and the research meets the Department of Health and Human Services' definition of gain-of-function research
- According to the National Science Advisory Board for Biosecurity, "The term 'gain-of-function' is generally used to refer to changes resulting in the acquisition of new, or an enhancement of existing, biological phenotypes"
- In a June 2021 essay, professor Jeffrey Sachs, head of The Lancet's commission tasked with investigating COVID's origin, described how the NIAID has funded gain-of-function research at the WIV, stating it's "common knowledge in the U.S. scientific community that NIH has ... supported genetic recombinant research on SARS-like viruses that many scientists describe as GOFROC [gain-of-function research of concern]"

In an August 31, 2021, substack article,[1] Paul Thacker, an investigative reporter and former investigator with the U.S. Senate, reviews evidence he claims shows Dr. Anthony

ied to Congress, an offense punishable by up to five years in prison, provided the tatements are materially relevant and knowingly false.

A new investigative documentary by the U.K.'s Channel 4[2] detailed some of the strongest evidence to date that the COVID19 pandemic may have started from a ab leak in Wuhan, China," Thacker writes.[3]

"At the very least, the documentary's interviews with experts and review of documents made explicit how China has misled the world about its research with dangerous pathogens ...

The documentary clarified one other point: Anthony Fauci lied before Congress and the American public when he claimed during a congressional hearing that he has not funded gain-of-function research conducted by the Wuhan Institute of Virology ...

President Biden has campaigned on honesty and decency. The question now for President Biden is, 'What will you do with Fauci now that he has broken the law and violated the public trust by lying before Congress?'"

auci Redefines Scientific Terms on the Fly

what appears to be an attempt to extricate himself from blame for the COVID andemic, Fauci — director of the National Institute for Allergy and Infectious Diseases NIAID), an arm of the National Institutes for Health (NIH), since 1986 — denied ever aving funded gain-of-function research at the WIV or elsewhere when questioned by nembers of the Senate Health, Education, Labor, and Pensions Committee in May 2021.[4]

> **"The term 'gain-of-function' is generally used to refer to changes resulting in the acquisition of new, or an enhancement of existing, biological phenotypes. ~ National Science Advisory Board for Biosecurity"**

According to Thacker, the evidence clearly refutes this. One "smoking gun" is a research article written by WIV scientists titled "Discovery of a Rich Gene Pool of Bat SARS-Related Coronaviruses Provides New Insights Into the Origin of SARS Coronavirus."[5] This research was funded by the NIH and meets the Department of Health and Human Services' definition of gain-of-function research.[6,7]

The Channel 4 documentary addressed this paper. When asked whether the NIH ever funded gain-of-function research at the WIV, David Relman, a research physician at Stanford University, replies, "Yes. Indirectly, but yes. How do we know? The paper says, right on the front page, 'Supported by NIAID, NIH.'" The clip featuring Relman is included below.

As previously reported by the National Review,[8] we know the WIV received NIAID/NIH funding to create novel chimeric SARS-related coronaviruses capable of infecting both human cells and lab animals. "Chimeric viruses" refers to artificial man-made viruses, hybrid organisms created through the joining of two or more different organisms.

This is precisely what gain-of-function research is all about. According to a 2016 report[9] from the National Science Advisory Board for Biosecurity, "The term 'gain-of-function' is generally used to refer to changes resulting in the acquisition of new, or an enhancement of existing, biological phenotypes."

Fauci now wants to adopt a far narrower definition of gain-of-function research that takes into account the supposed intent behind the research, but that really doesn't make sense. Just because you don't set out with intent to harm doesn't mean your creation can't cause harm or might inadvertently cause harm.

US Funding of Gain-of-Function Research Was Well-Established

According to Thacker, "Fauci certainly knew that the WIV he was helping to fund conducted gain-of-function studies, because it has been common knowledge."[10] For example, a year before Fauci was queried by Congress, Newsweek reported that:[11]

"In 2019, with the backing of NIAID, the National Institutes of Health committed $3.7 million over six years for research that included some gain-of-function work. The program followed another $3.7 million, 5-year project for collecting and studying bat coronaviruses, which ended in 2019, bringing the total to $7.4 million ...

The NIH research consisted of two parts. The first part[12] began in 2014 and involved surveillance of bat coronaviruses ... The program funded Shi Zheng-Li, a virologist at the Wuhan lab ... to investigate and catalogue bat coronaviruses in the wild. This part of the project was completed in 2019.

A second phase[13] of the project, beginning that year, included ... gain-of-function research for the purpose of understanding how bat coronaviruses could mutate to attack humans. The project was run by EcoHealth Alliance ... under the direction of President Peter Daszak ... NIH canceled the project ... April 24 [2020] ...

Many scientists have criticized gain of function research, which involves manipulating viruses in the lab to explore their potential for infecting humans, because it creates a risk of starting a pandemic from accidental release."

Around that same time, former Acting Director of the CIA Michael Morell told Politico[14] that "if the virus leaked from a Wuhan lab, the U.S. would shoulder some of the blame since it funded research at that lab through government grants from 2014 to 2019."

Mid-January 2021, the U.S. State Department published a fact sheet accusing the Chinese government of being obsessively secretive about gain-of-function research at the WIV, and that it was collaborating with the Chinese military on secret projects.

The fact sheet has since been removed from the State Department's website, but was reported by a number of outlets at the time. Among them, Life Site News, which wrote:[15]

"In a 'Fact Sheet' posted online ... the Department of State (DOS) presented three distinct elements about the origin of the virus, which 'deserve greater

scrutiny' ... The first of the three issues needing further investigation, was the outbreak of illness inside the Wuhan Institute of Virology (WIV).

The DOS revealed it had 'reason to believe' that 'several researchers inside the WIV became sick in autumn 2019, before the first identified case of the outbreak, with symptoms consistent with both COVID-19 and common seasonal illnesses' ...

Additionally, the DOS noted that researchers in the WIV had been performing experiments on 'RaTG13, the bat coronavirus identified by the WIV in January 2020 as its closest sample to SARS-CoV-2 (96.2% similar)' since at least '2016.'

The laboratory also 'has a published record of conducting 'gain-of-function' research to engineer chimeric viruses.' Such research, gain-of-function research, is a kind which 'improves the ability of a pathogen to cause disease.'"

Additional Reports Citing Gain-of-Function Research

March 6, 2021, the editorial board of The Washington Post published an article[16] calling for an independent investigation into the origin of SARS-CoV-2. In that article, the board pointed out that:

"... a senior researcher at the Wuhan Institute of Virology, Shi Zhengli, was working on 'gain-of-function' experiments, which involve modifying viral genomes to give them new properties, including the ability to infect lung cells of laboratory mice that had been genetically modified to respond as human respiratory cells would."

