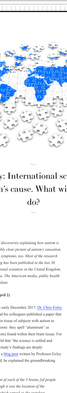

J.B. Handley: International scientists have found autism's cause. What will Americans do?

—

BY J.B. HANDLEY

Five close replicable, and related discoveries explaining how autism is triggered have formed an undeniably clear picture of autism's causation, and possibly ways to alleviate the symptoms, too. Most of the research that has caused this astonishing breakthrough has been published in the last 36 months, and largely from international scientists in the United Kingdom, Canada, France, Israel, and China. The American media, public health authorities, and Autism Speaks? Silent.

Autism Awareness Day 2016 (April 2)

STAFFORDSHIRE, England—In early December 2015, Dr. Chris Exley of Keele University in England and his colleagues published a paper that for the first time linked the brains tissues of subjects with autism to determine the level of aluminum (note: they spell "aluminum" as "aluminium" in the United Kingdom) found within their brain tissue. For anyone trying to convince the world that "the science is settled and vaccines don't cause autism," this study's findings are deeply contradictory to that statement. In a blog post written by Professor Exley on the day his study was published, he explained his groundbreaking research:

> "…*while the aluminum content of each of the 3 brains [of people with autism] was shockingly high it was the location of the aluminium in the brain tissue which served as the standout observation…The new evidence strongly suggests that aluminium is entering the brain in ASD [autism spectrum disorders] via pathways which could have become loaded up with aluminium in the blood earlier in life, much as has been demonstrated for aluminium or injection sites for vaccines including aluminium adjuvants.*"

Dr. Exley's quote includes a reference to "nonvaccine or injection sites" and the fact that the interaction between these nonvaccine and aluminum has been documented in previous published science. I know, that sounds pretty technical. But here with me, A "nonvaccine" is a type of whole blood cell, of which one type is called a "macrophage." A macrophage can be thought of as the garbage man of the immune system, eating up foreign substances, cell debris, etc. As you will see in a moment, macrophages appear to be playing a critical and devastating role in triggering autism, serving to insert aluminum injected from a vaccine directly into the brain, where it can disrupt brain development and trigger autism.

Dr. Exley's study—"Aluminium in brain tissue and autism"—is the final piece of a puzzle that first seemed to come together in 2006, and picked up steam since 2010, that has dramatically furthered the scientific understanding of what causes autism and how it develops. This finding is critical to recognize, because the Vaccine Court in the United States dismissed the vaccine-autism hypothesis in 2009, long before many of what I've about to explain even existed. Science is a continuum, an enterprise of truth through many different studies that often have to be pieced together before the picture becomes clear. And, scientific discoveries are sometimes like a puzzle that is being assembled by a mischievous toddler, pieces of the puzzle may not be in the right place, or even in the wrong place, but eventually, the toddler's parents will notice that the puzzle is missing a piece, and they will be able to find the missing piece and trigger autism.

Dr. Exley's study—"Aluminium in brain tissue and autism"—is the final piece of a puzzle that first seemed to come together in 2006, and picked up steam since 2010, that has dramatically furthered the scientific understanding of what causes autism and how it develops. This finding is critical to recognize, because the Vaccine Court in the United States dismissed the vaccine-autism hypothesis in 2009, long before many of what I'm about to explain even existed. Science is a continuum, an enterprise of truth through many different studies that often have to be pieced together before the picture becomes clear. And, scientific discoveries are sometimes like a puzzle that is being assembled by a mischievous toddler, pieces of the puzzle may not be in the right place, or even in the wrong place, but eventually, the toddler's parents will notice that the puzzle is missing a piece, and they will be able to find the missing piece and trigger autism.

Dr. Exley's study provided the only data missing from an outright explanation of what happened to my son and so many other children.

> For Americans, the race to discover what's causing all this autism will likely be won on foreign shores. As you'll soon see, ALL of the science explaining how autism can be caused has come from other countries, even though a Caltech scientist pushed the first domino back in 2006.

Why is aluminium in vaccines at all?

Aluminum is a critical component of most vaccines given to children. It serves as an "adjuvant" meaning the aluminum serves to "wake up" the immune system, provoking the immune system to recognize the "antigen" within the vaccine (for whatever disease the vaccine serves to protect against. The amount of aluminum in vaccines given to children skyrocketed beginning in the early 1990s for two reasons: 1), more vaccines were added to the vaccine schedule, and 2), the dose of vaccinations rise for all vaccines given to children rose from 50-100% of children vaccinated in the mid-1980s to over 90% today). A child in the mid-1980s would have received 1,250 micrograms of aluminum from their vaccines by their 18-month birthday if they were fully vaccinated. Today, that number is 4,925 micrograms, a near-quadrupling of total aluminum. You can read more about this in an excellent study published by Neil Miller, here's an image from the study.

Figure 3. Cumulative Aluminum Exposure from Recommended Childhood Vaccines

Source: The vaccine manufacturers' product inserts and the CDC's 2014 childhood vaccination schedule

Mystifyingly, aluminum has never experienced biological testing to consider its safety for being injected into babies, having been "grandfathered" into our modern safety standards. Canadian scientists Dr. Chris Shaw and Dr. Lucija Tomljenovic addressed this omission in a critical study they published in 2011 in *Current Medicinal Chemistry* titled, "Aluminum Vaccine Adjuvants: Are Safe Safe?" They wrote:

> "*Aluminum is an experimentally demonstrated neurotoxin and the most commonly used vaccine adjuvant. Despite almost 90 years of widespread use of aluminum adjuvants, medical science's understanding about their mechanisms of action is still immediately poor. There is also a concerning scarcity of data on toxicology and pharmacokinetics of these compounds. In spite of this, the safety of aluminum has been taken for granted and is rarely actually scrutinized. Experimental research, however, clearly shows that aluminum adjuvants have a potential to induce serious immunological disorders in humans. In particular, aluminum in adjuvant form carries a risk for autoimmunity, long-term brain inflammation and associated neurological complications and may thus have profound and widespread adverse health consequences.*"

I wrote an extensive article in January about the way aluminum's safety has been mismanaged, you can read that article right here:

> A lone FDA scientist could end the autism epidemic

Ground zero at Caltech

When Caltech scientist Dr. Paul Patterson passed away in 2014, I had little appreciation that he had suggested a chain of events over the course of his career that may now provide a clear and unambiguous explanation of how and why my son developed autism back in 2004. Knowing exactly how my son's autism was caused is incredibly important to my wife and I, because that stores information we have about causation, the more chance we have to do something about it, and perhaps recover my son from an affliction now impacting 1 in 36 American kids.

What you're about to read is the product of more than two dozen very recent peer-reviewed published scientific studies, with really an original thought by me. I'm a businessman and a father, but what follows is a "grand theory of autism" so complex and well-supported that I think it deserves the attention of every member of the autism community. When the reality of this explanation became clear to me, not only did my jaw hit the floor, but I was immediately consumed with thoughts about how this clear explanation might improve the way we treat our son's autism, and I hope it does the same for you and perhaps your doctor as well. What I'm certain of is that this "grand theory" needs to be heavily debated, and I hope by posting it in the public realm I help move it along that path.

If its indefinite to an anonymous scientist who runs a website called Vaccine Papers, where many of these insights came from. I will quote NP throughout this piece, referring to NP as "NP." I highly recommend you read the totality of his website, where the explanations are far more scientific than what you will read here.)

It shouldn't be a surprise that all of this science has been published outside the United States. I've learned slowly to the storm of American scientists wanting to study autism and complaining that any studies that are even remotely controversial are nearly impossible to fund or get approved.

