Center for Hormonforstyrrende Stoffer

Litteraturgennemgang for perioden 1. september 2014 - 26. november 2014

Indhold

Humane studier ved Afd. for Vækst og Reproduktion, Rigshospitalet

Søgning er udført på PubMed og dækker perioden 1. september 2014 - 26. november 2014

Følgende søgeprofil er benyttet:

Bisphenol A
Phthalat*
Paraben*
(perfluor* OR polyfluor*)
Triclocarban
Triclosan
(Flame retardant)
tributyltin
endocrine disrupters

kombineret med nedenstående tekst:

AND expos* AND (human OR men OR women OR child* OR adult* OR adolescen* OR infan*)

Limits: title/abstract, English language
For søgetermen "endocrine disrupters" har vi fjernet alle de hits, der også fremkom ved de øvrige søgninger.

De udvalgte artikler koncentrerer sig i denne omgang om phthalater og bisphenol A. Enkelte af artiklerne kommenteres på engelsk, da det er en finsk PhD studerende i afdelingen, der har hjulpet med disse.

God læselyst!

Udvalgte publikationer

Bornehag CG(1), Carlstedt F, Jönsson BA, Lindh CH, Jensen TK, Bodin A, Jonsson C, Janson S, Swan SH
Prenatal Phthalate Exposures and Anogenital Distance in Swedish Boys.
Environ Health Perspect. 2014 Oct 29. [Epub ahead of print]

BACKGROUND: Phthalates are used as plasticizers in soft polyvinyl chloride (PVC) and in a large number of consumer products. Due to reported health risks, di-isononyl phthalate (DiNP) has been introduced as a replacement for diethyl hexyl phthalate (DEHP) in soft PVC. This raises concerns since animal data suggest that DiNP may have anti-androgenic properties similar to DEHP. The anogenital distance (AGD) - the distance from the anus to the genitals - has been used to assess reproductive toxicity. OBJECTIVE: The objective of this study was to examine the associations between prenatal phthalate exposure and AGD in Swedish infants. METHODS: AGD was measured in 196 boys at age 21 months and first trimester urine was analyzed for ten phthalate metabolites of DEP, DBP, DEHP, BBzP as well as DiNP and creatinine. Data on covariates were collected by questionnaires. RESULTS: The most significant associations were found between the shorter of two AGD measures (anoscrotal distance, AGDas) and DiNP metabolites and strongest for oh-MMeOP and oxo-MMeOP. However, the AGDas reduction was small (4%) in relation to more than an interquartile increase in DiNP exposure. CONCLUSIONS: These findings call into question the safety of substituting DiNP for DEHP in soft PVC, particularly since a shorter male AGD has been shown to relate to male genital birth defects in children and impaired reproductive function in adult males and the fact that human levels of DiNP are increasing globally.

Araki A, Mitsui T, Miyashita C, Nakajima T, Naito H, Ito S, Sasaki S, Cho K, Ikeno T, Nonomura K, Kishi R.
Association between maternal exposure to di(2-ethylhexyl) phthalate and reproductive hormone levels in fetal blood: the Hokkaido study on environment and children's health.
PLoS One. 2014 Oct 8;9(10):e109039. doi: 10.1371/journal.pone.0109039.
eCollection 2014.

Prenatal di(2-ethylhexyl) phthalate (DEHP) exposure can produce reproductive toxicity in animal models. Only limited data exist from human studies on maternal DEHP exposure and its effects on infants. We aimed to examine the associations between DEHP exposure in utero and reproductive hormone levels in cord blood. Between 2002 and 2005, 514 pregnant women agreed to participate in the Hokkaido Study Sapporo Cohort. Maternal blood samples were taken from 23-35 weeks of gestation and the concentration of the primary metabolite of DEHP, mono(2-ethylhexyl) phthalate (MEHP), was measured. Concentrations of infant reproductive hormones including estradiol (E2), total testosterone (T), and progesterone (P4), inhibin B, insulin-like factor 3 (INSL3), steroid hormone binding globulin, follicle-stimulating hormone, and luteinizing hormone were measured from cord blood. Two hundred and two samples with both MEHP and hormone data were included in statistical analysis. The participants completed a self-administered questionnaire regarding information on maternal characteristics. Gestational age, birth weight and infant sex were obtained from birth records. In an adjusted linear regression analysis fit to all study participants, maternal MEHP levels were found to be associated with reduced levels of T/E2, P4, and inhibin B. For the stratified analyses for sex, inverse associations between maternal MEHP levels T/E2, P4, inhibin B, and INSL3 were statistically significant for males only. In addition, the MEHP quartile model showed a significant p-value trend for P4, inhibin B, and INSL3 decrease in males. Since inhibin B and INSL3 are major secretory products of Sertoli and Leydig cell, respectively, the results of this study suggest that DEHP exposure in utero may have adverse effects on both Sertoli and Leydig cell development in males, which agrees with

the results obtained from animal studies. Comprehensive studies investigating phthalates' exposure in humans, as well as their long-term effects on reproductive development are needed.

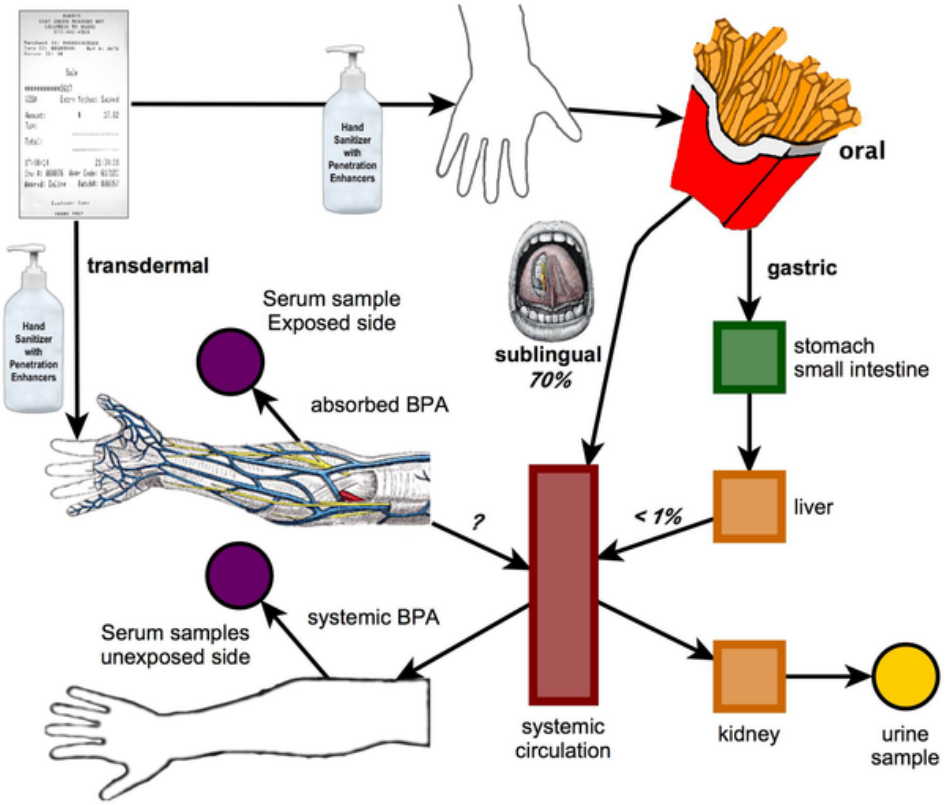
Jensen MS, Anand-Ivell R, Nørgaard-Pedersen B, Jönsson BA, Bonde JP, Hougaard DM, Cohen A, Lindh CH, Ivell R, Toft G.
Amniotic fluid phthalate levels and male fetal gonad function
Epidemiology. 2015 Jan;26(1):91-9. doi: 10.1097/EDE.0000000000000198.

BACKGROUND: Prenatal exposure to phthalates may pose a threat to human male reproduction. However, additional knowledge about the in vivo effect in humans is needed, and reported associations with genital abnormalities are inconclusive. We aimed to study prenatal di(2-ethylhexyl) phthalate (DEHP) and diisononyl phthalate (DiNP) exposure in relation to cryptorchidism, hypospadias, and human fetal Leydig cell function. METHODS: We studied 270 cryptorchidism cases, 75 hypospadias cases, and 300 controls. Second-trimester amniotic fluid samples were available from a Danish pregnancy-screening biobank (n = 25,105) covering 1980-1996. We assayed metabolites of DEHP and DiNP (n = 645) and steroid hormones (n = 545) by mass spectrometry. We assayed insulin-like factor 3 by immunoassay (n = 475) and analyzed data using linear or logistic regression. RESULTS: Mono(2-ethyl-5-carboxypentyl) phthalate (5cx-MEPP, DEHP metabolite) was not consistently associated with cryptorchidism or hypospadias. However, we observed an 18% higher (95% confidence interval [CI] = 5%-33%) testosterone level, and a 41% lower (-56% to -21%) insulin-like factor 3 level in the highest 5cx-MEPP tertile compared with the lowest. Mono(4-methyl-7-carboxyheptyl) phthalate (7cx-MMeHP, DiNP metabolite) showed elevated odds ratio point estimates for having cryptorchidism (odds ratio = 1.28 [95% CI = 0.80 to 2.01]) and hypospadias (1.69 [0.78 to 3.67]), but was not consistently associated with the steroid hormones or insulin-like factor 3. CONCLUSIONS: Data on the DEHP metabolite indicate possible interference with human male fetal gonadal function. Considering the DiNP metabolite, we cannot exclude (nor statistically confirm) an association with hypospadias and, less strongly, with cryptorchidism.

Hormann AM, Vom Saal FS, Nagel SC, Stahlhut RW, Moyer CL, Ellersieck MR, Welshons WV, Toutain PL, Taylor JA
Holding Thermal Receipt Paper and Eating Food after Using Hand Sanitizer Results in High Serum Bioactive and Urine Total Levels of Bisphenol A (BPA)
PLoS One. 2014 Oct 22;9(10):e110509. doi: 10.1371/journal.pone.0110509. eCollection 2014.

Bisphenol A (BPA) is an endocrine disrupting environmental contaminant used in a wide variety of products, and BPA metabolites are found in almost everyone's urine, suggesting widespread exposure from multiple sources. Regulatory agencies estimate that virtually all BPA exposure is from food and beverage packaging. However, free BPA is applied to the outer layer of thermal receipt paper present in very high (
~20 mg BPA/g paper) quantities as a print develop
according when considering dermal
paper as a source of BPA exposure is that some commonly used hand sanitizers, as well as other skin care products, contain mixtures of dermal penetration enhancing chemicals that can increase by up to 100 fold the dermal absorption of lipophilic compounds such as BPA. We found that when men and women held thermal receipt paper immediately after using a hand sanitizer with penetration enhancing chemicals, significant free BPA was transferred to their hands and then to French fries that were eaten, and the combination of dermal and oral BPA absorption led to a rapid and dramatic average maximum increase (Cmax) in unconjugated (bioactive) BPA of
~20 g/g total BPA/g creatinine in urine
within 90 min. The default method used by regulatory agencies to test for hazards posed by chemicals is intra-gastric gavage. For BPA this approach results in less than 1% of the administered dose being bioavailable in blood. It also ignores dermal absorption as well as sublingual absorption in the mouth that

both bypass first-pass liver metabolism. The elevated levels of BPA that we observed due to holding thermal paper after using a product containing dermal penetration enhancing chemicals have been related to an increased risk for a wide range of developmental abnormalities as well as diseases in adults.



J. Troisi, C. Mikelson, S. Richards, S. Symes, D. Adair, F. Zullo, M. Guida
Placental concentrations of bisphenol A and birth weight from births in the Southeastern U.S.
Placenta 35 (2014) 947-952

Introduction: Bisphenol A (BPA) is a weakly estrogenic compound that has been detected in a wide variety of food products and biological matrices (saliva, blood, urine, etc). Despite the potential risk of human exposure to BPA, little information exists concerning maternal and fetal exposure to BPA during pregnancy. The aim of this study is to evaluate the correlation between placental BPA concentration, infant birth weight and calculated birth weight centile, and several other maternal and infant parameters.
Methods: Placental sample were collected from 200 subjects. BPA levels were measured by isotope dilution GC-MS. Additional maternal and infant data were gathered from medical charts and were potential correlates with placental BPA levels.
Results: Placental BPA concentrations ranged from 4.4 ng/g to 273.9 ng/g in oven-dried tissue (average 103.4±61.8 ng/g). There was a significant negative correlation between calculated birth weight centile and levels of placental BPA ($p<0.05$). Low birth weight and small for gestational age infants also had significantly greater placental BPA concentrations as compared to normal weight infants and average/large for gestational age infants. Infants born to African American mothers also had greater placental BPA concentrations as compared to infants born to Hispanic mothers.
Discussion: Placental BPA concentrations are correlated with the growth potential of the fetus and may play a role in reduced fetal growth.

Bruttoliste

Bisphenol A

1: Luciani-Torres MG, Moore DH, Goodson WH 3rd, Dairkee SH. Exposure to the polyester PET precursor - terephthalic acid induces and perpetuates DNA damage harboring non-malignant human breast cells. Carcinogenesis. 2014 Nov 19. pii: bgu234. [Epub ahead of print] PubMed PMID: 25411358.

2: Tiwari SK, Agarwal S, Seth B, Yadav A, Ray RS, Mishra VN, Chaturvedi RK. Inhibitory Effects of Bisphenol-A on Neural Stem Cells Proliferation and Differentiation in the Rat Brain Are Dependent on Wnt/β-Catenin Pathway. Mol Neurobiol. 2014 Nov 9. [Epub ahead of print] PubMed PMID: 25381574.

3: Kim KN, Kim JH, Kwon HJ, Hong SJ, Kim BJ, Lee SY, Hong YC, Bae S. Bisphenol a exposure and asthma development in school-age children: a longitudinal study. PLoS One. 2014 Oct 30;9(10):e111383. doi: 10.1371/journal.pone.0111383. eCollection 2014. PubMed PMID: 25356742; PubMed Central PMCID: PMC4214730.

4: Hormann AM, Vom Saal FS, Nagel SC, Stahlhut RW, Moyer CL, Ellersieck MR, Welshons WV, Toutain PL, Taylor JA. Holding Thermal Receipt Paper and Eating Food after Using Hand Sanitizer Results in High Serum Bioactive and Urine Total Levels of Bisphenol A (BPA). PLoS One. 2014 Oct 22;9(10):e110509. doi: 10.1371/journal.pone.0110509. eCollection 2014. PubMed PMID: 25337790; PubMed Central PMCID: PMC4206219.

5: Ashley-Martin J, Dodds L, Arbuckle TE, Ettinger AS, Shapiro GD, Fisher M, Morisset AS, Taback S, Bouchard MF, Monnier P, Dallaire R, Fraser WD. A birth cohort study to investigate the association between prenatal phthalate and bisphenol A exposures and fetal markers of metabolic dysfunction. Environ Health. 2014 Oct 22;13:84. doi: 10.1186/1476-069X-13-84. PubMed PMID: 25336252.

