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What lies beneath: differences in brain connections

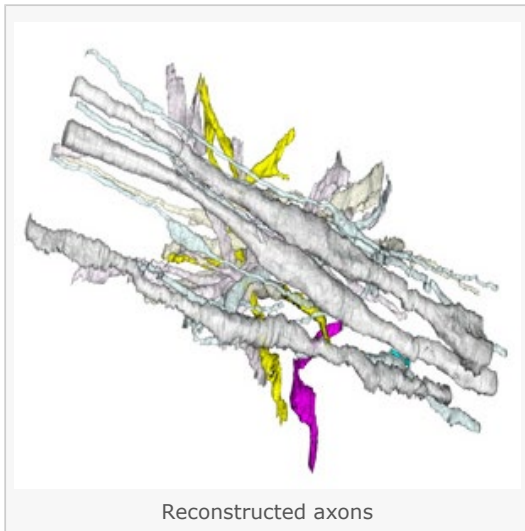
November 11, 2010

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A new Autism Speaks-funded study reveals differences in brain connections in areas that redirect attention, mediate social interactions and modulate emotional responses.



Reconstructed axons

Science is one step closer to understanding how the brains of individuals with autism process information. Over the past decade it became clear that neural communication is disrupted in autism, although the details, and the causes, remained elusive. Two hypotheses emerged to explain the information processing differences found in individuals with autism spectrum disorder (ASD). First, scientists identified over-activity at the level of the synapse—the point where two neurons connect. Second, imaging studies showed that the balance of local versus long-range connections was skewed in autism in favor of strong local connections but weak long-range connections between distant brain regions. Complex behavior, such as language and social interaction, depend upon such long

range connections. Although the findings supporting the two hypotheses were likely related, the mechanism relating over-activity at the synapse and biased local versus long-range connectivity was unclear.

Now, taking advantage of recent technical developments that facilitate the measurement of small structures within the brain, Autism Speaks'-funded researchers at Boston University have bridged these two hypotheses. Basilis Zikopoulos, Ph.D., and Helen Barbas, Ph.D., reconstructed the intricate fabric of neural "wires"—called axons—that connect prefrontal cortex with neighboring and distant brain regions. The prefrontal cortex is a collection of brain areas that are involved in higher cognitive functions such as attention, planning, social interactions, and abstract thinking. Using postmortem brain tissue generously donated by families of individuals with and without autism, the team measured features of the different axons traveling beneath the cortical surface.

Talking to itself

In comparison to the control samples, autism brain tissue had fewer large axons connecting regions of the prefrontal cortex to the other areas of cortex. Added to this connection imbalance is a thinner coat of axon insulation, called myelin. Myelin is a fatty substance that insulates axons to ensure faithful delivery of neural signals over long distances. Prefrontal axons from autism brain tissue traveling to distant brain areas have less myelin. Zikopoulos and Barbas also found more thin axons that connect neighboring regions in the prefrontal cortex in the autism brain tissue versus the control samples. This biased pattern of connectivity creates a situation in which prefrontal cortex is not efficiently exchanging information with other brain areas, but rather is operating in a solo fashion.

Pursuing the reason for the abundance of thin axons, the researchers first checked to see whether this was due to more neurons in the cortex just above. Detailed examination of neuron density showed no more neurons, just more axons. This finding led the team to speculate that atypical axon branching had occurred in the autism samples. By painstakingly tracing individual axon branches through a volume of tissue, Zikopoulos and Barbas confirmed that the abundance of thin axons emerged from overzealous branching. The thin axons found in autism samples formed tree-like branches that connected with many more cells in neighboring areas than is typical. This pattern of branching furthered the bias for local versus long-range communication.

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Differences in axons and their insulation may offer some links between the two hypotheses that aim to explain disrupted communication in autism. Fewer large axons travel to distant brain regions. Thin axons form too many branches that make extra connections locally. These factors can handily explain the local over-connectivity and long-range under-connectivity observation made through imaging studies. The fact that small axons seem to branch more frequently would also lead to an over-abundance of synaptic connections in a neighboring region. This result can help to explain the synaptic connection hypothesis. Taken together, the results lead us to a deeper understanding of how information may be processed quite differently in the brains of individuals with autism.

Anatomy offers a closer look

Imaging studies aiming to understand brain connectivity use techniques such as magnetic resonance imaging (MRI) and diffusion tensor imaging (DTI). These techniques focus on the large swaths of axons, often called “white matter” because of myelin’s fatty white hue.

While many of these studies have suggested an imbalance favoring local connectivity in the brains of individuals with autism and served as a stimulus for this study, the level of detail that comes from quantitative anatomy is much richer. “The study of brain tissue at high resolution is needed to pinpoint defects in the brain’s communication system, which is prerequisite to developing rational therapies. Studying pathways using DTI is comparable to looking down from a plane at 35,000 feet – you can see some of the major highways below but not the exits, and certainly not the driveway to your house to see if the car is there,” states Dr. Barbas.