Discovery #1: "Maternal Immune Activation" can cause autism

While Dr. Patterson's passing wasn't something I was aware of at the time, it was very unsuspected by the scientific community, of which Dr. Patterson, from Caltech explains to great detail:

> Dr. Patterson's "*research focused on interaction between the nervous and immune systems — a connection that was not universally acknowledged in the early days of neuroscience*."
>
> Dr. Patterson "*became intrigued by epidemiological studies that had linked a severe viral or bacterial infection during pregnancy with the increased risk of developing schizophrenia in the child. Patterson and his colleagues showed that maternal immune activation triggered neurochemical changes in the fetal brain, a sign that the mother's immune response to the infection may play a crucial role in the development of schizophrenia or autism in the offspring.*"

Are you with me so far? Basically, what Dr. Patterson is saying is that if a pregnant mother gets sick (virus, bacterial, whole pregnant—not even sick, just a little immune response), that immune response can cause a neurodevelopmental flaw, exactly the brain is constructed of her fetus, potentially leading to neurological problems after birth. Dr. Patterson took this explanation a step further, explaining that the brains of people with autism reflect the immune system activation that took place, even decades later, as his cites valuably work being done at Johns Hopkins:

> "*There is also very striking evidence of immune dysregulation in the brains itself. And just last year, a group led by Carlos Pardo at Johns Hopkins found what they've calling a "neural inflammation" in postmortem examination of brains of patients with autism who died between the ages of eight and 44 years. But these people weren't infected — they died of such things as drowning or heart attacks. The study found that the microglial cells, which act as the brain's own immune system, were activated. The study also found amazing increases of certain cytokines in the brain, and of others in the cerebro-spinal fluid. This is a very interesting finding, because it's the cerebro-spinal fluid that bathes the brain. And it's an ongoing, permanent, chronic activation in the brains of autistic people. It's a substantial issue, because there's no overt infection. But it's there.*

While Dr. Pardo and colleagues were the first to find this "microglial activation" in the brains of children with autism, this finding has now been replicated many times, here's a study from Japan in 2015 finding the same thing:

> "*In conclusion, the present PET measurements revealed marked activation of microglia in multiple brain regions of young adults with ASD. The results strongly support the contention that immune abnormalities contribute to the etiology of ASD.*"

If you're going to take one thing away from this section, I'd recommend an excerpt from Dr. Patterson's quote worth memorizing.

> "there's an ongoing, permanent immune-system activation in the brains of autistic people."

Is that what happened (and still is happening) to my son?

Further Refinement of Discovery #1: Immune Activation from the Cytokine Interleukin-6

If you're an autism parent, you've probably heard the expression "cytokine storm" and half-understood what that might mean (anything with "storm" at the end of it can't be good—what this really means is a chronic, slow burn inflammation in the brain). In 2006, Dr. Patterson and his colleagues were speculating that the immune system's cytokines might be responsible for altering the brain development of the fetus during gestation.

> "*Cytokines are produced by the white blood cells, and their levels in the blood increase when we get an infection. We think that maternal immune activation alters brain circuits…there's that permanent, subclinical, altered immune state in the autistic brain—these increased cytokine levels…one they [cytokines] actually interacting with the brain in an ongoing fashion, with consequences visible in the patients' behavior*"[1] (Zoom Zoom pathways)

Fast forward to 2015 and we are at:

Discovery #1 Revisited: IL-6 = Autism

Maternal Immune Activation Alters Fetal Brain Development through Interleukin-6

Stephen G. Smith[1], Jennifer J. Kneeland[1], Gerald Barrett[2], and Paul H. Patterson[1]
[1]Caltech, Pasadena, California Institute of Technology, Pasadena, California 91125
[2]Department of Biology and Biomedical Research Centre for Neuro-Endocrinology, Royal Holloway University, Egham, Surrey, TW20 0EX, UK

Abstract — Maternal immune activation (MIA) is a risk factor for neurodevelopmental disorders including schizophrenia and autism spectrum disorders (ASD). Cytokines have been implicated in fetal brain development and in the etiology of MIA-induced behavioral abnormalities in adult offspring. Here we show that MIA induced by polyinosinic:polycytidylic acid (poly I:C) alters the expression of many cytokines and chemokines in the placenta and fetal brain. Among the cytokines affected by MIA, we find that interleukin-6 (IL-6) is elevated in the placenta and fetal brain, and that IL-6 is sufficient to alter fetal brain development and to cause ASD-relevant behavioral abnormalities in adult offspring. We also find that the IL-6 receptor, but not IL-6 trans-signaling, is required in pregnant females for the effects of MIA on fetal brain development and on behavioral abnormalities in adult offspring. These results indicate that MIA yields multi-offspring ASD-relevant behavioral abnormalities in part through the action of maternal IL-6 and that IL-6 signaling in pregnant females is a key mediator of the effects of MIA on fetal brain development. These results suggest that maternal immune activation may increase risk for ASD and related neurodevelopmental disorders in offspring by causing a fetal brain cytokine profile sufficient to alter fetal brain development.

Keywords — Maternal immune activation, interleukin-6, cytokine, chemokine, placenta, fetal brain development, autism spectrum disorders, schizophrenia, poly I:C, mouse model

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Warning: Cytokines are cell signaling molecules, and disruption of cytokine signaling of the immune system can have many and varied developmental consequences. Injection of cytokines into pregnant mice is a common method for inducing maternal immune activation (MIA) in order to study the effects of MIA on offspring. Cytokines are also used therapeutically in humans, and their use is associated with many well-known side effects. Pregnant women should not be injected with cytokines outside of a controlled medical setting.

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Just a year after Dr. Patterson's excellent article about Maternal Immune Activation ("MIA"), he and his colleagues produced this first study that took understanding of cytokines to a more detailed level by discovering that MIA was producing offspring with neurological disorders (in their mouse model), they wanted to find out what—exactly WHAT—was causing the altered brain development. They figured it was a cytokine (of which there are many), but which one? So the Patterson and his colleagues tested, "however, the mechanism by which MIA causes long-term behavioral deficits in the offspring is unknown." That is until they discovered it:

> "*Here we show that the cytokine interleukin-6 (IL-6) is critical for mediating the behavioral and transcriptional changes in the offspring. A single maternal injection of IL-6 on day 12.5 of mouse pregnancy causes prepulse inhibition (PPI) and latent inhibition (LI) deficits in the adult offspring.*"

In the case of the 2007 experiment, Patterson and his colleagues injected pregnant mice with a specific cytokine—interleukin-6 ("IL-6")—and saw changes in the neurology of their offspring.

Replication Of Dr. Patterson's discovery about MIA and IL-6

Dr. Patterson's work was groundbreaking. He tied the immune system and brain together in ways previously not recognized. Like all great new discoveries in science, Dr. Patterson's breakthrough work has been replicated many times. In 2012, Dr. Patterson and his colleagues produced this study which was more specific and similarly conclusive:

> "*These results indicate that MIA yields multi-offspring ASD-relevant social and communication behaviors as well as high levels of repetitive behaviors, all of which are hallmarks of autism.*"

Across, Never

Activation of the Maternal Immune System During Pregnancy Alters Behavioral Development of Mouse Offspring

Elaine Hsiao and Paul Patterson Caltech, Pasadena, California, United States of America

Abstract — Maternal immune activation (MIA) is a risk factor for neurodevelopmental disorders including schizophrenia and autism spectrum disorders (ASD). Cytokines have been implicated in fetal brain development and in the etiology of MIA-induced behavioral abnormalities in adult offspring. Here we show that MIA induced by polyinosinic:polycytidylic acid (poly I:C) alters the expression of many cytokines and chemokines in the placenta and fetal brain. Among the cytokines affected by MIA, we find that interleukin-6 (IL-6) is elevated in the placenta and fetal brain, and that IL-6 is sufficient to alter fetal brain development and to cause ASD-relevant behavioral abnormalities in adult offspring. We also find that the IL-6 receptor, but not IL-6 trans-signaling, is required in pregnant females for the effects of MIA on fetal brain development and on behavioral abnormalities in adult offspring. These results indicate that MIA yields multi-offspring ASD-relevant behavioral abnormalities in part through the action of maternal IL-6 and that IL-6 signaling in pregnant females is a key mediator of the effects of MIA on fetal brain development. These results suggest that maternal immune activation may increase risk for ASD and related neurodevelopmental disorders in offspring by causing a fetal brain cytokine profile sufficient to alter fetal brain development.

Keywords — Maternal immune activation, interleukin-6, cytokine, chemokine, placenta, fetal brain development, autism spectrum disorders, schizophrenia, poly I:C, mouse model

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Warning: Cytokines are cell signaling molecules, and disruption of cytokine signaling of the immune system can have many and varied developmental consequences. Injection of cytokines into pregnant mice is a common method for inducing maternal immune activation (MIA) in order to study the effects of MIA on offspring. Cytokines are also used therapeutically in humans, and their use is associated with many well-known side effects. Pregnant women should not be injected with cytokines outside of a controlled medical setting.

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In 2014, the M.I.N.D. Institute at UC Davis published an important study that took Dr. Patterson's work to mice and replicated it in humans. Why do researchers love mice? The study authors explained:

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"Maternal infection during pregnancy is associated with an increased risk of schizophrenia and autism in offspring. Supporting this correlation, experimentally activating the maternal immune system during pregnancy in mouse produces offspring with abnormal brain and behavioral development. We have developed a nonhuman primate model to bridge the gap between clinical populations and rodent models of maternal immune activation (MIA)."