6: Fang C, Ning B, Waqar AB, Niimi M, Li S, Satoh K, Shiomi M, Ye T, Dong S, Fan J. Bisphenol A Exposure Enhances Atherosclerosis in WHHL Rabbits. PLoS One. 2014 Oct 21;9(10):e110977. doi: 10.1371/journal.pone.0110977. eCollection 2014. PubMed PMID: 25333893; PubMed Central PMCID: PMC4205098.

7: Marks HL, Pishko MV, Jackson GW, Coté GL. Rational Design of a Bisphenol A Aptamer Selective Surface-Enhanced Raman Scattering Nanoprobe. Anal Chem. 2014 Nov 10. [Epub ahead of print] PubMed PMID: 25329684.

8: Fang M, Webster TF, Ferguson PL, Stapleton HM. Characterizing the Peroxisome Proliferator-Activated Receptor ($PPAR_{\gamma}$) Ligand Binding Potential of Several Major Flame Retardants, Their Metabolites, and Chemical Mixtures in House Dust. Environ Health Perspect. 2014 Oct 14. [Epub ahead of print] PubMed PMID: 25314719.

9: Zhang KS, Chen HQ, Chen YS, Qiu KF, Zheng XB, Li GC, Yang HD, Wen CJ. Bisphenol A stimulates human lung cancer cell migration via upregulation of matrix metalloproteinases by GPER/EGFR/ERK1/2 signal pathway. Biomed Pharmacother. 2014 Sep 18. pii: S0753-3322(14)00116-4. doi: 10.1016/j.biopha.2014.09.003. [Epub ahead of print] PubMed PMID: 25312822.

10: Oppeneer SJ, Robien K. Bisphenol A exposure and associations with obesity among adults: a critical review. Public Health Nutr. 2014 Oct 14:1-17. [Epub ahead of print] PubMed PMID: 25311796.

11: Evans SF, Kobrosly RW, Barrett ES, Thurston SW, Calafat AM, Weiss B, Stahlhut R, Yolton K, Swan SH. Prenatal Bisphenol A Exposure and maternally reported behavior in boys and girls. Neurotoxicology. 2014 Oct 9. pii: S0161-813X(14)00171-5. doi: 10.1016/j.neuro.2014.10.003. [Epub ahead of print] PubMed PMID: 25307304.

12: Vom Saal FS, Welshons WV. Evidence that bisphenol A (BPA) can be accurately measured without contamination in human serum and urine and that BPA causes numerous hazards from multiple routes of exposure. Mol Cell Endocrinol. 2014 Oct 7. pii: S0303-7207(14)00308-6. doi: 10.1016/j.mce.2014.09.028. [Epub ahead of print] Review. PubMed PMID: 25304273.

13: Wang J, Xia W, Xiao Y, Ying C, Long J, Zhang H, Chen X, Mao C, Li X, Wang L, Xu S. Assessment of estrogen disrupting potency in animal foodstuffs of China by combined biological and chemical analyses. J Environ Sci (China). 2014 Oct 1;26(10):2131-7. doi: 10.1016/j.jes.2014.08.013. Epub 2014 Aug 13. PubMed PMID: 25288558.

14: Spanier AJ, Kahn RS, Kunselman AR, Schaefer EW, Hornung R, Xu Y, Calafat AM, Lanphear BP. Bisphenol A Exposure and the Development of Wheeze and Lung Function in Children Through Age 5 Years. JAMA Pediatr. 2014 Oct 6. doi: 10.1001/jamapediatrics.2014.1397. [Epub ahead of print] PubMed PMID: 25286153.

15: Hong SB, Im MH, Kim JW, Park EJ, Shin MS, Kim BN, Yoo HJ, Cho IH, Bhang SY, Hong YC, Cho SC. Environmental Lead Exposure and Attention-Deficit/Hyperactivity Disorder Symptom Domains in a Community Sample of South Korean School-Age Children. Environ Health Perspect. 2014 Oct 3. [Epub ahead of print] PubMed PMID: 25280233.

16: Bhandari RK, Deem SL, Holliday DK, Jandegian CM, Kassotis CD, Nagel SC, Tillitt DE, Vom Saal FS, Rosenfeld CS. Effects of the environmental estrogenic contaminants bisphenol A and 17α-ethinyl estradiol on sexual development and adult behaviors in aquatic wildlife species. Gen Comp Endocrinol. 2014 Sep 30. pii: S0016-6480(14)00371-2. doi: 10.1016/j.ygcen.2014.09.014. [Epub ahead of print] Review. PubMed PMID: 25277515.

17: Paulose T, Speroni L, Sonnenschein C, Soto AM. Estrogens in the wrong place at the wrong time: fetal BPA exposure and mammary cancer. Reprod Toxicol. 2014 Sep 29. pii: S0890-6238(14)00249-4. doi: 10.1016/j.reprotox.2014.09.012. [Epub ahead of print] PubMed PMID: 25277313.

18: Lee CC, Jiang LY, Kuo YL, Chen CY, Hsieh CY, Hung CF, Tien CJ. Characteristics of nonylphenol and bisphenol A accumulation by fish and implications for ecological and human health. Sci Total Environ. 2014 Sep 27;502C:417-425. doi: 10.1016/j.scitotenv.2014.09.042. [Epub ahead of print] PubMed PMID: 25268571.

19: Rocca CL, Tait S, Guerranti C, Busani L, Ciardo F, Bergamasco B, Stecca L, Perra G, Mancini FR, Marci R, Bordi G, Caserta D, Focardi S, Moscarini M, Mantovani A. Exposure to endocrine disrupters and nuclear receptor gene expression in infertile and fertile women from different Italian areas. Int J Environ Res Public Health. 2014 Sep 29;11(10):10146-64. doi: 10.3390/ijerph111010146. PubMed PMID: 25268510; PubMed Central PMCID: PMC4210972.

20: Troisi J, Mikelson C, Richards S, Symes S, Adair D, Zullo F, Guida M. Placental concentrations of bisphenol A and birth weight from births in the Southeastern U.S. Placenta. 2014 Nov;35(11):947-52. doi: 10.1016/j.placenta.2014.08.091. Epub 2014 Sep 6. PubMed PMID: 25227326.

21: Larsson K, Ljung Björklund K, Palm B, Wennberg M, Kaj L, Lindh CH, Jönsson BA, Berglund M. Exposure determinants of phthalates, parabens, bisphenol A and triclosan in Swedish mothers and their children. Environ Int. 2014 Dec;73:323-33. doi: 10.1016/j.envint.2014.08.014. Epub 2014 Sep 16. PubMed PMID: 25216151; PubMed Central PMCID: PMC4207945.

22: Zhuang W, Wu K, Wang Y, Zhu H, Deng Z, Peng L, Zhu G. Association of Serum Bisphenol-A Concentration and Male Reproductive Function Among Exposed Workers. Arch Environ Contam Toxicol. 2014 Sep 12. [Epub ahead of print] PubMed PMID: 25213476.

23: Wang W, Jiang C, Zhu L, Liang N, Liu X, Jia J, Zhang C, Zhai S, Zhang B. Adsorption of bisphenol A to a carbon nanotube reduced its endocrine disrupting effect in mice male offspring. Int J Mol Sci. 2014 Sep 10;15(9):15981-93. doi: 10.3390/ijms150915981. PubMed PMID: 25210847; PubMed Central PMCID: PMC4200835.

24: Ribeiro-Varandas E, Pereira HS, Monteiro S, Neves E, Brito L, Ferreira RB, Viegas W, Delgado M. Bisphenol A disrupts transcription and decreases viability in aging vascular endothelial cells. Int J Mol Sci. 2014 Sep 9;15(9):15791-805. doi: 10.3390/ijms150915791. PubMed PMID: 25207595; PubMed Central PMCID: PMC4200871.

25: Upson K, Sathyanarayana S, De Roos AJ, Koch HM, Scholes D, Holt VL. A population-based case-control study of urinary bisphenol A concentrations and risk of endometriosis. Hum Reprod. 2014 Nov;29(11):2457-64. doi: 10.1093/humrep/deu227. Epub 2014 Sep 9. PubMed PMID: 25205760; PubMed Central PMCID: PMC4191453.

26: D'Aniello R, Troisi J, D'Amico O, Sangermano M, Massa G, Moccaldo A, Pierri L, Poeta M, Vajro P. Emerging Pathomechanisms Involved in Obesity: A Paediatric Pilot Study. J Pediatr Gastroenterol Nutr. 2014 Sep 4. [Epub ahead of print] PubMed PMID: 25199037.

27: Sadowski RN, Wise LM, Park PY, Schantz SL, Juraska JM. Early exposure to bisphenol A alters neuron and glia number in the rat prefrontal cortex of adult males, but not females. Neuroscience. 2014 Oct 24;279:122-31. doi: 10.1016/j.neuroscience.2014.08.038. Epub 2014 Sep 1. PubMed PMID: 25193849; PubMed Central PMCID: PMC4197082.

28: Ali S, Steinmetz G, Montillet G, Perrard MH, Loundou A, Durand P, Guichaoua MR, Prat O. Exposure to low-dose bisphenol A impairs meiosis in the rat seminiferous tubule culture model: a physiotoxicogenomic approach. PLoS One. 2014 Sep 2;9(9):e106245. doi: 10.1371/journal.pone.0106245. eCollection 2014. PubMed PMID: 25181051; PubMed Central PMCID: PMC4152015.

29: Sakhi AK, Lillegaard IT, Voorspoels S, Carlsen MH, Løken EB, Brantsæter AL, Haugen M, Meltzer HM, Thomsen C. Concentrations of phthalates and bisphenol A in Norwegian foods and beverages and estimated dietary exposure in adults. Environ Int. 2014 Dec;73:259-69. doi: 10.1016/j.envint.2014.08.005. Epub 2014 Aug 28. PubMed PMID: 25173060.

30: Battal D, Cok I, Unlusayin I, Aktas A, Tunctan B. Determination of urinary levels of Bisphenol A in a Turkish population. Environ Monit Assess. 2014 Dec;186(12):8443-52. doi: 10.1007/s10661-014-4015-z. Epub 2014 Aug 30. PubMed PMID: 25171897.

31: Marmugi A, Lasserre F, Beuzelin D, Ducheix S, Huc L, Polizzi A, Chetivaux M, Pineau T, Martin P, Guillou H, Mselli-Lakhal L. Adverse effects of long-term

exposure to bisphenol A during adulthood leading to hyperglycaemia and hypercholesterolemia in mice. Toxicology. 2014 Nov 5;325:133-43. doi: 10.1016/j.tox.2014.08.006. Epub 2014 Aug 26. PubMed PMID: 25168180.

32: Rodríguez-Gómez R, Jiménez-Díaz I, Zafra-Gómez A, Ballesteros O, Navalón A. A multiresidue method for the determination of selected endocrine disrupting chemicals in human breast milk based on a simple extraction procedure. Talanta. 2014 Dec;130:561-70. doi: 10.1016/j.talanta.2014.07.047. Epub 2014 Jul 26. PubMed PMID: 25159447.

33: Machtinger R, Orvieto R. Bisphenol A, oocyte maturation, implantation, and IVF outcome: review of animal and human data. Reprod Biomed Online. 2014 Oct;29(4):404-10. doi: 10.1016/j.rbmo.2014.06.013. Epub 2014 Jul 10. PubMed PMID:25154017.

34: Ohlstein JF, Strong AL, McLachlan JA, Gimble JM, Burow ME, Bunnell BA. Bisphenol A enhances adipogenic differentiation of human adipose stromal/stem cells. J Mol Endocrinol. 2014 Dec;53(3):345-53. doi: 10.1530/JME-14-0052. Epub 2014 Aug 20. PubMed PMID: 25143472.

35: Quesnot N, Bucher S, Fromenty B, Robin MA. Modulation of metabolizing enzymes by bisphenol a in human and animal models. Chem Res Toxicol. 2014 Sep 15;27(9):1463-73. doi: 10.1021/tx500087p. Epub 2014 Aug 29. PubMed PMID: 25142872.

36: Liu Y, Mei C, Liu H, Wang H, Zeng G, Lin J, Xu M. Modulation of cytokine expression in human macrophages by endocrine-disrupting chemical Bisphenol-A. Biochem Biophys Res Commun. 2014 Sep 5;451(4):592-8. doi: 10.1016/j.bbrc.2014.08.031. Epub 2014 Aug 13. PubMed PMID: 25128825.

37: Vela-Soria F, Ballesteros O, Zafra-Gómez A, Ballesteros L, Navalón A. A multiclass method for the analysis of endocrine disrupting chemicals in human urine samples. Sample treatment by dispersive liquid-liquid microextraction. Talanta. 2014 Nov;129:209-18. doi: 10.1016/j.talanta.2014.05.016. Epub 2014 May 29. PubMed PMID: 25127586.

38: Wei J, Sun X, Chen Y, Li Y, Song L, Zhou Z, Xu B, Lin Y, Xu S. Perinatal exposure to bisphenol A exacerbates nonalcoholic steatohepatitis-like phenotype in male rat offspring fed on a high-fat diet. J Endocrinol. 2014 Sep;222(3):313-25. doi: 10.1530/JOE-14-0356. PubMed PMID: 25112833.

39: Zhao Q, Ma Y, Sun NX, Ye C, Zhang Q, Sun SH, Xu C, Wang F, Li W. Exposure to bisphenol A at physiological concentrations observed in Chinese children promotes primordial follicle growth through the PI3K/Akt pathway in an ovarian culture system. Toxicol In Vitro. 2014 Dec;28(8):1424-9. doi: 10.1016/j.tiv.2014.07.009. Epub 2014 Aug 7. PubMed PMID: 25108129.

40: Saura M, Marquez S, Reventun P, Olea-Herrero N, Arenas MI, Moreno-Gómez-Toledano R, Gómez-Parrizas M, Muñóz-Moreno C, González-Santander M, Zaragoza C, Bosch RJ. Oral administration of bisphenol A induces high blood pressure through angiotensin II/CaMKII-dependent uncoupling of eNOS. FASEB J. 2014 Nov;28(11):4719-28. doi: 10.1096/fj.14-252460. Epub 2014 Aug 7. PubMed PMID:25103225.

41: Mattison DR, Karyakina N, Goodman M, LaKind JS. Pharmaco- and toxicokinetics of selected exogenous and endogenous estrogens: a review of the data and identification of knowledge gaps. Crit Rev Toxicol. 2014 Sep;44(8):696-724. doi: 10.3109/10408444.2014.930813. Epub 2014 Aug 6. PubMed PMID: 25099693.