The board also noted that Shi was "working with bat coronaviruses that were genetically very similar to the one that caused the pandemic." A few months later, in a June 22, 2021, essay,[17] professor Jeffrey Sachs, head of The Lancet's commission tasked with investigating COVID's origin, also described how the NIAID has funded gain-of-function research at the WIV:

"It is in fact common knowledge in the U.S. scientific community that NIH has indeed supported genetic recombinant research on SARS-like viruses that many scientists describe as GOFROC [gain-of-function research of concern].

The peer-reviewed scientific literature reports the results of such NIH-supported recombinant genetic research on SARS-like viruses. More specifically, it is clear that the NIH co-funded research at the WIV that deserves scrutiny under the hypothesis of a laboratory-related release of the virus."

'Fauci's COVID-19 Treachery'

Someone who has taken a particular interest in Fauci's potential role in this pandemic is Dr. Peter Breggin, a Harvard-trained psychiatrist and former consultant for the National Institute of Mental Health. In October 2020, he published the report[18] "Dr. Fauci's COVID-19 Treachery," detailing Fauci's ties to the Chinese Communist Party (CCP) and its military.

Breggin is convinced Fauci "has been the major force" behind research activities that enabled the CCP to manufacture lethal SARS coronaviruses, which in turn led to the release — whether accidental or not — of SARS-CoV-2 from the WIV.

He claims Fauci has helped the CCP obtain "valuable U.S. patents," and that he, in collaboration with the CCP and the WHO, initially suppressed the truth about the origins and dangers of the pandemic, thereby enabling the spread of the virus from China to the rest of the world.

Fauci has, and continues to, shield the CCP and himself, Breggin says, by "denying the origin of SARS-CoV-2" and "delaying and thwarting worldwide attempts to deal rationally with the pandemic."

In the executive summary of the report, Breggin documents 15 questionable activities that Fauci has been engaged in, starting with the fact that he funded dangerous gain-of-function research on bat coronaviruses, both by individual Chinese researchers and the

WIV in collaboration with American researchers. This research, Breggin says, allowed the CCP and its military to create their own bioweapons, including SARS-CoV-2.

Will Fauci Be Held Accountable?

According to Thacker, "it's obvious" Fauci "broke the law and misled Congress." He adds:[19]

> *"This is not my personal opinion; I was required to know and enforce the relevant provisions of the law during the three years I ran investigations in the Senate. On two occasions I had to consult with Senate Legal Counsel and then warn people about lying to Congress ...*
>
> *Fauci lied while testifying before Congress. Fauci lied to the American people. Several lines of evidence make this clear. But catching Fauci lying and breaking the law does little good, because the Department of Justice prosecutes people for lying to Congress, and the Department of Justice is run ... by the Biden administration. So what is President Biden going to do about this?"*

During an appearance on the Hannity Show, July 20, 2021, U.S. Sen. Rand Paul — who has grilled Fauci about his research funding in two separate hearings this year — announced he would indeed ask the DOJ for a criminal referral.[20]

Paul specifically asked the DOJ to investigate whether Fauci violated 18 U.S. Code § 1001[21] — which makes it a federal crime to make "any materially false, fictitious or fraudulent statement or representation" as part of "any investigation or review" conducted by Congress — or any other statute. Time will tell if it amounts to anything.

Gain-of-Function Research Is the Real Threat

Regardless of what happens to Fauci, at the end of the day, the key issue that needs to be addressed is whether we should allow research that involves making pathogens more dangerous to humans at all, regardless of what the intent behind it might be, or the specific technology used.

Lab leaks have occurred on multiple occasions, so it's really only a matter of time before something far more devastating than SARS-CoV-2 gets out. World leaders need to realize that funding gain-of-function research is the real threat here, and take action accordingly to forestall another pandemic. As long as researchers are allowed to mutate and create synthetic pathogens, they're creating the very risk they claim they're trying to prevent.

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Proof: The US Funded Wuhan Coronavirus Research

A Freedom of Information Act request has produced a report more than 900 pages long detailing U.S. funding of research at the Wuhan Institute of Virology and the coordinated work that EcoHealth Alliance, the National Institutes of Health and Dr. Anthony Fauci's National Institute of Allergy and Infectious Diseases did with the Wuhan lab.

One of the NIH grants was for $666,422 to study the risk of bat coronaviruses. The grant's plan, as written by the recipient, EcoHealth Alliance, outlines a plan to physically work in China on it. "This is a road map to the high-risk research that could have led to the current pandemic," Gary Ruskin, executive director of U.S. Right To Know, a group that has been investigating the origins of COVID-19, told The Intercept.

"The documents contain several critical details about the research in Wuhan, including the fact that key experimental work with humanized mice was conducted at a biosafety level 3 lab at Wuhan University Center for Animal Experiment — and not at the Wuhan Institute of Virology, as was previously assumed," The Intercept added.

All told, the documents show that EcoHealth Alliance received $3.1 million, of which the Wuhan Institute of Virology received $599,000 to "identify and alter bat coronaviruses likely to infect humans."

In other news MSN reported that a cable obtained by U.S. diplomat Rick Switzer and U.S. consul-general Jamie Fouss had obtained a cable stating that "NIH was a major funder, along with the National Science Foundation of China, of Sars research by the Wuhan Institute of Virology ... In the last year, the institute has also hosted visits from the National Institutes of Health (NIH), National Science Foundation and experts from the University of Texas Medical Branch in Galveston."

SOURCES:

The Intercept September 6, 2021

MSN September 4, 2021

The Epoch Times September 7, 2021

19

Team Tucker Carlson

Fauci Funded 60 Projects At The Wuhan Institute Of Virology

By Team Tucker Carlson Sept. 20, 2021

New revelations have come out about Anthony Fauci, the mad medic, Director of the National Institute of Allergy and Infectious Diseases (NIAID) *and the Chief Medical Advisor to the President. This time from Australia.*

We first noted the Wuhan Institute of Virology in 2020 and in April noted that the Institute experimented with live animals.

Sharri Markson from Sky News is coming out with a book that's a culmination of her efforts studying Anthony Fauci. She notes the following on Sky News hours ago:

Dr Anthony Fauci was "up to his neck" funding coronavirus research in Wuhan, which "just shows how incredibly stupid" he is, says Sky News host Sharri Markson. Ms Markson has been investigating Anthony Fauci's involvement in funding the Wuhan Institute of Virology and discovered his agency "had funded 60 projects at the Wuhan laboratory."