And the M.I.N.D. Institute scientists now similar results to what had been found in mice:

"In this rhesus monkey model, MIA yields offspring with abnormal repetitive behaviors, communication, and social interactions. These results extended the findings in rodent MIA models to non-human primate behaviors resembling those in both autism and schizophrenia.

There are many additional studies that support Dr. Patterson's findings, here's one more to make the point from Neuroscience—Brain IL-6 elevation causes neonatal circuitry imbalances and mediates autism-like behaviors—published in 2012:

"In summary, our study supports a critical role of IL-6 elevation in mediating autism-like behaviors through impairment on synapse formation, dendritic spine development, as well as on neuronal circuit balance. These findings suggest the manipulation of IL-6 may be a promising avenue for therapeutic intervention."

Dr. Patterson: what can cause immune activation?

Dr. Patterson helped establish as scientific fact that an MIA during pregnancy can cause autism. As a parent, I'm haunted by Dr. Patterson's words that "there's an ongoing, permanent immune system activation in the brains of autistic people." If that's really what's happening to my son, it raises an obvious question: What can cause this? It's only by understanding exactly what happened to my son is so important.

And why there's something else Dr. Patterson mentioned in his 2006 magazine article, something that today might get him run out of town, but was still allowed in the scientific discourse back then, he said this:

*Finally, I want to ask a question that's come up in the literature in the last few years — **should we really be promoting universal maternal vaccination?** The flu vaccine has been recommended routinely in pregnant women in the United States since 1957. The official policy of the Centers for Disease Control states that "administration of vaccines to women wishing pregnant carry no an opportunity for preventative intervention that should not be taken." Do you suppose that "no" is based on a lot of research or just a gut feeling? Maternal flu vaccination does double immunization of IL6 in pregnancy — we activated the immune system, and it conveyed all those downstream effects on the fetus. I think we need a vaccination the 3 trimesters in the immune system. That's the point of vaccination. In pregnancy, not of pregnant women vaccinated, I think, and I **think that universal vaccination of pregnant women could put us into a whole new ear of problems.**

Dr. Patterson said it, so I claim it to be the first to bring it up. He said vaccination "activates the immune system" and he also told us that "immune activation" can cause autism. How exactly does a vaccine activate the immune system?

Answer: Aluminum hydroxide, aka "aluminum adjuvant".

Discovery #2: Aluminum Adjuvant causes immune-activation and is far more neurotoxic than previously thought.

Aluminum compounds (Al hydroxide and Al phosphate) are the most commonly used adjuvants in human vaccines. Adjuvants are: Alum, Saponin, A. Saponin, B. phthiriusvomus-peptides(GPMP, Tdm), Haemophilus influenzae type b (Hib), human papillomavirus (HPV) and pneumococcus (PCV) vaccines. Aluminum adjuvant "activates" the immune system, which induces long term immunity to antigens in the vaccine.

The scientific understanding of aluminum adjuvant toxicity has changed and deepened dramatically in recent years (since 2006).

In fact, the published research on aluminum adjuvant is so new it has not even been considered by our FDA or CDC, who are still basing their recommendations about aluminum use in vaccines on a study published in 2002 that erroneously concluded that aluminum from a vaccine likely ends up in the body's skeletal system.

"While the contribution of vaccines to an infant's aluminum body burden can be slightly higher than that of the dietary contribution in our model, the fact that the primary pool where the aluminum is residing, as a long term storage depot, is likely to be skeletal and not a more sensitive soft organ system is encouraging."

Most of the genes work about aluminum is based on dissolved aluminum, not aluminum hydroxide, which is the type of aluminum used in vaccines. We're now learning that aluminum hydroxide is a nanoparticle, absorbed by our body's macrophages into the immune system's pathage many where the macrophage can then easily transport the aluminum hydroxide to the brain (the macrophage passes easily through the blood-brain barrier). If you'd like to see a complete takedown of the "safe level" of aluminum exposure still made by the FDA and CDC, see Mike Lyon's excellent work, here's a short example:

"It is not reasonable or sensibly to use studies of injected, water-soluble aluminum salts (like AlCl3) or Al-lactate to establish a safe dose of aluminum phosphate adjuvant vaccines. The physical forms and routes of administration are different. It is well-established today that nanoparticles can have higher toxicity than bulk/ionic forms of the same material. It's the reactive promoters that are responsible. Aluminum-induced apoptosis is aluminum adjuvant safety. Vaccine critics including me argue that the safety of injected aluminum adjuvant can only be tested using injected aluminum adjuvant; not ingested aluminum salts like AlCl3 or Lactate. This should be common sense, but, learning under the important issues of nanoparticle toxicity and administration route, I want to address the question: is it really true that animals (mice or rats) are not harmed by ingesting 62mg/kg/day or 29 mg/kg/day aluminum? After all, this is the fundamental basis for aluminum adjuvant safety. Vaccine promoters rely on Karish and Mikkus to make the case that aluminum adjuvant is safe, and Karish and Mikkus depend on the claim that these dosages are safe for animals to ingest. If the 29 mg/kg/day dosage is in fact harmful to animals, then the analysis by Karish and Mikkus are wrong and nonsyllogistic. Several studies clearly demonstrate that dosages much lower than 29 mg/kg/day are harmful, and they are presented below."

The first time I personally woke up to the idea that the aluminum adjuvant used in vaccines might be far more toxic and dangerous than I knew was when I started reading about the incredible work of Dr. Chris Shaw at the University of British Columbia in Canada. (Check out this video of Dr. Shaw discussing aluminum adjuvant, and some of the experiments he and his colleagues did on mice.)

In 2007, Dr. Shaw published the first study looking at injected aluminum adjuvant in this paper, Aluminum Adjuvant Linked to Gulf War Illness Induces Motor Neuron Death in Mice and amended a worldwide alarm about the dangers of aluminum adjuvant:

"In addition, the continued use of aluminum adjuvants in various vaccines (i.e., Hepatitis A and B, DPT) and in vaccine the general public may have even more widespread health implications. Until vaccine safety can be comprehensively demonstrated by controlled long-term studies that examine the impact on the nervous system in detail, many of those already vaccinated as well as those currently receiving injections may be at risk in the future. Whether the risk of penetration from a denuded dermis outweighs the risk of toxicity is a question that demands urgent attention."

In 2009, Dr. Shaw's and his colleagues in British Columbia published another study looking at injected aluminum hydroxide, and the results were deeply disturbing:

"Overall, the results reported here mirror previous work that has shown that injected aluminum, in both oral and injected forms, can be neurotoxic. Potential toxic administrations of aluminum may include enhancement of inflammation (i.e., macrophagic).

"... it is somewhat surprising to find that in spite of over 60 years of use, the safety of Al adjuvants continues to rest on assumptions rather than scientific evidence For example, nothing is known about the toxicology and pharmacokinetics of Al adjuvants in infants and children... Yet, in spite of these observations children continue regularly to be exposed to much higher levels of Al adjuvants than adults, via routine childhood vaccination programmes."

The two scientists called for an urgent reevaluation of the safety profile of aluminum adjuvant containing vaccines:

"Moreover, the existing data set lack thoroughly raise questions on whether the current vaccines aimed at pediatric populations can be accepted as having adequate safety profiles. Because injuries from immunization are rare, the occurrence of adverse complications following vaccination, a more rigorous evaluation of potential vaccine-related adverse health impacts in pediatric populations than what has been provided to date is urgently needed."

2013: Mice CCL5-dependent translocation of Nanoparticle particles from muscle to brain

In 2013, French scientists demonstrated that aluminum adjuvant, when injected into the body of a mouse, ended up in the brain 1 year later. The study authors expressed serious concerns about this very new discovery:

"However, continuously escaping doses of this poorly biodegradable adjuvant in the population may become moderately toxic, especially in the case of neuroinflammation or immunocompromised blood-brain barrier."

The authors chose their words carefully, recognizing the ubiquity of aluminum adjuvant's use in pediatric vaccines all over the world, which is why their choice to call aluminum adjuvant "moderately toxic" should cause any parent worry. Unfortunately, the very thing they express real concern about—escaping doses—is exactly what has been happening to children since the early 1990s, when the immunization schedule in the U.S. and all over the world were much higher, largely due to new vaccines being introduced that contain aluminum adjuvant.

2015: Nanoparticles and brain translocation of aluminum adjuvants of vaccines

In 2015, another study from Universitè Paris Est Créteil (UPEC) in France further supported this new view of aluminum adjuvant as a dangerous, biopersistent, and ultimately brain-injuring toxin. (The study confirmed that aluminum adjuvant slowly makes its way to the brain, where it then stays, possibly forever.)