42: Menard S, Guzylack-Piriou L, Leveque M, Braniste V, Lencina C, Naturel M, Moussa L, Sekkal S, Harkat C, Gaultier E, Theodorou V, Houdeau E. Food intolerance at adulthood after perinatal exposure to the endocrine disruptor bisphenol A. FASEB J. 2014 Nov;28(11):4893-900. doi: 10.1096/fj.14-255380. Epub 2014 Aug 1. PubMed PMID: 25085925.

43: Xu XB, He Y, Song C, Ke X, Fan SJ, Peng WJ, Tan R, Kawata M, Matsuda K, Pan BX, Kato N. Bisphenol a regulates the estrogen receptor alpha signaling in developing hippocampus of male rats through estrogen receptor. Hippocampus. 2014 Dec;24(12):1570-80. doi: 10.1002/hipo.22336. Epub 2014 Aug 13. PubMed PMID: 25074486.

44: Braun JM, Lanphear BP, Calafat AM, Deria S, Khoury J, Howe CJ, Venners SA. Early-life bisphenol a exposure and child body mass index: a prospective cohort study. Environ Health Perspect. 2014 Nov;122(11):1239-45. doi: 10.1289/ehp.1408258. Epub 2014 Jul 29. PubMed PMID: 25073184; PubMed Central PMCID: PMC4216170.

45: Philippat C, Botton J, Calafat AM, Ye X, Charles MA, Slama R; EDEN Study Group. Prenatal exposure to phenols and growth in boys. Epidemiology. 2014 Sep;25(5):625-35. doi: 10.1097/EDE.0000000000000132. PubMed PMID: 25061923.

46: Sullivan AW, Beach EC, Stetzik LA, Perry A, D'Addezio AS, Cushing BS, Patisaul HB. A novel model for neuroendocrine toxicology: neurobehavioral effects of BPA exposure in a prosocial species, the prairie vole (Microtus ochrogaster). Endocrinology. 2014 Oct;155(10):3867-81. doi: 10.1210/en.2014-1379. Epub 2014 Jul 22. PubMed PMID: 25051448.

47: Yang Y, Guan J, Yin J, Shao B, Li H. Urinary levels of bisphenol analogues in residents living near a manufacturing plant in south China. Chemosphere. 2014 Oct;112:481-6. doi: 10.1016/j.chemosphere.2014.05.004. Epub 2014 Jun 5. PubMed PMID: 25048943.

48: Zhang Y, Gao J, Xu P, Yuan C, Qin F, Liu S, Zheng Y, Yang Y, Wang Z. Low-dose bisphenol A disrupts gonad development and steroidogenic genes expression in adult female rare minnow Gobiocypris rarus. Chemosphere. 2014 Oct;112:435-42. doi: 10.1016/j.chemosphere.2014.04.089. Epub 2014 May 29. PubMed PMID: 25048937.

49: Song M, Liang D, Liang Y, Chen M, Wang F, Wang H, Jiang G. Assessing developmental toxicity and estrogenic activity of halogenated bisphenol A on zebrafish (Danio rerio). Chemosphere. 2014 Oct;112:275-81. doi: 10.1016/j.chemosphere.2014.04.084. Epub 2014 May 20. PubMed PMID: 25048916.

50: Boucher JG, Husain M, Rowan-Carroll A, Williams A, Yauk CL, Atlas E. Identification of mechanisms of action of bisphenol a-induced human preadipocyte differentiation by transcriptional profiling. Obesity (Silver Spring). 2014 Nov;22(11):2333-43. doi: 10.1002/oby.20848. Epub 2014 Jul 22. PubMed PMID: 25047013.

51: Gao J, Zhang Y, Yang Y, Yuan C, Qin F, Liu S, Zheng Y, Wang Z. Molecular characterization of PXR and two sulfotransferases and hepatic transcripts of PXR, two sulfotransferases and CYP3A responsive to bisphenol A in rare minnow Gobiocypris rarus. Mol Biol Rep. 2014 Nov;41(11):7153-65. doi: 10.1007/s11033-014-3598-3. Epub 2014 Jul 20. PubMed PMID: 25038724.

52: Bemrah N, Jean J, Rivière G, Sanaa M, Leconte S, Bachelot M, Deceuninck Y, Bizec BL, Dauchy X, Roudot AC, Camel V, Grob K, Feidt C, Picard-Hagen N, Badot PM, Foures F, Leblanc JC. Assessment of dietary exposure to bisphenol A in the French population with a special focus on risk characterisation for pregnant

French women. Food Chem Toxicol. 2014 Oct;72:90-7. doi: 10.1016/j.fct.2014.07.005. Epub 2014 Jul 9. PubMed PMID: 25014159.

53: Moos RK, Angerer J, Wittsiepe J, Wilhelm M, Brüning T, Koch HM. Rapid determination of nine parabens and seven other environmental phenols in urine samples of German children and adults. Int J Hyg Environ Health. 2014 Nov;217(8):845-53. doi: 10.1016/j.ijheh.2014.06.003. Epub 2014 Jun 20. PubMed PMID: 25008406.

54: Jedeon K, Loiodice S, Marciano C, Vinel A, Canivenc Lavier MC, Berdal A, Babajko S. Estrogen and bisphenol A affect male rat enamel formation and promote ameloblast proliferation. Endocrinology. 2014 Sep;155(9):3365-75. doi: 10.1210/en.2013-2161. Epub 2014 Jul 8. PubMed PMID: 25004094.

55: Schiller V, Zhang X, Hecker M, Schäfers C, Fischer R, Fenske M. Species-specific considerations in using the fish embryo test as an alternative to identify endocrine disruption. Aquat Toxicol. 2014 Oct;155:62-72. doi: 10.1016/j.aquatox.2014.06.005. Epub 2014 Jun 20. PubMed PMID: 24992288.

56: Kasper-Sonnenberg M, Koch HM, Wittsiepe J, Brüning T, Wilhelm M. Phthalate metabolites and bisphenol A in urines from German school-aged children: results of the Duisburg birth cohort and Bochum cohort studies. Int J Hyg Environ Health. 2014 Nov;217(8):830-8. doi: 10.1016/j.ijheh.2014.06.001. Epub 2014 Jun 12. PubMed PMID: 24986699.

57: Bowman RE, Luine V, Khandaker H, Villafane JJ, Frankfurt M. Adolescent bisphenol-A exposure decreases dendritic spine density: role of sex and age. Synapse. 2014 Nov;68(11):498-507. doi: 10.1002/syn.21758. Epub 2014 Jul 15. PubMed PMID: 24975924.

58: Wang B, Wang H, Zhou W, He Y, Zhou Y, Chen Y, Jiang Q. Exposure to bisphenol A among school children in eastern China: A multicenter cross-sectional study. J Expo Sci Environ Epidemiol. 2014 Nov;24(6):657-64. doi: 10.1038/jes.2014.36. Epub 2014 May 28. PubMed PMID: 24866264.

59: FitzGerald RE, Wilks MF. Bisphenol A--Why an adverse outcome pathway framework needs to be applied. Toxicol Lett. 2014 Oct 15;230(2):368-74. doi: 10.1016/j.toxlet.2014.05.002. Epub 2014 May 14. PubMed PMID: 24831966.

60: Dhaini HR, Nassif RM. Exposure assessment of endocrine disruptors in bottled drinking water of Lebanon. Environ Monit Assess. 2014 Sep;186(9):5655-62. doi: 10.1007/s10661-014-3810-x. Epub 2014 May 15. PubMed PMID: 24829161.

61: Rajasärkkä J, Koponen J, Airaksinen R, Kiviranta H, Virta M. Monitoring bisphenol A and estrogenic chemicals in thermal paper with yeast-based bioreporter assay. Anal Bioanal Chem. 2014 Sep;406(23):5695-702. doi: 10.1007/s00216-014-7812-x. Epub 2014 May 11. PubMed PMID: 24817349.

62: Posnack NG. The Adverse Cardiac Effects of Di(2-ethylhexyl)phthalate and Bisphenol A. Cardiovasc Toxicol. 2014 Dec;14(4):339-57. doi: 10.1007/s12012-014-9258-y. PubMed PMID: 24811950; PubMed Central PMCID: PMC4213213.

63: Olea-Herrero N, Arenas MI, Muñóz-Moreno C, Moreno-Gómez-Toledano R, González-Santander M, Arribas I, Bosch RJ. Bisphenol-A induces podocytopathy with proteinuria in mice. J Cell Physiol. 2014 Dec;229(12):2057-66. doi: 10.1002/jcp.24665. PubMed PMID: 24809654.

64: Staniszewska M, Falkowska L, Grabowski P, Kwaśniak J, Mudrak-Cegiołka S,

Reindl AR, Sokołowski A, Szumiło E, Zgrundo A. Bisphenol A, 4-tert-octylphenol, and 4-nonylphenol in the Gulf of Gdańsk (Southern Baltic). Arch Environ Contam Toxicol. 2014 Oct;67(3):335-47. doi: 10.1007/s00244-014-0023-9. Epub 2014 Apr 22. PubMed PMID: 24752748; PubMed Central PMCID: PMC4156967.

65: Jusko TA, Shaw PA, Snijder CA, Pierik FH, Koch HM, Hauser R, Jaddoe VW, Burdorf A, Hofman A, Tiemeier H, Longnecker MP. Reproducibility of urinary bisphenol A concentrations measured during pregnancy in the Generation R Study. J Expo Sci Environ Epidemiol. 2014 Sep-Oct;24(5):532-6. doi: 10.1038/jes.2014.23. Epub 2014 Apr 16. PubMed PMID: 24736100; PubMed Central PMCID: PMC4140995.

66: Vilela J, Hartmann A, Silva EF, Cardoso T, Corcini CD, Varela-Junior AS, Martinez PE, Colares EP. Sperm impairments in adult vesper mice (Calomys laucha) caused by in utero exposure to bisphenol A. Andrologia. 2014 Nov;46(9):971-8. doi: 10.1111/and.12182. Epub 2013 Oct 23. PubMed PMID: 24147964.

67: Dobrzyńska MM, Jankowska-Steifer EA, Tyrkiel EJ, Gajowik A, Radzikowska J, Pachocki KA. Comparison of the effects of bisphenol a alone and in a combination with X-irradiation on sperm count and quality in male adult and pubescent mice. Environ Toxicol. 2014 Nov;29(11):1301-13. doi: 10.1002/tox.21861. Epub 2013 Apr 25. PubMed PMID: 23619965.

Phthalater

1: Liang Y, Xu Y. Emission of Phthalates and Phthalate Alternatives from Vinyl Flooring and Crib Mattress Covers: The Influence of Temperature. Environ Sci Technol. 2014 Nov 24. [Epub ahead of print] PubMed PMID: 25419579.

2: Hsu YL, Tsai EM, Hou MF, Wang TN, Hung JY, Kuo PL. Obtusifolin suppresses phthalate esters-induced breast cancer bone metastasis by targeting parathyroid hormone-related proteins. J Agric Food Chem. 2014 Nov 21. [Epub ahead of print] PubMed PMID: 25415928.

3: Hsu PC, Kuo YT, Leon Guo Y, Chen JR, Tsai SS, Chao HR, Teng YN, Pan MH. The adverse effects of low-dose exposure to Di(2-ethylhexyl) phthalate during adolescence on sperm function in adult rats. Environ Toxicol. 2014 Nov 20. doi: 10.1002/tox.22083. [Epub ahead of print] PubMed PMID: 25410017.

4: Mallow EB, Fox MA. Phthalates and critically ill neonates: device-related exposures and non-endocrine toxic risks. J Perinatol. 2014 Nov 6. doi: 10.1038/jp.2014.157. [Epub ahead of print] PubMed PMID: 25357096.

5: Ferguson KK, McElrath TF, Chen YH, Mukherjee B, Meeker JD. Urinary Phthalate Metabolites and Biomarkers of Oxidative Stress in Pregnant Women: A Repeated Measures Analysis. Environ Health Perspect. 2014 Nov 17. [Epub ahead of print] PubMed PMID: 25402001.

6: Park S, Lee JM, Kim JW, Cheong JH, Yun HJ, Hong YC, Kim Y, Han DH, Yoo HJ, Shin MS, Cho SC, Kim BN. Association between phthalates and externalizing behaviors and cortical thickness in children with attention deficit hyperactivity disorder. Psychol Med. 2014 Nov 12:1-12. [Epub ahead of print] PubMed PMID:25388623.

7: Chen P, Li S, Liu L, Xu N. Long-term effects of binary mixtures of 17α-ethynylestradiol (EE2) and dibutyl phthalate (DBP) in a partial life-cycle test with zebrafish (Danio rerio). Environ Toxicol Chem. 2014 Nov 10. doi: 10.1002/etc.2803. [Epub ahead of print] PubMed PMID: 25385324.

8: Jensen MS, Anand-Ivell R, Nørgaard-Pedersen B, Jönsson BA, Bonde JP, Hougaard DM, Cohen A, Lindh CH, Ivell R, Toft G. Amniotic Fluid Phthalate Levels and Male Fetal Gonad Function. Epidemiology. 2014 Nov 7. [Epub ahead of print] PubMed PMID: 25384265.

9: Wang SY, Wang Y, Xie FQ, Li YX, Wan XL, Ma WW, Wang DC, Wu YH. Analysis of PAEs in semen of infertile men. Int J Occup Environ Health. 2014 Nov 10:2049396714Y0000000088. [Epub ahead of print] PubMed PMID: 25384258.

10: Erythropel HC, Maric M, Nicell JA, Leask RL, Yargeau V. Leaching of the plasticizer di(2-ethylhexyl)phthalate (DEHP) from plastic containers and the question of human exposure. Appl Microbiol Biotechnol. 2014 Dec;98(24):9967-81. doi: 10.1007/s00253-014-6183-8. Epub 2014 Nov 7. PubMed PMID: 25376446.

11: Bornehag CG, Carlstedt F, Jönsson BA, Lindh CH, Jensen TK, Bodin A, Jonsson C, Janson S, Swan SH. Prenatal Phthalate Exposures and Anogenital Distance in Swedish Boys. Environ Health Perspect. 2014 Oct 29. [Epub ahead of print] PubMed PMID: 25353625.

12: Huang Y, Lu WW, Chen B, You J, Wu M, Li SG. Phthalates in commercial chinese rice wines: concentrations and the cumulative risk assessment to adult males in shanghai. Biomed Environ Sci. 2014 Oct;27(10):819-23. doi: 10.3967/bes2014.119. PubMed PMID: 25341819.

13: Ashley-Martin J, Dodds L, Arbuckle TE, Ettinger AS, Shapiro GD, Fisher M, Morisset AS, Taback S, Bouchard MF, Monnier P, Dallaire R, Fraser WD. A birth cohort study to investigate the association between prenatal phthalate and bisphenol A exposures and fetal markers of metabolic dysfunction. Environ Health. 2014 Oct 22;13:84. doi: 10.1186/1476-069X-13-84. PubMed PMID: 25336252.

