

Dr. Marcos A Orellana
Special Rapporteur on Toxics and Human Rights

Dear Dr. Orellana,

Thank you for your effort to explore the way science is differentially available for use in different sectors and the way the benefits from science can be minimized by dis/mis information. Thank you also for this opportunity to provide my insights. I have worked in the field of Endocrine Disrupting Chemicals (EDCs) for over 25 years. I have engaged with regulatory agencies in the U.S., E.U. and other countries during this time and have worked with UNEP and WHO both as an individual academic and as a representative of the Endocrine Society. I therefore would like to share some of my experience in relation to your specific interests as described below.

Tackling misinformation and disinformation campaigns and documenting attempts to manipulate or distort science in regulatory processes

The issue of Perchlorate. Perchlorate is chemical used extensively by the US Department of Defense (DoD; as well as in other countries) but is a potent inhibitor of thyroid function. Academic research to understand the effect of perchlorate on human health has been opposed by the DoD. For example, Dr. Mary Gilbert of the US EPA publish a paper in a reputable journal demonstrating the impacts of perchlorate exposure on brain function in rats (<https://pubmed.ncbi.nlm.nih.gov/18560531/>). In response to this publication, two consultants working for a private company under contract to the US Airforce published a harsh critique of the Gilbert paper (https://ehp.niehs.nih.gov/doi/10.1289/ehp.0800532?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed). Using the journal's "Correspondence" venue, the authors ended by stating that, "*Given the inadequacies of the experimental model, the absence of a dose response in the findings, and lack of corroboration of alleged hippocampal deficiency by behavioral tests, we believe that Gilbert and Sui's (2008) conclusions are not substantiated.*"

The arguments employed by Mavis and DeSesso to reach this conclusion are absurd. These individuals had never worked in the field of "thyroidology" and they had not published on perchlorate previously and their scientific contribution to this field clearly falls into the area of "misinformation and disinformation". What is even more outrageous is that a public funded government agency was spending tax dollars for no purpose other than to disparage the work of another public funded government agency. This disinformation was captured in articles by Peter Waldman, an investigative journalist at the Wall Street Journal at the time (<https://old.post-gazette.com/pg/05363/629644.stm>; <https://www.wsj.com/articles/SB105148103391213700>). Taxpayers contributing money to support disinformation campaigns by their elected government to continue exposure to a toxic chemical which is correlated with measurable cognitive deficits (<https://academic.oup.com/jcem/article/99/11/4291/2836745>).

The issue of Endocrine Disruptors. The field of toxicology is based on the principle that the "Dose Makes the Poison". This concept comes from a 400 year old maxim articulated by Paracelsus (https://www.jstage.jst.go.jp/article/jts/35/1/35_1_1/_article) and posits that "everything" is toxic, it just depends on the dose. This concept sets up a false equivalency (<https://www.ehn.org/the-consequences-of-status-quo-chemical-policy-are-becoming-increasingly-clear-2622271479/why-does-it-continue>). For example, arsenic and water are both toxic, just at different doses. A European Commission Report clearly articulates how safety determinations made by the current strategies are inadequate (https://ec.europa.eu/environment/chemicals/endocrine/pdf/sota_edc_final_report.pdf)

So, what "scientific discipline" should take precedence? Is it "disinformation" for a trained toxicologist to adhere to the principles they were taught in graduate school? In a perfect world, scientists trained in Toxicology and those trained in Endocrinology would cooperate and collaborate. Like a team of physicians

organized around a complicated medical case, each participant bringing their specific – and limited – expertise to the discussion. But this is not what happens. We attempted to reconcile the differences between disciplines in a publication (<https://ehjournal.biomedcentral.com/articles/10.1186/1476-069X-13-118>).

Toxicologists who are not expert in endocrinology or in specific endocrine systems are the preferred occupants of industry and government that make decisions concerning public health, assiduously avoiding input from experts.

Thus, in my opinion, the issue of EDCs is an example where modern science is not being allowed to impact safety decisions and public health benefit because it is inconvenient to the current system. The chemical industry and the industry of consultants and experts are all trained the same way as government regulators – often in the same graduate programs. As a result, any attempt to bring in other information that is not consistent with their world view is a threat.

We attempted to reconcile these two perspective at a “consensus” meeting in Berlin (<https://pubmed.ncbi.nlm.nih.gov/27714423/>) and while several of the industry toxicologists were present and agreed to the principles, they had already planned to travel to Brussels and argue against the very principles they espoused (<https://www.prnewswire.co.uk/news-releases/well-known-scientists-ready-to-stem-the-onslaught-of-pseudoscience-in-the-eu-578980091.html>)

Just as one would not want a heart patient to be seen solely by a diabetes doctor, regulators and regulatory agencies must be required to assemble their teams with the various kinds of experts so that modern science can be fully implemented to protect public and environmental health.