The study explained that aluminum adjuvant can generate a long-term immune response because of its "biopersistence", which basically means our body has no ability to rid itself of aluminum adjuvant, because it is man-made substance we have no natural designs to eliminate:

"Thus alum and other poorly biodegradable materials taken up at the periphery by phagocytic cerulean in the lymphatic and blood circulation and can enter the brain using a Trojan horse mechanism similar to that used by infectious particles. Previous experiments have shown that after administration cum cause CNS dysfunction and damage, causing doubts on the exact level of alum safety."

November 2016: Non-linear dose response of aluminum hydroxide adjuvant particles: Selective low dose neurotoxicity

And, just last Fall in 2016, the most important and revealing study yet done on aluminum adjuvant provided more bad news, and more insight.

It's safe to say that this study's conclusions have revolutionized our understanding of aluminum adjuvant. From the journal Neurology, the French study authors were very concerned about the widespread use of aluminum adjuvant:

"Concerns about its [aluminum adjuvant's] safety emerged following recognition of its neuropathogenic long-lasting biopersistence within immune cells in some individuals, and reports of chronic fatigue syndrome, cognitive dysfunction, myalgia, dysautonomia and autoimmune/inflammatory features temporally linked to multiple Al-containing vaccine administrations."

They also discovered, through mouse models, a deeply alarming unique characteristic of aluminum adjuvant: low, consistent doses were MORE neurotoxic than a single bolus dose:

"We conclude that Al(oxyhydr)[aluminum adjuvant] injected at low dose in mouse muscle may selectively induce long-term, if confirmed accumulation and neurotoxic effects. To explain this unexpected results, an avenue that could be explored in the future relates to the adjuvant size: mice the injected suspensions corresponding to the lowest dose, but not to the highest doses, exclusively contained small agglomerates in the bacterio-size range known to favour capture and, presumably, transportation by monocyte/macrophage cells. In any events, the view that Al(oxyhydr) neurotoxicity obeys the dose makes the present 'rule of classical chemical toxicity appears overly simplistic."

This a counter-intuitive conclusion, but profoundly important, so I'm bringing in VP to further explain:

A new paper (Crépeux et al.) by the Université research group in France reports important results on the toxicity and transport of aluminum (Al) adjuvant in mice. This single study is especially valuable because it looked at many outcomes: behavioral effects, immune (microglia) activation in the brain, and Al transport into the brain. The study tested dosages of 200, 400 and 800 mg/kg injected intramuscularly (IM). The Al adjuvant used was ADJU (brand name Alhydrogel), the most common vaccine adjuvant in use today. It is used in the tetanus, Hep A, Hep B, HIB pneumococcal, meningococcal and anthrax vaccines.

Remarkably, the study found that the lower dosages (200 mg/kg) were more toxic than the higher dosages (400 mg/kg). The study also found no clear dose-response effects, but the 200 mg/kg dosage did. The low toxicity of the higher dosages appears to be a consequence of dosage-dependent inflammation at the injection site. The high dosages caused intense inflammation at the injection site, forming "granulomas". The 200 mg/kg dosage did not produce granulomas. Granulomas are hard nodules in tissue produced in response to injury, infection or foreign substances. In a way the body "walls off" injured tissue and prevents the spread of infection or toxins. The granulomas appears to provide protection from Al adjuvant toxicity: apparently the granulomas prevented Al adjuvant particles from leaving the injection site. This explains why the 200 mg/kg dosage affected the brain and behavior, while the higher dosages did not. This suggests that it is more dangerous and harmful to administer numerous small injections of Al adjuvant compared to a large single injection capable of inducing a granuloma.

The study authors also disputed the way the FDA and CDC currently think about aluminum adjuvant toxicity, basically saying that the current approach is wrong:

"As a possible consequence, comparing vaccine adjuvant exposure to other non- relevant aluminum exposures, e.g. soluble aluminum and other sources of exposure, may not represent valid comparisons."

And the French scientists finish with a conclusion that all parents should find very troubling:

"In the context of massive development of vaccine-based strategies worldwide, the present study may suggest that aluminum adjuvant toxicokinetics and safety require revaluation."

Reminder: this study has only been public for just over a year. Please watch this incredibly thoughtful and detailed interview Dr. Romain Gherardi, the study's lead author. It's in French with English subtitles:

Discovery #3: Aluminum can increase IL-6 in the brain

One of the only frustrations of the remarkable toxicity studies on aluminum adjuvant coming out of France is that many scientists did not explicitly measure the mice brains for the cytokine IL-6 which we know was released during an immune activation event and also known to strongly associated with causing autism. But, a study from the Mobile Fast published roughly one year ago now provides a strong foundation for the IL-6 aluminum adjuvant connection.

In this study, scientists were using aluminum to induce Alzheimer's in mice, which they opinot to have done successfully, showing that aluminum caused 4-8-fold increase in IL-6:

*"The results also showed that aluminum administration increased the hippocampus proinflammatory cytokines TNF-α by 5.8-fold, **IL-6 by 4.8fold**, and IAB by 5.4-fold compared to the normal control group."*

If any of this remains confusing, I think VP's description of aluminum adjuvant in the body will fill in any holes:

> *Most vaccines contain aluminum, and aluminum is a proven neurotoxin, in amounts received from vaccines. Vaccines in combination can result in toxic aluminum overload. Even the aluminum in a single vaccine can be harmful because the aluminum is in a form that is more dangerous than ingested aluminum. Specifically, vaccine aluminum is in nanoparticulate form, which is harder for the body to eliminate, and because it is transported around the body differently than ingested aluminum.*

> *It is natural and normal to ingest small doses of aluminum from food and water. Its not good for you, but the body has adequate defenses. Absorption of ingested Al is low, about 0.3%, so about 99.7% is eliminated in feces. Ingested aluminum is in ionic form (individual charged atoms), which is readily removed by the kidneys. Also, ionic aluminum is blocked from entering the brain by the blood brain barrier. The low absorption, rapid elimination by the kidneys and barrier to brain entry adequately protects the brain from aluminum.*

> *However, nanoparticulate aluminum from vaccines cannot be removed by the kidneys. The particles are far too large to be filtered out by the kidneys. The Al nanoparticles do dissolve slowly (converting to ionic aluminum). But long before they can dissolve completely, the Al nanoparticles are "eaten" by immune system cells called macrophages. In other words, the particles wind up inside the macrophages. Once loaded with the Al nanoparticles, the macrophages spread aluminum as they travel through the body. This is dangerous, because the Al-loaded macrophages carry Al nanoparticles to tissues (e.g. the brain) that are damaged by very small amounts of aluminum.*

Quick Pause: The chicken-egg of immune activation

I want to address a topic that triggered much of the exploration that drove me to write this article in the first place. Earlier this year, I got into a bit of a public squabble with Dr. Peter Hotez, a vaccine patent holder who also serves as a spokesperson for the vaccine industry. Dr. Hotez also has a daughter with autism, so this debate is very personal for him, as it is for me. Dr. Hotez is convinced that autism is "created" in utero as he explained to me, "my read of the scientific literature is that brains of children with autism, like ours, were that way by the first or second trimester of pregnancy." Dr. Hotez bases his conclusion about autism's timing on the work of a single study by Dr. Eric Courchesne and colleagues titled, "Patches of disorganization in the neocortex of children with autism."which was published in 2014 in the *New England Journal of Medicine*. Dr. Hotez even took his refutation of some of the things I have publicly written about autism and vaccines a step further, and I think this is really the dividing line for many scientists, he wrote to me:

> *"A vaccine given in the first year of life could not possibly cause a total reorganization of the brain architecture, it just defies reason."*

Does it? Does it defy reason that the re-wiring of the brain—that we now believe is caused by an immune activation event—could never happen after a child is born?

This is the single most important question that needs to be answered to determine autism's cause, and I think the answer will govern the autism causation debate from here on out:

- If vaccines cannot cause a "reorganization of brain architecture" after a child is born, then vaccines are unlikely to be the cause of autism (however, vaccines given to a pregnant women may still pose a risk to triggering a Maternal Immune Activation).
- If vaccines given after birth can cause the brain to "reorganize", then we have a serious, serious problem with vaccines.

I believe the science is very clear on this point. Read on.

The evidence for post-natal autism triggers is strong

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Patches of Disorganization in the Neocortex of Children with Autism

Rich Stoner, Ph.D., Maggie L. Chow, Ph.D., Maureen P. Boyle, Ph.D., Susan M. Sunkin, Ph.D., Peter R. Mouton, Ph.D., Subhojit Roy, M.D., Ph.D., Anthony Wynshaw-Boris, M.D., Ph.D., Sophia A. Colamarino, Ph.D., Ed S. Lein, Ph.D., and Eric Courchesne, Ph.D.