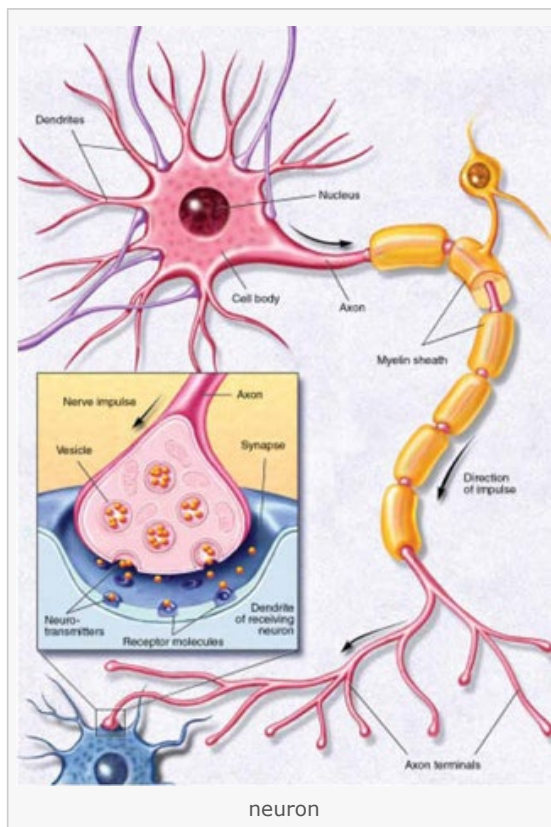
Martha Herbert, M.D., Ph.D., of Massachusetts General Hospital and LADDERS, an imaging expert who was not involved with this study, was enthusiastic about the new results. “Zikopoulos and Barbas have given us a paper about the cellular level of white matter changes in autism that has needed to be written for quite some time. Their analysis is meticulous and comprehensive, and goes far in providing microscopic details to answer provocative questions raised by the larger scale observations in so many brain scan studies in autism. Their findings suggest that the insult occurs later in brain development, after the neurons migrate to where they will live in the brain. The time when these neurons hook up with each other through white matter is crucial and during this period environment and immune factors as well as genes may play a role in the observed changes. These specific details about white matter in autism matter greatly for how we understand autism and how we go about providing the help people with autism need.”

Modeling the development of axon differences

The new axon data may also offer suggestions of what occurred to lead to this state of altered connectivity. Combining the axon data with what is known about the development of the cerebral cortex, the researchers devised a model that links differences in axons below frontal areas to a cascade of events in development that affects the growth of axons and their insulation. The hypotheses proposed are testable, and point to specific pathways that could be targeted for the development of therapeutic interventions in autism.

One pathway that Zikopoulos and Barbas analyzed in detail was GAP-43, one of a myriad of signals that are exquisitely timed to encourage the proper growth and integration of developing neurons. GAP-43 stimulates axon branching. GAP-43 also interacts with other signals to prevent premature myelination, and is turned down after myelination begins. In the anterior cingulate cortex, a region of the prefrontal cortex that was the most profoundly affected in the brains studied, the neurons are sensitive to GAP-43 signals for an especially long duration in development. This is an important point because environmental agents such as estrogen-like compounds can increase the GAP-43 signal altering the timing of different aspects of neural development.

One take-home message from this study is how important it is to have diverse lines of inquiry



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Autism Speaks Flickr



investigating autism. The axon results were consistent across individuals studied. For example, the same changes were found regardless of whether or not the individual experienced seizures. Zikopoulos and Barbas also note that many of the genes that have been associated with autism exert effects on neural connectivity. Dr. Barbas says, "Genome-wide association studies are valuable in pointing out potential vulnerability in affected individuals. Our study suggests further that environmental factors (in utero, after birth, or both) can lead to abnormal connectivity because external factors up-regulate signals such as GAP-43 that regulate axon growth. We need studies to take into account all of these aspects of autism, not just one."

This work was published in the *Journal of Neuroscience* and featured on the cover of the November 3 issue.

This research was made possible through funding from Autism Speaks and brain tissue supplied by Autism Speaks' Autism Tissue Program. These groundbreaking results came from the brain tissue of ten generous individuals who chose to make a lasting gift to science. Importantly, only a small portion of each donated brain was needed for this study, making other sections of this incredibly valuable research resource available to others to uncover new insights into autism spectrum disorders. Please consider making a lasting gift to science by participating in the ATP.

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Science

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Makiko Dickinson

November 12, 2010 at 3:53 am | #1

[Reply](#) | [Quote](#)

I totally agree with this article for the cause of autism. When I found my son was born with autism at age 3, now ten years old, I never doubt fertility pills such as progesteron and estrogen I took in the course of in vitro procedure changed chemical balance in utero and affected fetus brain development. I strongly believe autism is related to fertility medicine. In fact, many occasions, I encounter mothers who had gone through infertility treatment and their children were born with autism. I hope further study find connection between fertility pills and autism.



