Kim Boekelheide, M.D., Ph.D.

Expertise: life-long professional interest in male reproductive tract toxicity resulting from environmental and occupational exposures

- Member, National Advisory Environmental Health Sciences Council, 2011-2014
- Member, Expert Panel, EPA Cumulative Risk Assessment of Phthalates Workshop, Washington, DC, December, 2010
- Organizer, National Academy of Sciences Workshop on *Use of In Utero and Postnatal Indicators to Predict Health Outcomes Later in Life,* Washington, DC, October, 2010
- Member, Review Panel/Site Visit, EPA Reproductive Developmental Toxicology Division, 2006
- Member, Di-(2-ethylhexyl)phthalate Expert Panel of the National Toxicology Program Center for the Evaluation of Risks to Human Reproduction, 2005
- Vice-Chair, U.S. Consumer Product Safety Commission's Chronic Hazard Advisory Panel on Di-isononyl Phthalate, 2000 – 2001
- Member, Phthalates Expert Panel of the NTP Center for the Evaluation of Risks to Human Reproduction, 1999 – 2000

Publications: ~170 total; 28 with *phthalate* identified as a search term from 1992-present

Relevant funding:

- NIEHS R01ES017272 *Molecular Mechanism of Human Fetal Testis Susceptibility to Endocrine Disruption*
  - 12/2009 – 11/2015
  - Total costs *~$2.5M*
- NIEHS P20ES018169 & EPA RD-83459401 *Formative Center for the Evaluation of Environmental Impacts on Fetal Development*
  - 02/2010 -02/2014
  - Total costs ~$2M
- NIEHS R21 ES013020 *Phthalate-induced Murine Testicular Dysgenesis and p53*
  - 05/2005-02/2008
  - Total costs *~$400K*
- American Chemistry Council *Development of an inter-species bioassay to test phthalate susceptibility*
  - 2/2009-11/2011
  - Total costs ~$350K
- American Chemistry Council *Di-n-Butyl Phthalate-induced Multinucleated Germ Cells*
  - 11/2011-12/2013
  - Total costs ~$100K

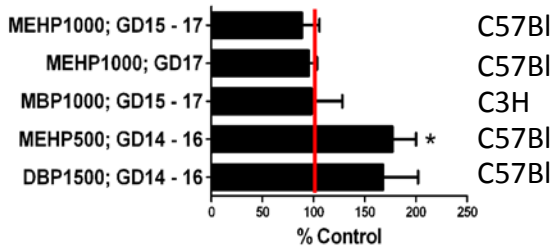
Phthalate-related Disclosures:

- Owner of small amount of Exxon-Mobil stock (gifted from my mother-in-law).
- Gave 10 seminar presentations at meeting and workshops in 2013-2014, including:
  - *Species Differences in the Developing Male Reproductive Tract Response to Phthalates: Implications for Human Risk Assessment,* Exxon-Mobil Biomedical Sciences, September, 2013 (invited seminar speaker with honorarium)
  - *Endocrine Disruptors and Reprotoxicity*, 20th International Plasticizers Meeting, Brussels, Belgium, May, 2013 (invited workshop speaker)

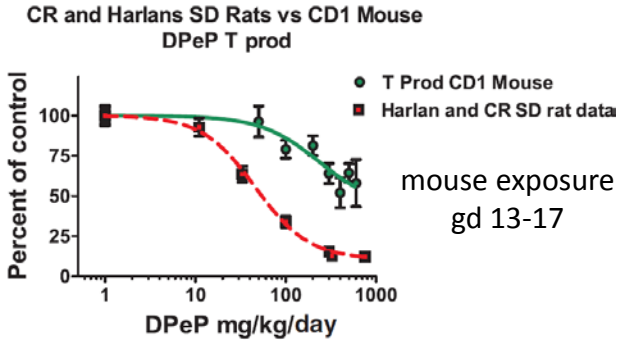
I am a National Academy of Sciences supported independent expert at this February EPA IRIS meeting, and I have not discussed or reviewed my comments or presentation materials with any interested parties.

Science Question 4. Use of phthalate mechanistic data

- A consensus has developed that the phthalate-induced fetal testis anti-androgenic response varies across species, with rats more sensitive than either mice or humans
  - ➢ In mice, this relative resistance to phthalate-induced anti-androgenicity has been shown to be pharmacodynamic, not pharmacokinetic



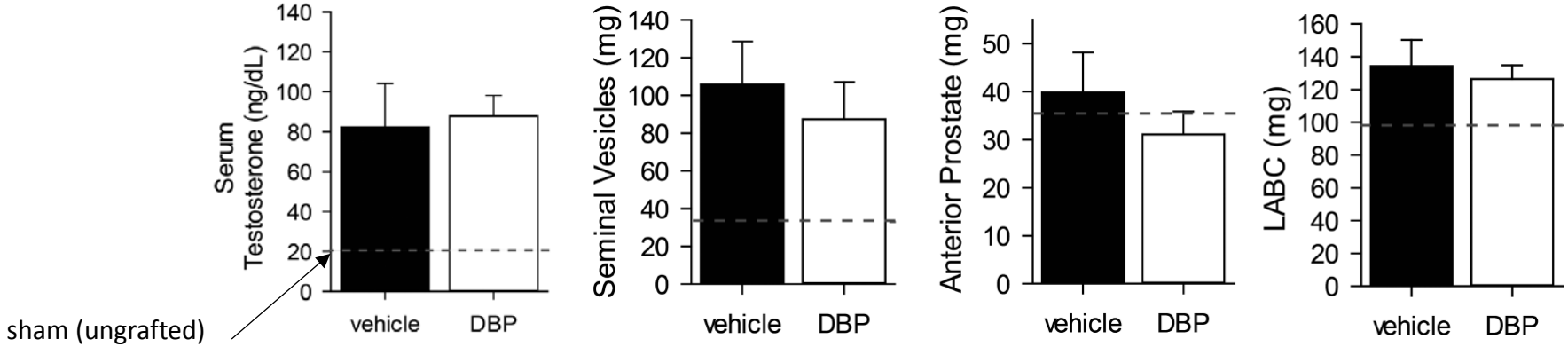
Gaido et al., Toxicol Sci 97: 491 (2007)



mouse exposure
gd 13-17

Furr et al., Tox Sci 140:403 (2014)

  - ➢ In humans, a relative resistance to phthalate-induced anti-androgenicity has been demonstrated with several human fetal testis xenotransplants models and in vitro cultures



sham (ungrafted) average

Xenotransplant model: 500 mg/kg di-*n*-butyl phthalate daily by gavage for 2 weeks

Spade et al., Tox Sci 138:148 (2014)