ABSTRACT

Read study HERE

The study that Dr. Hotez mentioned to me, the study that proved to him that autism was determined in utero, I have now read probably a dozen times. You can read it for yourself, it's a study where scientists looked at the actual post-mortem brains of children with autism, and found striking differences in brain architecture. What the study didn't do, because it would be impossible to do with post-mortem brains, some as old as 15 years, was speculate exactly WHEN the brain disorganization took place. And, really, how could they? I'm guessing Dr. Hotez was thrown off by the conclusion of this study, where the authors offered up a guess:

> *"In conclusion, we identified discrete patches of disorganized cortex in the majority of postmortem samples obtained from young autistic children that we examined. These patches occurred in regions mediating the functions that are disturbed in autism: social, emotional, communication, and language functions. Such abnormalities may represent a common set of developmental neuropathological features that underlie autism and* ***probably result from dysregulation of layer formation and layer-specific neuronal differentiation at prenatal developmental stages."***

Did you catch what the study said, the part that Dr. Hotez turned into fact to support his claim (and by the way he has cited this study repeatedly in public writings about autism's cause)? The authors said the disregulation they saw in the brains of children "probably" happened during "prenatal development stages." I think the evidence you will see actually points to the opposite. VP explained it well:

> *The "patches of disorganization" paper is actually further evidence implicating immune activation and therefore vaccines. Immune activation experiments have shown that immune activation/cytokines causes disruption of neuron layers. So a vaccine could definitely do this. I believe that autism-associated differences in the prenatal period are simply indicators that the baby is particularly susceptible to immune activation injury. Immune activation works like this: each time there is an activation event, the immune system becomes more sensitive and reactive to immune stimulus. So, an activation "hit" during gestation can render the baby more susceptible to immune activation injury postnatally. This increased reactivity is known to occur with microglia in the brain (microglia are immune cells in the brain). its called "microglial priming". Once microglia are primed by immune activation, they become hyperreactive for a long time, perhaps a lifetime.*

VP went a little farther than Dr. Hotez did, providing this image which is hard to shake once you've seen it:

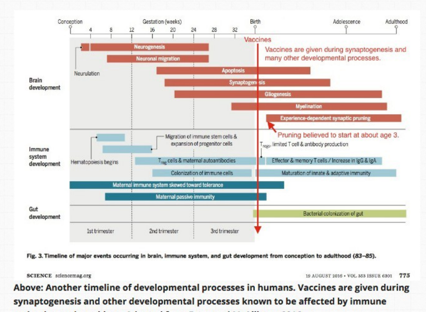

Fig. 3. Timeline of major events occurring in brain, immune system, and gut development from conception to adulthood (83–85).

Above: Another timeline of developmental processes in humans. Vaccines are given during synaptogenesis and other developmental processes known to be affected by immune activation and cytokines. Adapted from Estes and McAllister, 2016.

Click to enlarge

What you can see fairly clearly is that the brain is far from done developing once a child is born. In fact, 5 separate phases of brain development are either in process or yet to start. Could an immune activation event after the child has been born impact brain development? Yes, it could.

And, the published science also supports this view. In a study done in 2012, Wei and colleagues induced autism-like symptoms in mice by injecting them with IL-6 AFTER they were born. This is NOT a maternal immune activation event, this is an immune activation event of a newborn that leads to the development of symptoms of autism.

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Brain IL-6 elevation causes neuronal circuitry imbalances and mediates autism-like behaviors

Hongen Wei [a,e], Kathryn K. Chadman [c], Daniel P. McCloskey [d], Ashfaq M. Sheikh [a], Mazhar Malik [a], W. Ted Brown [b], Xiaohong Li [a,*]

[a] Department of Neurochemistry, NY State Institute for Basic Research in Developmental Disabilities, New York, NY 10314, USA
[b] Department of Human Genetics, NY State Institute for Basic Research in Developmental Disabilities, New York, NY 10314, USA
[c] Department of Developmental Neurobiology, NY State Institute for Basic Research in Developmental Disabilities, New York, NY 10314, USA
[d] Department of Psychology and Center for Developmental Neuroscience, College of Staten Island, New York, NY 10314, USA
[e] Shanghai Mental Health Center, Shanghai Jiao Tong University School of Medicine, Shanghai 200030, China

Read study HERE

The authors noted:

> *"Here we show that mice with elevated IL-6 in the brain display many autistic features, including impaired cognitive abilities, deficits in learning, abnormal anxiety traits and habituations, as well as decreased social interactions. IL-6 elevation caused alterations in excitatory and inhibitory synaptic formations and disrupted the balance of excitatory/inhibitory synaptic transmissions. IL-6 elevation also resulted in an abnormal change in the shape, length and distributing pattern of dendritic spines. These findings suggest that IL-6 elevation in the brain could mediate autistic-like behaviors, possibly through the imbalances of neural circuitry and impairments of synaptic plasticity."*

Still think Dr. Hotez has a point, that autism happens during gestation or never? Then this study will really blow your mind, from all the way back in 1981.

Child Neurology

Acquired Reversible Autistic Syndrome in Acute Encephalopathic Illness in Children

G. Robert DeLong, MD; S. Charles Bean, MD; Frank R. Brown III, MD, PhD

• In seeking the neurologic substrate of the autistic syndrome of childhood, previous studies have implicated the medial temporal lobe or the ring of mesolimbic cortex located in the mesial frontal and temporal lobes. During an acute encephalopathic illness, a clinical picture developed in three children that was consistent with infantile autism. This development was reversible. It was differentiated from acquired epileptic aphasia, and the language disorder was differentiated from aphasia. One child had rises in serum herpes simplex titers, and a computerized tomographic (CT) scan revealed an extensive lesion of the temporal lobes, predom-

strate of this symptom complex is unknown. We have previously reported that pneumoencephalograms in a subset of children with the autistic syndrome showed medial temporal lobe damage, especially evident on the left side.[3] We were led by this finding to explore the analogy between autistic symptomatology and that seen with medial temporal lobe disease in adult man and in experimental studies in animals (the Klüver-Bucy syndrome and the amnestic syndrome).[4] Boucher and Warrington noted the similarities between autistic behavior and the behavioral deficits reported in

in the left third.

Read study HERE

In this case study of three children, published in *Child Neurology*, the authors describe three cases of sudden onset autism, all caused by infection and inflammation of the brain. It appears that not only can an infection trigger an immune activation event that leads to autism after a child is born, it can even happen to a child who is 5, 7, or 11 years old (the ages of the three children in this study). Are you reading this, Dr. Hotez?

> *"During an acute encephalopathic illness, a clinical picture developed in three children that was consistent with infantile autism…In our cases, the abnormalities are acquired and not developmental, but they clearly fit the critical clinical features of the childhood autistic syndrome."*

Discovery #4: Hepatitis B vaccine induces IL-6 in postnatal rats

When this paper was published in China, no one I knew in the autism community mentioned it, I'm guessing because it was hard to patch together its significance. You had to appreciate all of Patterson's work. You had to understand the IL-6 connection to autism. You had to appreciate the brand new insights about aluminum adjuvant toxicity, the low dose implications, and that aluminum adjuvant was ending up in the brain. And, you had to read a paper from China that covered a lot of other ground, as well as providing a missing link in the aluminum adjuvant-cytokine (IL-6)-autism hypothesis that it helped fortify.

Contents lists available at ScienceDirect

Journal of Neuroimmunology

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Neonatal vaccination with bacillus Calmette–Guérin and hepatitis B vaccines modulates hippocampal synaptic plasticity in rats

Qingqing Li, Fangfang Qi, Junhua Yang, Luwen Zhang, Huaiyu Gu, Juntao Zou, Qunfang Yuan, Zhibin Yao *

Department of Anatomy and Neurobiology, Zhongshan School of Medicine, Sun Yat-Sen University, Guangzhou 510080, China

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Immune activation can exert multiple effects on synaptic transmission. Our study demonstrates the influence of neonatal vaccination on hippocampal synaptic plasticity in rats under normal physiological conditions. The results revealed that neonatal BCG vaccination enhanced synaptic plasticity. In contrast, HBV hampered it. Furthermore, we found that the cytokine balance shifted in favour of the T helper type 1/T helper type 2 immune response in BCG/HBV-vaccinated rats in the periphery. The peripheral IFN-γ:IL-4 ratio was positively correlated with BDNF and IGF-1 in the hippocampus. BCG raised IFN-γ, IL-4, BDNF and IGF-1 and reduced IL-1β, IL-6, and TNF-α in the hippocampus, whereas, HBV triggered the opposite effects.