MarkH

November 12, 2010 at 12:37 pm | #2

[Reply](#) | [Quote](#)

Who, how, where, and what will lead to the why. It's like trying to solve a 1000 piece puzzle with only 3 pieces. We need this information and understanding before we can solve this Autism puzzle.



Julie Humenik

November 12, 2010 at 1:02 pm | #3

[Reply](#) | [Quote](#)

I wonder if birth control pills may also have some cause in addition to fertility medicine. The increase in the number of women on birth control pills and now the depo shot over the years may correlate to the rise in autism. I was on the depo shot prior to having my son who has autism. Could those chemicals hang around in our bodies longer than thought, or affect our eggs?



Edward Colozzi

November 12, 2010 at 2:51 pm | #4

[Quote](#)

Hi Julie, Interesting idea. My Dad was an OBGYN Doc 1950's-80's and always used to talk about the complexities



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re birth control pills. I especially remember him asserting all the time, "we won't know for many, many years what the REAL effects of these pills will be on, not only patients but their children, and their children's children!". I just talked about him in my recent blog, "I Am My Father's Son", when he took me into the delivery room to watch him deliver a baby. I was 14, and it certainly influenced my first career choice back then! Ed C.



k graffius

November 17, 2010 at 11:50 am | #5

[Quote](#)

my thought is not necessarily that the chemicals hang around longer but rather the excreted hormones of the pills and/or shots is effecting the environment negatively. the pill/shot adds extra hormones to your body, you excrete the extra hormones. the hormones can not be filtered back out of the water before it is pumped back in as "clean" water. so you are consuming water with tons of female hormone. also with as many people who are on birth control, think about how much more female hormone is in our rivers:which then leads to farms, feilds and animals.the hormone is absorbed in the fresh vegetables and fruits we eat everyday. in addition to being in the feed for the farm animals that we eat also.



Tanya

November 12, 2010 at 1:34 pm | #6

[Reply](#) | [Quote](#)

Very informative. Interesting about the estrogen. When my son was about 2 mths the pediatrician suggested we switch from milk based formula to soy based. I have always wondered if this was wise since now hearing about the negatives of soy milk(with the estrogen) especially for boys. The main trigger for my son was the numerous vaccines. He was fine until after the 18 mth vaccines which he received while having a cold. Like Katie said, we also need to study specific triggers like the vaccinations and figure out how to reverse the damage so we can help our children now.



Lori

November 17, 2010 at 1:06 am | #7

[Quote](#)

I think the number of children being born with Autism points to more than one cause. It may be almost an allergic reaction. It could be vaccines, for one child and fertility drugs for the other. I treated a boy who was one of the 1st test tube babies, and he had Asberger's Syndrome. I am a speech pathologist and I see such a huge range in how the children are affected. Im not sure there is much hope that you can reverse this condition since the article points to the hypothesis that autism isn't damage it is a difference in how the brain was developed. But, the key is to finding out how these children learn, and how to bring them to focus in the moment. We need to have an understanding of what is going on in their brains and learning how to turn the right dials down and the correct dials up depending on the situation. I find this condition to be very idiosyncratic to each child. We need to figure out sort of the "main idea" for each grade of autism (the closest that resembles them)and then create a "web" that is more individualized for each student. I feel that we are beginning to understand the "main idea" but we do not have a web of treatment plans that will fit each child. If we try to introduce the same treatment to every child the only ones that are able to benefit are the ones that the "web treatments" were developed for. We have a long way to go in this process, however, progress is being made. I have enormous respect for the parents of children with autism. It takes so much strength and dedication to your child. God Bless all of you

and your children.



Tammie Lewis

November 12, 2010 at 5:00 pm | #8

[Reply](#) | [Quote](#)

I never took any type of fertility medicine and yet my son also has autism. I also have several friends who went through numerous fertility treatments and they don't have any children with autism. I don't see how there could be a link between fertility pills and autism.



Sonia Bradford

November 13, 2010 at 12:55 pm | #9

[Reply](#) | [Quote](#)

INTERESTING! I had twins (12 yrs ago) no fertility meds, but was on birth control prior to trying to get pregnant and had the depo shot once. My girl twin is fine, my son has aspergers. He also was put on soy milk as an infant, as was my daughter due to reflux. Estrogen could be the link!



k graffius

November 17, 2010 at 11:40 am | #10

[Reply](#) | [Quote](#)

then how do you explain someone like me, who had no infertility treatment to get pregnant yet i have a son with autism?



Loramath

November 23, 2010 at 2:38 am | #11

[Quote](#)

Same thing happens to me. No infertily treatment, no birth control, no soy milk, yet my son has autism.



Loramath

November 12, 2010 at 4:08 am | #12

[Reply](#) | [Quote](#)

Very interesting, thanks for the information.



