Policy Decisions on Endocrine Disruptors Should Be Based on Science Across Disciplines: A Response to Dietrich et al.


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We are writing as scientists and editors of leading peer-reviewed journals that have published important contributions in the study of endocrine disrupting chemicals (EDCs). By signing this editorial, we affirm that regulatory decisions on EDCs should be made based on the best available science and expertise that involves, among others, reproductive biology, endocrinology, medicine, genetics, behavior, developmental biology and toxicology (1). (For the complete list of Signatories, Journal Associate Editors, Additional Signatories, including edi-
the European Commission’s approach departs from that their position constitutes “common sense” and that
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thresholds (6), stating that the evidence “clearly demon-
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ments. The conclusions presented in each of these documents are
extraordinarily consistent: Like hormones, EDCs are ac-
tive at very low doses and can induce a range of adverse
health outcomes, many of which are not examined in tradi-
tional toxicology assays (1). In sum, these reports point
to the conclusion that EDCs pose a global health threat.

A recent editorial signed by a number of editors of tox-
icology journals argues for the status quo in the regulation
of EDCs (6), despite the large volume of evidence indicat-
that current regulations are ineffective in protecting
human populations from these chemicals (4–7). As the
UNEP/WHO report notes, the incidence of chronic disease
is now greater than that of communicable disease; many of
these diseases have an endocrine basis. Both experimental
animal and epidemiology studies provide plausible causal
links between EDCs and many of these diseases; for some,
the data are sufficiently robust (8).

The dismissive approach to endocrine disruption sci-
ence put forth by Dietrich et al (6) is unfounded, as it is
neither based on the fundamental principles of how the
endocrine system works and how chemicals can interfere
with its normal function, nor does it consider the conse-
quences of that interference. Their letter also ignores a
growing and rigorous body of literature on both endoge-
 nous hormonal and exogenous EDC effects.

Basic scientists, clinical investigators and physicians
understand that the endocrine system’s functions and re-
sponses change remarkably across the life cycle. Of par-
ticular concern is incontrovertible evidence, published
more than a half century ago (9, 10), that there are critical
life stages, especially during early development, when hor-
mones dictate the differentiation and development of tis-
sues. Any perturbation of the delicate hormonal balance,
whether due to the absence of natural hormones or the
presence of exogenous hormones, can have irreversible
effects on endocrine sensitive organs. EDCs are known to
upset this delicate balance.

Dietrich et al also misrepresent the state of science on
thresholds (6), stating that the evidence “clearly demon-
strates the presence of a threshold for nongenotoxic com-
pounds including EDCs.” Dietrich and colleagues assert
that their position constitutes “common sense” and that
the European Commission’s approach departs from
“common sense.” They do not, however, provide scien-
tific support for this position. Instead, they list several
references (11–15) that, upon examination, do not con-
tain data supporting their assumption but rather simply
assert that the assumption is true. They also fail to address
the considerable literature that speaks against that as-
sumption, eg, refs 16–20. Finally, they argue that struc-
turing regulation upon the assumption of no threshold
“will set an unforeseen precedence [sic].” This is simply
and demonstrably not true. The assumption of no thresh-
old has been widely used, for many years, in the regulation
of genotoxic carcinogens, often based upon in vitro data.
We believe extending this precedent to EDCs is supported
by the science (19).

Furthermore, we hold that common sense dictates that
policies, particularly those in which public health is at
stake, should be based on scientific evidence obtained
from the world’s leading researchers, and should derive
from a more evolved, modern understanding of the sci-
ence, rather than on older, outdated concepts and data
taught in classrooms 20 or more years ago. The European
Commission policy - by that standard - does represent
“common sense.”

Further, the U.S. National Academy of Sciences has
concluded that because of the range of susceptibility to
environmental chemicals across the population, such as
from age, pre-existing conditions, and genetic variation,
and because there are documented exposures to multiple
chemicals, including EDCs, in the population, that it is
more appropriate to consider lack of thresholds at a pop-
ulation level (16).

Many toxicologists have developed rigorous research
programs on EDCs that incorporate endocrinological
principles, including two former Presidents of the Society
of Toxicology, Cheryl Walker and Linda Birnbaum. They
and many other toxicologists do work in this area and
report results that have contributed to the breadth and
depth of concern about EDCs as a global public health
threat. The ad hominem attacks in Dietrich et al do noth-
ing to advance science or opportunities to protect public
health; we refer readers to two additional responses to
their editorial that support this point of view (21, 22). We
need the fields of toxicology, endocrinology, and other
stakeholders to work together to address these issues, not
engage in recriminations.

Policymakers in Europe and elsewhere should base
their decisions upon science, not assumptions based upon
principles that arose out of research on chemicals that are
not EDCs. The letter by Dietrich et al does the European
Commission, science - including the field of toxicology—
and most importantly, public health - a profound
disservice.
Signatories

Journal Editors-in-Chief
1. Prof. Jacques Balthazart, PhD, Frontiers in Neuroendocrinology
2. David O. Carpenter, M.D., Reviews on Environmental Health
3. Paul Czernichow M.D., Hormone Research in Pediatrics
4. Donald B. DeFranco, Ph.D., Molecular Endocrinology
5. Robert M. Dores, Ph.D., General and Comparative Endocrinology
6. Andrea C. Gore, Ph.D., Endocrinology
7. David Grattan, Ph.D., Journal of Neuroendocrinology
8. Stephen R. Hammes, M.D., Ph.D., Editor-in-Chief elect, Molecular Endocrinology
9. Patrick R. Hof, M.D., Journal of Comparative Neurology
10. Carol Lange, Ph.D., Hormones and Cancer
11. Jon E. Levine, Ph.D., Frontiers in Neuroendocrinology
12. Deborah M. Power, Ph.D., General and Comparative Endocrinology
13. Professor Robert P Millar, Ph.D., F.R.S.E, Neuroendocrinology
14. E. Chester Ridgway, M.D., M.A.C.P., Endocrine Reviews
15. Johannes A. Romijn, M.D., Ph.D., European Journal of Endocrinology
17. Hubert Vaudry, Ph.D., Dr. Sci., Frontiers in Neuroendocrine Science; also Senior Editor, Journal of Neuroendocrinology; Associate Editor, Hormone and Metabolic Research; Associate Editor, General and Comparative Endocrinology; Associate Editor, Peptides
18. Kim Wallen, Ph.D., Hormones and Behavior
20. Cheryl S. Watson, Ph.D., Endocrine Disruptors

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16. R. William Field, Ph.D., M.S.
17. Linda C. Giudice, M.D., Ph.D.
18. Emilie F. Rissman, Ph.D.
19. Paul E. Sawchenko, Ph.D., Journal of Comparative Neurology
20. Olle Söder, M.D., Ph.D., Hormone Research in Pediatrics
21. Ana M. Soto, M.D., Progress in Biophysics and Molecular Biology
22. Shanna Swan, Ph.D., Endocrine Disruptors
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24. Manuel Tena-Sempere, M.D., Ph.D., Endocrinology
25. Frederick vom Saal, Ph.D., Endocrine Disruptors
26. Zuo Xin Wang, Ph.D., Hormones and Behavior
27. Wade V. Welshons, Ph.D., Endocrine Disruptors
28. R. Thomas Zoeller, Ph.D., Endocrine Disruptors

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References