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Read study HERE

VP has written extensively about this study, I will start by quoting VP, but if you want a highly detailed scientific analysis of this study, check this out.

> *"An important new study by Li et al. reports the effects of bacillus calmette-guerin (BCG) vaccine (for tuberculosis) and hepatitis B vaccine on brain development in infant rats. The study relates the observed brain changes to the type of immune activation (Th1 or Th2, explained below) stimulated by the vaccines. The BCG and hep B vaccines had opposite effects on the brain (BCG being beneficial, and hep B being detrimental), and a combination of both vaccines resulted in cancellation of the effects.*

> *This is the first study to test the effects of immune activation by vaccination on brain development. All other studies of immune activation have used essentially pathological conditions that mimic infection and induce a strong fever. A criticism I have heard often from vaccine advocates is that the immune activation experiments are not relevant to vaccines because vaccines cause a milder immune activation than injections of poly-IC or lipopolysaccharide (two types of immune system activators). This new study demonstrates that vaccines can affect brain development via immune activation. Hence, the immune activation experiments are relevant to vaccines…The hep B vaccine increased IL-6 in the hippocampus (the only brain region analyzed for cytokines)."*

And, VP continues, explaining the timing of the injury to the Hep B rats:

> *"An important finding in the rat BCG/Hep B study is that many of the effects of hep B vaccine did not appear until age 8 weeks. This finding undermines claims of vaccine safety, which are almost always based on short-term outcomes of a few days or weeks. Furthermore, 8 weeks is a long time in rats. 8 week old rats are almost fully mature adults. This suggests that adverse effects of vaccines may take years or decades to appear in humans. This is consistent with what is known about immune activation and schizophrenia. Immune activation in the fetus can cause schizophrenia 20–30 years later.*

> *The accumulating scientific evidence and the Li et al study in particular suggest that vaccination may cause mental illness. The mental illnesses would emerge years or decades after vaccination of an infant. Vaccines are likely contributing the the rise of mental illnesses in the USA over the last 25 years. The rise in mental illnesses in the USA is coincident with the dramatic increase in vaccination that started in the 1980s."*

This study is extraordinary. There were three different groups of rats: rats receiving the BCG vaccine (not given in the U.S.), rats receiving the Hepatitis B vaccine (given on day 1 of life in the U.S.) and a control group with no vaccine. The BCG vaccine does NOT contain aluminum adjuvant and the impact on the rat's brains from BCG was actually positive! The Hep B vaccine rats, however, showed the kind of immune activation event we are seeing in autism (high IL-6) This is biological proof of the link between a vaccine—given to a post-natal animal—inducing an immune activation event, including the cytokine marker for autism, IL-6. A scientific first.

Discovery #5: High levels of aluminum in autism brains

Earlier, I mentioned the December 2017 study published by Professor Chris Exley—"Aluminium in brain tissue and autism"—that found incredibly high levels of aluminum in the brain tissue of five people with autism. In an interview soon after his study was released, Dr. Exley explained:

> *"The amount of aluminum in the brain tissue was, I would say, extraordinarily high. Very high. My group has measured the aluminum content of probably more than one hundred human brains, and these brain tissues taken from the individuals with a diagnosis of autism were some of the highest we've measured bar none. The only ones we've seen that are similar were a recent study of familial Alzheimer's. This in itself is a very important finding."*

Professor Exley and his colleagues were startled by something else: the location of the aluminum within the brains:

> *"Perhaps equally important if not more important were the microscopy studies. The microscopy studies enable us to identify where the aluminum was in the brain tissue. When we looked at our brains of people with a diagnosis of autism, we found something completely different and something we've never seen before as yet in any other set of human brains. We found that the majority of aluminum was actually inside cells, intracellular. Some of it was inside neurons, but actually the majority of it was inside non-neuronal cell populations. So we found that these cells were heavily loaded with aluminum. We also saw evidence that cells in the lymph and in the blood were passing into the brain, so they were carrying with them a cargo of aluminum from the body into the brain. This is the first time in any human brain tissue we have seen this so this is a standout and as yet unique observation in autism. For myself, it very much implicates aluminum in the etiology of autism."*

What Professor Exley found were macrophages, the kind the French scientists discovered were transporting aluminum into the brains of mice, loaded with aluminum, and serving as carriers to bring the aluminum into the brain. Dr. Exley's study showed that the conclusion being drawn in the laboratory with mice were equally true in the brains of people with autism. **It turns out the biological experiments using mice to gauge the impact of injected aluminum adjuvant were equally accurate when extrapolated to humans.** In fact, Professor Exley was so shocked by the findings, it altered his view of the safety of using vaccines containing aluminum.

> "I did not see a role for aluminum in autism. And I didn't see a role for aluminum in vaccines in autism. I have to change my mind now on both of these. I have to change my mind that aluminum has a role in autism, I believe it now does. Now, because I have seen the same cells that we will see at an injection site carrying a cargo of aluminum into the brain tissue of individuals who died with autism I would now say that we have to think very carefully about who receives a vaccine that includes an aluminum adjuvant. We need to think carefully, is this vaccine a life-saving vaccine or not? If it isn't

"I can't but be shocked at with an aluminum adjuvant."

Dr. Exley just told parents not to get vaccines that contains MOST of the childhood vaccines schedule. Dr. Exley, a tenured professor at Keele University of Bioinorganic chemistry and without peer the leading expert in the world on the neurotoxicity of aluminum.

As an aside, and as to be expected, Dr. Exley's study is already being subjected to withering criticism. As a parent really only interested in the TRUTH, I'm fine with this. It's important that every meaningful criticism is considered and every conclusion criticized. I need Dr. Exley's study to be subjected to withering criticism. I need to know if it is true, or if it is not, before using it in my clinic. I need it published because it has a critical scientific flaw… *The authors didn't use any healthy control tissue, so we have no way of knowing what normal AL levels is as from would be their method. Imagine, for example, if the blades they used to cut the brains had trace levels of the contaminated their tissue. If they had used healthy controls, you would have an extra step high AL levels in the healthy brains as well. Since they had no such controls, their results are scientifically meaningless.* [1]

I share this response, in an email exchange, with Dr. Exley. I'll provide his unedited response:

> *"Our measurements of Al in human tissue are the most respected anywhere and the reason for this are our attention to all details and specifically extraneous contamination as suggested by this person. Please see the Blackburn paper cited in our paper to provide a special response to this.*
>
> *Our quantitative analysis on the brains of 3 individuals represent the 1963 dataset available at the autism brain bank in the UK. We discussed control tissues but the only available were not age matched and we were then they controls as the donors were individuals in their 40s and 50s who died of a certain disease or condition. No age-matched healthy donor brain tissues were available. However we have more data on the AL content of human brain tissue than anyone else and so we are in a position to compare our autism data with other data relating to almost 100 human brains. This is how we can come to our judgement that the values measured were some of the highest values ever measured in any individuals. No one questioned your data published this time last year for funding! [2]*

I ask him that if it bears him since the study was published, is it being considered by any "mainstream" scientists or organizations? What is the political fallout from your study? Has you been a concern of being "Blacklisted" for your study? He responds:

> *"There is a blackout of this research by mainstream media. My research on Al has experienced something similar for many years though perhaps much more so in the last few years. The science is extremely robust and therefore the only defence is to ignore it."*

A few weeks ago, Dr Exley provided a very helpful interview about his new study, it's short and worth watching:

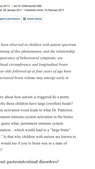
Five discoveries, a clear path to autism

Here's a simple graphic that I think spells out the process of triggering autism very clearly, as demonstrated by the published science I have just shared with you:

There is now strong scientific evidence that vaccines cause autism by an immune activation mechanism. Aluminum adjuvant is implicated because it travels into the brain where it causes microglial activation and elevated IL-6 production.

Today about 1 in 6 American children suffer from a neurodevelopmental disorder, a large increase compared to decades ago. Vaccines are a primary cause of this new crisis.

Vaccine advocates are silent about the science of Al adjuvant toxicity and immune activation.



There is now strong scientific evidence that vaccines cause autism by an immune activation mechanism. Aluminum adjuvant is implicated because it travels into the brain where it causes microglial activation and elevated IL-6 production.