Katie Wright

November 12, 2010 at 9:12 am | #13

[Reply](#) | [Quote](#)

"Genome wide association studies are valuable for pointing out potential vulnerability in affected individual."

AFTER the insult. We need to know WHAT is causing the insult. Vulnerability does not equal disease. It would be valuable for me to have a private plane but would it be cost effective for my family? Not unless we wanted to be homeless.

WE need to apply this vigor and largesse towards studying the environmental cause of autism, rather than only describing the neurological outcome. I am so tired of hearing how autism is diverse and how "the environment may play a role." Of course to #1 and #2. What in our environment is CAUSING brain damage in our kids?

I have no doubt this is a beautifully constructed study by brilliant scientists and that their work is important. However I already know my son's brain and body suffered from terrible inflammation / encephalitis after days of fevers post multiple vaccines. His social abilities, communicative skills were all destroyed within months. We need to study specific triggers like over vaccination and febrile seizures AND how to reverse this damage.

My son has suffered traumatic brain injury and needs help.



Greg

November 12, 2010 at 3:50 pm | #14

[Reply](#) | [Quote](#)

You need to give up on the idea that vaccines cause autism. The idea has been thoroughly studied. The original paper from Britain showing a link has been retracted by the journal due to evidence of bias and fraud. Follow-up studies on families who denied their children vaccines have showed no decrease in the rate of autism in those families. There are numerous studies out now showing unprecedent outbreaks of measles, for example in Detroit, where families have denied their children standard vaccination. Some of the children have died. It is imperative that such

disinformation be stopped or such outbreaks will only become more common and widespread. This article did in fact point the finger at a specific class of environmental toxin that has been suggested by other environmental studies to be a possible culprit. Estrogen-like compounds such as BPA pollute our environment from various plastic products and produce significant blood levels in normal individuals. Such hormone mimics have the potential to do a wide range of harm during all stages of development, but the governments of nations that produce them had never done studies to see what those might be. This study looks like it could be a smoking gun. I find these results very encouraging.



healingautis

November 12, 2010 at 5:02 pm | #15

[Reply](#) | [Quote](#)

I couldn't agree more! I don't believe it's a good use of researcher's time and funds on figuring out what happened after the fact unless they can apply it to something that can prevent it from happening or correct the problem. The cause, not the effect should be studied. I wish Autism Speaks would put a lot more of their funds into biomedical research. For example, the myelin that covers the brains axons for delivering nerve signals can be helped by increasing the child's essential fatty acid intake (Omega 3s). Why not include that piece of information into their study results? Give parents the to help their child recover from their environmental insult.



angie

November 16, 2010 at 9:02 am | #16

[Quote](#)

Great point!



k graffius

November 17, 2010 at 11:59 am | #17

[Quote](#)

my child was recently diagnosed with autism so i am new to all of this. what else do you know that can help besides the omega 3s? thanks for that bit of information by the way!



Robin Scheffler

November 12, 2010 at 9:58 am | #18

[Reply](#) | [Quote](#)

My practitioner uses neuro-feedback to help neurological pathways connect. Having done numerous biomedical treatments over the course of six years, all of which had linear progression but plateaued, this protocol has continued to be effective for the last two years. We document results with a QEEG every twenty-five sessions. Can anyone recommend a treatment that is more effective? Please respond...



Linda

November 12, 2010 at 1:12 pm | #19

[Reply](#) | [Quote](#)

Hi there, I read your post and I find that interesting. I have heard of research being done and effective with add patients that uses audio technology called hemi-sync to help synchronize both sides of the brain.



Sylvia Moneti

November 12, 2010 at 5:42 pm | #20

[Reply](#) | [Quote](#)

Brain Balance is a program that uses sensory, motor and academic exercises targeted to stimulate the areas of the brain that are out of sync. A recent outcome study showed that it is very effective in helping children with ADHD. My sister, Dr. Victoria Naumann, DC has had a center in Greenville SC for over a year and has had great success with improving the function of kids on the spectrum. Once we experienced the effectiveness of Brain Balance, we felt we needed to spread it, and we just opened a center in Charlotte, NC. The centers (there are now several across the country) give regular "parent talks" that fully explain the program, the science behind it (thank goodness for research like that which was outlined

in this article!) and why it can be very effective. The national website is <http://www.brainbalancecenters.com>.



Becky

November 12, 2010 at 10:15 am | #21

[Reply](#) | [Quote](#)

Thank you for this wonderful article. I copied and pasted this to a word document so that I could send just this part to my family. They haven't been able to get the autismspeaks' e-magazine sent to them for firewall reasons (I'm thinking". I did include every citation and footnote and made sure I said just exactly where I got the article from.