"Then he wrote a paper where he said gain of function research was worth the risk of a pandemic, and that he had even funded coronavirus research in conjunction with the Chinese military," Ms Markson said.

Mr Fauci, who has been the Director of the National Institute of Allergy and Infectious Diseases since 1984, apparently stayed silent during Oval Office meetings at the start of the pandemic about the "risky research that was underway at the Wuhan Institute of Virology".

"He never mentioned that his agency was funding this, and he actually knew a whole lot about it."

Sharri Markson explores this in a documentary premiering on Monday night, 'What Really Happened in Wuhan', including exclusive interviews with President Donald Trump and Mike Pompeo.

Watch at 8pm Monday on Sky News Australia.

Dr. Fauci never shared any of this with President Trump in the early months of the pandemic.

21

Foundations Advancing mRNA Science and Research

Biopharma | Government | Foundations | Research Institutes

BILL & MELINDA GATES *foundation*

Bill & Melinda Gates Foundation — Advancing an mRNA-based antibody combination to help prevent HIV infection

"Moderna Therapeutics' research has considerable potential for the development of an effective prevention intervention for HIV, and potentially other infectious diseases that disproportionately affect the world's poorest people." – Trevor Mundel, president of Global Health at the Bill & Melinda Gates Foundation

In January 2016, we entered a global health project framework agreement with the Bill & Melinda Gates Foundation to advance mRNA-based development projects for various infectious diseases. The Bill & Melinda Gates Foundation has committed up to $20.0 million in grant funding to support our initial project related to the evaluation of antibody combinations in a preclinical setting as well as the conduct of a first-in-human Phase 1 clinical trial of a potential mRNA medicine to help prevent human Immunodeficiency virus, or HIV, infections. Follow-on projects which could bring total potential funding under the framework agreement up to $100.0 million (including the HIV antibody project) to support the development of additional mRNA-based projects for various infectious diseases can be proposed and approved until the sixth anniversary of the framework agreement, subject to the terms of the framework agreement, including our obligation to grant to the Bill &Melinda Gates Foundation certain non-exclusive licenses.

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Moderna's Company History

FOUNDING YEAR:

2010

TEAM MEMBERS:

1,800+ (As of June 2021)

Current Job Openings >

HEADQUARTERS:

Cambridge, MA

CEO:

Stéphane Bancel

Learn About Stéphane >

US LOCATIONS:

200 Technology Square, Cambridge, MA

One Upland Road, Norwood, MA

THERAPEUTIC AREAS:

- Infectious Diseases
- Immuno-Oncology
- Rare Diseases
- Cardiovascular Diseases
- Autoimmune Diseases

CAPITALIZATION:

- Cash, cash equivalents, and investments in marketable securities: $12.2 billion (unaudited as of June 30, 2020)
- No Debt

PARTNERS:

Lonza
AstraZeneca
BARDA
MERCK
DARPA
VERTEX
Karolinska Institutet
BILL & MELINDA GATES foundation

PIPELINE:

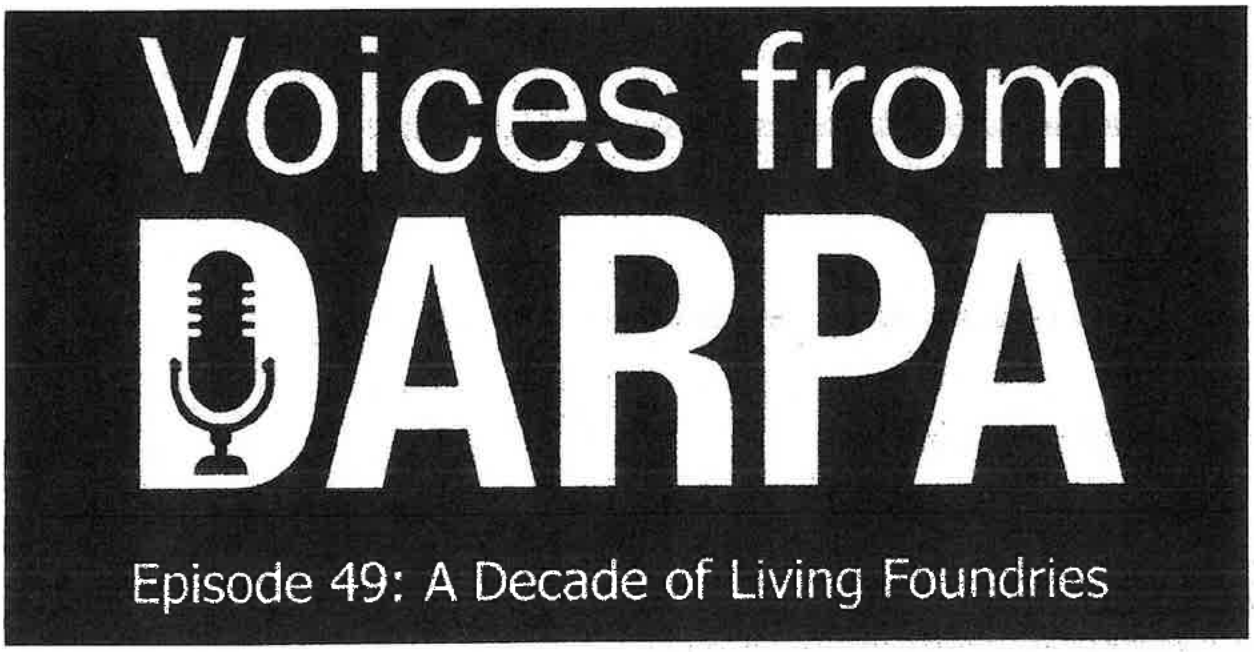
FOUNDING INVESTOR:

- Flagship Pioneering

moderna

Episode 49: A Decade of Living Foundries

OUTREACH@DARPA.MIL
9/15/2021



This episode of the *Voices from DARPA* podcast takes listeners on a tour of an audacious, decade-long project to merge biology and engineering into one of the most powerful engines of molecular invention the world has known. Although plenty of work remains to be done, the program, Living Foundries, is winding down. But not before its community of research performers and collaborators already has delivered a new and versatile biotechnology platform whose consequences have begun to ripple out. New companies. Follow-on investments. Chemical- and materials-based technologies for the Department of Defense … and perhaps one day for the public at large.

As it has unfolded, the Living Foundries program has created an innovation ecosystem of industry, academic, and government researchers and champions. In the podcast, you will hear a story about how they have developed, proven, deployed, and continue to hone a versatile biosynthetic technology platform capable of producing both low-cost, bulk materials such as fire-resistant coatings and polymers as well as high-cost, low-quantity specialty items such as high-energy-density jet and missile fuels.