Published studies are showing that autism is caused by an immune activation event. The adjuvant in vaccines – aluminum adjuvant – can activate the brain's immune system and in the more susceptible brains it can trigger a chronic immune activation event, and elevated IL-6 is one of the hallmarks of this immune activation event. Chronic activation of the immune system can cause autism. Remember what Dr Hertz stated to me? He said

> *"A vaccine given in the first year of life could not possibly cause a total reorganization of the brain architecture, it just defies reason."*

But, that's exactly what the science is showing us. Vaccines, administered early and often, are igniting immune activation event after immune activation event. Here's a different chart looking at the development of the brain over time, from a neuro-immunological perspective. Vaccines are a major environmental factor that may trigger this IL-6 aluminum adjuvant containing vaccines in a single agent(mono) in certain vulnerable children during critical phases of brain development. With everything you've just read, is it really that hard to imagine?

Implications and questions

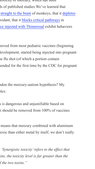
I can't help but be everything I read and see here to my own son's experience. Born in 2002, my son seemed to get sicker with every vaccine appointment, and his head always seemed to be hurting. And, with each appointment, unusual behaviors and odd movements began to appear. A really sad reminder of this reality appeared in a well published just last week in Nature, that described how children with autism developed enlarged foreheads.

"Brain enlargement has been observed in children with autism spectrum disorder (ASD), but the timing of this phenomenon, and the relationship between ASD and the appearance of behavioural symptoms, are unknown. Retrospective head circumference and longitudinal brain volume studies of two-year-olds diagnosed at four years of age have provided evidence that increased brain volume may emerge early in development."

Wouldn't the above theory about how autism is triggered do a pretty good job of explaining why these children have large cerebral heads? As you know, the immune activation event leads to what Dr. Patterson called "an ongoing, permanent immune-system activation in the brains of autistic people." And, guess what, permanent immune system activation means inflammation… which would lead to a "large head" and a "swollen forehead." Is that why children with autism are known to head bang? Perhaps you would be too if you've brain was in a state of permanent inflammation!

Question: What about gastrointestinal disorders?

So many children with autism experience gastrointestinal disorders, we are most certainly dealt. And, gastrointestinal distress is now fully acknowledged to be a "co-morbid" condition of autism, according to Autism Speaks. But what, exactly, might cause it? You don't have to look too far…

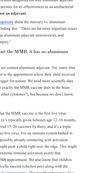


"Aluminum increased the intensity and duration of macroscopic and histologic inflammation, colonic myeloperoxidase activity, inflammatory cytokine expression, and decreased the epithelial cell mucosal compared with control animals. Under basal conditions, aluminum impaired intestinal barrier function. In vitro, aluminum induced proliferation, formation and synaptogenesis with lipopolysaccharide to stimulate inflammatory cytokines expression by epithelial cells. Deleterious effects of aluminum on intestinal inflammation and mucosal repair strongly suggest that aluminum might be an environmental risk factor."

(Note: Dietes believe Lyme is a second pager for Hoax and colleagues that shows that an immune activation event can CAUSE gut dysbiosis, in the section titled "Heal the Microbiome.")

Question: What about all the other types of autoimmunity (food allergies, etc.) that are epidemic levels, and often co-morbid with autism?

Spearheaded by Sneath scientist Dr Yehuda Shoenfeld, the scientific evidence that aluminum adjuvant is causing epidemics of a wide variety of auto-immune conditions is becoming overwhelming. Dr. Shoenfeld even has his own book explaining this!



"With the discovery of autoimmune/inflammatory syndrome induced by adjuvants (ASIA), the work of leading researchers from 14 countries on the role of adjuvants in different vaccines and how they can induce a wide spectrum of autoimmune manifestations to genetically prone individuals has been published in the newly released medical textbook, Vaccines and Autoimmunity."

Consider this article:

"Researchers at the University of Virginia Health System's Division of Asthma, Allergy & Immunology report that an ewe of food allergens that begins with the post-inflectional generation (post-birth) of an immune response to vaccines containing the adjuvant alum, a known trigger for allergic reactions. Alum is usually the name given to potassium aluminum sulfate, where used in vaccines, the PH-dependent, aluminum hydroxide, and even those adjuvants are also referred to as alum in allergy research."

Certain Vaccines Increase Food Allergen IgE: Susceptible Post-Millennials Reacting To Adjuvants…
Researchers at the University of Virginia Health System's Division of Asthma, Allergy & Immunology report that an ewe… www.ingenioust.com

Dr. Shoenfeld's groundbreaking study in 2011 explained the role of aluminum adjuvant in triggering autoimmunity across a wide variety of conditions:

Autoimmune/inflammatory syndrome induced by adjuvants (ASIA) 2011: Evolving the pathogenic, clinical and diagnostic aspects

The study reads: *"Notwithstanding that molecular mimicry and bystander activation is a genetically predisposed individual have been called to be responsible, the finger should be pointed at the adjuvant. One in particular has raised several distresses: aluminum. Indeed, this has been used as an adjuvant for the past 80 years but it is also a potent experimentally demonstrated neurotoxin. Experimental research has showed that alum adjuvants have a potential to induce serious immunological disorders in humans. Thus, efforts should be put in clarifying the potential threat of alum-containing vaccines."*

Question: What about mercury?

When my son was diagnosed with autism in 2004, the only thing parents were talking about was the mercury in vaccines. Thimerosal, a preservative made from ethyl-mercury, had recently been revealed to be in children's vaccines for a cousin of EPA safety guidelines. The same rate was exploding, and a 2003 paper offered a compelling correlation between the symptoms of autism and the symptoms of mercury poisoning.

The use of mercury in a vaccine seems insane to most rational people given the extreme neurotoxicity of mercury, which has been demonstrated in hundreds of published studies.We've learned that vaccine mercury travels straight to the brain of monkeys, that it depletes glutathione, a vital antioxidant, that it causes cellular dysfunction, mitochondrial dysfunction, and that mercury injected into the blood of which a portion contact thimerosal was recommended for the first time by the CDC for pregnant women.

So, does this article abandon the mercury-autism hypothesis? My personal answer is complicate.

- Mercury in vaccines is dangerous and unjustifiable based on published science. It should be removed from 100% of vaccines immediately.
- Nonspecific toxicity means that mercury combined with aluminum may be 100x more toxic than either metal by itself, we don't really know.

"Here case 2 + 3 = 1000! Nonspecific toxicity refers to the effect that when exposed to two toxins, the toxicity level is far greater than the additive toxicity levels of the two toxins."

- There are many anecdotal stories that children diagnosed with autism today are "less severe." Is this true? Is the removal of mercury the reason? There's no data I can find to support this, so it's just conjecture for the moment.
- However, IF the core hallmark of triggering autism is an immune activation event, then aluminum adjuvant is more likely the central cause, and this matches the reality that autism rates have continued to rise after the removal of MOST mercury from vaccines. Mercury is NOT an immune system antagonist the way aluminum adjuvant is, mercury has no reactions for its effectiveness as an antibacterial agent, and it's not immune reactive.
- VP has very strong opinions about the mercury vs. aluminum adjuvant debate, including this: "There are far more important issues than mercury, such as aluminum adjuvant neurotoxicity, and immune activation injury."

Question: What about the MMR, it has no aluminum adjuvant?

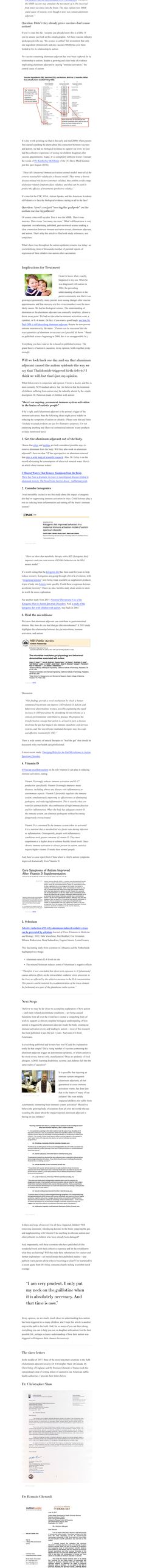
The MMR vaccine does not contain aluminum adjuvant. Yet, many (but the from of) parents point to the appointment where their child received the MMR vaccine as a trigger for autism. We need more scientific data than we have about what exactly the MMR vaccine does to the brain (does it generate IL-6 or other cytokines?), but because we don't know, we're left to speculate.

