Collins, Denise (OAH)

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From: Theresa Deisher <tdeisher@soundchoice.org>
Sent: Friday, June 14, 2013 10:09 AM
To: *OAH_RuleComments.OAH
Subject: Immunization Rules docket 0900-30570
Attachments: Transcript of Dr Deisher's presentation to MN HHS.docx; Environmental Triggers and AD.pdf; CV Theresa Deisher.pdf

Dear Judge Lipman,

Attached to this email is testimony given to the MN HHS legislative committee in April 2011 as well as a manuscript under review for publication in the journal Pediatrics describing the known dangers of administering vaccines contaminated with human DNA and retroviral fragments, such as the Hepatitis A and chickenpox vaccines. All poliovax containing vaccines, all hepatitis A containing vaccines, the MMR II, and the chickenpox vaccine are manufactured in aborted fetal cell lines. In addition to the moral objections that many people have to the use of vaccines manufactured in these cell lines, the final vaccine products contain residual DNA, cellular debris, and in some, retroviral fragments from the aborted fetal cell lines.

The introduction and use of the vaccines with the associated high level of contaminants presents the potential for autoimmune disease and for insertional mutagenesis in the recipients. Introduction of these vaccines is associated with sudden increases in autism disorder throughout the world, and in the US, where excellent data is available, the use of the Varivax (chickenpox) and the Hepatitis A vaccines is directly related to the number of children diagnosed with autism disorder, the most severe form of autism, each year.

While the intent of adding these vaccine requirements is to protect the health of our children, additional requirements for the Hepatitis A and Chickenpox vaccines may inadvertently introduce even heavier burdens of autism disorder and other forms of autism spectrum on our society. The FDA has 'discussed' the known dangers of using the aborted fetal cell lines for decades, without appropriate study. I would ask that you at least delay any decision on adding these vaccines until appropriate studies can be done to assure their safety.

Respectfully,
Theresa Deisher

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Chair Rep Gottwalt: We do not have quorum so we won't call the meeting to order but we have a presentation -- actually, a couple of presentations on vaccinations that we're going to have to do in committee. We're going to go 45 minutes with their presenter and then 45 minutes with the Department of Health. We agreed bipartisanly to kind of provide a balanced presentation here today and that's what we're going to accomplish. And then about 2 o'clock, we're going to hear House File 1584 Representative Dean's Bill and then we are done. We will not comeback this evening and I know there's at least a few people who will be pleased about that.

So with that, I'm going to invite our first presenter to the testifying table so we can begin.

Welcome to the committee.

Dr. Theresa Deisher: Good afternoon.

Chair Rep Gottwalt: Please state your name for the record and please begin with the presentation.

Dr. Theresa Deisher: Theresa Deisher. I am here to share with you some information and data that Sound Choice Pharmaceutical Institute has been working on for the past several years. And Sound Choice is a non-profit research and education organization dedicated to increasing awareness about the widespread and pervasive use of aborted fetal material in biomedical research and drug production, in cosmetics, and in the food and beverage industry.

I obtained my doctorate from Stanford University in Molecular and Cellular Physiology in 1990 and completed my post-doctoral work at the University of Washington. My career has been spent in the commercial biotechnology industry at companies that include Genentech, Repligen, ZymoGenetics, Immunex and Amgen.

During my career, I have done work from basic biological and drug discovery through clinical development. I'm an inventor on 22 issued U.S. patents and several clinical trials have resulted from these patents. FGF 18 is currently in phase one trials for osteoarthritis and phase 2 trials for cartilage repair. Factor XIII completed phase 2 surgical bleeding clinical trials in February 2011.

In January 2011, the U.S. Department of Health and Human Services, Interagency Autism Coordinating Committee released a strategic plan for autism disorder research and that's Appendix A. We have made copies that you can obtain from Terry Kopp.

In this plan, they accept the June 2009 recommendations of the National Vaccine Advisory Committee to support additional studies into the link between vaccines and autism disorders. Autism disorder is a polygenic disease requiring an additional environmental trigger or triggers. A polygenic disease is a disease for which multiple diverse genes may be involved, however, no single gene is neither necessary nor sufficient to induce the disease.

Chair Rep Gottwalt: Doctor Deisher, I'm going to interrupt you momentarily. We now have a quorum, so I will officially call the meeting to order, wait a minute. I was asking my table assistant here if we had minutes yet, and I think that's probably asking just a little much at this point, but Doctor Deisher please continue. Thank you.

Dr. Theresa Deisher: In the case of Autism disorders, over 300 genes have been associated with the disease. Additional environmental or health insults are required to trigger this disease in genetically susceptible individuals. What this means, the term polygenic, is that having a mutation in one of the genes associated with the polygenic disease does not mean a person will develop the disease. Some additional insult is what triggers the disease.

For instance, in animals we know that Crohn's like disease requires a genetic mutation, anintestinal bacterial anomaly, and a viral infection in order to be triggered.

In the IACC 2011 strategic plan from the Department of Health and Human Services, the fact that spontaneous de novo genetic mutations are associated with autism disorders in at least 10% of cases is discussed, that's on page 33 from the PDF pagination and page 25 from the IACC pagination.

What this means is that some mutations that have been associated with autism are not present in the parents and therefore have occurred only recently in the children. Some of these de novo mutations are present in genes that code for proteins that are critical for nerve cell communication which is also called synaptic connectivity.

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The IACC strategic plan states that "progress in identifying environmental factors that increase autism risk has been made recently. Although, this area of research has received less scientific attention and a far fewer research dollars than genetic risk factors.

Environmental factors may be pertinent, not only to brain development, but also to chronic systemic features of at least some groups ASD, Autism Spectrum Disorders." The

strategic plan goes on to state, on page 35, that "recent studies suggest that factors such as parental age and exposure to infections, toxins and other biological agents may confer environmental risk. These findings require further investigation and testing."

How would such investigation and testing be done? Analysis of autism disorder rates using what is called "Hockey Stick Analysis" published in March 2010 by the Environmental Protection Agency, has identified what is called a change point in U.S. and worldwide autism rates. Their change point analyses as well as Sound Choice's independent change point analysis consider autism prevalence for birth years. What this means is that a change point in say 1988 is not a year when autism diagnoses suddenly increases. It is the year that children subsequently diagnosed with autism disorder were born. This is important to remember because other statistics relevant to the topic we are discussing today are not given for birth year cohorts but for the actual year of measure.

Another important point to keep in mind is that the EPA and Sound Choice's change point analysis considered only autism disorder and not autism spectrum. Autism disorder is the more severe form of autism and is diagnosed prior to the age of three. From the data sets that the EPA analyzed, a change point occurs in birth year 1988. What this means is that autism was rising at a lower rate in children born prior to 1988 than in children born after 1988. Analyses such as these have been used to detect ecosystem response to environmental toxins and resulting estimated thresholds have been used as the basis for setting U.S. environmental policy. Therefore, this type of change point data is robust enough to set federal policy.

The EPA publication recommends on page four that "future study should examine for novel or increasing exposures to environmental factors from gestation to at least age three for our calculated 1988 to 1989 birth cohorts." For potential in utero exposures then, we would be looking for something widely almost universally introduced to pregnant mothers in the years 1987 through Q1 1989. For a childhood vaccine for instance, recommended to be given between 12 and 15 months of age with up to 20% immunized before 12 months and up to another 33% immunized between 15 and 36 months we would be looking for an event between 1988 and 1991. 4.

The method used by the EPA for change point analysis called "Hockey Stick Analysis" can identify only a single change point in a data set. More sophisticated analysis methods called segmented linefit algorithms are able to identify multiple change points in data sets. Sound Choice has

analyzed the data sets used by the EPA employing this more sophisticated segmented line fit algorithm as well as additional data sets of U.S. autism disorder. And we have confirmed the 1988 EPA change point and furthermore identified two additional U.S. change points, one in 1981 and the third in 1996.

Taken together the worked at Sound Choice and the EPA publication establish three U.S. change points for autism disorder; 1981, 1988 and 1996. These data indicate that some widespread perhaps almost universal exposure or environmental trigger was introduced that would affect children born in and after 1981, 1988 and 1996. The IACC strategic plan states that biological agents may confer environmental risk.

What is a biological agent? I'd like to quote from the FTA's website to give you the definition of a biological agent.

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"Biological products include a wide range of products such as vaccines, blood and blood components, allergenics, somatic cells, gene therapy, DNA, tissues and recombinant therapeutic proteins." There are those who may tell you that the vaccine autism question has been answered and debunked. However, not only is the U.S. Health and Human Services, IACC strategic plan calling for further investigation of the link between vaccines and autism, but they are also calling for investigation of biological agents contaminating the vaccines that we inject into our children.

What are these biological agents? I want to say only one thing about Thimerosal which is mercury in vaccines and I am not saying that Thimerosal is innocuous. However, there were higher levels of Thimerosal in total childhood vaccinations from 1948 to 1988 than there are today. And furthermore, change points in Thimerosal levels in vaccines do not coincide with autism disorder change points and the levels of mercury today are greatly reduced compare to 1999. However, autism disorder has continued to rise.

The viruses used in vaccines are produced in cell lines because production in a test tube is inefficient and too costly. Currently, both animal and human fetal cell lines are used by vaccine manufacturers. Production of viruses and cell lines results in residual DNA and cellular debris from the manufacturing cell line in the final product.

For instance, as can be found in Merck's Summary Basis for Approval which is Appendix F, page three, for the chickenpox vaccine over 2 micrograms of residual double stranded human fetal DNA are present in each vaccine which is

approximately twice the amount of the active ingredient of the vaccine which is the varicella virus, a DNA virus.

As FDA scientists state in their 2008 publication in the Journal Biological's, "the danger of residual DNA in vaccines has been debated for over 50 years" without appropriate studies. The 2008 publication by these FDA scientists demonstrates the real and present danger of human DNA residuals in vaccines which include cancer, autoimmunity and genomic disruption. As I have already mentioned, the IACC strategic plan well summarizes data demonstrating de novo genomic disruptions at varied sites in at least 10% of children diagnosed with ASD.

Sound Choice became interested in the potential link between vaccines and autism because we were approached and asked to develop alternative vaccines for parents who objected to the use of human fetal cells for vaccine production.

In the U.S., over 10 vaccines are manufactured using human fetal cell lines and for MMRII and hepatitis-A there are not alternatives available in the U.S. The vaccine for chickenpox is also produced using a human fetal cell line and the only alternative anywhere in the world, which some data indicates maybe the preferred alternative, is natural exposure.

Based on the research we have done, perhaps as many as 3% of parents decline vaccines primarily due to the use of human fetal cells in the manufacturing. The viruses for the chickenpox and the hepatitis-A vaccines are manufactured in the MRC5 cell line which was derived from a normal three and a half month male fetus, while the Rubella virus in the MMRII vaccine is manufactured in the WI38 cell line which was derived from a normal 3-month female fetus.

In taking on a mission to provide alternative vaccines to those who object to the use of human fetal cell lines for vaccine production on a moral basis, we begin to study the literature surrounding vaccines. The vaccine autism controversy is difficult to miss and simply reading the published literature should immediately arouse curiosity in a fresh and objective, perspective mind. Firstly, even in the publications that claim no link between MMR and autism, there is an evident autism change point in 1988. The authors dismissed the link between autism and the MMR vaccine in these publications,

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because as they point out vaccine compliance was already, well over 95% in the U.K. before 1988. However, what the authors documented on page 4, the top right which is Appendix L of our binders, but failed to investigate was that the MMR vaccine used in the U.K. was switched in 1988 and 1989. Prior to 1988 the MMR in the U.K. was produced in animal cell lines and in 1988 and

1989 three new MMR's replaced that original MMR, all of which use human fetal cell lines for the production of at least one of the viruses contained in the MMR.

Having worked in commercial biotechnology and clinical development programs, I was aware of the residuals that would be found in vaccines and having also worked with homologous recombination and molecular biology, I was also aware that the human fetal DNA introduced in vaccines has the potential to elicit autoimmune responses or to incorporate into the recipient's own genes and disrupt normal protein production.

Inflection points, change points, are clear by eye in U.S. autism prevalence data from the Department Of Education as well as from the California Department of Developmental Services. This intriguing and perplexing visual assessment of U.S. autism prevalence together with publications on autism rates in the U.K., led Sound Choice to more fully investigate. What we have found is that across continents and across decades, changes in autism disorder, not considering autism spectrum but only autism disorder, are clearly associated with the introduction of vaccines produced using human fetal lines.

Each time we inject our children with one of these vaccines, we are also injecting them with residual fetal human DNA. U.S. vaccination compliance information was collected by the U.S. immunization surveillance from 1959 to 1985 which was a telephone interview system, then, by the National Health Interview Survey, NHIS from 1991 to the present and by the National Immunization Survey, NIS from 1994 to the present. No data was collected for 1986 to 1991 except by retrospective studies after measles outbreaks had occurred. The CDC morbidity and mortality weekly reports contain data regarding measles immunization coverage that can be used to fill in this 1986 through 1991 gap.

I've already mentioned that the U.K. 1988 birth year change point in autism disorder is associated with the switch from animal to human fetal produced MMR. In the U.S., the switch was first approved in late 1979 and by 1983, only the human fetal produced MMRII was available in the U.S. coinciding with the 1981 birth year change point for autism.

In 1989, a second dose of MMRII was added to the U.S. vaccination recommendations to be given not less than 28 days after the first dose. We cannot determine the significance of the second dose without accessing each child's immunization record because while it is geared towards 4 to 6-year olds, the recommendation allows it 28 days after the first dose. And we know that significant numbers of children, up to 20%, receive vaccinations earlier than recommended.

More significantly a compliance campaign was undertaken after measles outbreaks in 1988 and 1989 that brought compliance with MMR from as low as 49%, and perhaps even lower (Appendix N) between 1986 and 1989 (birthyears 1984 to 1987), to over 82% in 1991 (Birthyear 1989, NHIS).Introduction of a second recommended dose in 1989 and the compliance campaign correlate with the 1988 calculated autism disorder birth year change point in the United States. MMR vaccination rates increased from birth year's 1987 to 1989 by at least 20% and perhaps by as much as 30% to 40%.

In 1995 the chickenpox vaccine was approved in the U.S. and correlates with the 1995.6 autism disorder birth year change point.

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The rate of chickenpox uptake also corresponds to the post 1995.6 birth year change point slopes. And not included in my written testimony but something that I want to add orally is also the fact that within the past five years, in our combination polio vaccines that we are giving to children at two months, four months and six months of age, asignificant proportion of our children at those early months of life are also receiving from the polio vaccine contained in those combination vaccines, human fetal DNA and this may explain the apparent earlier age of autism onset that we're seeing in the past few years.

Similar associations between autism disorder change points and human fetal DNA containing vaccines are evident for Canada, Denmark, Japan and several Southeast Asian countries. The U.S. Vaccine Safety Database contains data regarding immunizations and autism disorder for hundreds of thousands of children and careful analysis of this data comparing autism rates prior to 1995 and after 1995 as well as comparing autism disorder prevalence in children vaccinated or not vaccinated with the chickenpox vaccine, will provide significant information about the potential association between the use of human fetal cells for vaccine production and autism prevalence.

Sound Choice is preparing a proposal to gain access to the vaccine safety database to conduct this analysis. We are partially funded through a grant from the Murdock Charitable Trust and we are actively looking for additional funding to conduct these types of studies.

I also need to say that it is important that independent groups conduct these types of analyses and several groups should independently examine each question so that children are finally helped and protected. One of the key scientists

funded by the CDC to do studies into MMR and autism links, studies used to dismiss the MMR autism hypothesis, was indicted on April 13th this year 2011 on 13 counts of fraud and 9 counts of money laundering. Furthermore, Doctor Thorson had already been cited for academic misconduct by his own university and was charged with embezzling $1 million grant from the center's for disease control.

There are also viral contaminants from the human fetal cell lines used to produce the vaccines present in the final product. Human Endogenous Retrovirus K is present in the MMRII in Meruvax, which is a monovalent rubella no longer produced, and in the chickenpox vaccines. This work was published in the Journal of Virology in 2010. HERV-K, Human Endogenous Retrovirus K is a virus related to the MMLV virus, a virus that was used to deliver gene therapy in clinical trials for boys with SCID disease, that is severe combined immunodeficiency, they're also known as "The Bubble Boys".