14: Martinez-Arguelles D, Papadopoulos V. Identification of hot spots of DNA methylation in the adult male adrenal in response to in utero exposure to the ubiquitous endocrine disruptor plasticizer di-(2-ethylhexyl) phthalate. Endocrinology. 2014 Oct 20:en20141436. [Epub ahead of print] PubMed PMID: 25330100.

15: Zhao Y, Shi HJ, Xie CM, Chen J, Laue H, Zhang YH. Prenatal phthalate exposure, infant growth, and global DNA methylation of human placenta. Environ Mol Mutagen. 2014 Oct 18. doi: 10.1002/em.21916. [Epub ahead of print] PubMed PMID: 25327576.

16: Araki A, Mitsui T, Miyashita C, Nakajima T, Naito H, Ito S, Sasaki S, Cho K, Ikeno T, Nonomura K, Kishi R. Association between maternal exposure to di(2-ethylhexyl) phthalate and reproductive hormone levels in fetal blood: the Hokkaido study on environment and children's health. PLoS One. 2014 Oct 8;9(10):e109039. doi: 10.1371/journal.pone.0109039. eCollection 2014. PubMed PMID: 25296284; PubMed Central PMCID: PMC4189794.

17: Hong SB, Im MH, Kim JW, Park EJ, Shin MS, Kim BN, Yoo HJ, Cho IH, Bhang SY, Hong YC, Cho SC. Environmental Lead Exposure and Attention-Deficit/Hyperactivity Disorder Symptom Domains in a Community Sample of South Korean School-Age Children. Environ Health Perspect. 2014 Oct 3. [Epub ahead of print] PubMed PMID: 25280233.

18: Lien YJ, Ku HY, Su PH, Chen SJ, Chen HY, Liao PC, Chen WJ, Wang SL. Prenatal Exposure to Phthalate Esters and Behavioral Syndromes in Children at Eight Years of Age: Taiwan Maternal and Infant Cohort Study. Environ Health Perspect. 2014 Oct 3. [Epub ahead of print] PubMed PMID: 25280125.

19: Hsu JY, Ho HH, Liao PC. The potential use of diisononyl phthalate metabolites hair as biomarkers to assess long-term exposure demonstrated by a rat model. Chemosphere. 2014 Sep 29;118C:219-228. doi: 10.1016/j.chemosphere.2014.09.025.[Epub ahead of print] PubMed PMID: 25278043.

20: Rocca CL, Tait S, Guerranti C, Busani L, Ciardo F, Bergamasco B, Stecca L, Perra G, Mancini FR, Marci R, Bordi G, Caserta D, Focardi S, Moscarini M, Mantovani A. Exposure to endocrine disrupters and nuclear receptor gene expression in infertile and fertile women from different Italian areas. Int J Environ Res Public Health. 2014 Sep 29;11(10):10146-64. doi: 10.3390/ijerph111010146. PubMed PMID: 25268510; PubMed Central PMCID: PMC4210972.

21: Kumar N, Srivastava S, Roy P. The impact of low molecular weight phthalates in inducing reproductive malfunctions of male mice: Special emphasis on Sertoli cell functions. Gen Comp Endocrinol. 2014 Sep 28. pii: S0016-6480(14)00369-4. doi: 10.1016/j.ygcen.2014.09.012. [Epub ahead of print] PubMed PMID: 25268316.

22: Wang DC, Chen TJ, Lin ML, Jhong YC, Chen SC. Exercise prevents the increased anxiety-like behavior in lactational di-(2-ethylhexyl) phthalate-exposed female rats in late adolescence by improving the regulation of hypothalamus-pituitary-adrenal axis. Horm Behav. 2014 Sep 22;66(4):674-684. doi: 10.1016/j.yhbeh.2014.09.010. [Epub ahead of print] PubMed PMID: 25251977.

23: Rajesh P, Balasubramanian K. Phthalate exposure in utero causes epigenetic changes and impairs insulin signalling. J Endocrinol. 2014 Oct;223(1):47-66. doi: 10.1530/JOE-14-0111. PubMed PMID: 25232145.

24: Whyatt RM, Perzanowski MS, Just AC, Rundle AG, Donohue KM, Calafat AM, Hoepner LA, Perera FP, Miller RL. Asthma in inner-city children at 5-11 years of age and prenatal exposure to phthalates: the Columbia Center for Children's Environmental Health Cohort. Environ Health Perspect. 2014 Oct;122(10):1141-6. doi: 10.1289/ehp.1307670. Epub 2014 Jul 10. PubMed PMID: 25230320; PubMed Central PMCID: PMC4181924.

25: Hilton GM, Hoppin JA. Is Helicobacter Pylori an endogenous source of diethyl phthalate in humans? Environ Res. 2014 Sep 11;134C:402-404. doi: 10.1016/j.envres.2014.08.019. [Epub ahead of print] PubMed PMID: 25218706.

26: Larsson K, Ljung Björklund K, Palm B, Wennberg M, Kaj L, Lindh CH, Jönsson BA, Berglund M. Exposure determinants of phthalates, parabens, bisphenol A and triclosan in Swedish mothers and their children. Environ Int. 2014 Dec;73:323-33. doi: 10.1016/j.envint.2014.08.014. Epub 2014 Sep 16. PubMed PMID: 25216151; PubMed Central PMCID: PMC4207945.

27: Lee J, Pedersen AB, Thomsen M. The influence of resource strategies on childhood phthalate exposure-The role of REACH in a zero waste society. Environ Int. 2014 Dec;73:312-22. doi: 10.1016/j.envint.2014.08.003. Epub 2014 Sep 16. PubMed PMID: 25212603.

28: Lenters V, Portengen L, Smit LA, Jönsson BA, Giwercman A, Rylander L, Lindh CH, Spanò M, Pedersen HS, Ludwicki JK, Chumak L, Piersma AH, Toft G, Bonde JP, Heederik D, Vermeulen R. Phthalates, perfluoroalkyl acids, metals and organochlorines and reproductive function: a multipollutant assessment in Greenlandic, Polish and Ukrainian men. Occup Environ Med. 2014 Sep 10. pii: oemed-2014-102264. doi: 10.1136/oemed-2014-102264. [Epub ahead of print] PubMed PMID: 25209848.

29: Su PH, Chen JY, Lin CY, Chen HY, Liao PC, Ying TH, Wang SL. Sex steroid hormone levels and reproductive development of eight-year-old children following in utero and environmental exposure to phthalates. PLoS One. 2014 Sep 10;9(9):e102788. doi: 10.1371/journal.pone.0102788. eCollection 2014. PubMed PMID: 25207995; PubMed Central PMCID: PMC4160173.

30: Wijnands KP, Zeilmaker GA, Meijer WM, Helbing WA, Steegers-Theunissen RP. Periconceptional parental conditions and perimembranous ventricular septal defects in the offspring. Birth Defects Res A Clin Mol Teratol. 2014 Sep 5. doi: 10.1002/bdra.23265. [Epub ahead of print] PubMed PMID: 25196200.

31: Sakhi AK, Lillegaard IT, Voorspoels S, Carlsen MH, Løken EB, Brantsæter AL, Haugen M, Meltzer HM, Thomsen C. Concentrations of phthalates and bisphenol A in Norwegian foods and beverages and estimated dietary exposure in adults. Environ Int. 2014 Dec;73:259-69. doi: 10.1016/j.envint.2014.08.005. Epub 2014 Aug 28. PubMed PMID: 25173060.

32: Bernard L, Décaudin B, Lecoeur M, Richard D, Bourdeaux D, Cueff R, Sautou V; Armed Study Group. Analytical methods for the determination of DEHP plasticizer alternatives present in medical devices: a review. Talanta. 2014 Nov;129:39-54. doi: 10.1016/j.talanta.2014.04.069. Epub 2014 May 21. PubMed PMID: 25127563.

33: Meeker JD, Ferguson KK. Urinary Phthalate Metabolites Are Associated With Decreased Serum Testosterone in Men, Women, and Children From NHANES 2011-2012. J Clin Endocrinol Metab. 2014 Nov;99(11):4346-52. doi: 10.1210/jc.2014-2555. Epub 2014 Aug 14. PubMed PMID: 25121464; PubMed Central PMCID: PMC4223430.

34: Fierens T, Standaert A, Cornelis C, Sioen I, De Henauw S, Willems H, Bellemans M, De Maeyer M, Van Holderbeke M. A semi-probabilistic modelling approach for the estimation of dietary exposure to phthalates in the Belgian adult population. Environ Int. 2014 Dec;73:117-27. doi: 10.1016/j.envint.2014.07.017. Epub 2014 Aug 9. PubMed PMID: 25113625.

35: Han Y, Wang X, Chen G, Xu G, Liu X, Zhu W, Hu P, Zhang Y, Zhu C, Miao J. Di-(2-ethylhexyl) phthalate adjuvantly induces imbalanced humoral immunity in ovalbumin-sensitized BALB/c mice ascribing to T follicular helper cells hyperfunction. Toxicology. 2014 Oct 3;324:88-97. doi: 10.1016/j.tox.2014.07.011. Epub 2014 Aug 2. PubMed PMID: 25093321.

36: Christensen K, Sobus J, Phillips M, Blessinger T, Lorber M, Tan YM. Changes in epidemiologic associations with different exposure metrics: A case study of phthalate exposure associations with body mass index and waist circumference. Environ Int. 2014 Dec;73:66-76. doi: 10.1016/j.envint.2014.07.010. Epub 2014 Aug 2. PubMed PMID: 25090576.

37: Min KB, Min JY. Urinary phthalate metabolites and the risk of low bone mineral density and osteoporosis in older women. J Clin Endocrinol Metab. 2014 Oct;99(10):E1997-2003. doi: 10.1210/jc.2014-2279. Epub 2014 Jul 22. PubMed PMID: 25050905.

38: Polanska K, Ligocka D, Sobala W, Hanke W. Phthalate exposure and child development: the Polish Mother and Child Cohort Study. Early Hum Dev. 2014 Sep;90(9):477-85. doi: 10.1016/j.earlhumdev.2014.06.006. Epub 2014 Jul 16. PubMed PMID: 25038557.

39: Jones S, Boisvert A, Duong TB, Francois S, Thrane P, Culty M. Disruption of rat testis development following combined in utero exposure to the phytoestrogen genistein and antiandrogenic plasticizer di-(2-ethylhexyl) phthalate. Biol Reprod. 2014 Sep;91(3):64. doi: 10.1095/biolreprod.114.120907. Epub 2014 Jul 16.

PubMed PMID: 25031359.

40: Romani F, Tropea A, Scarinci E, Federico A, Dello Russo C, Lisi L, Catino S, Lanzone A, Apa R. Endocrine disruptors and human reproductive failure: the in vitro effect of phthalates on human luteal cells. Fertil Steril. 2014 Sep;102(3):831-7. doi: 10.1016/j.fertnstert.2014.05.041. Epub 2014 Jul 10. PubMed PMID: 25016925.

41: Zhao Y, Chen L, Li LX, Xie CM, Li D, Shi HJ, Zhang YH. Gender-specific relationship between prenatal exposure to phthalates and intrauterine growth restriction. Pediatr Res. 2014 Oct;76(4):401-8. doi: 10.1038/pr.2014.103. Epub 2014 Jul 8. PubMed PMID: 25003910.

42: Kasper-Sonnenberg M, Koch HM, Wittsiepe J, Brüning T, Wilhelm M. Phthalate metabolites and bisphenol A in urines from German school-aged children: results of the Duisburg birth cohort and Bochum cohort studies. Int J Hyg Environ Health. 2014 Nov;217(8):830-8. doi: 10.1016/j.ijheh.2014.06.001. Epub 2014 Jun 12. PubMed PMID: 24986699.

43: Bello UM, Madekurozwa MC, Groenewald HB, Aire TA, Arukwe A. The effects on steroidogenesis and histopathology of adult male Japanese quails (Coturnix coturnix japonica) testis following pre-pubertal exposure to di(n-butyl) phthalate (DBP). Comp Biochem Physiol C Toxicol Pharmacol. 2014 Nov;166:24-33. doi: 10.1016/j.cbpc.2014.06.005. Epub 2014 Jun 28. PubMed PMID: 24983780.

44: Misra S, Singh A, C H R, Sharma V, Reddy Mudiam MK, Ram KR. Identification of Drosophila-based endpoints for the assessment and understanding of xenobiotic-mediated male reproductive adversities. Toxicol Sci. 2014 Sep;141(1):278-91. doi: 10.1093/toxsci/kfu125. Epub 2014 Jun 27. PubMed PMID: 24973093.

45: Ernst J, Jann JC, Biemann R, Koch HM, Fischer B. Effects of the environmental contaminants DEHP and TCDD on estradiol synthesis and aryl hydrocarbon receptor and peroxisome proliferator-activated receptor signalling in the human granulosa cell line KGN. Mol Hum Reprod. 2014 Sep;20(9):919-28. doi: 10.1093/molehr/gau045.Epub 2014 Jun 20. PubMed PMID: 24950685.

46: Shin HM, McKone TE, Bennett DH. Attributing population-scale human exposure to various source categories: merging exposure models and biomonitoring data. Environ Int. 2014 Sep;70:183-91. doi: 10.1016/j.envint.2014.05.020. Epub 2014 Jun 14. PubMed PMID: 24934857.

47: Ferguson KK, McElrath TF, Ko YA, Mukherjee B, Meeker JD. Variability in urinary phthalate metabolite levels across pregnancy and sensitive windows of exposure for the risk of preterm birth. Environ Int. 2014 Sep;70:118-24. doi: 10.1016/j.envint.2014.05.016. Epub 2014 Jun 13. PubMed PMID: 24934852; PubMed Central PMCID: PMC4104181.

48: Bhat VS, Durham JL, English JC. Derivation of an oral reference dose (RfD) for the plasticizer, di-(2-propylheptyl)phthalate (Palatinol® 10-P). Regul Toxicol Pharmacol. 2014 Oct;70(1):65-74. doi: 10.1016/j.yrtph.2014.06.002. Epub 2014 Jun 9. PubMed PMID: 24925829.

49: Xu N, Chen P, Liu L, Zeng Y, Zhou H, Li S. Effects of combined exposure to 17α-ethynylestradiol and dibutyl phthalate on the growth and reproduction of adult male zebrafish (Danio rerio). Ecotoxicol Environ Saf. 2014 Sep;107:61-70. doi: 10.1016/j.ecoenv.2014.05.001. Epub 2014 Jun 4. PubMed PMID: 24905698.

50: Frederiksen H, Kuiri-Hänninen T, Main KM, Dunkel L, Sankilampi U. A

longitudinal study of urinary phthalate excretion in 58 full-term and 67 preterm infants from birth through 14 months. Environ Health Perspect. 2014 Sep;122(9):998-1005. doi: 10.1289/ehp.1307569. Epub 2014 May 29. PubMed PMID: 24879654; PubMed Central PMCID: PMC4154216.