Thank you, Drs., for this research. It just makes sense to me. I'm NOT saying that this has to be the definitive cause, but it sure explains a lot to me. You see, my Matthew has autism. His food aversions led us down the path of mostly fat foods (chicken nuggets, fries, hamburgers, mac and cheese, etc.) I've always wondered if the fatty foods may have helped (along with years of therapy) to cause him to have such great improvement. (At 5 1/2 yrs of age, he was at a 2yr 11m level of behavior. Now at 11 1/2, he is at an early 10 y/o level, with so much social improvement people who just meet him can not believe he is autistic!) With the fattiness of the myelin sheaths being in play here, I wonder if his diet may have played more of a role in his improvements. Just a thought from a mom who wants to know why.



k graffius

November 17, 2010 at 12:06 pm | #22

[Reply](#) | [Quote](#)

my 3 year old was just diagnosed with autism, so im new to all of this and there is a lot to take in. but are you saying that him eating all that "junk food" actually helped with his behavior? my son eats a lot of those things too! before the diagnosis, comments from my friends and family were always that i needed to teach him better eating habits; and that he needed more discipline to straighten out his behavior. i wonder if maybe they have a natural instinct telling them what they need?



Linda

November 19, 2010 at 9:05 am | #23

[Reply](#) | [Quote](#)

Wow Becky, I have chills reading your message. My son started working with an OT at age 7, We did not really know what was going on with him... we focused on his physical development... teaching him to crawl and walk down the stairs correctly.... now he is in 7th grade an all in all he is progressing! When you mentioned food; i had another aha moment! He has always seemed to know what would work best for him. He craves french fries. We are "granola type eaters" and i cave to his french fry addiction but now I am looking at it a different light, thank you! we do supplement with omega 3, I do feel i saw an improvement after that. Thanks so much



Lori Stroznia

November 12, 2010 at 12:36 pm | #24

[Reply](#) | [Quote](#)

Thank you for sharing this groundbreaking info with the autism community. I love when science moves the pieces of the puzzle to align. I believe we will find the scientific answers to prove the complex theories that biology, genetics and environmental factors collide and cellular structures are damaged. Please, please keep encouraging scientists to pursue theory and prove science beyond a reasonable doubt!



Liz

November 12, 2010 at 1:14 pm | #25

[Reply](#) | [Quote](#)

My son is 14 and never had any speech when he was a baby – so we saw no difference after his shots. He got speech & pt at age 3 thru the school district and have just worked with him. He's on Abilify & Lexapro which helps him tremendously. He speaks wonderfully now and is quite an artist. He is in special support classes, but is also integrated into some of the mainstream classes. Art & Science usually. He has great difficulty with reading, but the school is trying to teach him basics to get through life at this point. We are planning for his future as we his parents won't always be around to help him. 8th grade and we're

already planning how he will get through life – long term. Scary to think about. I hope something comes of these studies before I die – I worry about how my son will get through life without us. He is becoming more aware of how different he is from other kids and it's starting to cause behaviors at school that is defiant.



JR

November 12, 2010 at 1:24 pm | #26

[Reply](#) | [Quote](#)

This article just confirms what I have thought all along. My son was diagnosed with ASD at 3 years of age. I was told to find a home to put him in that it was hopeless. I have worked tirelessly with him and I am happy to say that he is now 14 and a freshman in high school. He is taking 2 regular classes and has the highest grades in those classes. Over the years when I explained to other children the difference in my son, I used the analogy of a computer. When a computer receives input it is programmed and wired to know exactly what to do with that input. Unfortunately, I explained, that my son's brain is wired differently and does not know what to do with certain input and because of this, things that typical people take for granted must be taught to him. This analogy gave him the acceptance he needed from peers and it also explained to him why he was different. Now I can show him this article and he can know that he is not weird just built differently.



Annette
Lemma,
RN, MSN,
CSN

November 12, 2010 at 2:28 pm | #27

[Reply](#) | [Quote](#)

Let's go back a little further... What is the primary reason for infertility and the subsequent need for fertility-based hormone therapy? Could it have anything to do with hormone suppression caused by contraceptive pills, gels, patches, etc.? It has always been my theory that some environmental – specifically hormonal – factor plays a part in the development of the brains of kids with autism. What is the incidence of children with Autism who had mothers on fertility medication? Similarly, has there been a study correlating the incidence of Autism with the advent of an incidence of hormone suppressive contraceptive therapy?



Jenny
Reichert

November 12, 2010 at 3:53 pm | #28

[Reply](#) | [Quote](#)

The article was interesting and could confirm some thoughts I have had. My 14 yr old son with autism has dealt with many immune issues including allergies. His intestines were so effected he was diagnosed with failure to thrive. This would effect fat absorption. He was put on soy milk(estrogen) as an infant, but after 1 1/2 yrs and alternative testing we found he was highly allergic to soy also. The immune system has so much effect on intestines and absorption, I wonder what the correlation is to this study? Then of course, the big question is, what environmental triggers are effecting the immune system? I, like many of us, get frustrated when reading studies that confirm my son has a problem, but what can be done to treat and just as important, what can be done to prevent this disability from happening to other children? I am glad to say that after many years and much effort my son's immune system is most likely better than mine. Unfortunately, his language deficit is severe.



