

Researchers offer recommendations for BPA study design

By Melissa Kerr

There is growing uncertainty among the public about whether or not people should be concerned about the health effects of exposure to bisphenol A (BPA). While NIEHS Comparative Medicine Branch microbiologist Julius Thigpen, Ph.D., and colleagues did not try to answer this burning question in their latest work, they do propose a way toward a clearer understanding of the true effects of BPA and other endocrine-disrupting compounds (EDCs) from low-dose exposures.

In an [overview](http://www.ingentaconnect.com/content/aalas/jaalas/2013/00000052/0000002/art00002) (<http://www.ingentaconnect.com/content/aalas/jaalas/2013/00000052/0000002/art00002>) of the literature published in the March issue of the *Journal of the American Association for Laboratory Animal Science*, Thigpen and colleagues find that results from low-dose BPA studies are inconsistent, and concludes that some of the discrepancies are likely due to differences in study designs.

Call for consistency

Thigpen and colleagues argue that when scientists design studies of EDCs, they should take into account the kind of diet used, as well as the choice of bedding. The researchers conducted one review of 69 publications from 1997 to 2004, and a second review of 103 publications from 2005 to 2010. One of the foremost inconsistencies they found was in the identification of the diet and its phytoestrogen content.

According to Thigpen, diet is an important issue, because most rodent diets contain natural phytoestrogens that have been shown to cause estrogenic effects, which may affect the activity of EDCs. Of the 172 studies reviewed, only 37 percent adequately reported what kind of diet was used, and only 20 percent reported using a phytoestrogen-reduced diet.

Another basic aspect of rodent care that may cause inconsistent findings is the bedding used in cages. Corncob bedding frequently contains a fungus that produces an estrogenic mycotoxin called zearalenone, which has been shown to have greater estrogenic potency than BPA, for some hormonal endpoints.

Back to basics

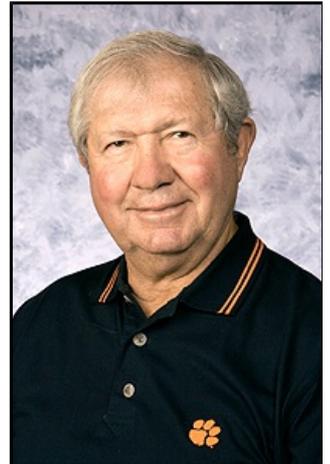
Thigpen and colleagues believe their overview will help underscore the importance of removing as many unnecessary variables in EDC studies as possible. "We are trying to reduce the background noise, so that we can better see the EDC signal," explained NTP biostatistician Grace Kissling, Ph.D., a co-author on the study.

The overview stresses that when conducting studies of BPA or other EDCs, scientists should choose a low phytoestrogen or phytoestrogen-free diet. The group also recommends alternatives to corncob bedding, in an attempt to remove a source of yet another estrogenic compound that may confound study results. In an additional recommendation they recognize as potentially controversial, the researchers propose that when the results are to be used to provide data for human risk assessments, researchers should expose animals to BPA by the oral route, rather than subcutaneously, since ingestion is the most likely route for human exposure.

"I think that if investigators follow these recommendations, the quality of research will improve," Thigpen concluded.

Citation: Thigpen JE, Setchell K, Kissling GE, Locklear J, Caviness GF, Whiteside T, Belcher SM, Brown NM, Collins BJ, Lih FB, Tomer KB, Padilla-Banks E, Camacho L, Adsit FG, Grant M. (<http://www.ingentaconnect.com/content/aalas/jaalas/2013/00000052/0000002/art00002>) 2013. The Estrogenic Content of Rodent Diets, Bedding, Cages, and Water Bottles and Its Effect on Bisphenol A Studies. *J Am Assoc Lab Anim Sci* 52(2):130-141.

(Melissa Kerr studies chemistry at North Carolina Central University, and is an intern in the NIEHS Office of Communications and Public Liaison.)



"We didn't attempt to answer the BPA question," Thigpen said of the group's new paper. "We want this to be a positive way for scientists to move forward with more clarity." (Photo courtesy of Steve McCaw)

This page URL: http://www.niehs.nih.gov/assets//Sites/NIEHS_eFactor/2013/4/
NIEHS website: <http://www.niehs.nih.gov/>
Email the Web Manager at webmanager@niehs.nih.gov