51: Dhaini HR, Nassif RM. Exposure assessment of endocrine disruptors in bottled drinking water of Lebanon. Environ Monit Assess. 2014 Sep;186(9):5655-62. doi: 10.1007/s10661-014-3810-x. Epub 2014 May 15. PubMed PMID: 24829161.

52: Pant N, Kumar G, Upadhyay AD, Patel DK, Gupta YK, Chaturvedi PK. Reproductive toxicity of lead, cadmium, and phthalate exposure in men. Environ Sci Pollut Res Int. 2014 Sep;21(18):11066-74. doi: 10.1007/s11356-014-2986-5. Epub 2014 May 11. PubMed PMID: 24816463.

53: Posnack NG. The Adverse Cardiac Effects of Di(2-ethylhexyl)phthalate and Bisphenol A. Cardiovasc Toxicol. 2014 Dec;14(4):339-57. doi: 10.1007/s12012-014-9258-y. PubMed PMID: 24811950; PubMed Central PMCID: PMC4213213.

54: Choi WJ, Kwon HJ, Hong S, Lim WR, Kim H, Kim J, Kim C, Kim KS. Potential nonmonotonous association between di(2-ethylhexyl) phthalate exposure and atopic dermatitis in Korean children. Br J Dermatol. 2014 Oct;171(4):854-60. doi: 10.1111/bjd.12953. Epub 2014 Aug 4. PubMed PMID: 24606224.

55: Ackerman JM, Dodson RE, Engel CL, Gray JM, Rudel RA. Temporal variability of urinary di(2-ethylhexyl) phthalate metabolites during a dietary intervention study. J Expo Sci Environ Epidemiol. 2014 Nov;24(6):595-601. doi: 10.1038/jes.2013.93. Epub 2014 Jan 22. PubMed PMID: 24448002.

56: Braun JM, Just AC, Williams PL, Smith KW, Calafat AM, Hauser R. Personal care product use and urinary phthalate metabolite and paraben concentrations during pregnancy among women from a fertility clinic. J Expo Sci Environ Epidemiol. 2014 Sep-Oct;24(5):459-66. doi: 10.1038/jes.2013.69. Epub 2013 Oct 23. PubMed PMID:24149971; PubMed Central PMCID: PMC4016195.

Parabens

1: Luciani-Torres MG, Moore DH, Goodson WH 3rd, Dairkee SH. Exposure to the polyester PET precursor - terephthalic acid induces and perpetuates DNA damage harboring non-malignant human breast cells. Carcinogenesis. 2014 Nov 19. pii: bgu234. [Epub ahead of print] PubMed PMID: 25411358.

2: Larsson K, Ljung Björklund K, Palm B, Wennberg M, Kaj L, Lindh CH, Jönsson BA,Berglund M. Exposure determinants of phthalates, parabens, bisphenol A and triclosan in Swedish mothers and their children. Environ Int. 2014 Dec;73:323-33.doi: 10.1016/j.envint.2014.08.014. Epub 2014 Sep 16. PubMed PMID: 25216151; PubMed Central PMCID: PMC4207945.

3: Piao C, Chen L, Wang Y. A review of the extraction and chromatographic determination methods for the analysis of parabens. J Chromatogr B Analyt Technol Biomed Life Sci. 2014 Oct 15;969:139-48. doi: 10.1016/j.jchromb.2014.08.015. Epub 2014 Aug 15. PubMed PMID: 25173495.

4: Rodríguez-Gómez R, Jiménez-Díaz I, Zafra-Gómez A, Ballesteros O, Navalón A. A multiresidue method for the determination of selected endocrine disrupting chemicals in human breast milk based on a simple extraction procedure. Talanta. 2014 Dec;130:561-70. doi: 10.1016/j.talanta.2014.07.047. Epub 2014 Jul 26. PubMed PMID: 25159447.

5: Wróbel AM, Gregoraszczuk EŁ. Actions of methyl-, propyl- and butylparaben on estrogen receptor-α and -β and the progesterone receptor in MCF-7 cancer cells and non-cancerous MCF-10A cells. Toxicol Lett. 2014 Nov 4;230(3):375-81. doi: 10.1016/j.toxlet.2014.08.012. Epub 2014 Aug 13. PubMed PMID: 25128701.

6: Vela-Soria F, Ballesteros O, Zafra-Gómez A, Ballesteros L, Navalón A. A multiclass method for the analysis of endocrine disrupting chemicals in human urine samples. Sample treatment by dispersive liquid-liquid microextraction. Talanta. 2014 Nov;129:209-18. doi: 10.1016/j.talanta.2014.05.016. Epub 2014 May 29. PubMed PMID: 25127586.

7: Philippat C, Botton J, Calafat AM, Ye X, Charles MA, Slama R; EDEN Study Group. Prenatal exposure to phenols and growth in boys. Epidemiology. 2014 Sep;25(5):625-35. doi: 10.1097/EDE.0000000000000132. PubMed PMID: 25061923.

8: Darbre PD, Harvey PW. Parabens can enable hallmarks and characteristics of cancer in human breast epithelial cells: a review of the literature with reference to new exposure data and regulatory status. J Appl Toxicol. 2014 Sep;34(9):925-38. doi: 10.1002/jat.3027. Epub 2014 Jul 22. PubMed PMID: 25047802.

9: Moos RK, Angerer J, Wittsiepe J, Wilhelm M, Brüning T, Koch HM. Rapid determination of nine parabens and seven other environmental phenols in urine samples of German children and adults. Int J Hyg Environ Health. 2014 Nov;217(8):845-53. doi: 10.1016/j.ijheh.2014.06.003. Epub 2014 Jun 20. PubMed PMID: 25008406.

10: Khanna S, Dash PR, Darbre PD. Exposure to parabens at the concentration of maximal proliferative response increases migratory and invasive activity of human breast cancer cells in vitro. J Appl Toxicol. 2014 Sep;34(9):1051-9. doi: 10.1002/jat.3003. Epub 2014 Mar 20. PubMed PMID: 24652746.

11: Braun JM, Just AC, Williams PL, Smith KW, Calafat AM, Hauser R. Personal care product use and urinary phthalate metabolite and paraben concentrations during pregnancy among women from a fertility clinic. J Expo Sci Environ Epidemiol. 2014 Sep-Oct;24(5):459-66. doi: 10.1038/jes.2013.69. Epub 2013 Oct 23. PubMed PMID:24149971; PubMed Central PMCID: PMC4016195.

Per og polyfluor

1: Filgo AJ, Quist EM, Hoenerhoff MJ, Brix AE, Kissling GE, Fenton SE. Perfluorooctanoic Acid (PFOA)-induced Liver Lesions in Two Strains of Mice Following Developmental Exposures: PPARα Is Not Required. Toxicol Pathol. 2014 Nov 14. pii: 0192623314558463. [Epub ahead of print] PubMed PMID: 25398757.

2: Blaine AC, Rich CD, Sedlacko EM, Hyland KC, Stushnoff C, Dickenson ER, Higgins CP. Perfluoroalkyl Acid Uptake in Lettuce (Lactuca sativa) and Strawberry (Fragaria ananassa) Irrigated with Reclaimed Water. Environ Sci Technol. 2014 Nov 25. [Epub ahead of print] PubMed PMID: 25386873.

3: Liu L, She J, Zhang X, Zhang J, Tian M, Huang Q, Eqani SA, Shen H. On-line background cleanup followed by high-performance liquid chromatography with tandem mass spectrometry for the analysis of perfluorinated compounds in human blood. J Sep Sci. 2014 Nov 11. doi: 10.1002/jssc.201400761. [Epub ahead of print] PubMed PMID: 25384988.

4: Governini L, Guerranti C, De Leo V, Boschi L, Luddi A, Gori M, Orvieto R,

Piomboni P. Chromosomal aneuploidies and DNA fragmentation of human spermatozoa from patients exposed to perfluorinated compounds. Andrologia. 2014 Nov 8. doi: 10.1111/and.12371. [Epub ahead of print] PubMed PMID: 25382683.

5: Bach CC, Bech BH, Brix N, Nohr EA, Bonde JP, Henriksen TB. Perfluoroalkyl and polyfluoroalkyl substances and human fetal growth: A systematic review. Crit Rev Toxicol. 2014 Nov 5:1-15. [Epub ahead of print] PubMed PMID: 25372700.

6: Hansmeier N, Chao TC, Herbstman JB, Goldman LR, Witter FR, Halden RU. Elucidating the Molecular Basis of Adverse Health Effects from Exposure to Anthropogenic Polyfluorinated Compounds Using Toxicoproteomic Approaches. J Proteome Res. 2014 Nov 11. [Epub ahead of print] PubMed PMID: 25350270.

7: Zeng XW, Qian Z, Vaughn M, Xian H, Elder K, Rodemich E, Bao J, Jin YH, Dong GH. Human serum levels of perfluorooctane sulfonate (PFOS) and perfluorooctanoate (PFOA) in Uyghurs from Sinkiang-Uighur Autonomous Region, China: background levels study. Environ Sci Pollut Res Int. 2014 Oct 23. [Epub ahead of print]PubMed PMID: 25339531.

8: Rocca CL, Tait S, Guerranti C, Busani L, Ciardo F, Bergamasco B, Stecca L, Perra G, Mancini FR, Marci R, Bordi G, Caserta D, Focardi S, Moscarini M, Mantovani A. Exposure to endocrine disrupters and nuclear receptor gene expression in infertile and fertile women from different Italian areas. Int J Environ Res Public Health. 2014 Sep 29;11(10):10146-64. doi: 10.3390/ijerph111010146. PubMed PMID: 25268510; PubMed Central PMCID: PMC4210972.

9: Fan H, Ducatman A, Zhang J. Perfluorocarbons and Gilbert syndrome (phenotype) in the C8 Health Study Population. Environ Res. 2014 Sep 25;135C:70-75. doi: 10.1016/j.envres.2014.08.011. [Epub ahead of print] PubMed PMID: 25262077.

10: Winquist A, Steenland K. Modeled PFOA Exposure and Coronary Artery Disease, Hypertension, and High Cholesterol in Community and Worker Cohorts. Environ Health Perspect. 2014 Sep 26. [Epub ahead of print] PubMed PMID: 25260175.

11: Du J, Wang S, You H, Jiang R, Zhuang C, Zhang X. Developmental toxicity and DNA damage to zebrafish induced by perfluorooctane sulfonate in the presence of ZnO nanoparticles. Environ Toxicol. 2014 Sep 25. doi: 10.1002/tox.22050. [Epub ahead of print] PubMed PMID: 25258305.

12: Bjerregaard-Olesen C, Bossi R, Bech BH, Bonefeld-Jørgensen EC. Extraction of perfluorinated alkyl acids from human serum for determination of the combined xenoestrogenic transactivity: A method development. Chemosphere. 2014 Sep 15. pii: S0045-6535(14)01052-2. doi: 10.1016/j.chemosphere.2014.08.071. [Epub ahead of print] PubMed PMID: 25234096.

13: Lenters V, Portengen L, Smit LA, Jönsson BA, Giwercman A, Rylander L, Lindh CH, Spanò M, Pedersen HS, Ludwicki JK, Chumak L, Piersma AH, Toft G, Bonde JP, Heederik D, Vermeulen R. Phthalates, perfluoroalkyl acids, metals and organochlorines and reproductive function: a multipollutant assessment in Greenlandic, Polish and Ukrainian men. Occup Environ Med. 2014 Sep 10. pii: oemed-2014-102264. doi: 10.1136/oemed-2014-102264. [Epub ahead of print] PubMed PMID: 25209848.

14: Stahl LL, Snyder BD, Olsen AR, Kincaid TM, Wathen JB, McCarty HB. Perfluorinated compounds in fish from U.S. urban rivers and the Great Lakes. Sci Total Environ. 2014 Nov 15;499:185-95. doi: 10.1016/j.scitotenv.2014.07.126. Epub 2014 Sep 2. PubMed PMID: 25190044.

15: Li Y, Han Z, Zheng X, Ma Z, Liu H, Giesy JP, Xie Y, Yu H. Comparison of waterborne and in ovo nanoinjection exposures to assess effects of PFOS on zebrafish embryos. Environ Sci Pollut Res Int. 2014 Sep 4. [Epub ahead of print] PubMed PMID: 25182431.

16: Coperchini F, Pignatti P, Lacerenza S, Negri S, Sideri R, Testoni C, de Martinis L, Cottica D, Magri F, Imbriani M, Rotondi M, Chiovato L. Exposure to perfluorinated compounds: in vitro study on thyroid cells. Environ Sci Pollut Res Int. 2014 Sep 4. [Epub ahead of print] PubMed PMID: 25182428.

17: Bonefeld-Jørgensen EC, Long M, Fredslund SO, Bossi R, Olsen J. Breast cancer risk after exposure to perfluorinated compounds in Danish women: a case-control study nested in the Danish National Birth Cohort. Cancer Causes Control. 2014 Nov;25(11):1439-48. doi: 10.1007/s10552-014-0446-7. Epub 2014 Aug 23. PubMed PMID: 25148915; PubMed Central PMCID: PMC4215104.

18: Liew Z, Ritz B, Bonefeld-Jørgensen EC, Henriksen TB, Nohr EA, Bech BH, Fei C,Bossi R, von Ehrenstein OS, Streja E, Uldall P, Olsen J. Prenatal exposure to perfluoroalkyl substances and the risk of congenital cerebral palsy in children. Am J Epidemiol. 2014 Sep 15;180(6):574-81. doi: 10.1093/aje/kwu179. Epub 2014 Aug 19. PubMed PMID: 25139206.

19: Osuna CE, Grandjean P, Weihe P, El-Fawal HA. Autoantibodies associated with prenatal and childhood exposure to environmental chemicals in faroese children. Toxicol Sci. 2014 Nov 1;142(1):158-66. doi: 10.1093/toxsci/kfu163. Epub 2014 Aug 14. PubMed PMID: 25124724.

20: Squadrone S, Ciccotelli V, Favaro L, Scanzio T, Prearo M, Abete MC. Fish consumption as a source of human exposure to perfluorinated alkyl substances in Italy: analysis of two edible fish from Lake Maggiore. Chemosphere. 2014 Nov;114:181-6. doi: 10.1016/j.chemosphere.2014.04.085. Epub 2014 May 17. PubMed PMID: 25113200.

21: Wang S, Lv Q, Yang Y, Guo LH, Wan B, Zhao L. Cellular target recognition of perfluoroalkyl acids: in vitro evaluation of inhibitory effects on lysine decarboxylase. Sci Total Environ. 2014 Oct 15;496:381-8. doi: 10.1016/j.scitotenv.2014.07.034. Epub 2014 Aug 3. PubMed PMID: 25093300.