The MMLV virus caused inappropriate gene insertion and subsequent somatic gene mutations in 4 of 9 boys that led to the development of cancer. Although experts testifying prior to the initiation of those clinical trials estimated the risk at 10 to the -26, the actual risk turned out to be 4 of 9 boys developed cancer. These studies are published and are included in the appendix of the binders that I have with me.

So not only was human fetal DNA introduced to our children with MMRII and chickenpox vaccines but a retrovirus capable of enhancing genomic insertion was also introduced in these vaccines. Sound Choice is focusing our work on quantifying the genomic integration of human DNA fragments into human recipient cells and on epidemiologic studies to evaluate the temporal link between human fetal cells produced vaccines and worldwide autism prevalence.

Additional safety questions about the use of human cell lines for vaccine production include viral contaminants such as the HERV-K. There are clearly several safety issues with our current vaccination program that have not yet, but need to be addressed, which may also include the number of vaccinations delivered to children over short time periods.

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Most importantly, solutions are readily available. Merck has monovalent animal-produced mumps and measles vaccines that could be reactivated within a few months. And Japan has several animal-produced MMR vaccines with outstanding safety and efficacy records that could be brought to the US rapidly. The monovalent measles vaccine was discontinued by Merck for economic reasons in December of 2008. That makes me ask, what will we now do for pregnant women in

the event of another measles outbreak? They should not be given the MMRII as the Rubella Virus in that vaccine crosses the placenta and can infect the fetus, potentially leading to congenital Rubella anomalies. This is just another example of where vaccine policy has not been based on the best interests of the patient.

The vaccine autism issue evokes strong emotional responses from people and the use of fetal human fetal cell lines for vaccine production may stir up pro-choice defenses. However this issue is not about Andrew Wakefield, whom I've never met, nor about women's reproductive rights. In fact, most pro-choice women, and most of my personal friends are pro-choice, are philosophically opposed to injecting their children with vaccines containing human fetal cell DNA. This issue is about the health of our children and what we give them in vaccines. And politics has no place when we think about the health of our children and a devastating disease like autism.

I would like to close with a quote from a father of two boys with autism, written to the Stanford Alumni Magazine. "Policy makers and medical professionals ought to be more motivated by a true desire to know more rather than ideology. As a parent, I don't care about ideology. I just need research to help me choose between therapies that work and those that don't." Thank you for your time and attention.

Vice Chair Rep Mack: Thank you Dr. Deisher. Members will take -- we have about 15 minutes for questions for Dr. Deisher and then we have another presenter to start it out at 1:15. So with that, members questions, comments, discussions? Representative Barret.

Rep. Barrett: Thank you Madam Madame Chairman and thank you Dr. Deisher for coming here today and giving us this good information. I -- quite frankly, I have no idea myself with all the things that happened with the immunizations we give. Can you just tell me how long and I came in late so you probably already mentioned this. How long have you been working on this issue?

Dr. Theresa Deisher: About three years.

Rep. Barrett: Three years, okay. And then can you give just a background, I don't know what happens when we create these, these -- I'm trying to think of a name now.

Dr. Theresa Deisher: Vaccines.

Rep. Barrett: Vaccines, thank you. Long night, last night. What is the process for testing and for understanding these issues before these vaccines are approved, if there are any?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: Thank you. There have been no studies on the residual human DNA in these vaccines that have been done that address all of these issues to date. The first publicationlooking at any of these questions came out in 2008 from FDA Scientists. And their concern was bout the danger of cancer induction using these cells and to give you a little background about what their concern is -- when we make the viruses that we use in vaccines, the active ingredient of a vaccine is a virus that elicits an immune response from the recipient and then would give you immunity if you were to be subsequently exposed to naturally occurring viruses, okay.

We have to make these viruses in cell lines because they're too large to make in the test tubes. So we make them in animal cell lines, we make them in human fetal cell lines, and people are developing methods to make these in plant cells now. And in that process when you go to harvest the virus you carry components of the producing cell line through to your final product. You cannot eliminate those. And for instance in the chicken pox vaccine, 2 micrograms of double-stranded DNA is present in the viral in the final product. That is from Merck's measuring of the residual DNA levels, not from our measuring. And those numbers are contained in their summary basis for approval. Recommendations originally, were that no more than 100 pictograms of residual DNA be present in each vaccine.

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And those recommendations have been relaxed twice. Now, it's at 10 nanograms, because the manufactures could not meet those. So here, we have chicken pox which is 2 micrograms, that's 200 fold higher even than those relaxed recommendations. So because the FDA knows that the presence of this gene poses a danger for genomic insertion, and they were worried about cancer, so what they thought is a cancer-causing gene would come all the way through the manufacturing process and be inserted and cause cancer.

They recommended that what the manufacturers do is chop up the residual DNA in the vaccines, so that it's about 250 nucleotides long. Our DNA is made up of nucleotides because the smallest known gene is 800 nucleotides. And so the reasoning probably was, well if we chop it up to 250 nucleotides we don't have a whole gene. So then we don't need to worry about a cancer gene being inserted in a cancer protein being made.

When they made those recommendations, we didn't have the molecular biology information that we have now. But we know and we know this primarily from scientists trying to do

gene therapy that those large fragments don't insert into the genome anyway. And it turns out that fragments about 250 base pairs and below, actually 500 base pairs, 500 nucleotides and below, more readily insert into the recipient's genome. And there's a large body of scientific literature published on this. So in trying to prevent the danger of a cancer gene, the recommendations have actually inadvertently created probably the most dangerous scenario.

Now, the levels in Merck's are so high that they did do additional safety studies. And those are contained in their summary basis for approval. However, they did not do the correct safety studies because they looked at genomic insertion of this human DNA in mice. And genomic insertion is species specific. They needed to look at this insertion in human cell lines, so -- therefore the appropriate studies have never been done.

Rep. Barrett: Thank you, thank you Doctor.

Vice Chair Rep Mack: Representative Ambler.

Rep. Ambler: Thanks Madam Chairman. Well this is fascinating and I think compelling. And these are list as a panel of people coming up this. I presume they'll be reacting to this and so now that I hoped they do. Doctor, what have been -- has the people embraced this idea? Are they moving away from this now and making the world safer? Could they believe you? How's that going?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: So, I've actually found the response interesting and I find the greatest opposition to this when I speak to groups of physicians who are affiliated with religious organizations. However, when I present this data to organizations that are completely secular like the Washington State Medical Association, they object I think to the potential pro-life components of it.

But the scientists and physicians are well aware of the potential danger. And some of them speak about the rise in, unexplained leukemias and lymphomas in children that they're seeing. And you know, well, -- they are very supportive of this, that research needs to be done because they know the potential dangers.

Vice Chair Rep Mack: Representative Abeler.

Rep. Abeler: Madame Chairman, I'm sure just -- I mean has anybody like embraced this and changed something that they didn't do before?

Vice Chair Rep Mack: Dr. Deisher.

Rep. Abeler: It's like in Minnesota we pay for this stuff. But it turns out that we're poisoning are -- creating more autistic children. In Somalia's are one in 25. They come here and they refine before they visited us and made this state their home. See if they've created a lot of responsibility, has anybody taken this seriously besides just letting you talk to groups? And like it's -- that the problem of health would be coming down? I mean this is really big news, it seems to me, and this is something that should be like on channel 5 or something.

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: I believe CBS recently covered this potential link in it, a new story that went out. And we obviously take it seriously and we're dedicated to providing alternatives. It's interesting you know, we go out to third world countries, we go down to Central and South America with the best intentions, humanitarian intentions to provide these immunizations.

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And in 2000 and 2001, the World Health Organization had a massive measles, MMR immunization campaign in Southeast Asia. And these countries previously did not have autism and now they do. So our humanitarian efforts may have unintended consequences and that's certainly not something that anyone would want to do. Introduce a novel disease in our efforts to actually improve the lives of these children.

Vice Chair Rep Mack: Okay members we have three more folks on the list with questions in about seven minutes. So just, keep that in mind, Representative Franzen.

Rep. Franzen: Thank you Madam Chair. Dr. Deissher, what about transfusions in the DNA that we've received from transfusions, could you explain?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: The fact, that we have blood transfusions was used by people like Dr. Paul Offit to just dismiss the dangers of this. And it's important to remember that DNA will be more or less dangerous depending on the cell type and the age of the cell that it is presented to.

So for instance, if you had genomic incorporation in a mature cell that had a limited life time, for instance our skin cells, they're sloughing off all the time. Probably there would not be any consequences. If you had genomic insertion into a stem cell, which is what happened in those gene therapy

trials in the SCID patients then you have the danger and you have the resulting cancer, okay.

So here, we're giving DNA to young children with rapidly developing brains, right. Now, if you want to look at where we are giving human DNA to adults or older children, the potential heath consequences are probably less likely to occur and less the DNA was to get into a stem cell. So if you go back then and you say "Well what about young children who received transfusions? Is that associated with autism?"

So first of all, not many children receive transfusions. And when young children receive transfusions, they tend to receive packed platelets not the whole blood components. Platelets do not have nuclei. They're enucleated, that means they do not have nuclei or nuclear DNA, and so they do not present the nuclear DNA to these children. So we don't have any information in children about how transfusions would impact them because they don't get them.

Vice Chair Rep Mack: Representative Benson.

Rep. Benson: Thank you Madam Chair. Doctor, I've been following it over the last few years, I had some four grand children. And you know I know from the perspective of the vaccine and following that but it's gotten some pretty disparaging news regarding the falsification of data and prior. I'm still very compelled to – I'm going to keep a watch on. I think there is some evidence that we need to study more.

It's more of policy rather than medical and listening to your testimony and reading them as you are reading then I guess I was reading in the script. That there's an animal line, an animal-produced vaccine line in Japan, and for us, I think this is a follow-up with Representative Abeler. Isn't there enough compelling evidence so at least to have us to modify for it on a temporary basis until this all be validated, that maybe we shouldn't be moving?

Wouldn't it be prudent then I -- and you know exactly this people -- Representative Abeler brought up one in 25 and in your paper here its one in 28 in terms of our Somali population. I found it online as you were speaking that at least in a certain population until we can -- I mean in your estimation as a policy maker, shouldn't we be moving to a less dangerous line of vaccine?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: So the type of change point analysis that the EPA did and that Sound Choice has done and we've submitted our analysis for peer reviewed publications and it's under review right now. It has been sufficient to set US Environmental Policy. And I --

this should be sufficient for us to take a close look at vaccines and make some changes.

Now, in response to the distress of Mercury in vaccines, that was removed from the Hepatitis B vaccine. Really with less, let's say robust compelling statistical evidence, and I'm not trying to say that Mercury is innocuous. I really don't want that in my vaccines. Then we have with this link, right. And I think when people -- we've discussed and debate all the time. How widespread do you make this information known?

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There isn't currently an alternative vaccine in the US because Merck's ceased production of the monovalent measles and mumps, right? So how should you inform people when you don't yet have an alternative and we're working very hard to bring in an alternative. I think if people know about this and think about the health of our children and what devastating a disease autism is, many people like to dismiss it. And they'll say "Well Bill Gates has autism." Well Bill Gates doesn't have autism.

So they dismiss the devastating effects of autism on these families. And if people just said "no", Merck would be producing the alternatives within several months, right. We have to make decisions and then we'll find that the alternatives will be available.

Vice Chair Rep Mack: Representative Haas(ph).

Rep. Haas: Thank you Madam Chair and Dr. Deisher. One of the things that I found interesting is the access and the importance of data and reporting for your research and one of the things that was discussed was the high prevalence of autism among our Somali community. We've been having a debate about racial disparities reporting and do you think it's important for us to try to gather data and to have access to that information when we're trying to make public policy decisions on the health care firm?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: Do I think that data regarding racial disparities is important in public policy --

Vice Chair Rep Mack: Representative Haas(ph).

Rep. Haas: Madam Chair, that or just data reporting over all. For us to make informed decisions and to be able to conduct a research we need to have access to that. And as policy makers that is something we're constantly debating and struggling over. So I just want to understand the importance and how you access

that data. And also, the components if that there are actual racial disparities when it comes to health outcomes.

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: So in regard to the autism work, we would look at that data through genomic efforts and sequencing efforts. And I believe one hypothesis would be that the Somali population has a snip. It's called the single nucleotide polymorphism or some other genetic anomaly in that population which makes them more susceptible to whatever triggers autism. And sequencing of the genome would look into that and compare the different races.

I do know from a broad health care perspective that different racial and ethnic backgrounds oftentimes respond differently to drugs. And so if we're going to adequately treat and give appropriate medical care to everyone in the US, we need to consider racial disparities when we're doing our clinical trials because one group, for instance, Chinese may respond better to this beta blocker than to that beta blocker. And we know that beta blockers have some racial disparities in the outcome. So I think it's very important.

Vice Chair Rep Mack: Representative Liebling.

Rep. Liebling: Thank you Madam Chair and I think Dr. Deisher you might have partly answered this. So I was going to ask you about whether any of your work has been published and peer reviewed because I have somewhat of a public health background and I know that oftentimes in health issues things that -- we sort of do have fads and health sometimes and things kind of come and go in the media. And our sort of our gold standard is publishing and having peer review and after a while sometimes granted, even things sometimes that a lot of people agree on it then can be found to be different. But I just wanted you to talk a little bit about if you have published and where?

Vice Chair Rep Mack: Dr. Deisher.

Dr. Theresa Deisher: We have presented our work at the International Meeting for Autism Research in 2010 and those are poster presentations. We've just submitted our change point analysis for peer review publication and it's under review. Our grant applications are peer reviewed. And I think most importantly, the evidence that I'm presenting to you today is not predominantly my evidence or my work. This is published evidence from the EPA, from the FDA, from academic scientists publishing in the Journal of Virology. And if you look at the 2011 Health and Human Services Interagency Autism Coordinating Committee Strategic Plan, you'll see a long list of these publications peer reviewed, published

publications documenting de novo genomic insertions in autism patients.

00:45:01

Vice Chair Rep MackFemale: Representative Liebling.

Rep. Liebling: Well thank you Madam Chairman, thank you Dr. Deisher. I don't doubt that a lot of the pieces of information that you're drawing from are peer review and published in various places. But I think that you're presenting something here which is rather noble and different from that's we've seen before. Bringing it together requires and the way you bring it together also requires peer review. I'm sure you would agree with that. And so you said that you've submitted this change point analysis but you didn't say where you've submitted it and I'd be curious to know that.

Vice Chair Rep Mack: Doctor Deisher.

Dr. Theresa Deisher: It's been submitted to Autism Research.

Rep. Liebling: Thank you.

Vice Chair Rep Mack: Representative Murphy.

Rep. Murphy: Thank you Madam Chair and welcome Doctor, you're a scientist, we're policy makers. We make decisions in a noisy and public in boisterous way. And we wrestle with difficult decisions. I think the public would probably not give us great marks necessary of how we make decisions but we make them. We're wrestling right now with the budget, having a difficult time with that.

We hear from people all the time. People come and testify about information, about the impact of our potential decisions on their lives. And we try and take that information and make a good decision.

You're presenting to us information that is very complex in a scientific way. It's the first hearing that we've had on this -- the session. And the first exposure we had to this information. And, so as a citizen, and not as a scientist, I'm wondering and I'm going to ask the other people who come up to talk about this, the same question as a citizen and not as a scientist. What advice do you have for us in terms of making a decision based on the testimony that you're providing for us today?

Dr. Theresa Deisher: Because of the publics perceived fears about the link between vaccines and autism, which nothing that Dr. Offit or Merck or the CDC has been able to do to allay, more and more people are refusing vaccinations. So this is a public health issue,

right? As well as a potential national security, issue. The solution is very simple, investigate objectively and fully the vaccines and the autism link and provide alternatives that people will readily use. Mercury has been taken out of many vaccines. We can keep mercury out of other vaccines if that continues to be a perceived issue. We can manufacture vaccines using animal cell lines.

All we have to do is insist that the pharmaceutical companies provide safe vaccines. Now in the US, it's interesting, these pharmaceutical companies have no liability for the safety of their vaccines.