The crux of the technology is the new ability to quickly reprogram the genomes of yeast and other microbes with in-cell biosynthetic pathways that can ferment a diversity of precursor chemicals into an inventory of more-useful target molecules. Think of this as the way brewers use yeast to convert sugar into alcohol, but now you can replace the sugar and alcohol with a wide range of starting and ending chemicals. In recent years of the

program, researchers have produced, among other useful materials, antibiotics, drug-precursors, pesticides, adhesives, fuels, filtering materials, mold inhibitors, detergents, catalysts for chemical reactions, and optical materials such as liquid crystals. The molecule count that the platform has produced so far has topped 1600.

The Living Foundries program will keep on giving, says Anne Cheever, the program manager in DARPA's Biological Technologies Office who is taking the program to the finish line. Says Cheever, "Post Living Foundries, the breadth and throughput of products will only continue to expand, especially since commercial applications of this technology span across the biotech sector. And for the DoD, this will include continuing the development path. There's going to be solutions. There's going to be new enhancements to military needs as well as capabilities."

Blubrry (podcast host): https://blubrry.com/voices_from_darpa/80842867/episode-49-a-decade-of-living-foundries/

YouTube: https://youtu.be/5FaweJeWx1Q

iTunes: https://itunes.apple.com/us/podcast/voices-from-darpa/id1163190520

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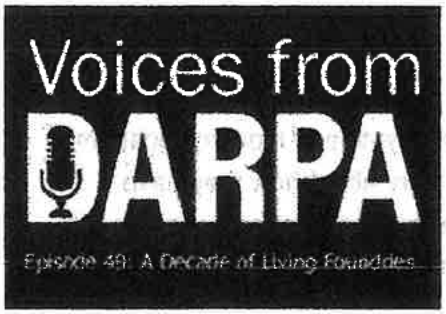
Electronics Resurgence Initiative Summit

IMAGES



Episode 49: A Decade of Living Foundries

18 U.S. Code § 1621 - Perjury generally

U.S. Code Notes

Whoever—

(1) having taken an oath before a competent tribunal, officer, or person, in any case in which a law of the United States authorizes an oath to be administered, that he will testify, declare, depose, or certify truly, or that any written testimony, declaration, deposition, or certificate by him subscribed, is true, willfully and contrary to such oath states or subscribes any material matter which he does not believe to be true; or

(2) in any declaration, certificate, verification, or statement under penalty of perjury as permitted under section 1746 of title 28, United States Code, willfully subscribes as true any material matter which he does not believe to be true;

is guilty of perjury and shall, except as otherwise expressly provided by law, be fined under this title or imprisoned not more than five years, or both. This section is applicable whether the statement or subscription is made within or without the United States.

(June 25, 1948, ch. 645, 62 Stat. 773; Pub. L. 88–619, § 1, Oct. 3, 1964, 78 Stat. 995; Pub. L. 94–550, § 2, Oct. 18, 1976, 90 Stat. 2534; Pub. L. 103–322, title XXXIII, § 330016(1)(I), Sept. 13, 1994, 108 Stat. 2147.)

NEWS AND COMMENTARY

DeSantis: Businesses Asking For Proof Of Vax Will Be Fined $5,000 A Violation

By Amanda Prestigiacomo

Sep 13, 2021 DailyWire.com

Joe Raedle / Getty Images

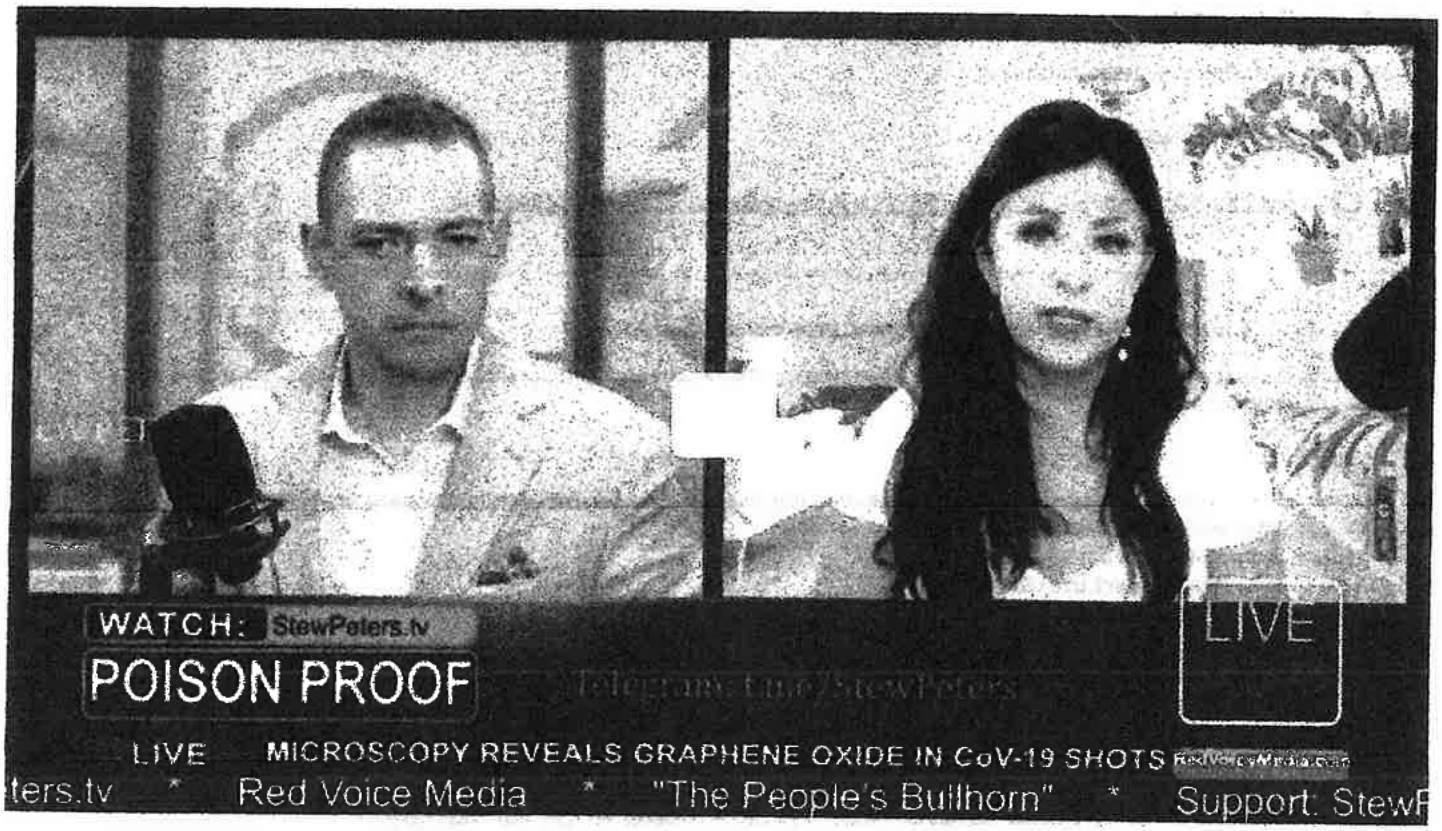
Businesses asking for proof of vaccination or government agencies mandating vaccination for employees will be facing $5,000 fines per violation, Florida Governor Ron DeSantis (R) reiterated this week.