22: Petro EM, D'Hollander W, Covaci A, Bervoets L, Fransen E, De Neubourg D, De Pauw I, Leroy JL, Jorssen EP, Bols PE. Perfluoroalkyl acid contamination of follicular fluid and its consequence for in vitro oocyte developmental competence. Sci Total Environ. 2014 Oct 15;496:282-8. doi: 10.1016/j.scitotenv.2014.07.028. Epub 2014 Aug 2. PubMed PMID: 25089690.

23: Jurado-Sánchez B, Ballesteros E, Gallego M. Analytical method for biomonitoring of perfluoroalkyl acids in human urine. Talanta. 2014 Oct;128:141-6. doi: 10.1016/j.talanta.2014.04.071. Epub 2014 May 8. PubMed PMID: 25059141.

24: Toms LM, Thompson J, Rotander A, Hobson P, Calafat AM, Kato K, Ye X, Broomhall S, Harden F, Mueller JF. Decline in perfluorooctane sulfonate and perfluorooctanoate serum concentrations in an Australian population from 2002 to 2011. Environ Int. 2014 Oct;71:74-80. doi: 10.1016/j.envint.2014.05.019. Epub 2014 Jun 27. PubMed PMID: 24980755.

25: Gorrochategui E, Casas J, Pérez-Albaladejo E, Jáuregui O, Porte C, Lacorte S.Characterization of complex lipid mixtures in contaminant exposed JEG-3 cells using liquid chromatography and high-resolution mass spectrometry. Environ Sci Pollut Res Int. 2014 Oct;21(20):11907-16. doi: 10.1007/s11356-014-3172-5. Epub

2014 Jun 28. PubMed PMID: 24969426.

26: Lam J, Koustas E, Sutton P, Johnson PI, Atchley DS, Sen S, Robinson KA, Axelrad DA, Woodruff TJ. The Navigation Guide - evidence-based medicine meets environmental health: integration of animal and human evidence for PFOA effects on fetal growth. Environ Health Perspect. 2014 Oct;122(10):1040-51. doi: 10.1289/ehp.1307923. Epub 2014 Jun 20. PubMed PMID: 24968389; PubMed Central PMCID: PMC4181930.

27: Johnson PI, Sutton P, Atchley DS, Koustas E, Lam J, Sen S, Robinson KA, Axelrad DA, Woodruff TJ. The Navigation Guide - evidence-based medicine meets environmental health: systematic review of human evidence for PFOA effects on fetal growth. Environ Health Perspect. 2014 Oct;122(10):1028-39. doi: 10.1289/ehp.1307893. Epub 2014 Jun 23. PubMed PMID: 24968388; PubMed Central PMCID: PMC4181929.

28: Scheringer M, Trier X, Cousins IT, de Voogt P, Fletcher T, Wang Z, Webster TF. Helsingør statement on poly- and perfluorinated alkyl substances (PFASs). Chemosphere. 2014 Nov;114:337-9. doi: 10.1016/j.chemosphere.2014.05.044. Epub 2014 Jun 14. PubMed PMID: 24938172.

29: Humblet O, Diaz-Ramirez LG, Balmes JR, Pinney SM, Hiatt RA. Perfluoroalkyl chemicals and asthma among children 12-19 years of age: NHANES (1999-2008). Environ Health Perspect. 2014 Oct;122(10):1129-33. doi: 10.1289/ehp.1306606. Epub 2014 Jun 5. PubMed PMID: 24905661; PubMed Central PMCID: PMC4181915.

30: Taylor PH, Yamada T, Striebich RC, Graham JL, Giraud RJ. Investigation of waste incineration of fluorotelomer-based polymers as a potential source of PFOA in the environment. Chemosphere. 2014 Sep;110:17-22. doi: 10.1016/j.chemosphere.2014.02.037. Epub 2014 Apr 5. PubMed PMID: 24880594.

31: Roth N, Wilks MF. Neurodevelopmental and neurobehavioural effects of polybrominated and perfluorinated chemicals: a systematic review of the epidemiological literature using a quality assessment scheme. Toxicol Lett. 2014 Oct 15;230(2):271-81. doi: 10.1016/j.toxlet.2014.02.015. Epub 2014 Feb 25. PubMed PMID: 24583043.

32: Lee YJ, Choi SY, Yang JH. NMDA receptor-mediated ERK 1/2 pathway is involved in PFHxS-induced apoptosis of PC12 cells. Sci Total Environ. 2014 Sep 1;491-492:227-34. doi: 10.1016/j.scitotenv.2014.01.114. Epub 2014 Feb 15. PubMed PMID: 24534200.

33: Yamada A, Bemrah N, Veyrand B, Pollono C, Merlo M, Desvignes V, Sirot V, Marchand P, Berrebi A, Cariou R, Antignac JP, Le Bizec B, Leblanc JC. Dietary exposure to perfluoroalkyl acids of specific French adult sub-populations: high seafood consumers, high freshwater fish consumers and pregnant women. Sci Total Environ. 2014 Sep 1;491-492:170-5. doi: 10.1016/j.scitotenv.2014.01.089. Epub 2014 Feb 14. PubMed PMID: 24530183.

34: Corsini E, Luebke RW, Germolec DR, DeWitt JC. Perfluorinated compounds: emerging POPs with potential immunotoxicity. Toxicol Lett. 2014 Oct 15;230(2):263-70. doi: 10.1016/j.toxlet.2014.01.038. Epub 2014 Feb 3. PubMed PMID: 24503008.

35: Pereiro N, Moyano R, Blanco A, Lafuente A. Regulation of corticosterone secretion is modified by PFOS exposure at different levels of the hypothalamic-pituitary-adrenal axis in adult male rats. Toxicol Lett. 2014 Oct 15;230(2):252-62. doi: 10.1016/j.toxlet.2014.01.003. Epub 2014 Jan 17. PubMed PMID: 24440345.

36: Huang Q, Zhang J, Peng S, Du M, Ow S, Pu H, Pan C, Shen H. Proteomic analysis of perfluorooctane sulfonate-induced apoptosis in human hepatic cells using the iTRAQ technique. J Appl Toxicol. 2014 Dec;34(12):1342-51. doi: 10.1002/jat.2963. Epub 2013 Dec 3. PubMed PMID: 24301089.

Triclocarban og triclosan

1: DeLorenzo ME, Brooker J, Chung KW, Kelly M, Martinez J, Moore JG, Thomas M. Exposure of the grass shrimp, Palaemonetes pugio, to antimicrobial compounds affects associated Vibrio bacterial density and development of antibiotic resistance. Environ Toxicol. 2014 Oct 28. doi: 10.1002/tox.22060. [Epub ahead of print] PubMed PMID: 25348372.

2: Szychowski KA, Sitarz AM, Wojtowicz AK. Triclosan induces Fas receptor-dependent apoptosis in mouse neocortical neurons in vitro. Neuroscience. 2014 Oct 10. pii: S0306-4522(14)00855-0. doi: 10.1016/j.neuroscience.2014.10.001. [Epub ahead of print] PubMed PMID: 25313001.

3: Makkar S, Goyal M, Kaushal A, Hegde V. Effect of desensitizing treatments on bond strength of resin composites to dentin - an in vitro study. J Conserv Dent. 2014 Sep;17(5):458-61. doi: 10.4103/0972-0707.139840. PubMed PMID: 25298648; PubMed Central PMCID: PMC4174707.

4: Manevski N, Balavenkatraman KK, Bertschi B, Swart P, Walles M, Camenisch G, Schiller H, Kretz O, Ling B, Wettstein R, Schaefer DJ, Pognan F, Wolf A, Litherland K. Aldehyde oxidase activity in fresh human skin. Drug Metab Dispos. 2014 Dec;42(12):2049-57. doi: 10.1124/dmd.114.060368. Epub 2014 Sep 23. PubMed PMID: 25249692.

5: Ribalta C, Solé M. In vitro interaction of emerging contaminants with the cytochrome p450 system of mediterranean deep-sea fish. Environ Sci Technol. 2014 Oct 21;48(20):12327-35. doi: 10.1021/es5029603. Epub 2014 Sep 30. PubMed PMID: 25225740.

6: Larsson K, Ljung Björklund K, Palm B, Wennberg M, Kaj L, Lindh CH, Jönsson BA,Berglund M. Exposure determinants of phthalates, parabens, bisphenol A and triclosan in Swedish mothers and their children. Environ Int. 2014 Dec;73:323-33.doi: 10.1016/j.envint.2014.08.014. Epub 2014 Sep 16. PubMed PMID: 25216151; PubMed Central PMCID: PMC4207945.

7: Wu X, Conkle JL, Ernst F, Gan J. Treated wastewater irrigation: uptake of pharmaceutical and personal care products by common vegetables under field conditions. Environ Sci Technol. 2014 Oct 7;48(19):11286-93. doi: 10.1021/es502868k. Epub 2014 Sep 25. PubMed PMID: 25211705.

8: Prosser RS, Trapp S, Sibley PK. Modeling uptake of selected pharmaceuticals and personal care products into food crops from biosolids-amended soil. Environ Sci Technol. 2014 Oct 7;48(19):11397-404. doi: 10.1021/es503067v. Epub 2014 Sep 26. PubMed PMID: 25207852.

9: Huang CL, Ma HW, Yu CP. Substance flow analysis and assessment of environmental exposure potential for triclosan in mainland China. Sci Total Environ. 2014 Nov 15;499:265-75. doi: 10.1016/j.scitotenv.2014.08.032. Epub 2014 Sep 3. PubMed PMID: 25194904.

10: Wu Y, Wu Q, Beland FA, Ge P, Manjanatha MG, Fang JL. Differential effects of

triclosan on the activation of mouse and human peroxisome proliferator-activated receptor alpha. Toxicol Lett. 2014 Sep 3;231(1):17-28. doi: 10.1016/j.toxlet.2014.09.001. [Epub ahead of print] PubMed PMID: 25193434.

11: Donnachie RL, Johnson AC, Moeckel C, Pereira MG, Sumpter JP. Using risk-ranking of metals to identify which poses the greatest threat to freshwater organisms in the UK. Environ Pollut. 2014 Nov;194:17-23. doi: 10.1016/j.envpol.2014.07.008. Epub 2014 Jul 31. PubMed PMID: 25084241.

12: Philippat C, Botton J, Calafat AM, Ye X, Charles MA, Slama R; EDEN Study Group. Prenatal exposure to phenols and growth in boys. Epidemiology. 2014 Sep;25(5):625-35. doi: 10.1097/EDE.0000000000000132. PubMed PMID: 25061923.

13: Forbes S, Dobson CB, Humphreys GJ, McBain AJ. Transient and sustained bacterial adaptation following repeated sublethal exposure to microbicides and a novel human antimicrobial peptide. Antimicrob Agents Chemother. 2014 Oct;58(10):5809-17. doi: 10.1128/AAC.03364-14. Epub 2014 Jul 21. PubMed PMID: 25049246; PubMed Central PMCID: PMC4187928.

14: Moos RK, Angerer J, Wittsiepe J, Wilhelm M, Brüning T, Koch HM. Rapid determination of nine parabens and seven other environmental phenols in urine samples of German children and adults. Int J Hyg Environ Health. 2014 Nov;217(8):845-53. doi: 10.1016/j.ijheh.2014.06.003. Epub 2014 Jun 20. PubMed PMID: 25008406.

15: Bertelsen RJ, Engel SM, Jusko TA, Calafat AM, Hoppin JA, London SJ, Eggesbø M, Aase H, Zeiner P, Reichborn-Kjennerud T, Knudsen GP, Guidry VT, Longnecker MP.Reliability of triclosan measures in repeated urine samples from Norwegian pregnant women. J Expo Sci Environ Epidemiol. 2014 Sep-Oct;24(5):517-21. doi: 10.1038/jes.2013.95. Epub 2014 Jan 29. PubMed PMID: 24472755; PubMed Central PMCID: PMC4115053.

Flame retardants

1: Dodson RE, Van den Eede N, Covaci A, Perovich LJ, Brody JG, Rudel RA. Urinary Biomonitoring of Phosphate Flame Retardants: Levels in California Adults and Recommendations for Future Studies. Environ Sci Technol. 2014 Nov 12. [Epub ahead of print] PubMed PMID: 25388620.

2: Makey CM, McClean MD, Sjödin A, Weinberg J, Carignan CC, Webster TF. Temporal Variability of Polybrominated Diphenyl Ether (PBDE) Serum Concentrations over One Year. Environ Sci Technol. 2014 Nov 25. [Epub ahead of print] PubMed PMID: 25383963.

3: Cato A, Celada L, Kibakaya EC, Simmons N, Whalen MM. Brominated flame retardants, tetrabromobisphenol A and hexabromocyclododecane, activate mitogen-activated protein kinases (MAPKs) in human natural killer cells. Cell Biol Toxicol. 2014 Oct 24. [Epub ahead of print] PubMed PMID: 25341744.

4: Van den Eede N, Heffernan AL, Aylward LL, Hobson P, Neels H, Mueller JF, Covaci A. Age as a determinant of phosphate flame retardant exposure of the Australian population and identification of novel urinary PFR metabolites. Environ Int. 2014 Sep 29;74C:1-8. doi: 10.1016/j.envint.2014.09.005. [Epub ahead of print] PubMed PMID: 25277340.

5: Hendriks HS, Koolen LA, Dingemans MM, Viberg H, Lee I, Leonards PE, Ramakers GM, Westerink RH. Effects of neonatal exposure to the flame retardant

tetrabromobisphenol-A, aluminum diethylphosphinate or zinc stannate on long-term potentiation and synaptic protein levels in mice. Arch Toxicol. 2014 Sep 25. [Epub ahead of print] PubMed PMID: 25253649.

6: Zatecka E, Castillo J, Elzeinova F, Kubatova A, Ded L, Peknicova J, Oliva R. The effect of tetrabromobisphenol A on protamine content and DNA integrity in mouse spermatozoa. Andrology. 2014 Nov;2(6):910-917. doi: 10.1111/j.2047-2927.2014.00257.x. Epub 2014 Aug 22. PubMed PMID: 25146423.

7: Butt CM, Congleton J, Hoffman K, Fang M, Stapleton HM. Metabolites of organophosphate flame retardants and 2-ethylhexyl tetrabromobenzoate in urine from paired mothers and toddlers. Environ Sci Technol. 2014 Sep 2;48(17):10432-8. doi: 10.1021/es5025299. Epub 2014 Aug 13. PubMed PMID: 25090580.

8: Miller-Rhodes P, Popescu M, Goeke C, Tirabassi T, Johnson L, Markowski VP. Prenatal exposure to the brominated flame retardant hexabromocyclododecane (HBCD) impairs measures of sustained attention and increases age-related morbidity in the Long-Evans rat. Neurotoxicol Teratol. 2014 Sep-Oct;45:34-43. doi:10.1016/j.ntt.2014.06.009. Epub 2014 Jul 1. PubMed PMID: 24995466.