Rep. Murphy: Thank you Dr. Deisher. I don't think that you really answered my question. And maybe it's a hard question for you to answer as a citizen. And I understand that you're suggesting that we should make vaccine safe, but we don't have the capacity to do the investigation that you're describing. As the legislators, as the policy makers, that is the work of Americas Scientists. So when you bring to us a piece of information like this, it's the first that we've seen it. Its complex, I have a background in nursing. There is someone who is a doctor in science on this committee but most of us don't have a lot of background in science.

So, as a citizen, I am wondering if you think that we should take this information today and make public policies decisions based on this one and single hearing. Would it this be a decision -- wouldn't this discussion be better in a scientific forum with people with scientific backgrounds like you to render a conclusion about the data before you bring it to a policy arena, and ask us to make a decision on something that is such an important public health question for the people of Minnesota.

Dr. Theresa Deisher: I did not come here to ask you to make a public policy decision about this. I was asked as a scientist to come here to present the scientific data to the committee. As this issues are grappled with, okay. So, I am not here myself to introduce legislation or to ask you to make public policy. I'm here to inform you, that's what I was invited here to do.

00:50:14

Rep. Murphy: Thank you Madam Chair and Dr Deisher, I appreciate that. I appreciate that we both understand that you're here to present to us a perspective but not to advocate for public policy at this time, thank you.

Vice Chair Rep Mack: Okay members at this point, we're going to move on to our next testifier. Dr. Deisher will still be here if there are follow up questions after the next presenter, but we have about 45

minutes for the next presenter. So if you could approach the table? And I believe there are three that will be testifying.

If you want to approach the table, you can do that. But we will need to wrap up this portion at about 2:05, still however, the three of you want to divide up that time. If you could introduce yourself, for the record and who you represent and proceed.

Ms. Kristen Ehresmann: Sure, my name is Kristen Ehresmann and I'm the Director for Infectious Disease Epidemiology Prevention and control at the Minnesota Department of Health. I'm also one of the 15-member Federal Advisory Committee for Immunization practices that makes national immunization recommendations and I'm the parent of a child on the autism spectrum. And I've been asked to give the department's perspective on the issues raised by Dr. Deisher regarding vaccines produced using human cell lines.

Dr. Deisher has presented a theory that raises concerns about vaccine safety. We at the Department of Health, they're very interested in vaccine safety. Public health nurses visit clinics all over the state, giving trainings on immunization, and on thing they stress is the importance of reporting anything that looks like it might be a side effect from a vaccine. We also teach the importance of giving out a copy of the Federal Vaccine Information Statement with every vaccine that's given. So that the patient or parent knows, what kind of side effects might occur and what to do if that happens.

However, we have concerns about Dr. Deisher's theory that vaccines cause autism, because of the research that's been done in this area over the last 15 years. A great deal of Dr. Deisher's points is based on observation -- an ecologic observation. In other words, looking at how autism is occurring in the population. And that's a very, very -- and ecologic study is a very, very important part of generating hypothesis. And that's what Dr. Deisher has done.

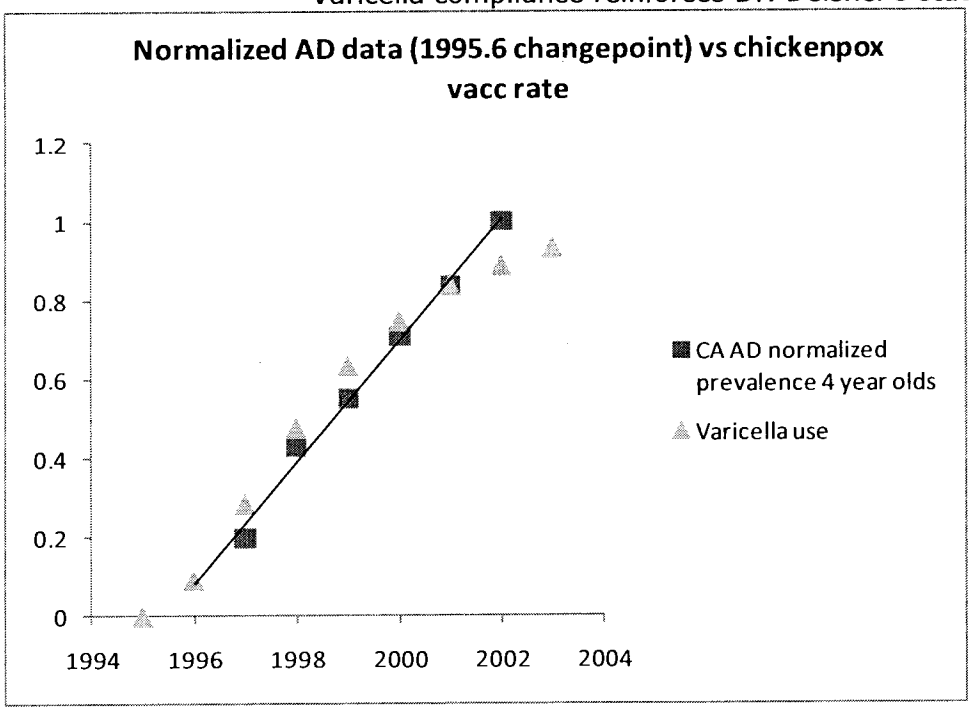
Her comments and perspective is very dependent on the change point analysis that she described. But it's very important to take an ecologic study beyond that level to take it to the next point. And I think the concern that we have is this view point or this theory has not moved beyond theory and has not moved to the point of causation. And as we heard, has not yet been published in the peer review literature.

I'll also just make a couple points on her change point analysis comments just to remind you that the booster MMR dose that we talked about is routinely given at 4-6 years of age, a pre-school vaccine. And although when we talked about minimum intervals if the child is behind on vaccination

or in the case of our current outbreak, we will say, you can give that second dose at least 28 days after the first dose. So that minimum interval, that's not actually the time that the vaccine is recommended. So, I just want to clarify that.

And then I also want to comment on the licensure of the Varicella vaccine in 1995. Unfortunately, we had very poor uptake of that vaccine right after it was licensed and had to work very hard over subsequent years to increase on vaccine coverage levels. And so, that was not a vaccine for which we had immediate uptake. So, just those comments on the ecologic study in change point analysis.

As Dr. Deisher pointed out in her testimony, the coverage levels for the Varicella vaccine parallel the slope of the rise in autism, so this slow Varicella compliance reinforces Dr. Deisher's statements.



So when we're talking about these vaccines that have been grown in human diploid cells, I want to acknowledge that Rubella is one of them. The Rubella vaccine is now given as part of the MMR vaccine as you heard. And as you heard today too, that MMR vaccine has been the focus of vaccine concerns. An English physician, Andrew Wakefield suggested in the article in the Lancet Medical Journal and an accompanying media coverage that MMR could cause autism and this set off a panic in England and eventually, the United States with many parents rejecting the MMR vaccine.

00:55:03

Public health authorities around the world launched studies to provide definitive answers that would resolve the issue. And

more than 25 large population studies were eventually conducted. And I think it's important to comment in relation to Dr. Deisher's testimony that those were conducted in multiple countries.

So although Dr. Wakefield was from the UK and there were some studies that were done in the UK, the experience of the United Kingdom was not the only -- that was not the only country that was looked at in those multiple studies. And none of them found the link between the MMR vaccine and autism. And this is relevant to the issue that we're talking about today because MMR contains Rubella.

No studies have ever been conducted that looked at the link between vaccines containing contaminating HERVK retrovirus and human fetal DNA fragments, and autism. None of the already conducted studies can be used to retrospectively look into this potential link because the studies did not track nor report all of the vaccines the children received. For instance, in Europe, a polio vaccine produced in aborted fetal cells has been available since 1979, so we must know which children received the human fetal cell produced vaccine in addition to the human fetal produced MMR in order to know whether there is a population association between the contaminants and autism. We do not have any studies that have ever looked at this question.

And therefore, if there was a relationship between the Rubella vaccine or this vaccine in becoming autistic, it should have shown up in this large population studies. Because one of the things that's important is -- if you look at, as I said an ecologic study that's looking at what are we seeing when we just look at trends. When we look at fluoride in the water and communities that have natural fluoride, we sought less dental caries and therefore, we looked into that more.

When we looked at an ecologic study, we see a trend and we look into it more closely. But when we get to a population study, we're actually looking at how that relationship affects to people. And that's really, what we care about. And so those studies didn't find that association.

From her above statements, Ms. Ehresmann and the Minnesota Department of Health agree with Dr. Deisher than an ecological trend warrants further population based studies.

And I won't get into the genetic issues. We'd have two experts from the university who are here to do that. But let me just say that while we at the department appreciate and share Dr. Deisher's interest in making sure that vaccines are safe. We know from experience that any expression of doubt can scare parents out of vaccining their children against diseases that are real, present and potentially lethal. We can see this happening at our doorstep.

In Minnesota right now, we are experiencing the largest outbreak of measles since 1995. And with just one more case, it would be the largest outbreak since 1990. We currently have 23 confirmed cases of measles, 14 of which have been hospitalized. That's an over 60% hospitalization rate. The number of parents whose children caught measles in the last few weeks said that they chose not to let them get the MMR vaccine because they were worried that it might cause autism, an idea put forth by Dr. Wakefield a decade ago.

Since he proposed his theory, the research behind his claims has been debunked. And Dr. Wakefield himself has been stripped of his license to practice medicine because of the fraudulent and an act of the nature of his work. However, none of these silences that would a voice in the back of a parents head that whispers, "What if this really isn't safe?" The fear of MMR causing autism is so strong that after all these years it is still putting kids in the hospital with measles.

Dr. Deisher's operating a commercial venture to produce a new version of vaccines. The Department would welcome additional vaccine manufacturers to the market. Having more manufacturers would reduce the possibility of vaccine shortages and to the extent that parents would want to avoid vaccines produced by human cell lines, they would be able to do so. If a new vaccine was FDA licensed, we would be very happy to let healthcare providers in the public know about them. However, to suggest right now without firm data and approve an alternative at hand, that there is something undesirable about current vaccines is to suggest that parents let their children take their chances with measles, mumps, rubella, chicken pox or hepatitis.

I understand that Dr. Deisher has concerns about the moral implications of human cell derived vaccines. To make vaccines against rubella or varicella, chicken pox, we need to grow the viruses in live cells and then weaken them so they aren't strong enough to actually cause illness. Other vaccines against viruses are grown in different types of cells such as monkey kidney cells, or chick embryo cells, but the rubella and varicella vaccines are grown in human cells. All of the cells used for this purpose are laboratory grown descendants of two lung tissues samples, one taken in 1961, and 1966.

These cell lines can be maintained indefinitely. There is no ongoing need nor do we expect one to arise in the future to take new samples that would establish new cell lines. What goes into a vaccine is only the viral material, not the cells within which the viruses are grown. So there is no fetal tissue in vaccines as has been stated.

Ms. Ehresmann has made an incorrect statement. There is indeed fetal material in the final vaccine product; fetal cell debris and DNA as is

documented in the Merck Varicella package insert (excerpt pasted here)

VARIVAX, when reconstituted as directed, is a sterile preparation for subcutaneous administration.
Each 0.5 mL dose contains the following: a minimum of 1350 PFU (plaque forming units) of Oka/Merck
varicella virus when reconstituted and stored at room temperature for 30 minutes, approximately 25 mg of
sucrose, 12.5 mg hydrolyzed gelatin, 3.2 mg sodium chloride, 0.5 mg monosodium L-glutamate, 0.45 mg
of sodium phosphate dibasic, 0.08 mg of potassium phosphate monobasic, 0.08 mg of potassium chloride;
residual components of MRC-5 cells including DNA and protein; and trace quantities of sodium phosphate
monobasic, EDTA, neomycin, and fetal bovine serum. The product contains no preservative.

The National Catholic Bioethics Center recognized this one at stated, "Vaccine use does not contribute directly to the practice of abortion, since the reasons for having an abortion are not related to vaccine preparation." The Bioethics Center has also said that when there is no vaccine available that was not produced using fetal cell lines, "One is morally free to use the vaccine regardless of its historical association with abortion. The reason is that the risk to public health that one chooses not to vaccinate out weighs the legitimate concern about the origins of the vaccine. This is especially important for parents who have a moral obligation to protect the life and help of their children on those around them."

01:00:22

Legislators are also in a position to protect children's lives and health and everyone in this room wants to avoid both vaccine preventable diseases and the possibility of vaccine side effects. So, let me just close by saying that it's the departments view that there is not scientific evidence linking MMR vaccines to autism that there is -- there are only -- that the vaccines available excuse me, are limited. We don't have other options and at least one religious organization to Catholic Church has said that individuals are morally free to use vaccines regardless of how they originally develop.

And finally, if Dr. Deishers Company does develop vaccines that are FDA licensed, we would be happy to make providers in the public aware of the alternatives. But we feel that until there is an alternative to protecting children and adults against vaccine preventable diseases, unproven theories like this one can cause undue fear and results in untoward consequences, thank you.

Vice Chair Rep Mack: Thank you. Whoever would like to go next, it would take about 20 more minutes if it's needed for presentation and then move to questions. Please introduce yourself for the record and proceed.

Dr. Brian Van Ness: Okay, I'm Brian Van Ness. I'm a professor at the University of Minnesota and also a Director of the Institute of Human Genetics and the Division of Medical Genomics. Despite the fact that I don't have any particular specific genetic research interest in autism per se, I do have a vested interest in understanding autism because I also live with a stepson who has autism. So I do understand the daily life and I have a very vested interest in understanding causes and opportunities to prevent autism.

I don't want to discuss any of the moral issues related to the fetal issues because that's not an area of expertise, probably one of more of opinion. But I do want to address some of the scientific concerns. And I first want to say that Dr. Deisher certainly has a credentialed career. She has been accomplished, she has been productive and I congratulate her for moving science into translational practice. I don't think there's any reason of all to question her credentials or her sincerity and asking the questions that she's asking.

I also agree with her at the end of her presentation and end of the discussion that for now, the things that she is proposing as concerns have no basis of firm conclusions and as a result of those lack of firm conclusions, as she agree there's probably no indication to change public policy based on concerns without any real conclusions.

We in genetics frequently work on probability issues. What is the probability of an event happening based on genetic inheritance, based on the opportunity for mutations? I also agree with Dr. Deisher that autism and the autism spectrum disorder is a complex genetic disease that likely represents a multitude of genetic events that are being deregulated potentially in brain development and in multitude of environmental exposures that may trigger the susceptibility into autism.

For that reason, I think one also then wants to look at the probability that these kinds of events can take place as a result of small contaminating amounts of human DNA in a vaccine. Let me make an analogy here, the analogy is that we know that there are asteroids out there that have the chance of blasting our planet. We don't seem to be too worried about it because it seems to be an improbable event. But we know about it because we have telescopes that can amplify our vision of the heavens to the point where we can actually see them, but it requires enormous amounts of magnification.

Likewise, when you look at these vaccines, you have to apply molecular techniques that amplify millions of fold, the amount of DNA that's in there so that you can even see it or detect it. So, I would argue on the first pass that the amount of DNA

and the amount of intact DNA is remarkably small in these kinds of vaccines. As Dr. Deisher pointed out, these vaccines off maintained fragments of DNA which means that the functional components of DNA is lost as it is being fragmented. She points out the fact that retroviral DNA has been shown to be inserted into individual's getting gene therapy and causing cancer, true.

01:05:00

However, these are intact retroviral vectors that have been designed to increase their capacity for integrating into the DNA, not at all available and not of component of the DNA fragments that are present in the vaccine. In addition, one might argue that in order to have an impact, this DNA would have to integrate into the right cells, into the right positions, into the right genes and in sufficient numbers to affect sufficient number of brain cell if you will to impact the cause of autism.

These are all not zero probability events but in some and in total, highly improbable events. That is the likelihood that a vaccine DNA fragment is going to travel to the appropriate cells, potentially brain cells despite the fact that there's a blood brain barrier and get into the right cells and infect those cells integrate into the DNA, low probability.

Integrate into genes that cause autism, low probability. Integrate into a multitude of the complex genes that cause autism, an even lower probability. So as I sit on study sections at the National Institutes of Health that evaluate the proposed studies that scientists are proposing based on a logic rationale, I would feel that this doesn't meet the qualifications of a logic of rationale that suggest that highly improbable events in total would mean that the DNA would have to insert into sufficient number of cells, into sufficient number of the right genes at the right time in order to effect autism.

