

An International Riposte to Naysayers of Endocrine-Disrupting Chemicals

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I take this opportunity as the editor-in-chief of *Endocrinology* to share one of the most remarkable experiences in my career, and to describe events leading to the publication of a companion editorial in this month's *Endocrinology* (1). By way of background, in August 2013, an editorial was published by 18 toxicology journal editors seeking to dismiss the state-of-the-science on environmental endocrine-disrupting chemicals (EDCs) with the explicit goal of influencing, and weakening, regulatory policy. Their editorial has been published to date in four different toxicological journals (2–5). However, the Dietrich et al commentary is flawed, as it is not soundly rooted in the fundamental biological properties of hormones, their receptors, and physiological responses. It neglects to mention over a half-century of research that has led to the well-established understanding that hormones act at extremely low dosages. It ignores the literature showing that natural hormones and EDCs can cause permanent cellular and molecular changes to organs and tissues, especially when exposure occurs during sensitive developmental periods; these actions are often not immediately manifest, but may be exhibited later in life as a disease or dysfunction. Dietrich et al also dismiss conclusive evidence, both in vivo and in vitro, for the biological relevance of low-dose effects of hormones and EDCs, the existence of nonmonotonic dose-response curves, and they misstate the science of thresholds.

Published today in *Endocrinology* (1) is an unprecedented response from the community of basic scientists, clinical researchers, and physicians with expertise in the fields of hormone actions and EDC effects. Our editorial was signed by 20 editors-in-chief and 28 associate and senior editors of endocrine, neuroendocrine, environmental, and other peer-reviewed journals. These journals are

primary venues for publishing cutting-edge scientific evidence for physiological and molecular hormone actions; basic, translational, and clinical endocrinology; as well as EDC effects.

Scientists traditionally speak in terms that hedge certainty – for example, we state with 95% confidence that something may be true; and we are the first to admit the possibility of false positives and false negatives. The editorial of Dietrich et al capitalizes upon uncertainty, as it seeks to foment doubt on the relevance of EDCs. While the science behind EDC health effects is unequivocal (6–8), there continues to be unrelenting pressure from individuals and corporations with stakes in the status quo to keep doubt alive. This concept was brilliantly articulated by Gerald Markowitz and David Rosner, authors of the book *Lead Wars: The Politics of Science and the Fate of America's Children*. In an interview with Bill Moyers (May 17, 2013), Rosner and Markowitz said: “Industry has been fighting to cast doubt on really amazing science,” and they invoked examples not just of lead and asbestos, but also of EDCs including bisphenol A and PCBs. Of the manufacturers of these and other hazardous materials, Rosner and Markowitz said, “You introduce doubt about the data it's really the production of uncertainty.” I agree wholeheartedly, as this has been the strategy of individuals and corporations seeking to defang regulatory policy worldwide on EDCs.

I am proud to take my place among my fellow editors and colleagues who enthusiastically coauthored and signed this statement. This community of experts has formed a united front to state the undeniable: that endocrine-disrupting chemicals pose a threat to human health and to the ecosystems of the earth.

Abbreviations:

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