Robbie
Creamer

November 12, 2010 at 4:29 pm | #29

[Reply](#) | [Quote](#)

As a mother of a 22 year old young man with Autism, I would love to someday get a way to somehow relate to my son and have him somehow relate back to me – I want to see some "practical" life altering steps within my life time. Reading articles with hopeful diagnostic information is interesting but I can't wait till someone says "we can help you and your son communicate someone"....can't wait!
R



maria

November 16, 2010 at 9:26 am | #30

[Reply](#) | [Quote](#)

Hi Robbie – I am wondering, will your son play game with children in the internet? I have almost the some situation here but mine is due to betray by a friend and make the situation worst. Maybe we can share our experience and encourage each other. I believe

someday Science will have a cure for this, but now our only hope is God, I believe he has the power to change and I believe He will show us more good news in the near future. Email me if you need someone to talk my email is maria.kbl.new@gmail.com.



**Vinny
DeCarluccio**

November 12, 2010 at 4:43 pm | [#31](#)

[Reply](#) | [Quote](#)

All of these findings seem great. Do you think it could lead to treatments for children with Autism. Whether it be an operation, or medication of some sort? Is this the first step to curing Autism, or at least correcting some of the symptoms that are associated with Autism.

Thank you very much.



SMC Mom

November 12, 2010 at 7:07 pm | [#32](#)

[Reply](#) | [Quote](#)

Has anyone ever heard that the convolutions of the brain itself may be linked to autism?



**Janet
Tedder**

November 12, 2010 at 8:09 pm | [#33](#)

[Reply](#) | [Quote](#)

Very interesting article. My 5 yr was diagnosed at 3 1/2 with ASD. She went from perfectly developing to no speech at all after her second set of ear tubes and adnoids being removed. Hence we then find out she also has a submucous cleft palate. I took fertility pills to get pregnant with my 11 yr old who is developing normally and Rhogam injections for A- blood through both pregnancies. My 5 yr old had issues for myelin sheathing. Quite curious indeed.



Carlo

November 12, 2010 at 8:48 pm | [#34](#)

[Reply](#) | [Quote](#)

Read the article and the comments below. They are making alot of progress.



Laura t

November 12, 2010 at 10:23 pm | [#35](#)

[Reply](#) | [Quote](#)

I have often wondered if fertility treatments had an anything to do with my daughters autism. She was fine until around 15 months until she had her mmm vaccine. A few days later she became extremely ill running a 105 fever. Within a week she started loosing speech and started showing signs of stimming. The odd part is her twin sister does not have autism and had no reaction to her vaccines. Can someone explain this?



Ruby

November 13, 2010 at 12:49 am | [#36](#)

[Reply](#) | [Quote](#)

Hi there,I have a son name karan.He is 7 years old now but he was 3 years old when we found about that he is autistic.we had no idea about that back then. My husband always acused me about his being autistic.i left him 3years ago.When ever i go to stores with karan and pople always told me tp put him on gluten free diet.because Karan understand everything he just don't talk yet.Iwant to help him but no matter how hard i can try to help i can't do anything for him.If i put him on a diet so is it going to help him.Thank you



maria

November 13, 2010 at 12:17 pm | [#37](#)

[Reply](#) | [Quote](#)

I hope this article will let more people know and understand about autism and people who suffer from autism. I have a problem and I really need some advise and help. My son who is 20 years old is suffer from Asperger Syndrome. I was unable to get the right people to help him to cope with the society. He dislike getting out of the house and was negative about people because he was betray by people while setting up a business once. He trusted the guy but was betray and now he think everybody is trying to hurt him and he distrust everybody except the family member (which is me, the father and his sister). He refuse to mix around, What should I do? I have try lots of method of encourage him but was not successful. Can someone help / advise me? Thanks.



joy parr

November 14, 2010 at 6:04 pm | #38

[Reply](#) | [Quote](#)

Hi Maria – I am a speech language pathologist for Children’s Hospital in Pittsburgh. We have a social skills program that deals with these issues. If you are local contact me at 412/692-3438.



maria

November 16, 2010 at 9:13 am | #39

[Quote](#)

Dear Joy – Thank you for your response to my call. Unfortunately I am not local, I stay in Singapore. In Singapore, is still rather ‘new’ to Autism and especially Asperger Syndrome or associated syndrome. If you can email me or any skill or information that I can help my son, will be most appreciated. my email is maria.kbl.new@gmail.com. Thanks. God Bless.



GreenYourLife

November 13, 2010 at 12:40 pm | #40

[Reply](#) | [Quote](#)

Professor Haley, an expert in heavy metal poisoning should have led the study. Heavy metals effect hormone levels.