9: Powers CM, Gift J, Lehmann GM. Sparking connections: toward better linkages between research and human health policy-an example with multiwalled carbon nanotubes. Toxicol Sci. 2014 Sep;141(1):6-17. doi: 10.1093/toxsci/kfu117. Epub 2014 Jun 13. PubMed PMID: 24928890.

10: Bradman A, Castorina R, Gaspar F, Nishioka M, Colón M, Weathers W, Egeghy PP,Maddalena R, Williams J, Jenkins PL, McKone TE. Flame retardant exposures in California early childhood education environments. Chemosphere. 2014 Dec;116:61-6. doi: 10.1016/j.chemosphere.2014.02.072. Epub 2014 May 15. PubMed PMID: 24835158.

11: Hoffman K, Fang M, Horman B, Patisaul HB, Garantziotis S, Birnbaum LS, Stapleton HM. Urinary tetrabromobenzoic acid (TBBA) as a biomarker of exposure to the flame retardant mixture Firemaster® 550. Environ Health Perspect. 2014 Sep;122(9):963-9. doi: 10.1289/ehp.1308028. Epub 2014 May 9. PubMed PMID: 24823833; PubMed Central PMCID: PMC4154220.

12: Stapleton HM, Misenheimer J, Hoffman K, Webster TF. Flame retardant associations between children's handwipes and house dust. Chemosphere. 2014 Dec;116:54-60. doi: 10.1016/j.chemosphere.2013.12.100. Epub 2014 Jan 31. PubMed PMID: 24485814; PubMed Central PMCID: PMC4116470.

Tributyltin

1: Brown S, Whalen M. Tributyltin alters secretion of interleukin 1 beta from human immune cells. J Appl Toxicol. 2014 Nov 7. doi: 10.1002/jat.3087. [Epub ahead of print] PubMed PMID: 25382723.

2: Cato A, Celada L, Kibakaya EC, Simmons N, Whalen MM. Brominated flame retardants, tetrabromobisphenol A and hexabromocyclododecane, activate mitogen-activated protein kinases (MAPKs) in human natural killer cells. Cell Biol Toxicol. 2014 Oct 24. [Epub ahead of print] PubMed PMID: 25341744.

3: Gorrochategui E, Casas J, Pérez-Albaladejo E, Jáuregui O, Porte C, Lacorte S. Characterization of complex lipid mixtures in contaminant exposed JEG-3 cells using liquid chromatography and high-resolution mass spectrometry. Environ Sci Pollut Res Int. 2014 Oct;21(20):11907-16. doi: 10.1007/s11356-014-3172-5. Epub 2014 Jun 28. PubMed PMID: 24969426.

4: Celada LJ, Whalen MM. Effects of butyltins on mitogen-activated-protein kinase kinase kinase and Ras activity in human natural killer cells. J Appl Toxicol. 2014 Sep;34(9):1002-11. doi: 10.1002/jat.2921. Epub 2013 Sep 5. PubMed PMID: 24038145; PubMed Central PMCID: PMC3868639.

Endocrine disrupters

1: Boberg J, Johansson HK, Hadrup N, Dreisig K, Berthelsen L, Almstrup K, Vinggaard AM, Hass U. Perinatal exposure to mixtures of anti-androgenic chemicals causes proliferative lesions in rat prostate. Prostate. 2014 Oct 18. doi:10.1002/pros.22897. [Epub ahead of print] PubMed PMID: 25327291.

2: Vega A, Baptissart M, Martinot E, Saru JP, Baron S, Schoonjans K, Volle DH. Hepatotoxicity induced by neonatal exposure to diethylstilbestrol is maintained throughout adulthood via the nuclear receptor SHP. Expert Opin Ther Targets. 2014 Dec;18(12):1367-76. doi: 10.1517/14728222.2014.964209. Epub 2014 Sep 29. PubMed PMID: 25263461.

In vitro studier ved DTU Fødevareinstituttet

Søgt i Pubmed med følgende kriterier:

" Endocrine disrupt* AND in vitro*" samt "Endocrine disrupt* AND expose* AND in vitro*",

"Paraben* AND in vitro*,"perfluor* OR polyfluor* AND in vitro*" og "Phthalat* AND in vitro*".

Publiceret fra i perioden 2014/08/30 to 2014/12/30 present (September 2014 og fremefter)

Efter at have fjernet genganger fra forrige litteraturopdateringslister gav litteratursøgningen, med de angivne søgekriterier, tilsammen en liste med i alt 35 artikler (Bruttolisten). Artiklerne er blevet fordelt i 4 grupper:"Perflourinated and Polyflourinated compounds","Plastic derivatives (BPA, Phthalates and others)", "Pesticides/Fungicides/Insecticides /Biocides" og "Various EDCs, Mixtures and Other endpoints".

Udvalgte publikationer

2 artikler er blevet udvalgt (fra bruttolisten) til nærmere beskrivelse baseret på, at de beskriver resultater der bidrager til ny eller yderligere viden om grupper af hormonforstyrrende stoffer.
Den første artikel beskriver et in vitro studie, hvor man har undersøgt den østrogene effekt af bisphenol A og to BPA alternativer BPS of polyethersulfone (PES), samt deres metabolitter.
Den anden artikel omhandler in vitro studier til at undersøge hormonforstyrrende effekter af en række godkendte og almindelig anvendte ikke-persistente pesticider.

Estrogenic potency of bisphenol S, polyethersulfone and their metabolites generated by the rat liver S9 fractions on a MVLN cell using a luciferase reporter gene assay.

Kang JS, Choi JS, Kim WK, Lee YJ, Park JW.

Abstract

Background:
Bisphenol A (BPA) is an applied chemical that is used in many industrial fields and is a potential endocrine disruption chemical (EDC) that is found in the environment. Bisphenol S (BPS) and polyethersulfone (PES) have been suggested as putative BPA alternatives. In this study, the estrogenic potency induced by the binding of 17-beta-estradiol (E2), BPA, BPS, PES and their metabolites formed by the rat liver S9 fraction to the human estrogen receptor (ER) was estimated.
Methods:
We used an in vitro bioassay based on the luciferase reporter assay in MVLN cells to evaluate the estrogenic activity of 17-beta-estradiol (E2), BPA, BPS, PES (E2: 0.001 to 0.3 nM; BPA, BPS and PES: 0.0001 to 5 microM) and their metabolites (E2: 0.05 microM; BPA, BPS and PES: 0.1 mM) according to incubation times (0, 20 and 40 min). After chemical treatment to MVLN cells for 72 hrs, and the cell viability and luciferase intensity induced were estimated, from which the estrogenic activity of the chemicals tested was evaluated.
Results:
BPA and BPS induced estrogenic activity whereas PES did not show any estrogenic activity in the concentrations tested. In an in vitro assay of metabolites, BPA metabolites displayed comparable estrogenic activity with BPA and metabolites of both BPS and PES showed increasing estrogenic activity.
Conclusions:
The results suggest that the metabolites of BPS and PES have estrogenic potential and the need for the assessment of both chemicals and their metabolites in other EDC evaluation studies. The estrogenic potency of PES and its metabolites is the first report in our best knowledge.

Effect of nonpersistent pesticides on estrogen receptor, androgen receptor, and aryl hydrocarbon receptor.
Medjakovic S, Zoechling A, Gerster P, Ivanova MM, Teng Y, Klinge CM, Schildberger B, Gartner M, Jungbauer A.

Abstract

Nonpersistent pesticides are considered less harmful for the environment, but their impact as endocrine disruptors has not been fully explored. The pesticide Switch was applied to grape vines, and the maximum residue concentration of its active ingredients was quantified. The transactivation potential of the pesticides Acorit, Frupica, Steward, Reldan, Switch, Cantus, Teldor, and Scala and their active compounds (hexythiazox, mepanipyrim, indoxacarb, chlorpyrifos-methyl, cyprodinil, fludioxonil, boscalid, fenhexamid,

and pyrimethanil) were tested on human estrogen receptor α (ERα), androgen receptor (AR) and arylhydrocarbon receptor (AhR) in vitro. Relative binding affinities of the pure pesticide constituents for AR and their effect on human breast cancer and prostate cancer cell lines were evaluated. Residue concentrations of Switch's ingredients were below maximum residue limits. Fludioxonil and fenhexamid were ERα agonists (EC50 -values of 3.7 and 9.0 μM, respectively) and had time-dependent effects on endogenous ERα-target gene expression (cyclin D1, progesterone receptor, and nuclear respiratory factor 1) in MCF-7 human breast cancer cells. Fludioxonil, mepanipyrim, cyprodinil, pyrimethanil, and chlorpyrifos-methyl were AhR-agonists (EC50 s of 0.42, 0.77, 1.4, 4.6, and 5.1 μM, respectively). Weak AR binding was shown for chlorpyrifos-methyl, cyprodinil, fenhexamid, and fludioxonil. Assuming a total uptake which does not take metabolism and clearance rates into account, our in vitro evidence suggests that pesticides could activate pathways affecting hormonal balance, even within permitted limits, thus potentially acting as endocrine disruptors.

Bruttoliste

Perflourinated and Polyflourinated compounds

1. Exposure to perfluorinated compounds: in vitro study on thyroid cells.
Coperchini F, Pignatti P, Lacerenza S, Negri S, Sideri R, Testoni C, de Martinis L, Cottica D, Magri F, Imbriani M, Rotondi M, Chiovato L.
Environ Sci Pollut Res Int. 2014 Sep 4. [Epub ahead of print]

2. Chronic Exposure to Perfluorooctane Sulfonate Induces Behavior Defects and Neurotoxicity through Oxidative Damages, In Vivo and In Vitro.
Chen N, Li J, Li D, Yang Y, He D.
PLoS One. 2014 Nov 20;9(11):e113453. doi: 10.1371/journal.pone.0113453. eCollection 2014.

3. Vaporization dynamics of volatile perfluorocarbon droplets: a theoretical model and in vitro validation.
Doinikov AA, Sheeran PS, Bouakaz A, Dayton PA.
Med Phys. 2014 Oct;41(10):102901. doi: 10.1118/1.4894804.

4. Analysis of apoptosis induced by perfluorooctane sulfonates (PFOS) in mouse Leydig cells in vitro.
Zhang DY, Xu XL, Shen XY, Ruan Q, Hu WL.
Toxicol Mech Methods. 2014 Oct 13:1-5. [Epub ahead of print]

5. In vitro surfactant and perfluorocarbon aerosol deposition in a neonatal physical model of the upper conducting airways.
Goikoetxea E, Murgia X, Serna-Grande P, Valls-i-Soler A, Rey-Santano C, Rivas A, Antón R, Basterretxea FJ, Miñambres L, Méndez E, Lopez-Arraiza A, Larrabe-Barrena JL, Gomez-Solaetxe MA.
PLoS One. 2014 Sep 11;9(9):e106835. doi: 10.1371/journal.pone.0106835. eCollection 2014.

6.Inhalation and oral toxicokinetics of 6:2 FTOH and its metabolites in mammals.
Russell MH, Himmelstein MW, Buck RC.
Chemosphere. 2014 Aug 30;120C:328-335. doi: 10.1016/j.chemosphere.2014.07.092. [Epub ahead of print]

Plastic derivatives" (BPA, Phthalates and others)

1. Inhibitory Effects of Bisphenol-A on Neural Stem Cells Proliferation and Differentiation in the Rat Brain Are Dependent on Wnt/β-Catenin Pathway.
Tiwari SK, Agarwal S, Seth B, Yadav A, Ray RS, Mishra VN, Chaturvedi RK.
Mol Neurobiol. 2014 Nov 9. [Epub ahead of print]

2. Estrogenic potency of bisphenol S, polyethersulfone and their metabolites generated by the rat liver S9 fractions on a MVLN cell using a luciferase reporter gene assay.
Kang JS, Choi JS, Kim WK, Lee YJ, Park JW.
Reprod Biol Endocrinol. 2014 Nov 4;12(1):102. doi: 10.1186/1477-7827-12-102.

3. Bisphenol A stimulates human lung cancer cell migration via upregulation of matrix metalloproteinases by GPER/EGFR/ERK1/2 signal pathway.
Zhang KS, Chen HQ, Chen YS, Qiu KF, Zheng XB, Li GC, Yang HD, Wen CJ.
Biomed Pharmacother. 2014 Sep 18. pii: S0753-3322(14)00116-4. doi: 10.1016/j.biopha.2014.09.003. [Epub ahead of print]

4. Bisphenol A, oocyte maturation, implantation, and IVF outcome: review of animal and human data.
Machtinger R, Orvieto R.
Reprod Biomed Online. 2014 Oct;29(4):404-10. doi: 10.1016/j.rbmo.2014.06.013. Epub 2014 Jul 10.

5. Screening of bisphenol A, triclosan and paraben analogues as modulators of the glucocorticoid and androgen receptor activities.
Kolšek K, Gobec M, Mlinarič Raščan I, Sollner Dolenc M.
Toxicol In Vitro. 2014 Sep 2;29(1):8-15. doi: 10.1016/j.tiv.2014.08.009. [Epub ahead of print]

6.Mixture effects of nonylphenol and di-n-butyl phthalate (monobutyl phthalate) on the tight junctions between Sertoli cells in male rats in vitro and in vivo.
Hu Y, Wang R, Xiang Z, Qian W, Han X, Li D.
Exp Toxicol Pathol. 2014 Sep 4. pii: S0940-2993(14)00093-1. doi: 10.1016/j.etp.2014.07.003. [Epub ahead of print]

7. Genotoxicity of phthalates.
Erkekoglu P, Kocer-Gumusel B.
Toxicol Mech Methods. 2014 Sep 23:1-11. [Epub ahead of print]

8. Impact of di-ethylhexylphthalate exposure on metabolic programming in P19 ECC-derived cardiomyocytes.
Schaedlich K, Schmidt JS, Kwong WY, Sinclair KD, Kurz R, Jahnke HG, Fischer B.
J Appl Toxicol. 2014 Oct 29. doi: 10.1002/jat.3085. [Epub ahead of print]

9. In vitro evaluation of the quality of blood products collected and stored in systems completely free of di(2-ethylhexyl)phthalate-plasticized materials.
Lagerberg JW, Gouwerok E, Vlaar R, Go M, de Korte D.
Transfusion. 2014 Oct 21. doi: 10.1111/trf.12870. [Epub ahead of print]

10. Di-(2-ethylhexyl) phthalate accelerates atherosclerosis in apolipoprotein E-deficient mice.
Zhao JF, Hsiao SH, Hsu MH, Pao KC, Kou YR, Shyue SK, Lee TS.
Arch Toxicol. 2014 Oct 2. [Epub ahead of print]

11. Curcumin influences semen quality parameters and reverses the di(2-ethylhexyl)phthalate (DEHP)-induced testicular damage in mice.
Głombik K, Basta-Kaim A, Sikora-Polaczek M, Kubera M, Starowicz G, Styrna J.
Pharmacol Rep. 2014 Oct;66(5):782-7. doi: 10.1016/j.pharep.2014.04.010. Epub 2014 Apr 30.