DeSantis in May signed a bill allowing "the state to issue fines beginning Sept. 16 if people are asked to show proof they have received a COVID-19 vaccine

- Red Voice Media - https://www.redvoicemedia.com -

Microscopy Expert: Vials Contain Graphene Oxide, Parasites, Stainless Steel

Posted By *Stew Peters Show* On August 30, 2021 @ 9:32 am In Stew Peters Show | 23 Comments



Americans are being illegally coerced to take medicine. That's a fact. That's happening in the land of the free. From 100% of the military to millions of healthcare workers (propped up early last year as heroes, now being told they can kick rocks), airline pilots, cops, firefighters are you seeing a trend here? The so-called servants to the public are being targeted and every key area of essential workers are now being subjected to tyranny at the hands of unchecked communist overlords with a newly-found authority to force you into an ineffective and in many cases dangerous face muzzle transforming what we're used to seeing as liberty-loving socialites into an almost mirror image of a burka-ridden extremist militant-run Muslim way of life.

Cover your face, stay away from your family, cancel your gatherings, forget about your holidays and take this shot. The safety and effectiveness of the injection is never a part of the conversation, and anyone that questions the ingredients or has noticed the historically record-smashing injuries and deaths is the new conspiracy theorist, right wing radical terrorist on the DHS list recently released in order to scare you into submission.

It's scary to be forced into doing something, even more so when the results could kill you but we're going to keep asking the question. What's in these shots? Why can't we know? Why hasn't Pfizer had a press conference since the fake FDA approval was set up as a furtherance of lies for the CNN propaganda machine? Maybe it's because you're not supposed to know.

Dr. Robert Young, a microscopy expert holding two PhD's, says he has examined the contents [1] of the four publicly-available CoV-19 "vaccines", and determined the vials to contain graphene oxide, deadly parasites and stainless steel, among other metals and contents. You can see his findings here [1].

One doctor, an expert in the field of microscopy, says he's examined the vials, and if what he's saying is accurate we now definitively know why it's a big secret. Dr. Jane Ruby [2] is an expert pharmaceutical researcher that joined Stew Peters to reveal the findings to the public.

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Senior Trump HHS COVID Advisor Drops BOMBS! Task Force Mislead POTUS, No "Pandemic" [10]

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URL to article: **https://www.redvoicemedia.com/2021/08/microscopy-expert-vials-contain-graphene-oxide-parasites-stainless-steel/**

URLs in this post:

[1] examined the contents: **https://www.drrobertyoung.com/post/science-team-reveals-graphene-aluminum-inp-capsids-peg-parasites-in-4-cov-vaccines**
[2] Dr. Jane Ruby: **https://drjaneruby.com**
[3] social media: **http://evrl.ink/StewPeters**
[4] premium user: **https://www.redvoicemedia.com/premium**
[5] StewPeters.TV: **https://stewpeters.tv**
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[9] Advertise: **https://www.redvoicemedia.com/2021/08/cut-out-big-tech-and-advertise-with-red-voice-media-directly/**
[10] Senior Trump HHS COVID Advisor Drops BOMBS! Task Force Mislead POTUS, No "Pandemic": **https://www.redvoicemedia.com/2021/08/senior-trump-hhs-covid-advisor-drops-bombs-task-force-mislead-potus-no-pandemic/**

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World

Japan Suspends Moderna Covid-19 Vaccine Doses after Metallic Containment Found in Dozens of Vials

The country's health has dismissed concerns over significant health problems for those who have been administered the vaccine from those vials, as the chances of the metals entering the body are extremely low.

By R. Ghosh

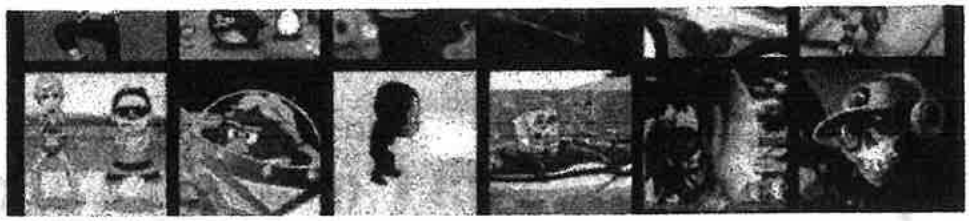
August 27, 2021 20:42 +08

The foreign substance detected in dozens of vials of Moderna's Covid-19 vaccine in Japan is believed to be tiny pieces of metal, according to the country's health ministry. Japan had suspended the use of more than 1.63 million doses of the Moderna vaccine following reports of contamination in the vials.

However, experts have dismissed concerns over significant health problems for those who have been administered the vaccine from those vials, as the chances of the metals entering the body are extremely low. The foreign substances were found in vials at multiple vaccination sites.

Contaminated Vaccine?

On Thursday, Takeda Pharmaceuticals, which distributes the vaccine in Japan for Moderna, said that it had notified the ministry after several vaccination sites reported an unspecified foreign object was found in one specific lot.



The foreign substances were found in as many as 39 vials at eight vaccination sites in the prefectures of Ibaraki, Saitama, Tokyo, Gifu and Aichi since August 16, reports Xinhua news agency. Following that, the health ministry immediately suspended the use of all the Moderna vaccines in the country.

However, the ministry clarified on Friday that the foreign substances are believed to me metals and are a few millimeters in size and don't pose any threat to a person's health. The ministry said that the particles are too small to enter a person's body, so those who have already been jabbed from these vials.