Put this into my analogy. I think the likelihood of this from a genetic standpoint is not zero. But I think the likelihood is about the same likelihood as an asteroid hitting the Royal Wedding tomorrow. And I've really -- and I don't mean to be facetious about that, but I really think that these are series of individual events that have extremely low probabilities with extremely low amounts of DNA getting into the appropriate cells to cause autism.

Dr. Van Ness's probability calculations are reminiscent of the experst who determined that the probability of the MMLV virus inappropriately inserting into the human genome was about the same probability of an asteroid falling on President Clinton's front lawn. Unfortunately, the experts were incorrect, and the REAL LIFE occurrence was 4 of 9 boys had

inappropriate insertions and developed cancer. Probability and predictions are fine, but REAL LIFE evidence trumps all.

I share my -- the concerns, I acknowledge the fact that the Hockey Stick Analysis is accurate. The increase in autism is a huge concern in the community. It is on the increase. The causes for that are our causes for concern. I do not believe from my at least my scientific evaluation of this kind of information to suggest that this in any way should have an impact on changing policy. Thank you.

Vice Chair Rep Mack: To our third testifier, if you could introduce yourself, who you represent and proceed.

Dr. Perry B. Hackett: Thank you. I'm Perry Hackett. I'm a professor in the Department of Genetics, Cell Biology and Development. I've been a professor at the University of Minnesota for the past 31 years. My degrees are from Stanford and the University of Colorado. My 3-year post doctoral experience before I came here to the University of Minnesota was with Jay Michael Bishop and Harold Varmus. They were called Noble Recipients in 1989 for the work that was done when we were in the lab.

Dr. Varmus went on to become head of the National Institutes of Health and Sloan-Kettering Memorial Cancer Institute. He's now head of the National Cancer Institute. Dr. Bishop has just resigned from being the Chancellor at the University of California, San Francisco.

My research focus has been for the past 20 years on Gene Therapy and methods of introducing DNA into the animal genomes of mice, fish, dogs, and starting in two weeks, human beings. We don't use viruses for this work. We've elected to use DNA's called Transposons that are designed by evolution to hop into genomes. It wasn't until last night that I was asked if I wanted to or would be willing to speak to this community. Chris had asked me if I would talk with the Department of Health after the earlier testimony. And I said I would be glad to give my remarks on and impressions on the materials that she supplied me which concerned the aspects of getting double stranded DNA or even single stranded DNA to incorporate in the human genomes to cause autism. And much of -- well, I concur with everything Brian said except for the bottom line.

01:10:02

Dr. Van Ness used the word low probability over and over. It's no probability, all right? Each of the aspects that are required for these problems to occur is far below scientific abilities to detect. Let me be more specific. The amount of DNA that's in these vials and that would be injected into an

arm of a child is about a million fold less than the DNA that the child is going to take sucking from its mother's nipple, from the get-go.

Again, Dr. Hackett's testimony is reminiscent of the testimony of 'experts' before the SCID gene therapy trials.

Each one of us eats billions of times more DNA in a week than occurs in these vaccines. There's an incredible amount of DNA in our environment. The DNA and each one of you will stretch to the sun and back 200 times, our cells are dying all the time. We have bacterial cells 10 times as many of them as human cells. They're turning over, all of these DNA gets into our blood system, it's degraded for most part.

The second issue is the size. And Dr. Van Ness brought this up. The average size is around 35-base-pairs that are way too small to encode anything, but its way too large to enter cells. It can't do it unless the cells are treated with very special agents to get them in. I know I've had millions of dollars in research branch that try and get cells to take up therapeutic DNA. And it is damn hard. Close to impossible without incredible interventions.

The fourth aspect that has occurred is integration. Our chromosomes are highly resilient to getting DNA into them unless very special agents are used. We use transposable elements, nature also uses viruses. We heard the discussion on the use of the retro viruses for gene therapy. There was an important aspect left out of this report about the kids who came down with leukemia when treated for excelling SCID.

Five patients developed childhood leukemia's directly from the gene therapy. No doubt about that out of the first ten. Four of them were cured completely. Now these are bubble boys. They're confined bubbles and space suits without this type of therapy and they die at an early age, because it's nearly impossible to protect them for their entire lives from any germs that might come about. But what hasn't been told is, is that another 15 kids have been enrolled in this Gene Therapy since these cases.

All the parents are lining up. Because we understand what was involved, the last 15 have not come down with any leukemia's as to date, because we understand what's involved and because we understand that these viruses are designed to do just this. But the DNA in the vials is not in that state. Where would the DNA actually go? According to the hypothesis that was presented to me and the almost certain place it would go is to repetitive elements in our genomes.

Our genomes are roughly 50% repeated DNA elements largely from a transposons and viruses that have been invading them for millions and millions, well hundreds of

millions of years. And this is where these recombination occur. But little bits of DNA should they even be able to get into the cell which as I've told you they can, would not cause a problem because this repetitive elements are inoculated places in our genome. If they were in bad place of our genome, we would run into trouble.

Now what I heard then in the discussion was a mixing not of apples and oranges, but its equivalent of mixing jell-o and steak. Viruses and DNA are very different. Viruses may have DNA in them, but the virus itself confers the ability to get into your cells and possibly, they may get into your genomes. But that's not what the issue is.

01:15:00

And the second thing that I heard that sounded really like a buzz word which scientist don't like to hear and you would never see in a grant proposal, I can assure you. I'll sit on 30 years worth of panels reviewing grants. Is the presence of human fetal cell DNA, the DNA that you had as a fetus is the DNA you have as an adult with very, very small changes that have occurred during differentiation of certain cells.

It's DNA. DNA from an animal, with a mammal is close to 90% to 95% identical to that found in humans. It turns out that the genome projects have shown there's not that much of difference. So where does this lead me? I'm the husband of a retired public health nurse. I'm a father, I'm a grandfather, and I'm an uncle to a nephew who has autism.

DNA is more than merely nucleotides, it is decorated. We call this epigenetics. The epigenetic signature of DNA is highly species specific. Therefore, when considering DNA beyond mere nucleotides, chicken DNA is NOT cow DNA is NOT human DNA. The DNA is very distinct. Genomic insertion is a species specific event when the DNA is in its 'natural' form. The natural form is DNA that has an epigenetic signature. This is DNA made by cells. DNA made in test tubes is only nucleotides, and does not have an epigenetic signature. Dr. Hackett is not distinguishing between natural and test tube made DNA in his comments.

I too, have been interested in this, though it's not my specialty. I'm interested in taxpayer dollars being spent for the very best purposes they can be spent for. Everything that I've seen come before me regarding this project would never get funded by a competitive granting agency. Because the rationale for it is not low probability, it's no probability.

Vice Chair Rep Mack: Okay, we have one more testifier. If you want to come to the table, introduce yourself and who you represent and proceed.

Ms. Diane Peterson: Madame Chair and members of the committee. My name is Diane Peterson. And I've been an advocate for safe and effective vaccines for several decades, first, at the State Health Department and most recently, at the Immunization Action Coalition which is non-national, non-profit organization based in Saint Paul. The coalition's primary function is to create and distribute educational materials for health professionals and the public that enhance the delivery of immunization services.

I'm not here to critique any of the scientific information presented to you today. I leave that to a rigorous review by scientists. When I was a toddler and maybe this is true for a few of you, I received my small pox vaccination and a series of baby shots for Diphtheria, Tetanus and Pertussis. In grade school, I was among the first to be able to stand in line for the Polio vaccine, delivered on a sugar cube but great technology that was.

Today, my grandchildren are blessed to be able to receive vaccinations against 16 different diseases and isn't that wonderful? Immunization has been called one of the 10 greatest achievements of the 20th century in improving the health and life expectancy of people living in the US. We now have the means to protect our nation's children, adolescence and adults against terrible diseases. That in the past caused great suffering, disability and premature death. Yet in many respects, we have become victims of our own success. Without diligent efforts to maintain confidence in our immunization programs and allow easy access to this life saving, safe and effective vaccines, the diseases seen 50 years ago will return to the US. Many of these, such as measles is plain right away, as we only painfully know in the last -- from the last month.

There have been multiple theories of possible links of vaccines to autism that have been proposed in the last 15 years. And many of these theories most of all of these theories have been discarded. A study that's going to be published in the May issue of Pediatrics found that while the majority of parents trust their child's physician for advice on immunizations, there were still about a quarter who trusted celebrities for advice on their child's shots. And a study that's going to be published in the May issue of the American Journal Preventive Medicine, found that in a typical month about 80% of physicians report at least one vaccine refusal, 8% report refusal for more than 10% of children in their practice. And 90% report at least one request to spread out their vaccines.

Each time a theory is proposed that vaccines are somehow linked to autism, the wedge of doubt over vaccine safety is driven more deeply into the minds of parents. Yesterday, I

have the privilege of attending a wonderful event coinciding with national infant immunization week that was hosted by the Children's Hospitals of Minnesota.

01:20:05

It was a celebration of our achievements in immunization, and a reminder of the work that still lies ahead of us. One very brave mom told us of how her precious 15-month old daughter who was vaccinated, but had an impaired immune system, contracted Hib disease and fought for her life. The mom was outraged to that other parent had chosen not to vaccinate their children for Hib and deliberately put her child at risk.

Another, a Somali mom of a child with autism who had been convinced not the give MMR vaccine to her other children had since learned that they were duped by bad science. She pleaded with us that we help to educate the Somali community of the truth about MMR vaccine and to also help in finding the true causes of autism.

In conclusion, I asked the committee members to consider the significant achievements we've made with vaccination. And the need to assure continued access to this life saving vaccines. And I encourage the Legislature to support increased funding for research and to the true causes of autism. Thank you.

Vice Chair Rep Mack: Thank you, Ms. Peterson. Members will open it up for questions. I have one right after that. For Ms. Peterson, I'm wondering what your response or your organizations responses. I have met with constituents. I have a family member and know several people who undoubtedly have taken their child at various ages. A child that has met their various myo markers and developmental progress the way their supposed to go in for a vaccine and would say that their child was injured and was markedly different and never to be the same after that vaccine.

There is -- you know some of them whether it's been autism or other issues that they've developed after that and on their personal experience in watching that before their very eyes. In my mind, it's hard to refute their opinion that something happened that day that was not compatible with their child and causing injury from the vaccine. What is the response of your organization to those -- there are books written on it.

The people that have written about their personal experience on what they've witnessed in their child that was perfectly healthy up until the day they got the vaccine, which undoubtedly creates concern in people's mind. Whether they hear this science and want to get into the scientific debate.

Their own personal experience is compelling to the public and creates a great deal of fear. And I'm wondering what is the organization or your personal response however, you'd like to address that, to those particular situations and how the public should respond to some of those incidences.

Ms. Diane Peterson: Well, any child injured by any means is certainly a tragedy. I think if it -- there was some association or some coincidental event with receiving the vaccine that would be studied. And there are numerous scientific studies on their way to look at adverse events that occur after vaccination. They determine if there was a true cause and effect, or if it was just a coincidental event.

So I would look to the science, but what you comment on with these anecdotal reports is what usually gets on Oprah and other talk shows and it's a tragedy. And it does trigger in a lot of people's perceptions that there must have been a cause and a result from that particular event. But I would look to the science before I would be able to comment on that.

Vice Chair Rep Mack: Thank you for that and I have one more question. And then if there's any other members who want a way in. And I don't know who the best person is for this, so you can determine. Based on the combination of testifiers we've heard about the ability of not having -- forgive me if I messed up the terminology, but whether or not the DNA that is used can be carried through and if it's residual or not, Dr. Deisher presented one side of that. It seems as though one of you gentleman refuted that.

I guess what I'm wondering is that a widespread point of discussion in the scientific community. And I've seen other materials that talked about how this DNA, it cannot be separated in the vaccine process. Therefore, it does come along with and vaccine that is or I'm sorry the virus that's injected as a way of being immunized.

01:25:03

And so I'm just -- I'm curious, are there studies to see is that whether or not that DNA is carried forward? It seems to be a point of contention that would be a fairly significant point in the science of this whole issue. Mr. Hackett.

Dr. Perry B. Hackett: As you probably know DNA, Deoxyribonucleic Acid is a double stranded molecule that looks like a circular helix. It's made up of building blocks called base pairs. And each base pair is composed of two nucleotides. The only thing you need to know for the answer to your question is that all scientist who do any type of work with nucleic acids of mammalian cells know that even a single nucleotide cannot be taken up at all

efficiently by cells, only because the nucleotide has a phosphate group on it. And that prohibits it from being taken up into the cell.

DNA is a whole string of these nucleotides with phosphate groups on it. Probably this is an evolutionary defense mechanism that's very powerful to keep DNA of any size including down to its -- the smallest component of it, out of the cell until that phosphates have been removed. But without the phosphate and then its just a very elementary building block.

So when many of us run all kinds of experiments and this have been run since -- well, Ive got started in 1964 on this. You can't get radioactively labeled nucleotides in the cells. You can't do it. You have to let them build it up. And this is not a scientific issue. This is a scientific fact.

Vice Chair Rep Mack: Okay, Representative Barrett.

Rep. Barrett: Thank you Madame Chair. A question for and I'm sorry I forget your name Ma'am from the Department of Health. How many people and how many kids have not been vaccinated in Minnesota and around the country recently related to the diseases that may according to the hypothesis caused autism? And how much has then increased over the previous period of time?

Vice Chair Rep Mack: Ms. Ehresmann.

Kristen Ehresmann: Chairman Mac and representative. The department, when we've looked at information on conscientious objection or choosing not to vaccine it. We need to look at information that is provided to us from the schools. And as we look at the number of children that you know are not vaccinated for certain diseases, we have seen an increase over the last number of years.

In the past, we saw perhaps 1% to 2% of children who weren't vaccinated. In the last number of years, we've seen that increase. It's still in relatively small numbers. So we're probably looking at 3% to 4% that are choosing not to vaccinate at this point. But what's significant about that and what we see with our current measles outbreak is if you have a situation in which you have clustering of individuals who have not vaccinated that can really contribute to outbreaks and transmission of disease and then once disease gains a foothold, then you can continue to see that disease spread into other parts of the community where you may have just individuals who are not vaccinated.

So what we're concerned about is there's a concept in public health called Herd Immunity. So it's also referred to as

community immunity. It has nothing to do with cows but it has everything to do with the fact that, the more people that are protected against the disease the less likelihood that any individual who is unprotected will come into contact with disease and so that's the concept that Ms. Peterson was talking about when that mom was concerned that her child had been vaccinated but couldn't develop an immune response when other people don't vaccinate, that increases the likelihood that that susceptible person will be exposed to disease and develop disease. So that's why we are concerned when we think about rates dropping or we see rates dropping. Did that answer your question?

Rep. Barrett: It does.

Vice Chair Rep Mack: Representative Barrett.

Rep. Barrett: Thank you Madam Chair. The reason with my question wants to know how many kids exactly either on a state or in a country were not vaccinated. Wouldn't that make a good study of kids who are and who aren't and what the rates of autism disorder would be in both groups?

Kristen R. Ehresmann: Yeah and actually--

Vice Chair Rep Mack: Ms. Ehresmann.

Kristen R. Ehresmann: Excuse me sorry Chairman and representative. That's what was done with these population studies that I referred to looking at autism in multiple countries. They compared vaccinated individuals and unvaccinated individuals and looked at rates of autism. That's an important component of any type of epidemiologic study as a comparison. So we talked about case control studies.

You have the case who has the characteristic of interests and then at control. In this case, it would be vaccinated or unvaccinated or it could be autism or no autism or in a cohort study either way but you're looking -- you're comparing those two groups and looking at if there's a difference in outcomes and that's what was done in those studies. So it has been done.

Vice Chair Rep Mack: Representative Barrett.

Rep. Barrett: Chairman, thank you very much for that information. It leads to a third question which is related to the change point analysis of the doctor and how she correlated the specific instance of changes in the make up of the vaccines with changes in autism rates. And so I'd like to bring that together with your study, to see if they link, to see if you're actually starting the kids at the proper time where the change

was made from a one type of gene to a human gene and making up the – antibiotic would be a vaccine.

Vice Chair Rep Mack: Ms. Ehresmann.