Becky

November 13, 2010 at 2:21 pm | #41

[Reply](#) | [Quote](#)

I am the parent of two boys who have autism, they are now 12 and 13 years old. I had my first son when I was 18 yrs old and the youngest when I was 20 yrs old. I never took any birth control pills and only had one depo shot after my first son was born. My oldest is nonverbal and the youngest even tries to speak other languages. I can only say that if it was caused by vaccines, nobody wants to take the blame. My youngest son had genetic testing done on him, and I received a letter saying that there is no known cause for his autism. I have four other nephews and they do not have autism. What I can say is treat them like any other neurotypical child and understand their inabilities. My sons attend play days, are in a social group, have friends over, love to go out hiking and riding bikes. What has help me a lot is taking out my stress on other people who make remarks or look at them strange. When going out always have a plan and know what might happen and know how will you react.



Melanie

November 19, 2010 at 12:35 pm | #42

[Reply](#) | [Quote](#)

Try not to worry about what other people say or look a certain way (i am like you in that i do worry about those things sometimes like that with my 3 yr old son-he is apraxic..in the checkout line at the store they wonder why he doesnt say hello or that if he tries it doesnt sound correct as well as other behaviors which are not typical) ...they are just clueless to what we deal with every day and they dont understand if they arent in our shoes...just know that they have issues of their own they deal with too (everybody has “something” you know?) . i agree with you on the vaccines..we’ll nver know..bc no one would take the blame for that...i still wonder. I wonder about the genetic issue...do i have a hormone imbalance or something genetically that would have been passed on? i just try to stay up on any new study that might have an answer. even if i never get an answer I will do my best to try to make his life as close to “typical” and enjoyable as possible. I watch my 17 month old closely and see differences...he is milestoning earlier than older brother and is verbal and seems to act typical but of course occasionally if i see him flap his hands and make a toy circle around and watch it go around, etc i start to wonder about him, or is he just imitating what hes seen older brother doing. Regardless, i will deal with whatever comes as we have so far.



jeanette Dakessian

November 13, 2010 at 7:32 pm | #43

[Reply](#) | [Quote](#)

Wow...love all this information...my son is 10 and was diagnosed with autism at 2!! He developed normally until around 18 months...he turned over, sat up, crawled..babbed...walked and had a few words...then he started having high

fevers, the croup, pneumonia, asthma and ear infections. It was awful....now he only has about 20 words that he can not say completely...currently working on toilet training...goes to a private special ed school b/c his own school district couldn't handle him and said he couldn't go there anymore as of ast year.

I would really like to know whats going on...my 8 year old daughter is typical...no issues.

My ex -husbands side of the family have a few cousins with autism and relatives with depression...i seriously do not know anymore...are these children born with a weakened immune system and can't handle all the shots...i did not smoke, drink, take pills..nothing while i was pregneant...scary world we live in to have children...everytime someone has a boy...i think...he could have autism...so sad...i really hope they find the cause so other parents do not have to hear those words " your child has autism"...i love my son sooooo much and he has taught me love, patience and to be thankful for what we have and not what we don't have....he is amazing to me....i just feel bad for him b/c he has no friends even though he likes being alone...but does try to interact at times with others...but doesnt know how...



Tonya

November 14, 2010 at 9:36 am | #44

[Reply](#) | [Quote](#)

I am so glad to see this great discussion goin on. I agree with both the birth control pills and the vaccine thing. Most people I have talked to have had one and maybe not the other. I was given something – I can't remember what to start my period again after a 6 month pause from stress related issues. I was so messed up after that and my hormones were that who knows what REALLY did me in. You all have valid points and it can be different causes for different people. We are all different and that's why medicine is so hard to figure out. Me my self I have found that Angel is very high in a certain mineral used in xrays. They have some clay baths that can remove harmful chemicals from kids but I would also like to try the natural stem cell enhancer. It helps you body make more stem cells naturally and then they will find what's wrong and try to fix it. To bad my insurance won't let me pursue the avenues I want to try to help my daughter out.



Tonya

November 14, 2010 at 9:47 am | #45

[Reply](#) | [Quote](#)

Oh I forgot to mention this – there are some B12 patches that you can get now. You can put one behind their ear and leave it for 24 hours. My child was not doing much talking at all before I started using these. Once I started using them she was babbling away. I have not used them in a while but I know I should. They around 20 online and because they are slow absorb patches they get more B12 in their system to help with the nerves.

<http://www.b12patch.com/product.html>



Tessie Crosby

November 15, 2010 at 3:12 am | #46

[Reply](#) | [Quote](#)

I never took birth control pills, and my child is autistic.



Tessie Crosby

November 15, 2010 at 3:26 am | #47

[Reply](#) | [Quote](#)

I need to be able to say...I am trying...and I will...do everything in my power to make sure neurotypicals understand that autistic people maybe have to moderate, and do everything in their power to fit into the society, any were in the world, but neurotypicals also need to understand tha autistics do not need to change their genetic makeup to satisfy the status quo that everyone needs to be a cookie cutter of everyone else. Neurotypicals do not go to handicaps and say "hey you in the wheel chair...get up and walk, or run like I do." Or hey you blind person, stop being blind you need to see like I do. I am sick and tired of hearing about were, were, were does autism comes from...that information is important to know, specially for future treatments or possible discoveries. BUT we need to find out how can we get regular, and ordinary neurotypical people to understand one and for all that we are not going to even intent to change the personalities, and idiosincracies of autistic, just to fullfil a society that is hiprocritical to beguin

with.