More than 187,000 shots from the three suspended lot had already been administered in at least 21 prefectures, according to a tally by *Kyodo News*. Those include 50,000 doses in Osaka, 41,500 in Hyogo, 26,020 in Aichi and 13,330 in Hiroshima. This created a lot of panic but any threat to health has now been ruled out.

All's Well

Moderna too was initially in tension following the revelation. The company along with Rovi and Takeda Pharmaceutical Co. has launched an investigation and according to initial reports the entire thing happened during the production process.

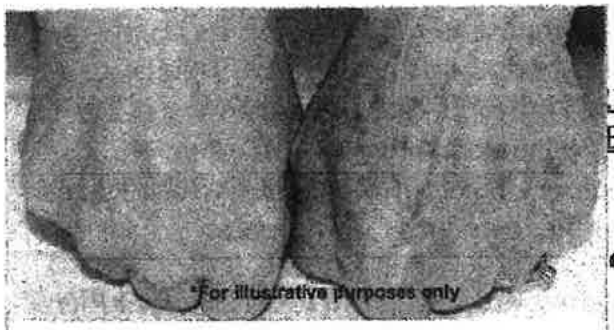
According to *Asahi Shimbun*, an unidentified senior health ministry official said that the foreign material is "a metal that reacts to a magnet." That said, the ministry also confirmed that so far, there have been no reports of ill health from contaminated doses, or of foreign materials in other batches of the Moderna vaccine that have been distributed in Japan.

Health minister Norihisa Tamura said the government was contacting the 863 workplace and mass vaccination centers that received the three lot numbers to see if they are short of vaccines, and that it would start distributing replacement vials Friday.

Related topics : Coronavirus

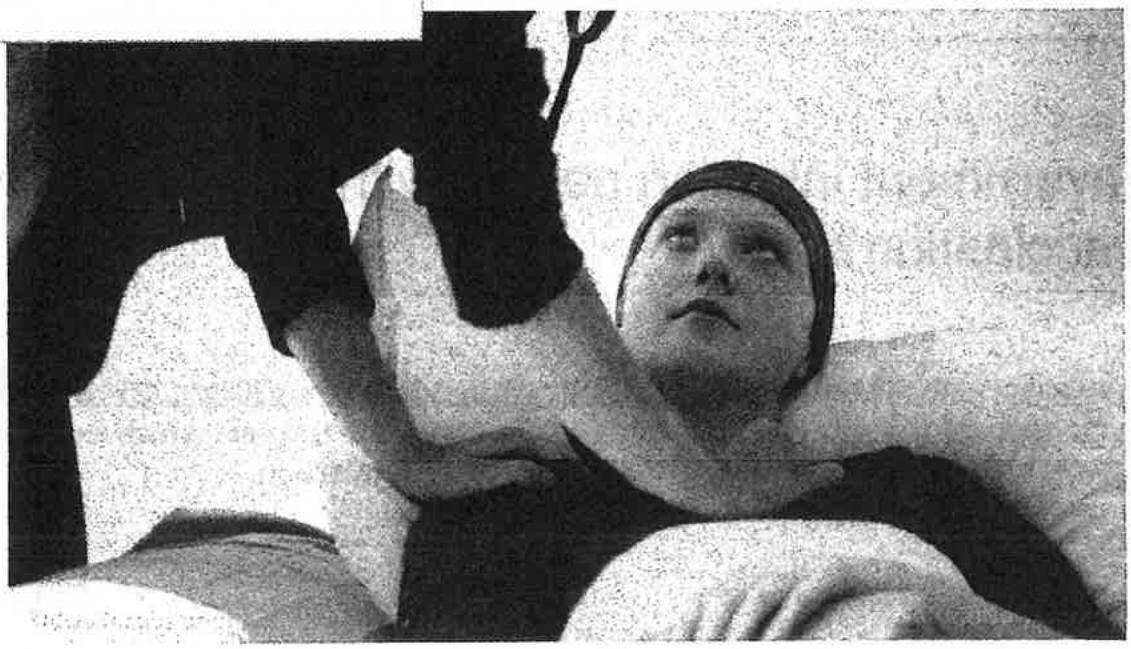
Popular in the Community

31



Relieve Dark Spots In the Blink Of an Eye (Watch THIS)

Idaho doctor reports "20 times increase" in cancer among those vaccinated for covid



Dr. Ryan Cole, a board-certified pathologist and diagnostics lab owner and operator based out of Idaho, has released shocking new information (https://www.lifesitenews.com/news/idaho-doctor-reports-a-20-times-increase-of-cancer-in-vaccinated-patients/) about how Wuhan coronavirus (Covid-19) "vaccines" are causing a massive "uptick" in autoimmune diseases and cancer.

In a video produced by the Idaho state government's "Capitol Clarity" project, Cole revealed how he is now seeing a 2,000 percent chronic illness increase in folks who took Donald "father of the vaccine" Trump's "Operation Warp Speed" injections (https://archive.is/WAZLp).

(https://go.globalhealingcenter.com/c/435257/381717/5534)"Since January 1, in the laboratory, I'm seeing a 20-times increase of endometrial cancers over what I see on an annual basis," Cole stated in the video.

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"I'm not exaggerating at all because I look at my numbers year over year, and I'm like 'Gosh, I've never seen this many endometrial cancers before.'"

Cole revealed these and other statistics at a March 18 event, telling Idahoans that the so-called "vaccines" for the Fauci Flu are invoking a "reverse HIV" type of autoimmune response in people's bodies.

A normal, well-functioning immune system has two types of cells that keep the body healthy: "helper" T-cells, also known as CD4, and "killer" T-cells, also known as CD8 cells. In the "fully vaccinated," there is a massive suppression of "helper" T-cells, Cole warns, which leaves the patient susceptible to an array of illnesses.

"Post-vaccine, what we are seeing is a drop in your killer T-cells, in your CD8 cells," Cole stated. "And what do CD8 cells do? They keep all other viruses in check."

Is the government injecting people with HIV and calling it "covid vaccination?"

Cole's claims resonate with the results of a study (https://dreddymd.com/2020/12/25/covid-19-vaccines-may-increase-the-risk-of-hiv-infections/) published in *The Lancet* late last year which found that Chinese Virus shots greatly increase a person's risk of developing an HIV infection.

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Could it be that the jabs are actually inserting HIV into people's bodies under the guise of "vaccinating" them against Chinese Germs? Is everyone being lied to about what these vials truly contain?

It would appear so, based on the latest evidence and revelations. While HIV is known to suppress "helper" T-cells, covid jabs are apparently suppressing "killer" T-cells, which Cole says has a similarly negative effect on immunity.