01:30:00

Kristen R. Ehresmann: Chairman Mac and Representative. Well I think -- I would make two points on that. First of all, as I described earlier, the hockey-stick approach is what's called an ecologic analysis. It's looking at the biggest picture saying, you know we see this trend in autism and then we're going to look at a couple of other things that happened into the environment at the same time and gee, there seems to be a link. That's really the first step.

Now we could look at that same trend in autism and we could look at cell phone use for instance or intake of pizza or any number of things that may or may not be related and part of the next steps are the subsequent studies.

So one is to look at is there a biologic plausibility and that's really what I defer to the presenters from the university floor, but the issue there is could this really happen? Is there a biological way that this hypothesis that's been presented could happen? And I think the have clearly said no. They don't see how that can happen based on their understanding of genetics and so while I think it's an interesting theory, I think that given the opportunity, we could probably present similar data with other things other than just autism that matched those change points.

Vice Chair Rep Mack: Okay members. We have three more people who want to comment. We're going to cut it off, there so if we could keep both questions and answers extremely brief. We have just a couple minutes, Representative Franzen.

Rep. Franzen: Yes thanks, Madam Chair and I'm so sorry I forgot your name. But anyway, so I'm just wondering about those children that choose not to vaccinate, the parents that choose not to have their children vaccinated and you tracked those children?

Vice Chair Rep Mack: Ms. Ehresmann.

Kristen R. Ehresmann: Chairman Mac and representative, actually yes and no. The department tracks immunization rates generally within schools and within the state. That's an important thing that we look at to see if we have communities that are at risk for vaccine preventable diseases. But no, we don't typically-- we don't track to see if John Smith is not vaccinated. The only time that that would come into play is if we had an outbreak in the schools.

Schools do keep track of children's immunization records and so, if we have an outbreak of measles in a school, we would talk to the school nurse and say, "We've got an outbreak of measles. It's important that you identify who your unvaccinated children are, because they need to be notified that they are at risk of these diseases and they need to be excluded from school for their health and for the health of the other students".

So that's the only instance in which that something that's important to the department and it's related to are Disease-Prevention Outbreak Control Activities.

Vice Chair Rep Mack: Representative Franzen.

Rep. Franzen: Because I'm one of these parents that don't vaccinate their children and I don't get my information from celebrities either. However, it is one of my concerns because I go to the doctor for their appointments and we are shunned because we choose not to and treated way differently than when I use to vaccinate my children. So that's a concern as well and then you're now going to school and having our children, this is the one that's not vaccinated. This is the one that is vaccinated type of things. So just, don't want our children to be labeled differently because they're not vaccinated.

01:35:00

Vice Chair Rep Mack: Representative Lomer.

Rep. Lomer: Thank you Madam Chair and I don't know exactly, who to address this question to but it keeps coming to me. That if we have what's called an ethical alternative, if there's a way to make these vaccines without using the human DNA and that the risk is so great. I just don't understand as I'm sitting here why we aren't just using other -- whether it's animal DNA or whatever that has a binder. And the other question that keeps coming to my mind is yes chicken pox is not pleasant, measles, mumps, rubella, those are serious illnesses.

But autism is a life-long struggle for somebody and to take that risk, I mean isn't that risk equally or even greater than measles, mumps, rubella, chicken pox and these things. I just don't understand why this isn't as much of a concern to take more seriously.

Vice Chair Rep Mack: Ms. Ehresmann.

Kristen R. Ehresmann: Chairman Mack and Representative. Well couple of things first, of all at this point with the exception of rabies vaccine, there are no other alternative vaccines licensed for use in the United States and that's why I did make the comment that if

Dr. Deisher was successful to developed the vaccine that was licensed by the department would be very happy to be making that as an option of promoting that vaccine and it would be promoted or be made available nationally. But just to be clear, there are no other options at this point. With the exception of the rabies vaccine which is not part of a routine schedule. So I just want to be clear about that.

I think that probably we're coming at this from two different prospective because you're talking about the risk of autism and I've just presented that really the view of scientists in the world of public health and in other aspects of science that there is not an association between autism and vaccination. And so I understand what you're saying is that autism might-- my son is on the autism spectrum. So I mean certainly that-- something that we take very seriously but because there is not a link that's been found, it's not something that we're focusing. And we're focusing on the very real aspects of measles, mumps, rubella and these diseases are not benign.

Having 60% of the children who just developed measles recently hospitalized is quite significant. If you think back to rubella in 1964, we had 20,000 cases in the United States. We had mental retardation. We had autism caused by rubella. We had many, many problems from these diseases. So I think it's important that although we don't see them now and they seem sort of old news, they were and can still be very, very significant. So I think that's where were coming at this from different perspective.

So first of all to clarify that, there aren't other vaccine options and then second, the reason that were taking measles, mumps, rubella, varicella, all these things are serious because they're real diseases that we can prevent with vaccine preventable disease and autism relationship is not one that we see supported in the science.

Vice Chair Rep Mack: Okay and our last question. We see Representative Liebling.

Rep. Liebling: Well thank you Madame Chairman. I just first of all I want to thank all of you very much for coming on really short notice. We really appreciate that. We know you have important work that you could be doing elsewhere. My question goes back to representative Mac's question and I think that the term that, now I have to use is the biologic plausibility which the two scientists were talking about and I think that-- I think what Representative Mac was getting to and she wasn't I want to get to it is sort of here, we have three scientists basically, Dr. Deisher, Dr. Van Ness and Dr. Hackett and so we're hearing from three of you.

And she's saying that there's a biologic plausibility and two of you are saying that there absolutely is not. And so what I want you to maybe explain is we-- all we see, is the three people sitting here. So it looks like two to one but I don't think that's the way it really is. So I think what we need to-- what I'd like you to tell us is where the weight of the scientific understanding is or the weight of opinion -- if opinion's even the right word about this. So just, give us a better perspective on that if you would.

Vice Chair Rep Mack: Dr. Van Ness.

Dr. Brian Van Ness: Yeah I think you probably raised the issue before and that is the gold standard of acceptance of scientific hypothesis is the peer review of other scientists. I will grant you that you have two people here who are skeptical on Dr. Deisher's hypothesis.

01:40:05

I would argue that that position that is being taken by Dr. Deisher would be significantly strengthened by peer review publication which you had asked for. The reason unavailable at this point so, I think that the answer to your question is there is a peer review process of scientists well beyond the two of us sitting here that I think should come to bear on a burden of proof that is required to have any impact on changing a policy on an immunization that is known to have an impact on preventing known diseases.

Vice Chair Rep Mack: Representative Liebling.

Rep. Liebling: Thank you Madam Chairman, I just want to follow up real quickly because Representative Lomer was asking about sort of the impact I know, she's not listening right now but Representative Lomer, I wanted to get her attention but you know we had talked in a previous hearing when we were talking about abortion policy. And I had mentioned somebody close to me, had aborted a fetus late term because of an anomaly. And I just wanted to point out that that was caused by exposure to rubella. In a previous hearing Representative Lomer, when I talked about someone close to me who had had a late term abortion because of a very serious fetal anomaly cause that she have discovered, a very wanted child that was because of exposure to rubella.

So that's just an example. This really is -- and that was within the last ten years. This is a really serious thing, really serious things that occur to people that we know about versus what was called something equivalent to an asteroid hitting the royal wedding. So I just think that's really important to keep in mind.

Chair Rep. Gottwalt: Very good. Thank you very much to all of the speakers and testifiers and to the committee for a good discussion.

Chair Rep Gottwalt: Appreciate you all coming.

Impact of Environmental Factors on the Prevalence of Autistic Disorder After 1979

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Background

Autistic Disorder (AD) is the most severe subset of Autism Spectrum Disorders (ASDs), developmental disabilities that have reached epidemic levels worldwide. The existence of changepoints (CPs) in rate of increase of AD has been suggested as a guide for identification of environmental triggers for onset, requiring: universal exposure, absence prior to the changepoint, dose-dependence and plausible biology.

Methods

AD data for the US was from the DOE IDEA program and California DDS; vaccination coverage from CDC NIS. For Western Australia and UK, AD prevalence was extracted from published studies. Live births by paternal age cohort, and male population data were obtained from US and Western Australian government statistics websites. R software was used to calculate CPs.

Results

Birth year CPs were identified as 1980.9, 1988.4 and 1996 for the U.S., 1987-1988.6 for UK, and 1990.4 for Western Australia. CPs in these countries correspond to introduction or increased doses of human fetal cell line manufactured vaccines, while no relationship is found between paternal age and AD diagnosis. Further, linear regression revealed that Varicella and Hepatitis A immunization coverage were significantly correlated to the absolute number of AD cases.

Conclusions

AD CP years are coincident with introduction of vaccines manufactured using human fetal cell lines, all containing fetal and retroviral contaminants, into childhood vaccine regimens. This pattern is repeated in the U.S., UK, and Western Australia. Thus, rising AD prevalence is directly related to vaccines manufactured utilizing human fetal cells. Increased paternal age is not related to rising AD prevalence.

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INTRODUCTION

Autistic Disorder (AD) is a subset of the Autism Spectrum Disorders (ASDs), a group of developmental disabilities that have reached epidemic levels. Worldwide, 1988 has been identified by the EPA as a critical incident year for AD [(1)]. The CDC estimates current US ASD prevalence at 1 in 50 children. In addition to ASD, there are also apparent epidemic levels of other early onset neuro-developmental (ND) syndromes such as childhood onset schizophrenia (0.4% of population affected) [(2)] and bipolar disorder [(3)]. Shared characteristics among childhood ND epidemics include associations with male gender, reduced reproductive fitness, increased paternal age and the presence of excess de novo genomic mutation rates. Paternal age is currently a favored explanation for the worldwide autism epidemic. However, evolving concepts about autism spectrum and other ND diseases suggest these diseases to be 'multi-hit' with genetic, genomic and environmental contributors. Accumulating evidence from family-based exome sequencing points to the importance of hundreds of rare, diverse, de novo mutations (DNMs) in childhood ND diseases [(4)(5)(6)(7)(8)(9)(10)].

The de novo mutations in these diseases are consistently found in exons or critical coding regions of genes that would lead to premature stop or non-functional proteins [(6)(7)(8)(11)]. In addition to the increase in DNMs in children with ND disease, de novo genomic insertions and deletions are significantly increased in childhood onset schizophrenia and autism disorder (10% disease versus 0% typically developing) [(7)(8)(10)]. Diverse, rare DNMs mandate that environmental factors known to cause genomic instability be evaluated for their relationship to these diseases.

Consideration of potential environmental triggers requires statistical assessment to identify birth year changepoints (CP) associated with a rising rate in the incidence of autism. Requirements for an environmental factor as a trigger for disease include 1) absent or lower levels before a CP, 2) continued increase after a CP is demonstrated (dose-effect), 3) biological mechanism consistent with pathology, and 4) in instances of non-geographically limited disease such as autism, schizophrenia and intellectual disability, it should have almost

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universal exposure [1]. This study identifies a previously overlooked, universally introduced environmental factor, fetal and retroviral contaminants in childhood vaccines, absent prior to CPs in AD prevalence with subsequent dose-effect evidence and known pathologic mechanisms of action. Vaccinations have done tremendous good in the world, however, further investigation fetal manufactured-vaccine contaminants as an environmental contributor to the current autism spectrum epidemic is called for.

METHODS

Data Sources

Broadening changes in diagnostic criteria for ASDs complicate interpretation of the current epidemic. Therefore, we focused on Autistic Disorder (AD) (previously called infantile autism), the most severe form of ASD, which has relatively constant diagnostic criteria over the past 5 decades, despite nomenclature changes from childhood schizophrenia to infantile autism to autistic disorder [1]. For the US, autistic disorder data were obtained from the California Department of Developmental Services (DDS) [1] [12] [13] and from the Individuals with Disabilities Education Act (IDEA) program website of the Department of Education [14]. Live birth data were extracted from the CDC's "Annual reports of Vital Statistics of the United States", [15] [16] and birth year AD prevalence per 10,000 was then calculated. Male population data were obtained from the U.S. Census Bureau website, [17] for data prior to 2000 and from the "factfinder" web site for data after 2000 [18]. Birth rates by age of father were obtained from the National Vital Statistics Reports: "Birth Final Data" [19]. Varicella and Hepatitis A immunization coverage for children 19 to 35 months of age was obtained from the CDC National Immunization Survey (NIS) [20].

For Western Australia, AD prevalence for children aged 2-3, 4-5 and 6-8 years was obtained from Nassar et al. [21]. Live birth, live births by paternal age cohort, and male population data were obtained from the Australian Bureau of Statistics [22]. Autism disorder data (core & atypical combined) for North East Thames were from Taylor et al. [23].

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Linear Regression and Changepoint analysis

Linear regression and R^2 analyses were used to assess correlations between AD prevalence and vaccine coverage or births by paternal age; associations with $P<0.05$ were considered significant.

For CP determination, both the hockey-stick [24] and segmented line fitting [25] methods were employed. The robustness of our algorithm was tested by repeating the algorithm using deliberately chosen poor initial inputs. Our fit results were robust across a wide variation of input parameters (data not shown).

The Akaike Information Criterion (AIC) [26] and the Bayesian Information Criterion (BIC) [27] determined the optimal segmented line fits and associated changepoints. The R statistical software was used to run the 'segmented' and AIC algorithms. For the data presented, all possible pairs of input changepoint years were tested. All other input parameters were set to default values. Not all pairs of input years led to convergence; what are presented here are results from fits that converged and had the lowest AIC and BIC scores.

Cell Substrate Residuals in Selected Childhood Vaccines

Residual human DNA (single and double stranded) levels from the human fetal cell lines used to manufacture Meruvax, II® (Rubella, Merck & Co. Inc.), the rubella component of MMR II®, and HAVRIX® (Hepatitis A, GSK Biologicals) were measured using commercially available ELISA kits (Pico Green (dsDNA) and OliGreen (ssDNA) (Life Technologies). DNA fragment sizes were determined using SYBR gold staining after 4% agarose gel electrophoresis.

RESULTS

Autistic Disorder Changepoint Analysis

Since hockey-stick analysis of IDEA AD data for 19-year-olds born during 1973–1987 identified an AD CP not identified by the EPA [1] at birth year 1980.8 (Figure 1B panel A), we compared hockey-stick to segmented line fit for California DDS data for birth years 1970–1997 (Figure 1A). Based on the AIC and BIC, the 'segmented' algorithm with 2 CPs (1980.9, 1988.4) resulted in a better fit of the data than the hockey-stick method, which identified a single CP at birth year 1987.5. The hockey-stick method yielded a CP for the California DDS data for birth years 1970–1997 equivalent to the EPA's published CP to the nearest tenth (Figure 1A)

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Segmented line fitting analysis identified three CP years from the US IDEA and CA DDS AD data for birth years 1970 to 2002; 1980.8 (Fig 1B panels A&B), 1988.4 (panel B), and 1995.6; 1996.5 (panels C &D). Panels E-G show segmented line fit results for North East Thames (UK) for birth years 1979-1992 (core and atypical AD, CP: 1988.6) and for birth years 1979-1999 (core AD, CP: 1987); and for Western Australia for 2-3 year olds (birth years 1983 to 1999, CP: 1990.4).

