Good Afternoon Dr. Insel and members of the IACC,

My name is Katie Weisman and I am here today on behalf of SafeMinds.

I am the mother of 14 year-old identical triplet boys, two diagnosed with PDD-NOS and one with autism. I have been a full-time advocate for 11 ½ years now. I have run a parent support group for a decade, have fundraised, have started a safety campaign, have done autism awareness training for typical kids, have lobbied for insurance, and have worked on the bill that reauthorized this committee. More importantly, I have helped three of the best, hardest working young men on the planet learn how to talk and write and read and live in their world happily. But I am here to tell you that this is all taking too long. My boys and all the people like them and all the children who are being diagnosed now, today, while we are sitting here, need answers and help now, today.

I am here to tell you why the mercury/autism connection is stronger than it has ever been. It is time to set politics aside and look at the science. Anyone who truly cares about individuals with autism simply cannot ignore mercury. For those who say that the link has been disproven, I say go and actually read the literature – it currently supports a connection by a 2 to 1 margin. The positive studies rarely make the press. Included with my comments are e-mails, obtained through the Freedom of Information Act, showing that the CDC omitted data showing that autism rates in Denmark actually dropped in 2001 after they removed thimerosal from their vaccine program. I have also included Mark Blaxill's graphic analysis of the early Verstraeten VSD data, also obtained through the Freedom of Information Act, showing 7.6 times the relative risk of autism in children who received high thimerosal by one month of age compared to children who received zero thimerosal. This is important because, later, unvaccinated children were excluded from the study eliminating the zero exposure control group.

I have read most of the autism abstracts in Pubmed for over 4 years now, along with hundreds of studies and have followed the research for over a decade. I can tell you unequivocally that the number one, best supported, most logical suspect for autism causation is mercury and it is only being ignored because it implicates vaccines. It will not be the only cause, but it is logical to tackle mercury because

exposures are often easy to avoid. With about 45,000 children a year being diagnosed with autism spectrum disorders in the US alone, based on the most current prevalence ratio, I do not believe that anything can be off the table for research.

However, thimerosal is not the only mercury exposure of concern in autism. Mercury comes from many other sources including fish, other food, dental amalgam, skin-lightening creams, fluorescent bulbs, Santeria rituals, air pollution and even tattoos. Despite recent emissions controls in developed countries, global mercury pollution is on the rise due to massive growth of industry in countries like India and China. The EPA estimates that 83% of the mercury deposited in the US is from international sources. Any candidate for causation must fit trends of exposure, and cause symptoms that make sense. There are obvious studies like those linking autism rates to mercury in the air or the number of fillings a mother had, but there have been no studies yet of total mercury exposure relative to autism. Those studies need to be done.

What we do know is that the EPA estimates 1 in 6 women of child-bearing age in the US already has mercury blood levels that put her children at risk because mercury preferentially concentrates in the cord blood at a ratio between 1.8 and 3 times that of the maternal blood. It is not just methyl mercury that is the problem. NHANES data shows that inorganic mercury is rising in the blood of women of childbearing age and increases significantly with age. A Chinese study last year found that cord blood mercury level was negatively correlated with adaptation, language, social and average DQ while the relationship between cord mercury level and motor DQ was not statistically significant (Li et al. 2011).

The single biggest roadblock in autism research is that researchers stay in their silos and do not pay attention to what is happening in other fields. The geneticists are not talking to the clinicians. The behaviorists are not talking to the neurologists. And almost everybody is avoiding the 800 pound gorilla in the room – mercury. There is currently enough research to write a paper titled, “How the known genetics of autism support mercury causation.” I read about methylation defects due to MeCP3 in Rett’s and know that Dick Deth has shown that

thimerosal completely inhibits methionine synthase – thereby shutting down a primary driver of the methyl cycle. I read that calcium channel signaling and glutamate receptors are disrupted in autism and CACNA1C is a strong candidate gene and see the extensive literature showing that mercury is a potent disruptor of calcium signaling.

I would like to quote from two studies that have been published in the past week and see if you can make the connections to the autism. From Ye and colleagues – "A significant change in cell viability was observed after exposure to 0.001% thimerosal for 30 minutes. DNA single and double strand breaks were significantly increased in a dose-dependent manner with thimerosal exposure." The concentration of thimerosal in a typical vaccine is 0.01%, or ten times the amount in this study.