Who says that autistics need to be social...why...they do not have to be polite, or caring...specially if they are doing it because they have been taught to do so, like robots, but has no meaning for them. Every city in the world should pass laws protecting autistics, because they do not have to be hypocritical, and lifeless as we are. Lying thru our teeth just to "fit" in. They do not have to fit in.



Lauren

November 15, 2010 at 1:56 pm | #48

[Reply](#) | [Quote](#)

I have identical twin boys, now age 7. One has Autism PDD-NOS and his brother was not diagnosed with ASD. I was not on fertility drugs and was off birth control for a number of months prior to my pregnancy. I did have gestational diabetes but was not on insulin, as it was controlled by diet. I was 39 when I had my twins—not sure if that if was a factor. Very interesting article. I am in BC Canada. Just became involved in autism research.



ivonne s

November 16, 2010 at 2:58 pm | #49

[Reply](#) | [Quote](#)

i am young mother of a 3 year old autistic little girl, i was never on birth control or fertility drugs, don't drink or smoke, i had great prenatal care and still my baby has asd. my husband has a sister who is bipolar and has a 6 year old niece who i suspect is autistic too, i really dont know if the cause of autism is the vaccines or the enviroment, or b/c and fertility drugs, maybe it could be genetic. who knows, i hope they find a cure for it, or at least the reason why it hapens.



Linda

November 19, 2010 at 9:30 am | #50

[Reply](#) | [Quote](#)

Hi, My situation sounds alot like yours. Did your daughter have alot of trouble with infections? My son had terrible tonsilitis and ear infections. he was on alot of antibiotics and steroids. (the steroids to reduce inflammation of his tonsils) I have always wondered if the meds were apart of his problem... but know the antibiotics kept him alive, could the steroids have kept him on this side of verbal? He is mainstreamed in 7th grade and reads ect... just has social difficulties and major sensory issues!???



Paul & Sonja Kiser

November 18, 2010 at 11:12 am | #51

[Reply](#) | [Quote](#)

What effects will this study have on the psychiatrists since all that they do is to interview their patients? If an xray is taken of a brain, will abnormalities show up so that treatment can be based on substance?



Melanie

November 19, 2010 at 12:06 pm | #52

[Reply](#) | [Quote](#)

My 3 year old son was diagnosed this year with ASD, severe apraxia, and sensory processing disorder. i've read some of your comments and I was 33 when i had him and i was not on any fertility pills(it did take us a while to get pregnant but no pills etc were used...just finally happened when we just about accepted the fact it wasnt meant for us). As all of you, i have many questions in my head all the time as the cause...mmr vaccine (he did have a "viral rash" after a vaccine around age 2..is it coincidental? environmental? my tough pregnancy issues...I had bad case of Hypermesis (NOT morning sickness...dif...you are sick ALL the time...so how do nutrients get to baby if i lost them all time?) Toxemia and HELLP syndrome...is it bc he was 6 wks premature? im curious as to how many premature children are diagnosed or it just happens to some? We had emergency c-sec and i was in ICU getting blood transfusions and more after his birth and he was in NICU about 3 wks. We had a tough start and very happy to both be here and we will do whatever necessary to help him have a good life. Currently we are having war with Insurance company and school system in order to get him the speech and other services he so badly needs...i hear children speaking sentences much younger than him and he has his own language, but atleast he is now speaking some words?approximations which we are very happy.

November 29, 2010 at 11:54 am | #53

[Reply](#) | [Quote](#)



nicole

Hello!

I work with children on the spectrum and all I can tell you parents is to fight for your children. No one can get them the help they need but you. It can be a hard and long road but it is worth it in the end. Your child is entitled to FAPE in the LRE. Fight for the rights they deserve. They deserve it just as much as anyone else. If you look there are people who will help in the fight.



Chris Phillips

December 3, 2010 at 7:29 am | #54

[Reply](#) | [Quote](#)

Great summary of this article. Thanks so much for your excellent work!



Diane Grell

December 9, 2010 at 2:39 pm | #55

[Reply](#) | [Quote](#)

I also did not have fertility treatments or take birth control. I had a depo shot after my autistic son was born. Maybe one day the pieces of the puzzle will come together.



Tina

March 25, 2011 at 1:05 pm | #56

[Reply](#) | [Quote](#)

Has anyone heard about Vitamin D? Supposedly, Autistic children are lacking Vitamin D. Vitamin D helps with inflammation. Does Autism have to do with inflammation of the brain?

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[Autism in the News – Thursday, 11.11.10](#)

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