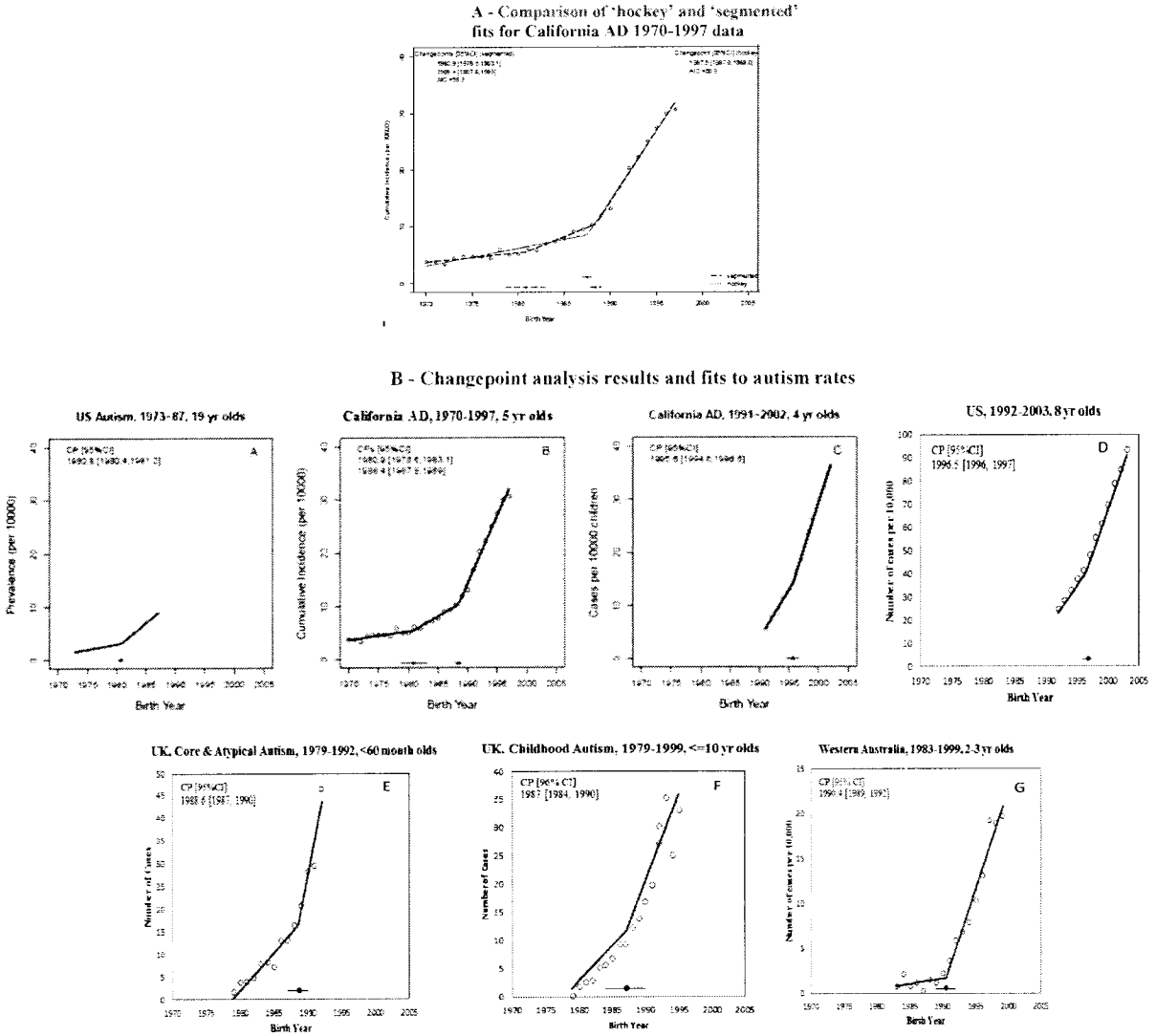

Figure 1. AD Changepoint Analysis Robustness and Results.

Figure 1A shows a comparison of 'hockey' and 'segmented' fits for California AD 1970-1997 data. Both analyses yield changepoints with overlapping confidence intervals near 1988. However, 'segmented' analysis reveals a second changepoint near 1981. The lower AIC (Akai Information Criterion) value for the 'segmented' analysis shows that 2-

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Association between Paternal Age and Autistic Disorder

Figure 2A shows that US live births declined during the 1960s and 1970s in almost all paternal age groups, and then rebounded after 1978 in all paternal age groups over the age of 30. Of note, fathers over the age of 40 had similar numbers of live births in 1963 (333,785) as they did in 2001 (342,030); therefore, if paternal age were a major trigger for autistic disorder, older fathers would have been fathering as many autistic children in 1963 as 2008. However, reported AD prevalence was 0.7 cases per 10,000 in 1963 [28] compared to 79 per 10,000 in 2001. In addition, linear regression analysis of paternal age versus AD at each specific birth year did not reveal a relationship (Figure 2C; $R^2 = 0.1027$).

In Western Australia, from 1975 to 2011, live births increased slightly for fathers $\geq$ 40years of age. However, live births in 1999 to fathers over age 40 were less than 2-fold higher than in 1989, while AD diagnosis had risen 10-fold between birth years 1989 and 1999. Linear regression analysis revealed no relationship between paternal age and autistic disorder diagnosis for Western Australia (Figure 2B; $R^2 < 1$).

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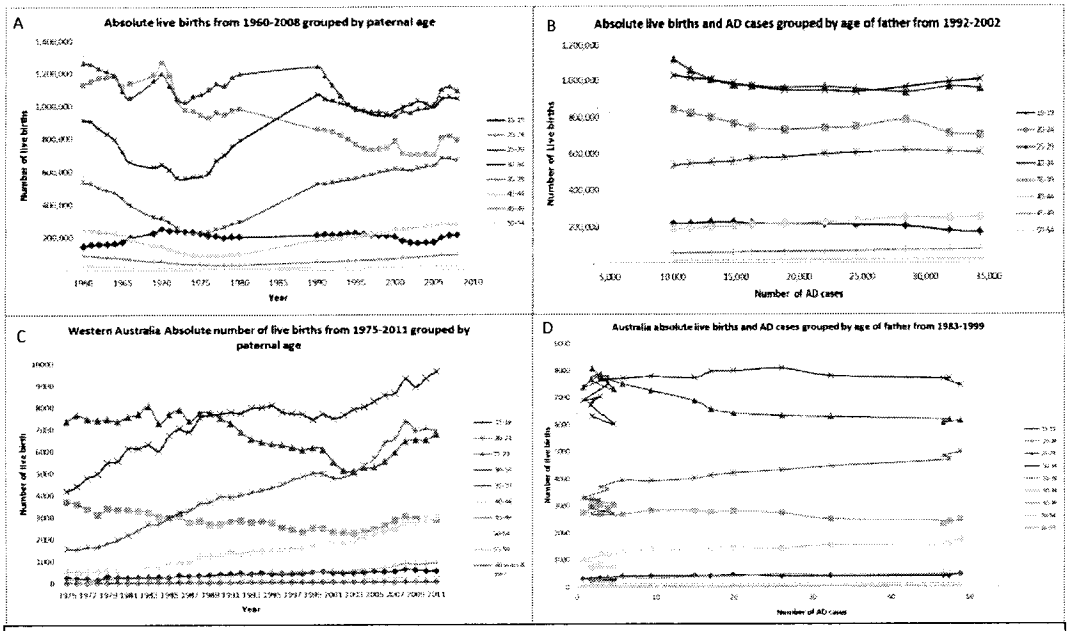

Figure 2. Number of live births grouped by paternal age and its correlation with AD cases over years of US and Western Australia.

Panel A and panel C show number of live births at different father's age recorded from 1960 to 2008 for the US and from 1975 to 2011 for Western Australia, respectively - The number of US live births fathered by men over the age of 30 decreased during 1960's and 1970's and came back up during the 1980's and 1990's to the same or higher number of live births in 1960. From 1975 to 2011, Australia live births slightly increased for paternal age groups of 30 and up (Panel C). **Panel B and D show the number of live births and number of AD cases by age of father of the U.S. and Western Australia**-The graph demonstrates that there is no relationship between the number of live births for any paternal age group and the number of children diagnosed with AD from the same birth year.

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Association between Approval of Human Fetal Cell Line Manufactured Vaccines and AD Changepoints

UK [29] and Northeast Thames [23] data demonstrated that AD rose conspicuously around 1989, and our calculated CP for the Northeast Thames AD data is also 1988.6. While MMR coverage was >90% before this time [23], the AD CP followed a switch in the UK from animal cell line to human fetal cell line manufacture of MMR vaccine in October 1988 (Table 1). We therefore evaluated the relationship between AD prevalence and use of vaccines manufactured using human fetal cell lines elsewhere.

The US 1980–1981 AD CP followed the January 1979 approval of Meruvax® II and M-M-R® II, which are manufactured in the human fetal cell line WI-38. The US 1988.4 CP corresponded to the addition of a second dose of M-M-R® II and a measles vaccination campaign that increased compliance from ≤50% to 82% between birth years 1987 and 1989 [30] [31]. The 1995.6 AD CP corresponded to the approval and introduction of the varicella vaccine (Varivax®). The Western Australia 1990 AD CP came shortly after the 1989 addition to the vaccination schedule of MMR, supplied solely with M-M-R® II (Table 1).

Association between Autistic Disorder and Fetal Cell Manufactured Vaccination Coverage

US autistic disorder prevalence began rising after 1978, and has continued to rise through birth year 2008. Figure 3A illustrates the continuing rise in US autistic disorder for 8 year olds born between 1992 and 2003. IDEA data for 3 year olds (not shown) through birth year 2008 demonstrates a continuing rise in US autistic disorder. Figure 3B illustrates that varicella coverage increased steadily after its approval in 1995 for children whose birth years were 1993 through 1998 to 1999, leveling off after reaching just over 80% saturation. Hepatitis A vaccine was approved for use in the U.S. in 1995; however, it was not until 1999 that 17 states began recommending/considering its use, and not until 2005 that it was included in the ACIP recommended vaccination schedule (Table 1). Hepatitis A coverage (Figure 3D) shows a more complicated compliance due to the non-uniform state recommendations from 1999 through 2005. Since 2005, Hepatitis A immunization coverage has increased steadily for birth year 2003 through birth year 2008 (Figure 3D).

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To compare absolute numbers of children diagnosed with AD to the absolute numbers of children vaccinated with Varivax®, we performed linear regression analysis for birth years 1992–1998, during which time Varivax® coverage increased linearly. Additionally, birth years 1992–1998 were chosen because state variation in use of Hepatitis A vaccine after 1999 confounds the use of Varivax® as a measure of exposure to vaccines manufactured in human fetal cell lines for birth years subsequent to 1998. Figure 3C illustrates the highly significant correlation between the absolute number of children vaccinated with Varivax® and the absolute number of children diagnosed with autistic disorder (R^2=0.8774; P<0.001). A similar strong correlation was also observed between the number of children vaccinated against Hepatitis A and the number of AD cases for birth years 2003–2008 (R^2=0.6762; P<0.001).

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Table 1 - History of vaccines approved for use in the US, UK and Western Australia manufactured using human fetal cell lines and contaminated with human fetal DNA and/or retroviral fragments.

Date	Vaccine Name	Type of vaccine	Manufacturer	Age of immunization	Events
History of vaccines approved for use in US.					
01/1979	Meruvax II	A rubella vaccine with the RA 27/3 (human diploid fibroblast)	Merck	12 months or older	Licensed.
1979	MMR II	Combined measles, mumps and rubella with the RA 27/3 strain	Merck	12 months or older	Licensed
3/17/1995	Varivax	Varicella virus vaccine, live	Merck	12 months or older	Licensed
History of vaccines approved for use in Australia.					
1989	MMR II	Combined measles, mumps and rubella with the RA 27/3 strain	Merck, Sharp, Dohme - MSD	12 months or older	Licensed
1999	Varivax	Varicella virus vaccine, live	Merck, Sharp, Dohme - MSD	12 months or older	Licensed
History of vaccines approved for use in UK.					
10/1988	MMR II	Combined measles, mumps and rubella with the RA 27/3 strain	SmithKline Beecham, Merieux, Merck Sharpe	12 months or older	Licensed

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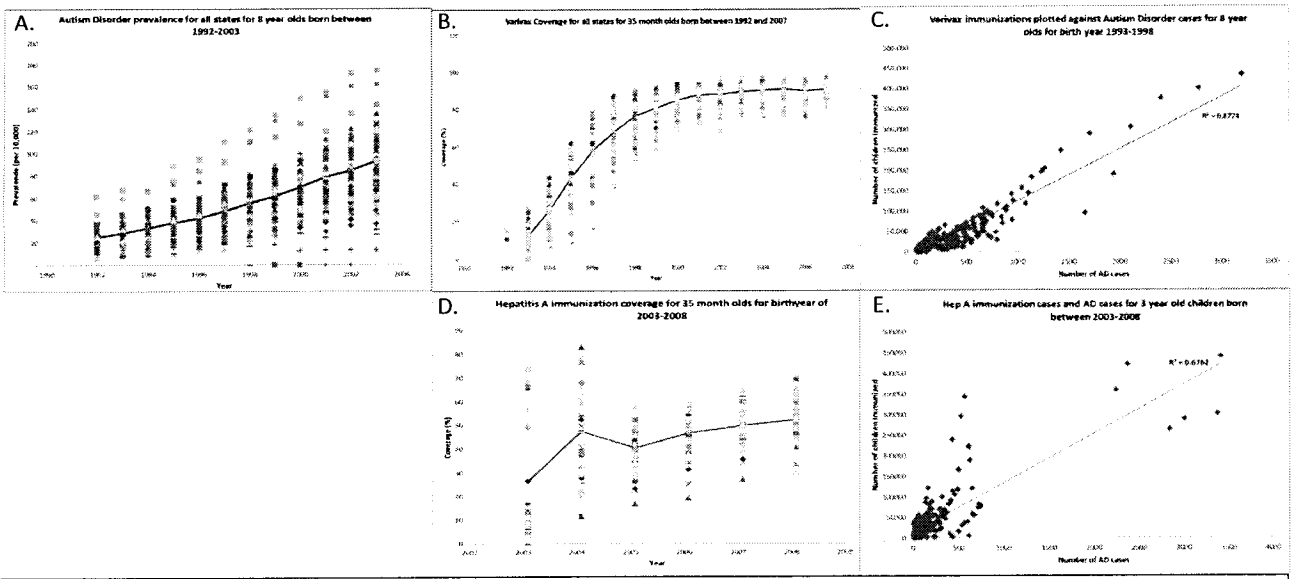

Figure 3. Varicella® and Hepatitis A vaccine coverage trend and their correlations with AD cases over years in US.

Panel A shows the continual increase in AD prevalence for all states for 8 year-old children born between 1992-2003. Panel B shows Varivax® coverage for all states for 35 month-old children born between 1993 and 2007 that dramatically increased from 1993 to 1998 and became stable until 2007. Panel C shows the high correlation between the absolute number of children vaccinated with Varivax® and the absolute number of 8 year olds diagnosed with AD throughout every state in the U.S. (R^2=0.8774; P-value=2.31E-140). Panel D shows the trend of the Hepatitis A coverage that increased from 2003 to 2004 and decreased in 2005; then it has been increasing until 2008 and predictably continues to increase. The absolute number of children vaccinated with Hepatitis A is highly significantly related to the absolute number of 3 year olds diagnosed with AD throughout every state in the U.S.(R^2 =0.6762; P-value=3.13E-70) (Panel E).
For panel A, B and D, the black connected line represents the overall AD prevalence of the U.S. The various markers are state by state data.

DNA Residuals in Human Fetal Cell Line Manufactured Vaccines

In addition to the ingredients listed on the package insert for Meruvax® II (rubella), we detected significant levels of human ssDNA (142 +/-8 ng/vial) as well as dsDNA (35 +/-10 ng/vial) fragmented to ~215 base pairs in length. In each vial of Havrix® we detected ssDNA (301 +/-153 ng/vial) as well as dsDNA (44 +/-24 ng/vial) unfragmented residual DNA >48.5K base pairs in length. The Havrix® package insert discloses the presence of human fetal cellular residuals from the MRC-5 cell line, but not the DNA contaminants specifically.

DISCUSSION

Autistic disorder began to rise in the US in birth year 1978 [32]. According to EPA guidelines, birth year CPs for prevalence of AD should drive consideration of environmental triggers, as for any disease [1]. In this study we report three calculated US AD birth-year CPs for birth years 1970 through 2002. Iterative fitting algorithms identified 1980.8 (1980.4-1981.2), 1988.4 (1987.8-1989) and 1996.5 (1994.6-1996.6) as 'CP' years for US AD prevalence. While no reporting system is perfect, we have tried to minimize any effects of erroneous

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diagnosis or coding by choosing the narrower autistic disorder or infantile autism. Whether or not the increase is real, diagnoses have risen dramatically, adding a significant public health burden and therefore demanding critical assessment of environmental triggers that may be responsible for this apparent epidemic. Candidate environmental triggers should have the following attributes: exposure from conception to at least 3 years of age around each CP, absent or substantially lower prior to the first identified CP, a dose-effect associated with calculated CPs, and toxicological mechanisms compatible with disruption in early neural development – i.e. biological plausibility.