From Sharpe and colleagues, "We find that ethylmercury (in astrocytes) not only inhibits mitochondrial respiration leading to a drop in the steady state membrane potential, but also, concurrent with these phenomena, increases the formation of superoxide, hydrogen peroxide and Fenton/Haber-Weiss generated hydroxyl radical….Additionally, we find a five-fold increase in the levels of oxidant damaged mitochondrial DNA bases and increases in the levels of mtDNA nicks and blunt-ended breaks."

Gadhia and colleagues published this in May, "Exposure to metals alters gene expression, changes transcription rates or interferes with DNA repair mechanisms. We tested a hypothesis to determine whether in vitro acute metal exposure, with or without recovery, alters epigenetic pathways in mouse embryonic stem (mES) cells." They found that mercury and arsenic, in particular, not only alter gene expression, but impair the cells ability to repair DNA damage.

We need to stop looking at finding these risk genes as an end unto themselves. They are simply markers for the biochemical pathways of concern. It is not helpful to generate an endless list of candidate genes. We need to look at the toxins likely to both cause DNA mutations and trigger epigenetic effects on those pathways. He and colleagues published a study last week of four members of a Chinese family. They found 89 de novo copy number variations in the siblings

with autism in that single family. Do we really need to be spending millions of dollars making a phone book of genetic variations that may or may not be relevant or do we need to look at potential causes of those variations?

There is not a single identified gene that always leads to autism. For Fragile X full mutations, 67% of males are affected along with only 23% of females. For tuberous sclerosis 43-86% of cases meet criteria for a PDD. Those lead the pack by a wide margin. Untreated PKU results in only 5.71% of cases meeting autism criteria. We also need to bear in mind that developing pharmaceuticals to correct genetically caused disregulation is going to take decades and any individual drug is likely to help only a small fraction of those affected.

Getting back to mercury, we have the Shandley/Austin study from last year showing that the grandchildren of survivors of acrodynia have 7 times the rate of ASD of the general population in Australia – 1 in 22. Acrodynia is a form of mercury poisoning in a genetically susceptible population - which should sound familiar.

The support for mercury causation goes well beyond genetics, though. We have studies showing that severity of autism is related to inability to excrete mercury in hair (poor detoxification). We know that porphyrinuria related to heavy metals shows up in children with autism. Some less obvious connections are as follows:

Mercury accumulates as you age. (Autism risk increases in older moms and dads.)

Neonatal jaundice is a risk factor for autism. (Mercury is detoxed through the biliary system.)

Low birth weight/prematurity are risk factors for autism. (Mercury toxicity is relative to body weight.)

Mercury causes impaired speech and hearing. (Both are well-documented in autism.)

Mercury causes reduction in visual color discrimination. (This is also documented in autism.)

This is just a sampling of the strength and consistency of the mercury-autism research. For a good overview at the cellular level, see Garrecht and Austin, 2011. If we truly mean to improve the lives of those with autism and stop autism's most devastating effects, we need to stop ignoring the obvious.

Therefore, these are the challenges I have for you:

1) I challenge all of you to actually follow **all** the autism research so you can see the imbalance, the holes and the connections. Also, look at the mercury literature and actually read the studies. Then decide if you are here to make a difference. If you aren't let someone else have your seat. The status quo is **not** acceptable.

2) I challenge you to hold a conference on autism with a sampling of leading autism researchers and a group of mercury toxicologists to discuss the connections and plan the research that still needs to be done.

3) Create a mechanism to determine the effectiveness of the work you are doing. Can you show that any of the studies you've funded have actually made a difference in the lives of people with autism? Have new treatments been proven effective? Have you established best practices for service programs? Are people with autism protected from abuse in schools?

4) Rebalance the autism portfolio. The Simons Foundation has the genetics covered and the imaging studies are not helping. There is a glaring vacuum of comparative best practice research past age 5 for all issues related to education, social skills, employment, service provision, staff training and, most importantly, treatment of medical issues. Commit 30% of the IACC research dollars towards environmental causation studies, particularly mercury, and 30% towards actual comparative studies of the best methods for teaching and providing services for people with autism. The remaining 40% should go towards studies to treat the comorbid seizures, gastrointestinal disease, sleeplessness, allergies, anxiety, depression and sensory problems that so dramatically affect individuals with autism. Let's improve the quality of some lives today and let's try to prevent the severe impacts of autism on individuals in the future.

5) I challenge all of you to visit a school or classroom that educates people with severe autism if you have never done so. You are here to serve and you must understand who you are serving.

Thank you,

Katie Weisman

Director of Communications and Public Policy

Coalition for SafeMinds

SafeMinds is a non-profit 501c-3 organization whose mission is to restore health and protect future generations by eradicating the devastation of autism and associated health disorders induced by mercury and other toxicants resulting from human activities.