This vaccine-induced "killer T-cell" suppression, Cole goes on to warn, is generating a major uptick in cases of endometrial cancer, melanomas, herpes, shingles, mono, and even human papillomavirus (HPV) when "looking at the cervical biopsies of women."

Other ingredients in the jabs, including polyethylene glycol, are also causing problems for people's immune systems. Rather than protect them against a China Virus infection as claimed, these injection additives present a serious toxicity risk that could lead to even more health problems on top of those caused by the jabs' HIV-like effects.

"Most concerning of all, there is a pattern of these types of immune cells in the body keeping cancer in check," Cole warns about what these shots are doing, including in young people who were fully healthy before getting jabbed.

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"I'm seeing invasive melanomas in younger patients; normally we catch those early, and they are thin melanomas, [but] I'm seeing thick melanomas skyrocketing in the last month or two."

Cole has spoken at several events over the past several months, warning people about the serious risks involved with getting jabbed. Some of his work has been scrubbed from YouTube for being too truthful, so keep an eye out for fresh content about Dr. Ryan Cole at Rumble.com (https://rumble.com/vmk84t-post-vaccine-20-x-increase-of-cancer.html?mref=9qiox&mc=7i756).

"Can you imagine what cancer rates will look like five years from now?" asked one commenter at *LifeSiteNews*. "This won't get reported. They won't even do a study."

More related news stories about Chinese Virus injections can be found at ChemicalViolence.com (http://chemicalviolence.com/).

Ethan Huff

Sources for this article include:

LifeSiteNews.com (https://www.lifesitenews.com/news/idaho-doctor-reports-a-20-times-increase-of-cancer-in-vaccinated-patients/)

DrEddyMD.com (https://dreddymd.com/2020/12/25/covid-19-vaccines-may-increase-the-risk-of-hiv-infections/)

(https://www.amazon.com/Augason-Farms-Dinner-Emergency-Supply/dp/B00GDGGR4S?crid=2TQTS7KR1SSYK&dchild=1&keywords=food+buckets+survival+food&qid=1631738779&sprefix=food+bucket%2Caps%2C392&sr=8-5&linkCode=li3&tag=dreddyclinic-20&linkId=5ac798677c12be7e3edb932fb5c02fba&language=en_US&ref_=as_li_ss_il)

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- Are covid vaccines part of the mark of the beast system? (https://dreddymd.com/2021/09/07/are-covid-vaccines-part-of-the-mark-of-the-beast-system/)
- Scientists warn push for COVID-19 booster shots not based on scientific data; "politics" and profits now driving vaccine policies (https://dreddymd.com/2021/08/24/scientists-warn-covid-booster-shots-not-based-scientific-data/)
- SATAN'S PUPPET: Pope Francis calls getting the abortion-tainted COVID-19 vaccine "an act of love" (https://dreddymd.com/2021/08/24/pope-francis-covid-19-vaccine-act-of-love/)

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– biological, psychological, social and spiritual. Biological Medicine is a big part of my work and so is Dark field Microscopy, what I use in my daily practice and what I teach more then 15 years in Asia and around the world: Live Blood Analysis in dark field based on Haematology. We utilize Live blood analysis since 2004, conventional as well as specialty laboratories for a thorough diagnostic work up of the disease in question. Our integrative medicine treatment regimens are especially unique and are tailored specifically to the individual needs of each patient. Our Mission: don't harm, prevent, use food as medicine We are a reliable partner for integrative medicine in Medical Spa & Clinic Development and integrative medicine Education Training for alternative doctors – we bring different holistic approaches, like Integrative Medicine, Traditional Chinese Medicine and Ayurveda Medicine together. On your request we offer our service in your place as well. Heavy metal poisoning Heavy metal poisoning is much more common than most people realize, and if you're thinking that it doesn't apply to you because you haven't been exposed to any, think again. If you've eaten fish regularly, had amalgam fillings, received vaccinations, drank contaminated water, or done industrial or agricultural work or pharmaceutical manufacturing, there's a good chance that you have a fair amount of toxic metals in your system.. We are here to help and to educate! Wishing your health and happiness Dr Eddy Bettermann MD Multimedia library https://bit.ly/2Wgqsd3 Protect you and your family from harmful radiation https://bit.ly/synergyscience-dreddymd More information about 5G and EMF: https://dreddymd.com/?s=5G+and+EMF Protocol https://amzn.to/2Nxsfql View all posts by dreddymd

One thought on "Idaho doctor reports "20 times increase" in cancer among those "vaccinated" for covid"

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   Thank you for sharing you e set yourself apart from these other incompetent journalists that spread lies!!! Thank you

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37

MATERIAL SAFETY DATA SHEET
GRAPHENE OXIDE

Ceylon Graphene Technologies

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product Details

Name	Graphene Oxide
Product Code	CGT-GO
REACH NO.	A registration number is not available for this substance as the substance or its uses are exempted from registration or the annual tonnage does not require a registration.

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

Identified Uses:
Additive material for energy, coating, electronics, composites, etc. For professional use only. For R&D and industrial use only.

1.3 Supplier Details

Supplied By:	Ceylon Graphene Technologies Pvt Ltd, 100/1, Sri Jayawardenepura Mawatha, Rajagiriya, Sri Lanka
Telephone:	+ 94 0713 666 888 + 94 0770 411 985
Email:	info@ceylongraphene.com

SECTION 2: Hazards Identification

2.1 Classification of the substance or mixture

Not a hazardous substance or mixture according to Regulation (EC) No. 1272/2008. Substance properties have been derived from graphite (bulk substance); the properties of the single/few-layer nanomaterial is under evaluation and to some extent not known.

2.2 Label elements

No label required.

2.3 Other hazards

Exposure may aggravate pre-existing eye, skin, or respiratory conditions.

www.supremecourt.gov/opinions/12pdf/12-398_1b7d.pdf

SUPREME COURT OF THE UNITED STATES

No. 12–398

ASSOCIATION FOR MOLECULAR PATHOLOGY, ET AL., PETITIONERS *v.* MYRIAD GENETICS, INC., ET AL.

ON WRIT OF CERTIORARI TO THE UNITED STATES COURT OF APPEALS FOR THE FEDERAL CIRCUIT

[June 13, 2013]

JUSTICE SCALIA, concurring in part and concurring in the judgment.

I join the judgment of the Court, and all of its opinion except Part I–A and some portions of the rest of the opinion going into fine details of molecular biology. I am unable to affirm those details on my own knowledge or even my own belief. It suffices for me to affirm, having studied the opinions below and the expert briefs presented here, that the portion of DNA isolated from its natural state sought to be patented is identical to that portion of the DNA in its natural state; and that complementary DNA (cDNA) is a synthetic creation not normally present in nature.