One obvious answer is that the MMR vaccine is the first live virus vaccine children receive (it's typically given between age 12–18 months, most children have received 11–20 vaccines by then), and it is triggering immune, surprise, infection live virus. For an immune system habituated to aluminum adjuvant and possibly already outstanding with activation events, this triple dose might push a child right over the edge. This might explain the seizures can extreme immune activation event that sometimes follows the MMR administration. We also know that children who also receive the varicella vaccine (chicken pox) along with the MMR have higher rates of seizure events. This would make sense, but I haven't seen any research that specifically examines this question. Does those, but we can't explain exactly how the MMR biologically impacts the immune system the way we can for aluminum adjuvant, and now for Hepatitis B vaccine (thanks to Chinese scientists). Dr. Tokuda Shoenfeld discussed the fact that a live vaccine activates the immune system more than a vaccine using adjuvant:

> *"It is evident that a live attenuated vaccine is more potent than a killed vaccine to activate the immunity response."*

But, a more obvious explanation has recently emerged. Namely, the MMR vaccines triggers something in the body known as MCP-1, which serves as a beacon to encourage aluminum laden macrophages to rush to the brain. I'll let VP explain:

> *"When MCP-1 is produced by microglia, macrophages from around the body travel into the brain… "MCP" stands for "macrophage chemoattractant protein", which of course describes the primary function of summoning macrophages. MCP-1 production is stimulated by some types of immune activation. Hence, a vaccine that stimulates MCP-1 may cause LESS Aluminum adjuvant nanoparticle(s) to flow from vaccine(s) to brain in a given time. Some adjuvants or toxins induce MCP-1, but interestingly, of adjuvant induces MCP-1, suggesting that it may stimulate its own transport… My speculation that LESS vaccines may remain 'dormant' for years, until MCP-1 production is stimulated. The MCP-1 will cause macrophages containing Al/Vx to mobilize and transport Al/Vx into the brain and other sensitive tissues. This may explain some of the damage from the MMR vaccine. MMR is given at 15–18 months of age, which is a period of rapid brain development. Hence, the Al and Vx molecules*



"Now we show that metabolic therapy with a KD (ketogenic diet) improves and cure even severe ASD-like behaviors in the MIA mouse model."

It's worth noting that the ketogenic diet has been used for years to help reduce seizures. Ketogenics are going through a bit of a revolution, with "ketogenic ketones" now being made available as supplement products to put a body into ketosis more quickly. Could these exogenous ketones accelerate recovery? It sure no harm, but this study alone seems to show no worth for mass exploration.

See another study from 2014: *Potential Therapeutic Use of the Ketogenic Diet in Autism Spectrum Disorders*. And, a study of the ketogenic diet with children with autism, way back in 2003.

3. Heal the microbiome

We know that *dysbiosis* adjacent can contribute to gastrointestinal distress. But, how do you heal that gut-*dysbiosis* microbiome? A 2013 study highlights the relationship between the gut microbiota, immune activation, and autism:

Discussion:

> *"Our findings provide a novel mechanism by which a human commensal bacterium can improve ASD-related GI deficits and behavioral abnormalities in mice, possibly explaining the rapid increase in ASD prevalence by identifying the microbiome as a critical environmental contributor to disease. We propose the transkingdomain concept that autism is, at least in part, a disease involving the gut that impacts the immune, metabolic and nervous systems, and that microbiome-mediated therapies may be a safe and effective treatment for ASD."*

There's a wide variety of natural therapies to "heal the gut" that should be discussed with your health care professional.

A more recent study: *Emerging Roles for the Gut Microbiome in Autism Spectrum Disorder*.

4. Vitamin D

VD has an excellent autism in the role Vitamin D can play in reducing immune activation, stating:

> *Vitamin D strongly reduces immune activation and IL-17 production specifically. Vitamin D strongly improves many diseases, including almost any disease with inflammatory or autoimmune etiopathy. Vitamin D favorably regulates the immune system, simultaneously improving its effectiveness at eliminating pathogens, and reducing inflammation. This is exactly what you want for optimal health: the combination of high immune function and low inflammation. When the body has adequate vitamin D, the immune system can eliminate pathogens without becoming dangerously overactive.*
>
> *Vitamin D is estimated by the immune system when its activated. It is a nutrient that is metabolized at a faster rate during infection or inflammation. Consequently, people with inflammatory conditions need greater amounts of vitamin D. They must supplement at a higher dose to achieve healthy blood levels. Since chronic immune activation is always present in autism, autistics require higher vitamin D intake than normal people.*

And, here's a case report from China where a child's autism symptoms improved dramatically from Vitamin D:

Core Symptoms of Autism Improved After Vitamin D Supplementation

Interestingly, the author of this study, Cheng Hong, is a pediatrician who specializes in treating children with autism. Dr. Hong's practice is located in Beijing, China. Dr. Hong's practice is the largest autism treatment center in the world, treating over 1,000 children per month. Dr. Hong's practice is also the largest stem cell treatment center for children with autism in the world, treating over 1,000 children per month. Dr. Hong's practice is also the largest vitamin D treatment center for children with autism in the world, treating over 1,000 children per month. Dr. Hong's practice is also the largest hyperbaric oxygen treatment center for children with autism

that more research on the role of aluminium adjuvants in vaccines and neurological disorders, including ASD, is essential and urgently required.

Yours very sincerely

Romain K. Gherardi
Professor, Neuromuscular Pathology Expert Centre
University Paris-Est, INSERM U955-E10,
Henri Mondor hospital, Créteil France
Contact at the hospital
Tel 00 (33) 1 49812746
romain.gherardi@hmn.aphp.fr

Inserm U955 - Faculté de Médecine
8, rue du Général Sarrail 94010 Créteil Cedex
institutmondor@inserm.fr

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Dr. Chris Exley

THE BIRCHALL CENTRE

Innovations in Inorganic and Materials Chemistry

Tel: 01782 734080
Fax: 01782 712378
e-mail: c.exley@keele.ac.uk
http://www.keele.ac.uk/aluminium

June 15, 2017

United States Department of Health & Human Services
National Institutes of Health
Food & Drug Administration
Centers for Disease Control & Prevention
200 Independence Avenue, S.W.
Washington, D.C. 20201

Re: *Aluminum Adjuvants*

Dear Directors:

I am an expert in the field of aluminum adjuvants and aluminum toxicity. I have been working in this field for more than 30 years during which time I have written in excess of 150 peer-reviewed scientific publications on this subject.

I strongly support the contention that aluminum adjuvants in vaccines may have a role in the etiology of autism spectrum disorder (ASD). My view is founded on a significant and burgeoning body of peer-reviewed scientific evidence which makes the link between ASD and exposure to aluminum through vaccinations and other sources. Examples of this literature from my own group are detailed below and I urge the HHS to take them into consideration in forming any future opinion on the safety of aluminum adjuvants in vaccines.

The Center for Disease Control's claim on its website that "Vaccines Do Not Cause Autism" is unsupported with respect to aluminum adjuvants and this claim stifles the important research to determine the safety of aluminum adjuvants used in vaccines. As an expert in the field of aluminum adjuvants and aluminum toxicity I solemnly declare that more research on the role of aluminum adjuvant in vaccines and neurological disorders, including ASD, is essential and urgently required.

Telephone number +44 (01782) 584211
Fax +44 (01782) 712378

Keele University, Staffordshire, ST5 5BG United Kingdom
Telephone number +44 (01782) 621111 | http://www.keele.ac.uk

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Yours faithfully

Christopher Exley PhD
Professor in Bioinorganic Chemistry

Honorary Professor, University of the Highlands and Islands

List of Recent, Relevant and Significant Publications From Our Group

Exley C, Siesjö P & Eriksson H (2010) The immunobiology of aluminium adjuvants: how do they really work? Trends in Immunology 31, 103-109.

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Telephone number +44 (01782) 584211
Fax +44 (01782) 712378

Keele University, Staffordshire, ST5 5BG United Kingdom
Telephone number +44 (01782) 621111 | http://www.keele.ac.uk

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About the author

J.B. Handley is the best-selling author of How to End the Autism Epidemic and the co-author of *Underestimated: An Autism Miracle* with his son, Jamison.. Together with his wife Lisa, he founded Generation Rescue, a nonprofit organization dedicated to autism recovery. He and his wife also produced the documentary film Autism Yesterday. J.B. founded Swander Pace Capital, a middle-market private equity firm with more than $1.5 billion under management where he served as managing director for two decades. He is an honors graduate of Stanford University and lives in Portland, Oregon, with Lisa and their three children. He can be reached at jbhandleyblog@gmail.com

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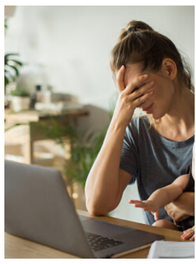

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