OREGON HEALTH & SCIENCE UNIVERSITY

School of Medicine

Department of Psychiatry

Mail code DC-7P
3181 S.W. Sam Jackson Park Road
Portland, OR 97239-3098
tel 503 494-8613
fax 503 494-6170
www.ohsu.edu/url

Joel Nigg, Ph.D.
Director, Division of Psychology
niggj@ohsu.edu

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RE: Testimony on the Toxic Free Kids Act (SB478) for Senate Committee on Environment and Natural Resources

Chairman Edwards and Members of the Committee:

I am a clinical scientist at OHSU, which has endorsed this bill, although I speak here representing only my own views. I have a Ph.D. in clinical psychology and for the past 20 years I have conducted research on child development, at the level of behavior, neuropsychology, brain imaging, and genes. My special expertise is neurodevelopmental disorders, that is, developmental brain problems, like ADHD and Autism. I have conducted some studies on lead exposure and ADHD, as well as done considerable literature review on other toxicants. I do this because of my scientific interests in how genes and environmental exposures influence children's risk for these costly developmental problems. Thus, my special interest in this bill pertains to containing risks to children's neurodevelopment and psychiatric outcomes. I want to make the following points.

Playing catch up wastes scientific health research. Over several decades, those of us in the scientific community have been playing catch up—we discover one chemical at a time that a particular product or agent is harmful in child development. In the meantime many more come to market without having been evaluated for their effects on developing children. So we start again. And publically funded scientists must do this work instead of working on cures to diseases, because these potential effects are so preventable. In this context, the least we can do when we find chemicals in question have known bioactive effects, is to note the level of risk and take reasonable precautions to limit children's exposures.

Level of exposure harmful to brain development is consistently lower than first thought. In my own research, I have studied lead in child ADHD. The lesson we learned for lead has been repeated by other investigators with many chemicals on this bill's list. That is, particularly when we move to the child's brain and skills like learning and attention, we find that the level of exposure that causes harm is persistently lower than we thought. Lead safe levels were lowered again recently in part due to studies like ours showing associations at background level of exposure. Now we know that the average, "background" exposure level that is common in children for lead is harming at least some of these children, and the same is now true for other chemicals on this bill's list.

Coming to the chemicals on the list in SB478, I note these points:

Chemicals on list are active in numerous biological systems in humans. These are all bioactive chemicals that can alter multiple biological systems: including immune, inflammatory, white matter development in the brain, synapse formation in the brain, and gene expression. One of my areas of work is epigenetic changes associated with experience and disease outcome. When epigenetic change is looked at in relation to these

chemicals, it shows effects. As you may know, epigenetic changes can have effects that persist across generations. Therefore, these chemicals have clear potential for adverse health effects.

Chemicals can escape from consumer products. But what about the *products* that contain the chemicals? The second point here is that many of these chemicals are difficult to neutralize. They can and do leach out of consumer products and be absorbed via skin, inhalation, or ingestion. This is demonstrated by looking at urine and blood levels in consumers using different amounts of the products and in controlled animal studies. Thus, there is potential for the products that contain the chemicals to be harmful. And again, for the chemicals I have looked at on this list in the literature (particularly the phthalates), there is evidence that even *low level* exposure (that is, routine exposures) can have meaningful effects on human biological functioning, including on the child's brain.

Evaluation is difficult without reporting and information. Finally, it is difficult to evaluate how big chemical contribution is to disease in Oregon because their use in consumer products is not disclosed. We have to change the pattern of being in the dark and waiting until we have very serious harms before we collect information. In a sense, we are at present conducting a poorly designed experiment. That is, we are exposing children to products which contain chemicals that may leech out and be harmful to their brain development, without collecting the basic data that would allow us to evaluate that harm. Do you really want your child in that experiment? At least let's track the information, and let's limit use of those chemicals that are already known to be too risky for children's products.

Source evidence available. If anyone would like specific scientific reports on any of the points made here, I will be happy to provide more background, citations, or papers.

In conclusion, it is prudent to take some action to protect children against exposure of these substances. A minimal step is to begin to track their use so we can see their exposures and to limit or phase out the most risky compounds. This bill is a prudent, measured, and proportional intervention to limit health risks to children's brain development. I therefore urge you to support it.

Sincerely yours,

Joel Nigg, Ph.D.
Director, Division of Psychology
Professor of Psychiatry, Pediatrics, and Behavioral Neuroscience
Oregon Health & Science University