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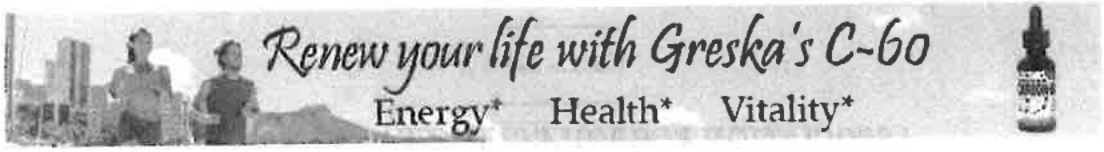

ALT NEWS

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If You Have Been Vaxed You Are Now Owned And Have No More Access To HUMAN RIGHTS

Supreme Court 2013 - Pathology vs Myriad Genetics

The Vaxed Can Be Patented (Owned)

Summary From The Net
7-11-21

In a Supreme Court case decision in 2013 - Pathology vs Myriad Genetics, Inc - the United States Supreme Court ruled that you cannot patent human DNA as it is 'a product of nature'. However, at the end of the ruling, the Supreme Court wrote that if you were to change a human's genome by mRNA vaccines (being used currently) then the (altered) genome CAN be patented.

This means that everyone who has had the 'vaccine' is now technically 'patented'. Anything that is patented is 'owned' and comes under the definition of 'trans human'.

All people who are legally identified as being 'trans human' do not have access to Human Rights or any Rights granted by the State. That is because they are not classified as anything 100% organic or human.

Therefore, technically, anyone having this 'vaccine' can no longer have any access to Human Rights. There have been a few legal papers discussing this recently, so there should be clarification on this soon. As of now, the high court ruling stands.

Full Supreme Court Ruling
www.supremecourt.gov/opinions/12pdf/12-398_1b7d.pdf

THE BLOGS

Christina Lin

Gene-editing, Moderna, and transhumanism

As gene-based mRNA vaccines from Moderna are being designed and tested at warp speeds to fight Covid-19, this is also bringing the debate over transhumanism into the forefront.

Transhumanism is a type of futurist philosophy aimed at transforming the human species by means of biotechnologies. Transhumanists see disease, aging and death as undesirable and unnecessary, and aim to transform human beings into post-human species with greater capacities than those of present human beings.

The philosophy is based on secular humanism and sees human nature as an evolutionary work-in-progress with room for improvement and enhancement. However, it is more radical in that it promotes not only traditional means of improving human nature such as education and cultural refinement, but also direct application of medicine and technology to overcome basic biological limits.

Latest Articles from ToI

Transhumanists give special attention to genetic engineering, robotics, molecular nanotechnology and artificial intelligence, and the Covid-19 pandemic is providing gene-based vaccines a chance to break through into the global health market.

Moderna and gene-editing

Currently there are various companies such as Inovio, Moderna and CanSino Biologics that are testing mRNA and DNA vaccines to counter SARS coronavirus-2 (SARS CoV-2) which causes Covid-19, but Moderna is the front runner that recently nabbed $472 million from U.S. government's Biomedical Advanced Research and Development Authority (BARDA) to develop the vaccine. This is in addition to the $483 million it had already received back in April, bringing its total funding to $955 million.

With U.S. government funding at nearly $1 billion for one company, Moderna may be too big to fail. However, this is perplexing for a company that has never produced a single vaccine. According to a CNN report, Moderna was only established in 2010, has never brought a product to market, nor gotten any of its nine or so vaccine candidates approved for use by the FDA.

However, it has been a long-term Pentagon contractor for biodefense, working closely with Defense Advanced Research Project Agency (DARPA) on gene-editing and mRNA therapeutics. DARPA is focused on developing emerging disruptive technologies to maintain a competitive edge over adversaries, including many 'transhuman' projects such as genetic engineering and soldier enhancement via robotics.

In the case of Moderna and mRNA therapeutics, DNA vaccines is considered a new paradigm that would disrupt the pharmaceutical industry. Its vision is to harness a new technology that synthesizes messenger RNA, or mRNA—which is an instruction manual in every living cell for creating protein—to prompt the human body to make its own medicine.

So instead of injecting a piece of virus into a person to stimulate the immune system, the synthesized genes would be shot into the body whereby the genes are edited, deleted, added, to re-engineer human DNA to resist the disease. If successful, scientists hope DNA vaccines could be a "transformative" treatment for heart disease, metabolic and genetic diseases, kidney failure and even cancer. Moreover, it could be an effective form of biodefense to protect the population against biological warfare, which is also the mandate for DARPA and BARDA.

Transhumanism and hybrids

Indeed, DARPA is also developing other forms of human enhancement in addition to gene editing. Already scientists are merging robotics with the human body in brain-to-computer interface (BCI), wherein individuals with physical injuries can regain their functions, and soldiers become smarter and more powerful through the fusing of their brain with machines.

In a way, the Pentagon is now building real iron man similar to the American superhero based on the Marvel Comics character. Soldiers in exoskeleton suits

are physically more powerful than those without, while other soldiers with bionic limbs perform better than adversaries with human limbs. When one adds artificial intelligence with BCI, the sky is the limit for an army of these genetically modified and robotically enhanced humanoids.

But U.S. is not the only country engaged in human enhancement and transhumanism, as Russia and China are also in hot pursuit with exoskeletons, vaccines and brain implants. As this competition gains traction, one wonders what the future of their militaries may look like as human beings are steadily integrated with machines to become armies of iron man.

Here the Book of Daniel may lend some insights. In interpreting King Nebuchadnezzar's dream of an image with a head of gold, chest and arms of silver, belly and thighs of bronze, legs of iron, and feet of iron and clay, Daniel revealed the parts as the sequence of world empires, with the feet of iron and clay being the last.

King Nebuchadnezzar's dream man
Daniel 2

In Daniel 2:43 it is written, "as you saw iron mixed with ceramic clay, they will mingle with the seed of men; but they will not adhere to one another, just as iron does not mix with clay," that seems to describe a hybrid of man (clay) mixed with machine (iron). And as transhumanism and biotech gain momentum, armies of hybrid humans of iron and clay may be a real possibility in a not too distant future world.

ABOUT THE AUTHOR

Dr. Christina Lin is a US-based foreign policy analyst specializing in China-Mediterranean relations. She has extensive US government experience working on national security issues and was a CBRN (chemical, biological, radiological, nuclear) research consultant for Jane's Information Group.

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