In 1979, coincident with the first autism disorder CP, vaccine manufacturing changes introduced human fetal DNA fragments and retroviral contaminants into childhood vaccines. [33] While we do not know the mechanism behind these new vaccine contaminants and AD, human fetal DNA fragments are inducers of autoimmune reactions, while both DNA fragments and retroviruses are known to potentiate genomic insertions and mutations [34] [35] [36]. Infants and children are almost universally exposed to these additional vaccine components/contaminants, and these converging events are associated with rising AD in a dose-dependent fashion due to the increasing numbers of human fetal manufactured vaccines which have been introduced to US immunization guidelines, including containing Pentacel®, which contains inactivated polioviruses grown on the MRC-5 human fetal cell line, in 2008. Recent evidence has shown that human endogenous retroviral transcripts are elevated in the brains of patients with schizophrenia or bipolar disorder [37], in peripheral blood mononuclear leucocytes of patients with autism spectrum [38] as well as associated with several autoimmune diseases [39]. The strong ecological association, between the introduction of human fetal cells for manufacturing and AD CPs, calls for further investigation of these childhood vaccine contaminants and, for the sake of preserving critical vaccination coverage, even a return to animal based manufacturing.

Multiple publications over the past several years point to the potential importance of protein disrupting de novo point mutations in the etiology of autism spectrum disorders and other childhood onset ND diseases. Paternal age at conception has been found to be a significant risk factor for autism spectrum disorder diagnosis, and taken together with the evidence that advancing age leads to sperm susceptible to double-strand break formation and genomic instability, emphasis has recently been given to advancing paternal age as a trigger for increased childhood ND disorders. In the U.S., advancing paternal age has an apparent association with these

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disorders, if one looks only at from 1980 and later. However, as we show here, consideration of live births to older fathers from 1960 on questions the importance of paternal age as a primary trigger for the increased prevalence of autism disorder. Autism disorder diagnosis was low and stable from birth year 1960 through 1978. Furthermore, in their publication on advancing paternal age and de novo mutations Kong et al. do point out that live births to older fathers in Iceland were substantially higher from 1650 through 1940 than they are today [40]. Furthermore, no studies have been done to determine if the de novo mutations in children with ND disease are occurring in the sperm of older fathers or in the somatic cells of the children.

Manufacture of childhood vaccines in human fetal cell lines, with its associated retroviral and human DNA fragment contaminants, fulfills all of the necessary requirements as a primary trigger for the ND disease, autistic disorder. The contaminants were not present prior to the first US AD CP, they have continued to increase in the environment with additional human fetal vaccine approvals and doses, and they have clinically documented adverse mutagenic side effects. With the 2008 US approval of Pentacel® for children at 2, 4, and 6 months of age we may see age of onset of autism decrease dramatically. Our study is the first laboratory and ecological study conducted to date that has examined the question of a relationship between human cell line manufactured vaccines and autism. The Vaccine Safety Datalink, VSD, theoretically contains sufficient data to perform definitive retrospective epidemiological studies to investigate this potential link. Between birth year 1992 through birth year 1998 there are significant numbers of children vaccinated or not vaccinated with Varivax® (chickenpox) to determine a relative risk of autistic disorder diagnosis with use of a heavily fetal contaminated vaccine [36]. This overlooked potential trigger for the worldwide autism disorder epidemic demands additional studies in order to assure the safe manufacture of routine recommended childhood vaccines.

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CURRICULUM VITAE
THERESA ANN DEISHER, Ph.D.

Dr. Theresa Deisher's career has focused on discovering and developing new therapies for grievous human illness. Dr. Deisher obtained her PhD in Molecular and Cellular Physiology from Stanford University and has spent over 19 years in commercial biotechnology, working with such illustrious companies as Genentech, Repligen, ZymoGenetics, Immunex and Amgen, prior to founding AVM Biotechnology and Sound Choice Pharmaceutical Institute. AVM Biotechnology is the marquee prolife biotech company worldwide, certifying that it does not use morally illicit material in any process.

Dr. Deisher is an inventor on 23 issued US patents, and her discoveries have led to clinical trials of FGF18 for osteoarthritis and cartilage repair, and for Factor XIII for surgical bleeding. Dr. Deisher was the first person to discover adult cardiac derived stem cells, and has been a champion of adult stem cell research, both professionally and privately, for two decades. Dr. Deisher is a plaintiff in the US federal lawsuit to prohibit use of federal tax payer dollars for embryo destructive research. She is a frequent lecturer on the stem cell issues delving into topics such as ; research, clinical progress, policy, economics and ethics. She provides a breath of fresh air with a common sense approach which allows lay audiences to readily grasp the issues. Dr. Deisher has appeared on numerous radio shows, televised debates and live on The World Over Live with Raymond Arroyo.

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EDUCATION

1990-1993 Post-Doctoral Fellowship, University of Washington,
Department of Pathology/Hematology, Seattle, WA.,
Dr. John Harlan.

1985-1990 PH.D., Department of Molecular and Cellular Physiology,
Stanford University, Stanford, CA., Dr. Michael Fowler.
(Dissertation) Catecholamine-Induced Cardiotoxicity: Basic Mechanisms of Disease and Prevention. Evaluation of the Role of Beta-Adrenergic Stimulation, Cellular Calcium Handling, and Oxygen Radical Production.

1980-1984 B.A., Department of Human Biology, Stanford University;
degree concentration in cardiovascular and exercise physiology.
Graduated with honors and distinction.

EXPERIENCE

Inventor on 23 issued US patents

Patented discoveries currently in clinical trials:

FGF18 (zFGF5) is currently in Ph I trials for osteoarthritis and Ph II trials for cartilage repair (Merck licensee), while Novo Nordisk (licensee) completed Ph II surgical bleeding clinical trials for Factor XIII in February 2011.

Selected list of Presentations and Awards:

Nov 10, 2012 recipient Fr. Spitzer's Healing the Culture 2012 Cultural Hero Award.

July 17 & 19, 2012 The Legacy Institute Radio Show with Carrie Abbott

July 11, 2012 CS Lewis Fellows Program on Science and Society

May 25, 2012 Autism One National Conference, Chicago, IL, plenary speaker

May 04, 2012, Legatus National Culture of Life conference speaker

April 21, 2012 Fort Myers, FL speaking event; co-speakers John Haas, George Weigel

March 26, 2012 Lafayette, LA speaking events

February 24, 2012 American Association of Prolife OBGyns annual meeting speaker

December 13, 2011 : Bishop Blanchet HS guest AP Biology lecturer.

October 26, 2011 The Legacy Institute Radio Show with Carrie Abbott

July 2011 CS Lewis Fellows Program on Science and Society : "Common Sense Approach to Stem Cell Choices" and "Vaccines and Human Fetal DNA Contaminants."

June 2011 : Catholic Professionals of Seattle : "The Commoditization of Human beings for Biomedical Research"

May 2011 : Cedar Park Assembly of God : "State of the Field of Stem Cells in the US"

April 2011 : National Medical Students for Life Meeting "Vaccines and Aborted Fetal DNA Contaminants"

April 2011 : Testimony to Minnesota Health and Human Services Committee on the use of aborted fetal cell lines for vaccine production and the resulting autism epidemic.

Dec 2010 Human Life International Medical Conference The Commoditization of America's Children for Biomedical Research.

Nov 10, 2010 The Legacy Institute Radio Show with Carrie Abbott

Catholic Medical Association meeting Oct 2010 Conscience Rights and Pharmaceutical Practices and Human Fetal Cell Lines for Biomedical Research and Drug Production

Discovery Institute Oct 2010 with Wesley Smith : Is the Wall Against Human Cloning about to Fall?

September 2010 multiple radio appearances regarding adult stem cell therapies as a plaintiff in Sherley vs Sebelius.

Oct 2010 What Are Stem Cells and What are They Good for? St. Hubert's Whidbey Island

August 2010 Live appearance on Raymond Arroyo World Over Live

August 2010 Laura Ingraham talk radio

April 2010 Presentations to Baker Diocese Right to Life Committees on stem cells and pharmaceutical manufacturing practices.

April 2010 Scientific expert testimony for MN Full Disclosure and Informed Consent Legislation (Brod).

February 2010 Assisted South Dakota FRC chapter in defeat of embryonic stem cell research legislation by individual meetings with KOLs and testimony to full committee.

Oct 2009, One More Soul Conference presenter

May 30, 2009 presentation to Seattle chapter of the Catholic Medical Association "Conscience Rights and Pharmaceutical Practices".

May 15, 2009 presentation to Yakima chapter of the Christian Medical and Dental Association "Conscience Rights and Pharmaceutical Practices".

March 10, 2009 Sound Insight radio program with Tom Curran discussing President Obama's Executive Order to fund embryonic stem cell research.

March 03, 2009 Testimony to Oregon Legislative Commerce Committee on stem cells.

February 10, 2009 Bellevue, WA., Rotary International "Big Macs, Vaccines and Informed Consent."

January 26, 2009 "The Science and Promise of Adult and Embryonic Stem Cell Research," Literary and Travel Women's Club, Seattle, WA.

January 23, 2009 "Fostering and Understanding Personhood in Scientific Stem Cell Research," American Life League conference, Washington, D.C.

January 21, 2009 "March for Life Plenary Session," Washington, D.C.

October 03, 2008, presentation to the Physicians Resource Council, Colorado Springs, CO.

September 26, 2008 University District Seattle, WA., Rotary International "Big Macs, Vaccines and Informed Consent."

September 11, 2008 presentation to United States Congressional Values Action Team.

September 09, 2008, presentation to United States Senate Values Action Team.

September 08, 2008, radio interview on "Business Off the Beaten Path: Blog Talk Radio with Mary Anne Dorward".

June 26, 2008, Focus on the Family, Colorado Springs, CO "Vaccines, Abortion and the conception of AVM Biotechnology to provide alternatives."

June 04, 2008, radio interview with Martha Kleder, Concerned Women for America, "Embryonic Stem Cell Research Bill Resurfaces."

March 2008, Catholic Medical Association "Spotlight on Theresa Deisher, AVM Biotechnology." by John Brehany.

March 23, 2008, National Catholic Register "Seattle Scientist Launches Pro-Life Biotech Company." by Steve Weatherbe.

March 04, 2008, Sacred Heart Radio, Cincinnati, OH "Stem cell interview."

February 11, 2008 "The Ethics and Promise of Stem Cells," University of Washington Medical Students for Life.

2007 Distinguished Graduate, Assumption-St. Bridget School.

Theresa Deisher, "Conversations with Fr. Bob" December 2007
The Conversations with Father Bob

Theresa Deisher, "The Science and Promise of Adult and Embryonic Stem cells" Assumption Church November 2007

Theresa Deisher , September 2007 presentation to Group Health Senior Association "Stem Cells, what are they and what are they good for?"

Theresa Deisher , panel participant, "Stem Cells, what are they and what are they good for?" Assumption Church May 2007.

Theresa Deisher, panel participant Channel 9 KCTS Connects March 15, 2007 stem cell discussion with Ron Reagan, Jr., Jim McManus, Pastor Joe Fuiten.

Theresa Deisher, panel participant, February 2007 presentation to Washington State Republican caucus "Which stem cell to choose?"

Theresa Deisher, panel participant, January 2007 presentation to Positive Christian Agenda "Current state of stem cell research and where it is going."

Theresa Deisher, panel participant, October 2006 MIT forum on stem cells.

Theresa Deisher, "Stem Cell Research: What it is and why it
matters." Panel participant, May 2006, Wa State Mainstream Republicans Convention.

Theresa Deisher, Amgen, Inc. Dept. of Inflammation, Seattle, WA., "4-1BB Beyond Co-stimulation: The 4-1BB Pathway Directly Modulates Cardiac Contractility and Apoptosis" (University of Washington/ Fred Hutchison Cancer Research Center/ Amgen annual symposium 2006 invited oral presentation).

Theresa Deisher, Amgen, Inc., Dept. of Inflammation, Seattle, WA., "Cardiovascular Research at Amgen WA Site: The Set-Up, The Event and The Outcome". (invited seminar, University of British Columbia, iCapture Centre, June 2005).

Stefanie Bonigut*, Kimberly Alford*, Bernie Buetow , Xiaozhen Wang, and **Theresa Deisher** Amgen Inc., Dept of Inflammation, Seattle, WA., The immune co-stimulatory molecule, 4-1BB, is expressed by damaged cardiac interstitial cells, and 4-1BB/4-1BBL signaling contributes to Adriamycin-induced cardiomyopathy in mice. (2003 American Heart Association Scientific Sessions oral presentation given by T. Deisher). Circulation 2003, 108(17) 276.

B Yanagawa[1], S Bonigut[2], H Luo[1], T White[3], GF Schreiner[3], J Yuan[1], M Zhang[1],
P Cheung[1], **T Deisher**[2], T Daniel[2], DC Yang[1], BM McManus[1] **GENE PROFILING IN CVB3-INFECTED MOUSE HEARTS** Research Award NW CV Frontiers Feb 2-4, 2003

California Young Investigator Cardiovascular Research Symposia. Jul 27-29, 1989. Santa Barbara, California.

California Young Investigator Cardiovascular Research Symposia. Aug 11-13, 1988. Santa Barbara, California.

RESEARCH

January 2008 -	AVM Biotechnology, LLC CEO, Founder and Research and Development Director *Dedicated to safe, effective, affordable and ethical human therapeutics, focusing initially on regenerative medicine and vaccinations.*
June 2008-	Sound Choice Pharmaceutical Institute

President
Committed to providing education, scientific research, development and resources to encourage safe and moral medicines and therapeutics.

Sept 2006 – Oct 2007 CellCyte Genetics Corporation
Vice President, Research and Development

July 2002 – July 2006 Amgen Inc., Seattle, WA.
Principal Scientist, Inflammation Department.

- Interdepartmental Project Leader
- Directly supervised four staff from mid- to senior-research associate level.
- Post-Doctoral Advisor to Xiaozhen Wang, who is currently a Research Scientist with Centocor/Eli Lilly in the Stem Cell Department.
- Summer intern mentor for two students evaluating the impact of co-stimulatory molecules and GHSR agonists on cardiac contractility.
- Co-contributor to two patents related to the use of anti-cytokine therapies for heart failure. Lead inventor on a patent describing the mobilization and use of ckit+ stem cells for cardiac repair.

Responsible for a multi-disciplinary team working on the biology and commercial development of novel co-stimulatory pathways involved in the initiation and progression of cardiac failure. My research interests encompassed stem cell therapies for myocardial regeneration, the role of cytokine and co-stimulatory molecules in heart failure (ischemic, myocarditic and cytotoxic), and novel ectonucleotidases for stroke, atherosclerosis and plaque rupture.

My research group introduced non-invasive imaging technologies to the company, including ultrasound (echocardiography) and near-infrared imaging. We were named an official 'Site of Excellence' by Philips Medical for our pioneering work in standardizing rodent echocardiography methods.

Additional responsibilities have included presentations to the research review board, and serving on inter-departmental task forces to evaluate in-licensing opportunities, internal research opportunities, and new clinical indications. Academic research collaborations have included: Dr. David Pinsky, Chief of Cardiology, University of Michigan, Dr. Myron D. Ginsberg, University of Miami, and Dr. Bruce McManus, iCapture Centre University of British Columbia.

October 2000-July 2002 **Immunex Corp,** Seattle, WA.
Senior Staff Scientist, Vascular Biology

- Project Leader – Anti-Thrombotics
- Project Leader – Inflammation and Myocardial Repair
  Responsibilities were carried over to my position at Amgen, Inc.

1995-2000 **ZymoGenetics, Inc.**, Seattle, WA.
1998-2000 Senior Scientist, Cardiovascular Biology
1995-1998 Scientist, In Vivo Biology

- Project Leader – FGF18
- Directly supervised two staff research associates
- Contributed to the filing of over 15 patents related to the discovery of novel ESTs and proteins.

At ZymoGenetics I directed a research program focused on the discovery of cardioprotective compounds for ischemic or cytotoxic damage. I was responsible for the development of a micro-surgical model of ischemia-reperfusion, in addition to

executing established models of heart failure such as catecholamine or anthracycline administration. My work in this area lead to the discovery of a novel regenerative growth factor (licensed to Serono for development) and to the identification of adult cardiac stem cells (see patent list).

Additional areas of research at ZymoGenetics included hematopoiesis, diabetes and obesity. Academic collaborators included Dr. Michael Schneider, Baylor College of Medicine, Dr. Brad Olwin, University of Colorado, Dr. Michael Fowler, Stanford University.

1993-1995 Research Scientist, **Repligen Corp.**, Cambridge, MA., Inflammation Department.

- Directly supervised four staff from junior associates to scientist positions.
- Served on Repligen/Eli Lilly joint development committee.

Responsibilities included the development of research and clinical assays in support of Phase I and Phase II clinical trials of an anti-CD11b mAb for ischemia-reperfusion injury. Research interests included neutrophil-mediated inflammation and hematopoiesis.

1988-1990 Research Associate, **Genentech, Inc.** South San Francisco, CA., Cardiovascular Pharmacology Department

Developed in vitro and in vivo assays in support of the gpIIb/IIIa program. Other research areas involved plaque rupture and the development of models and methods to study the response of vascular smooth muscle to balloon injury.

1983-1984 Honors Student, Dr. H. Craig Heller (mentor), Human Biology Department, Stanford University; honors thesis research on central versus spinal control of thermoregulation.

1980-1981 Research Assistant, Department of Medicine, Stanford University.
Data compilation and analysis for the Stanford High Blood Pressure Prevention Study Group.

Academic Teaching Experience

1988-1989 Undergraduate Honors Thesis Advisor
1986-1987 Undergraduate Honors Thesis Advisor

Fall 1987 and 1988 Lecturer, Department of Physiology, Stanford University School of Medicine"Vascular Smooth Muscle" series (graduate/medical school course)

1985-1986 & 1984-1985 Teaching Assistant, Department of Biology, Human Physiology course, Stanford University (undergraduate course).

SOCIETY MEMBERSHIPS

1998 - present AHA member: Council on Basic and Clinical Science
1999 - present Heart Failure Society of America member

GRANTS and AWARDS

M.J. Murdock Charitable Trust, February 2010." Population, Bioinformatics and In Vitro Studies into the Relationship between Residual Human DNA Vaccine Contaminants and Autism." $500,000.00

American Heart Association, California Affiliate Grant-In-Aid recipient, 1988. "Biochemical Aspects of Catecholamine-Induced Cardiotoxicity." $30,000

American Heart Association, California Affiliate Grant-In-Aid recipient, 1989. "Biochemical Aspects of Catecholamine-Induced Cardiotoxicity." $30,000 (renewed)

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Selected MANUSCRIPTS and Scientific Presentations:

LaMadrid, M, Brown C, **Deisher T** : "US Autistic Disorder (1970-2002) Changepoints Do Not Coincide With Changepoints for Suspected Sociologic and Environmental Causes", submitted for publication to Autism Research March 16, 2011.

International Meeting for Autism Research May 2010, poster presentations of abstracts below:

"Computational Detection of Homologous Recombination Hotspots in X-Chromosome Autism Associated Genes,"

"Quantitative Evaluation of Sociologic Factors That Can Lead to Apparent Increases in Autism Prevalence"

Effects of granulocyte-colony stimulating factor on bone marrow-derived progenitor cells in murine cardiac transplantation.
Rezai N, Deisher TA, Heine HL, Wang X, Corbel SY, Leung J, Kerjner A, Rossi FM, Podor TJ, McManus BM.
Cardiovasc Pathol. 2010 Jan-Feb;19(1):36-47. Epub 2009 Jan 14

Deisher TA, "Why Are We Celebrating Reprogramming of Adult Cells?" Celebrate Life, March-April 2008, pages 34-35.

Caroline T.Y. Cheung[1], **Theresa Deisher**[2], Honglin Luo[1], Bobby Yanagawa[1], Stefanie Bonigut[2], Amrit Samra[1], Hongyan Zhao[1], Elizabeth Walker[1], Bruce M. McManus.
Neutralizing Anti–4–1BBL Treatment Improves Cardiac Function in Viral Myocarditis. Lab Investigations 2007 v87(7) 651-661.

Yanagawa B, Taylor L, **Deisher TA**, Ng R, Schreiner GF, Triche TJ, Yang D, McManus BM.
Affymetrix oligonucleotide analysis of gene expression in the injured heart.
Methods Mol Med. 2005;112:305-20.

Sean P. Mazer, Matthew C. Hyman, Diane Bouïs, **Theresa A. Deisher**, Kim E. Olson, M. Johan Broekman, Aaron J. Marcus, David J. Pinsky. " Ecto-enzymatic suppression of atherogenesis by CD39." Submitted to Nature June.

Xiaozhen Wang, Stefanie Bonigut, Kimberly Alford, Dong Xia, Eric Butz, **Theresa A. Deisher** "Inhibition of the tumor necrosis factor receptor family member, 4-1BB, alleviates doxorubicin-induced apoptosis and improves cardiac function in mice." under revision for resubmission to Circulation 2007.

Ludmila Belayev, Larissa Khoutorova, **Theresa A. Deisher**, Andrey Belayev, Raul Busto, Yongbo Zhang, Weizhao Zhao, and Myron D. Ginsberg, "The Neuroprotective Effect of SolCD39, A Novel Platelet Aggregation Inhibitor, On Transient Middle Cerebral Artery Occlusion In Rats". Stroke 34:758-763, 2003.

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PATENTS:

Title	Publication number	Publication date	Inventor(s)	Applicant(s)	European classification
Disintegrin homologue, MAHBP	US2003153064 (A1)	8/14/2003	SHEPPARD PAUL O [US]; BAINDUR NAND [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]; TAFT DAVID W [US]	ZYMOGENETICS INC [US]	C12N9/64F2C24
SGIP peptides	US2003176640 (A1)	9/18/2003	SHEPPARD PAUL O [US]; JASPERS STEPHEN R [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]	ZYMOGENETICS INC [US]	C07K14/47; C07K14/575
Low-power noise characterization over a	US2004002860 (A1)	1/1/2004	DEISHER MICHAEL E [US]; MORRIS ROBERT W [US]	INTEL CORP [US]	G10L21/02A1; G10L11/00A
USE OF TUMOR NECROSIS FACTOR INHIBITORS TO TREAT CARDIOVASCULAR DISEASE	WO02080847 (A2)	10/17/2002	WARREN MARSHELLE S [US]; DEISHER THERESA A [US]	IMMUNEX CORP [US]; WARREN MARSHELLE S [US]; DEISHER THERESA A [US]	A61K38/17C; G01N33/68V
Use of tumor necrosis factor inhibitors to treat cardiovascular	US2004072805 (A1)	4/15/2004	WARREN MARSHELLE S [US]; DEISHER THERESA A [US]	WARREN MARSHELLE S, ; DEISHER THERESA A	G01N33/68V
Novel FGF homologs	US2003008351 (A1)	1/9/2003	DEISHER THERESA A [US]; CONKLIN DARRELL C [US]; RAYMOND FENELLA C [US]; BUKOWSKI THOMAS R [US]; HOLDERMAN SUSAN D [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC [US]	C07K14/50
Testis specific transcription factor ZGCL-1	US2002160487 (A1)	10/31/2002	YEE DAVID P [US]; DEISHER THERESA A [US]	ZYMOGENETICS INC [US]	C07K14/47A1
Zsig33-like peptides	AU6303201 (A)	11/26/2001	JASPERS STEPHEN R; SHEPPARD PAUL O; DEISHER THERESA A; BISHOP PAUL D	ZYMOGENETICS INC	C07K14/63
Disintegrin homologs	US2002072102 (A1)	6/13/2002	SHEPPARD PAUL O [US]; BAINDUR NAND [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]	SHEPPARD PAUL O, ; BAINDUR NAND, ; DEISHER THERESA A, ; BISHOP PAUL D	C12N9/64F2C24
Disintegrin homologs.	ZA200007766 (A)	12/21/2001	SHEPPARD PAUL O; BAINDUR NAND; DEISHER THERESA A; BISHOP PAUL D	ZYMOGENETICS INC	C12N9/64F2C24
METHOD OF FORMING A PEPTIDE-RECEPTOR COMPLEX WITH ZSIG33	WO0138355 (A2)	5/31/2001	SHEPPARD PAUL O; JASPERS STEPHEN R; DEISHER THERESA A; BISHOP PAUL D	ZYMOGENETICS INC [US]	C07K14/575

Fibroblast growth factor homologs	EP2339002 (A1)	6/29/2011	DEISHER THERESA A [US]; CONKLIN DARRELL C [ES]; RAYMOND FENELLA C [US]; BUKOWSKI THOMAS R [US]; JULIEN SUSAN D [US]; HANSEN BRIGIT [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC [US]	A61K47/48R; A61K47/48T4; C07K14/50; C07K16/22; C12N5/06B6C
FGF HOMOLOGS COMPOSITIONS AND USES THEREOF	US2010160235 (A1)	6/24/2010	DEISHER THERESA A [US]; CONKLIN DARRELL C [GB]		A61K38/18C
ADJUSTMENT OF TEMPORAL ACOUSTICAL CHARACTERISTICS	US2010169075 (A1)	7/1/2010	RAFFA GIUSEPPE [US]; NACHMAN LAMA [US]; GRAUMANN DAVID L [US]; DEISHER MICHAEL E [US]		G10L13/04U; G06F17/27R4
Methods of using motilin homologs	US2009270333 (A1)	10/29/2009	SHEPPARD PAUL O [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]; JASPERS STEPHEN R [US]; LABROO VIRENDER M [US]	ZYMOGENETICS INC [US]	C07K14/575
TML polynucleotides	US2008194484 (A1)	8/14/2008	SHEPPARD PAUL O [US]; DEISHER THERESA A [US]; JASPERS STEPHEN R [US]; BISHOP PAUL D [US]	ZYMOGENETICS INC [US]	C07K14/575
HANDHELD DEVICE ASSOCIATION VIA SHARED VIBRATION	US2009169018 (A1)	7/2/2009	DEISHER MICHAEL E [US]		H04L9/32
NOVEL FGF HOMOLOGS	US2008233114 (A1)	9/25/2008	DEISHER THERESA A [US]; CONKLIN DARRELL C [US]; RAYMOND FENELLA C [US]; BUKOWSKI THOMAS R [US]; HOLDERMAN SUSAN D [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC	C07K14/50
Disintegrin homologs	US2006024805 (A1)	2/2/2006	SHEPPARD PAUL O [US]; BAINDUR NAND [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]; TAFT DAVID W [US]	ZYMOGENETICS INC	C07K14/47; C12N9/64F2C24
SGIP peptides	US2005208626 (A1)	9/22/2005	SHEPPARD PAUL O [US]; JASPERS STEPHEN R [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]	ZYMOGENETICS INC	C07K14/63; C07K7/06A
METHODS OF USING G-CSF MOBILIZED C-KIT+CELLS IN THE PRODUCTION OF EMBRYOID BODY-LIKE CELL CLUSTERS FOR	WO2005047491 (A2)	5/26/2005	DEISHER THERESA [US]; WANG XIAOZHEN [US]; BEGLEY C GLENN [US]	AMGEN INC [US]; DEISHER THERESA [US]; WANG XIAOZHEN [US]; BEGLEY C GLENN [US]	A61K35/28; C12N5/06B2L; C12N5/06B6P; C12N5/06B21P
Methods of using G-CSF mobilized C-Kit+ cells in the production of embryoid body-like cell clusters for tissue repair	US2005186182 (A1)	8/25/2005	DEISHER THERESA [US]; WANG XIAOZHEN [US]; BEGLEY C G [US]	DEISHER THERESA, ; WANG XIAOZHEN, ; BEGLEY C. G	C12N5/06B2L; C12N5/06B6P; C12N5/06B21P
Zsig33-like peptides and polynucleotides	US2005048618 (A1)	3/3/2005	JASPERS STEPHEN R [US]; SHEPPARD PAUL O [US]; DEISHER THERESA A [US]; BISHOP PAUL D [US]	ZYMOGENETICS INC [US]	C07K14/575; C07K14/63
Novel FGF homologs	US2005043234 (A1)	2/24/2005	DEISHER THERESA A [US]; CONKLIN DARRELL C [US]	DEISHER THERESA A, ; CONKLIN DARRELL C	A61K38/18C; C07K14/50

SGIP PEPTIDES	WO0100830 (A1)	1/4/2001	SHEPPARD PAUL O; JASPERS STEPHEN R; DEISHER THERESA A; BISHOP PAUL D	ZYMOGENETICS INC [US]	C07K14/47; C07K14/63
HUMAN THYROID PROTEIN ZSIG45 AND DNA ENCODING	NO20002832 (A)	7/20/2000	DEISHER THERESA A [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC [US]	C07K14/475
Antibodies and methods of making antibodies to human thyroid protein zsig45	US6486304 (B1)	11/26/2002	DEISHER THERESA A [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC [US]	C07K14/47
Human thyroid protein ZSIG45	US6500925 (B1)	12/31/2002	DEISHER THERESA A [US]; SHEPPARD PAUL O [US]	ZYMOGENETICS INC [US]	C07K14/47
MOTIUN HOMOLOGS	NO994614 (A)	11/23/1999	SHEPPARD PAUL O [US]; DEISHER THERESA A [US]	ZYMOGENETICS INC [US]	C07K14/575
CARDIAC-DERIVED STEM CELLS	WO9949015 (A2)	9/30/1999	DEISHER THERESA A [US]; HANSON BIRGIT [US]; MOORE EMMA E [US]; ROBERTSON TAMARA L [US]; THOMPSON DEBORAH L [US]; LUM KAREN D [US]	ZYMOGENETICS INC [US]; DEISHER THERESA A [US]; HANSON BIRGIT [US]; MOORE EMMA E [US]; ROBERTSON TAMARA L [US]; THOMPSON DEBORAH L [US]; LUM KAREN D [US]	C12N5/06B6P
A HUMAN 2-19 PROTEIN HOMOLOGUE, Z219C	WO9925828 (A1)	5/27/1999	CONKLIN DARRELL C; BLUMBERG HAL; DEISHER THERESA A	ZYMOGENETICS INC [US]	C07K14/47
TESTIS-SPECIFIC TRANSCRIPTION	WO9909168 (A1)	2/25/1999	YEE DAVID P; DEISHER THERESA A	ZYMOGENETICS INC [US]	C07K14/47A1
USE OF FACTOR XIII FOR THE MANUFACTURE OF A MEDICAMENT FOR THE	WO9851333 (A1)	11/19/1998	DEISHER THERESA A; BISHOP PAUL D; GARCIA RICHARD M	ZYMOGENETICS INC [US]	A61K38/45
HOMOLOGOS DE MOTILINA.	ES2317664 (T3)	4/16/2009	SHEPPARD PAUL O [US]; DEISHER THERESA A [US]	ZYMOGENETICS INC	C07K14/575
Motilin homologs	CN1733918 (A)	2/15/2006	SHEPPARD PAUL O DEISHER THERES [US]	ZYMOGENETICS INC [US]	C07K14/575
TREATMENT AGENTS AND METHODS FOR TREATING TYPE II DIABETES AND SYMPTOMS OF	WO9827986 (A1)	7/2/1998	DEISHER THERESA	ZYMOGENETICS INC [US]	A61K31/57
Treatment agents and methods for treating type II diabetes and	US5929058 (A)	7/27/1999	DEISHER THERESA A [US]	ZYMOGENETICS INC [US]	A61K31/58

ABSTRACTS

Mazer, SP., Fedarau, M., Liu, YL., Hwang, DW., Towe CW., Liu, CF., Olson, KE>, Borekman, MJ., Marcus, AJ., **Deisher, TA.**, Pinsky, DJ: Deletion of endothelial ectoapyrase (CD39) promotes atherogenesis in hyperlipidemic mice. Circulation 2004 110(17) 79.

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Civic Activities

May 2001 to present — **University District Youth Center**
Donor to center, and monthly chef for 60 homeless youths.

May 2002 to Jan 2007 — **Seattle Biotech Legacy Foundation Board Member**
The Seattle Biotech Legacy Foundation works toward a healthy, sustainable future by promoting science-based understanding, solutions and actions that are grounded in recognition of the interconnected nature of our world.
Scientific Advisory Group member *Mar 2006 to Jan 2007*
Board Member to oversee development efforts for SBLF.
Oct 2004 to Jan 2007

Grant Committee member
May 2002 to Jan 2006