Pesticides/Fungicides/Insecticides/Biocides

1. Antiandrogenic Mechanisms of Pesticides in Human LNCaP Prostate and H295R Adrenocortical Carcinoma Cells.
Robitaille CN, Rivest P, Sanderson JT.
Toxicol Sci. 2014 Oct 15. pii: kfu212. [Epub ahead of print]

2. Effective attenuation of atrazine-induced histopathological changes in testicular tissue by antioxidant N-phenyl-4-aryl-polyhydroquinolines.
Chandak N, Bhardwaj JK, Zheleva-Dimitrova D, Kitanov G, Sharma RK, Sharma PK, Saso L.
J Enzyme Inhib Med Chem. 2014 Sep 29:1-8. [Epub ahead of print]

3. Effect of nonpersistent pesticides on estrogen receptor, androgen receptor, and aryl hydrocarbon receptor.
Medjakovic S, Zoechling A, Gerster P, Ivanova MM, Teng Y, Klinge CM, Schildberger B, Gartner M, Jungbauer A.
Environ Toxicol. 2014 Oct;29(10):1201-16. doi: 10.1002/tox.21852. Epub 2013 Feb 23.

4. Utilization of microfluidic V-junction device to prepare surface itraconazole adsorbed nanospheres.

Kucuk I, Ahmad Z, Edirisinghe M, Orlu-Gul M.
Int J Pharm. 2014 Sep 10;472(1-2):339-46. doi: 10.1016/j.ijpharm.2014.06.023. Epub 2014 Jun 16.

Various EDCs, Mixtures and Other endpoints

1. Exposures, mechanisms, and impacts of endocrine-active flame retardants.
V Dishaw L, J Macaulay L, Roberts SC, Stapleton HM.
Curr Opin Pharmacol. 2014 Oct 9;19C:125-133. doi: 10.1016/j.coph.2014.09.018. [Epub ahead of print] Review.

2. Detection of immunotoxic effects of estrogenic and androgenic endocrine disrupting compounds using splenic immune cells of the female three-spined stickleback, Gasterosteus aculeatus (L.).
Bado-Nilles A, Techer R, Porcher JM, Geffard A, Gagnaire B, Betoulle S, Sanchez W.
Environ Toxicol Pharmacol. 2014 Sep;38(2):672-83. doi: 10.1016/j.etap.2014.08.002. Epub 2014 Aug 13.

3. Exposure to paper mill effluent at a site in North Central Florida elicits molecular-level changes in gene expression indicative of progesterone and androgen exposure.
Brockmeier EK, Jayasinghe BS, Pine WE, Wilkinson KA, Denslow ND.
PLoS One. 2014 Sep 8;9(9):e106644. doi: 10.1371/journal.pone.0106644. eCollection 2014.

4. Toxicogenomic analysis of the ability of brominated flame retardants TBBPA and BDE-209 to disrupt thyroid hormone signaling in neural cells.
Guyot R, Chatonnet F, Gillet B, Hughes S, Flamant F.
Toxicology. 2014 Nov 5;325:125-32. doi: 10.1016/j.tox.2014.08.007. Epub 2014 Aug 27.

5. Assessment of the sensitizing potency of preservatives with chance of skin contact by the loose-fit coculture-based sensitization assay (LCSA).
Sonnenburg A, Schreiner M, Stahlmann R.
Arch Toxicol. 2014 Nov 14. [Epub ahead of print]

6. Establishment, Characterization, and Toxicological Application of Loggerhead Sea Turtle (Caretta caretta) Primary Skin Fibroblast Cell Cultures.
Webb SJ, Zychowski GV, Bauman SW, Higgins BM, Raudsepp T, Gollahon LS, Wooten KJ, Cole JM, Godard-Codding CA.
Environ Sci Technol. 2014 Nov 10. [Epub ahead of print]

7. A bioinspired omniphobic surface coating on medical devices prevents thrombosis and biofouling.
Leslie DC, Waterhouse A, Berthet JB, Valentin TM, Watters AL, Jain A, Kim P, Hatton BD, Nedder A, Donovan K, Super EH, Howell C, Johnson CP, Vu TL, Bolgen DE, Rifai S, Hansen AR, Aizenberg M, Super M, Aizenberg J, Ingber DE.
Nat Biotechnol. 2014 Nov;32(11):1134-40. doi: 10.1038/nbt.3020. Epub 2014 Oct 12.

8. Thrombin-inhibiting nanoparticles rapidly constitute versatile and detectable anticlotting surfaces.
Myerson JW, He L, Allen JS, Williams T, Lanza G, Tollefsen D, Caruthers S, Wickline S.
Nanotechnology. 2014 Oct 3;25(39):395101. doi: 10.1088/0957-4484/25/39/395101. Epub 2014 Sep 9.

9. Effects of Polychlorinated Biphenyls 28, 30 and 118 on Bovine Spermatozoa In Vitro.
Yurdakok B, Tekin K, Daskin A, Filazi A.
Reprod Domest Anim. 2014 Nov 15. doi: 10.1111/rda.12447. [Epub ahead of print]

10. Induction of mesenchymal stem cell differentiation and cartilage formation by cross-linker-free collagen microspheres.
Mathieu M, Vigier S, Labour MN, Jorgensen C, Belamie E, Noël D.
Eur Cell Mater. 2014 Sep 2;28:82-96; discussion 96-7.

11.In Vitro Antibacterial Activity, Gas Chromatography-Mass Spectrometry Analysis of Woodfordia fruticosa Kurz. Leaf Extract and Host Toxicity Testing With In Vitro Cultured Lymphocytes From Human Umbilical Cord Blood.
Dubey D, Patnaik R, Ghosh G, Padhy RN.
Osong Public Health Res Perspect. 2014 Oct;5(5):298-312. doi: 10.1016/j.phrp.2014.08.001. Epub 2014 Sep 6.

12. Inhibition of PPARα attenuates vimentin phosphorylation on Ser-83 and collapse of vimentin filaments during exposure of rat Sertoli cells in vitro to DBP.
Zhang X, Liu W, Yang H, Tan L, Ao L, Liu J, Cao J, Cui Z.
Reprod Toxicol. 2014 Oct 4. pii: S0890-6238(14)00252-4. doi: 10.1016/j.reprotox.2014.09.015. [Epub ahead of print]

13. Enteric-coated capsule containing β-galactosidase-loaded polylactic acid nanocapsules: enzyme stability and milk lactose hydrolysis under simulated gastrointestinal conditions.
He H, Zhang X, Sheng Y.
J Dairy Res. 2014 Nov;81(4):479-84. doi: 10.1017/S0022029914000491. Epub 2014 Sep 29.

14. Transcriptomic characterization of C57BL/6 mouse embryonic stem cell differentiation and its modulation by developmental toxicants.
Gao X, Yourick JJ, Sprando RL.
PLoS One. 2014 Sep 23;9(9):e108510. doi: 10.1371/journal.pone.0108510. eCollection 2014.

In Vivo studier ved DTU Fødevareinstituttet

(September- primo December 2014)

Følgende søgeprofil er benyttet i PubMed: ((endocrine disrupt*) AND (rat OR mice OR mammal*)) OR ((endocrine disrupt*) AND (in vivo*)) OR ((endocrine disrupt*) AND (Paraben*)) OR ((endocrine disrupt*) AND (Phthalat*)) OR ((Endocrine disrupt* AND (antiandrogen)) OR ((endocrine disrupt*) AND (behaviour OR behavior*)) OR ((Endocrine disrupt*) AND (Bisphenol A or BPA) OR ((PFAS* OR Perfluor*) AND toxicity).

Efter at have fjernet gengangere fra dem vi havde med på den forrige litteraturopdateringsliste samt *in vitro*, human eller SDU relevante artikler, gav litteratursøgningen en liste med i alt 57 artikler (Bruttolisten). Disse er efter Miljøstyrelsens ønske blevet fordelt i grupper efter stofnavne: ”Parabens, ”Plastic derivatives” (BPA, Phthalates and others), Perflourinated and Polyflourinated compounds, ”Pesticides/fungicides” og ” Various EDCs, Mixtures and Other endpoints”.

Udvalgte publikationer

Tre artikler er blevet udvalgt til nærmere beskrivelse (abstrakt og konklusion) og en artikel kun med abstract. Disse artikler er valgt fordi vi mener de bidrager til ny viden om hormonforstyrrende stoffer. Den første artikel er fra Sharpes gruppe og ser på AGD og om dette endepunkt kan ændres ved hormonpåvirkning i voksne gnavere (Mitchell et al 2014). De 2 næste artikler er fra det store EU projekt CONTAMED, dels om prostata effekter og om brystvævsforandringer efter mix eksponering (Boberg et al. og Mandrup et al 2014). Den sidste artikel (kun abstract) er et review der har til formål at bygge bro mellem den akademiske forskning og den regulatoriske risikovurdering af kemikalier (Beronius et al. 2014).

Ud fra bruttolisten (se længere nede i dokumentet) er udvalgt følgende 4 artikler til engelsk abstrakt og/eller dansk resume og kommentarer.

Anogenital distance (AGD) plasticity in adulthood: Implications for its use as a biomarker of fetal androgen action.

Mitchell RT, Mungall W, McKinnell C, Sharpe RM, Cruickshanks L, Milne L, Smith LB. Endocrinology. 2014 Nov 6:en20141534. [Epub ahead of print]

Abstract

Androgen action during the fetal masculinization-programming window (MPW) determines the maximum potential for growth of androgen-dependent organs (e.g. seminal vesicles, prostate, penis, perineum) and is reflected in anogenital distance (AGD). As such, determining AGD in postnatal life has potential as a lifelong easily accessible biomarker of overall androgen action during the MPW. However, whether the perineum remains androgen-responsive in adulthood and thus responds plastically to perturbed androgen drive remains unexplored. To determine this, we treated adult male rats with either the anti-androgen Flutamide, or the estrogen Diethylstilbestrol (DES) for five weeks, followed by a four-week wash-out period of no treatment. We determined AGD, and its correlate anogenital index (AGI; AGD relative to bodyweight), at weekly intervals across this period and compared this to normal adult rats (male and female), castrated male rats, and appropriate vehicle controls. These data showed that, in addition to reducing circulating testosterone and seminal vesicle weight, castration significantly reduced AGD (by ~17), demonstrating that there is a degree of plasticity in AGD in adulthood. Flutamide treatment increased circulating testosterone yet also reduced seminal vesicle weight due to local antagonism of androgen receptor. Despite this suppression, surprisingly, Flutamide treatment had no effect on AGD at any time-point. In contrast, whilst DES treatment suppressed circulating testosterone and reduced seminal vesicle weight, it also induced a significant reduction in AGD (by ~11%), which returned to normal one week after cessation of DES treatment. We conclude that AGD in adult rats exhibits a degree of plasticity, which may be mediated by modulating local androgen/estrogen action. The implications of these findings regarding the use of AGD as a life-long clinical biomarker of fetal androgen action are discussed.

Mixtures of environmentally relevant endocrine disrupting chemicals affect mammary gland development in female and male rats.

Mandrup KR, Johansson HK, Boberg J, Pedersen AS, Mortensen MS, Jørgensen JS, Vinggaard AM, Hass U. Reprod Toxicol. 2014 Oct 8. pii: S0890-6238(14)00253-6. doi: 10.1016/j.reprotox.2014.09.016. [Epub ahead of print]

Abstract

Estrogenic chemicals are able to alter mammary gland development in female rodents, but little is known on the effects of anti-androgens and mixtures of endocrine disrupting chemicals (EDCs) with dissimilar modes of action. Pregnant rat dams were exposed during gestation and lactation to mixtures of environmentally relevant EDCs with estrogenic, anti-androgenic or dissimilar modes of action (TotalMix) of 100-, 200- or 450-fold high end human intake estimates. Mammary glands of prepubertal and adult female and male offspring were examined. Oestrogens increased mammary outgrowth in prepubertal females and the mRNA level of matrix metalloproteinase-3, which may be a potential biomarker for increased outgrowth. Mixtures

of EDCs gave rise to ductal hyperplasia in adult males. Adult female mammary glands of the TotalMix group showed morphological changes possibly reflecting increased prolactin levels. In conclusion both estrogenic and anti-androgenic chemicals given during foetal life and lactation affected mammary glands in the offspring.

Perinatal exposure to mixtures of anti-androgenic chemicals causes proliferative lesions in rat prostate.
Boberg J, Johansson HK, Hadrup N, Dreisig K, Berthelsen L, Almstrup K, Vinggaard AM, Hass U.
Prostate. 2014 Oct 18. doi: 10.1002/pros.22897. [Epub ahead of print]

Abstract
BACKGROUND. Elevated levels of endogenous or exogenous estrogens during fetal life can induce permanent disturbances in prostate growth and predispose to precancerous lesions. Recent studies have indicated that also early anti-androgen exposure may affect prostate cancer risk.
METHODS. We examined the influence of perinatal exposure to mixtures of anti-androgenic and estrogenic chemicals on prostate development. Wistar rats were exposed from gestation day 7 to postnatal day 22 to a mixture of 8 anti-androgenic compounds (AAMix), a mixture of four estrogenic compounds (EMix), or paracetamol or a mixture of all 13 compounds (TotalMix) in mixture ratios reflecting human exposure levels.
RESULTS. Ventral prostate weights were reduced by the TotalMix and AAMix in pre-pubertal rats. Histological changes in prostate appeared with increasing age and indicated a shift from the normal age-dependent epithelial atrophy towards hyperplasia. These lesions showed similarities to pre-cancerous lesions in humans. Increased proliferation was observed already in pre-puberty and it was hypothesized that this could be associated with reduced ERβ signaling, but no clear conclusions could be made from gene expression studies on ERβ related pathways. The influences of the estrogenic chemicals and paracetamol on prostate morphology were minor, but in young adulthood the estrogen mixture reduced ventral prostate mRNA levels of lgf1and paracetamol reduced the mRNA level of Pbpc3.
CONCLUSIONS. Mixtures of endocrine disrupters relevant for human exposure was found to elicit persistent effects on the rat prostate following perinatal exposure, suggesting that human perinatal exposure to environmental chemicals may increase the risk of prostate cancer later in life.

Bridging the gap between academic research and regulatory health risk assessment of Endocrine Disrupting Chemicals.
Beronius A, Hanberg A, Zilliacus J, Rudén C.
Curr Opin Pharmacol. 2014 Dec;19C:99-104. doi: 10.1016/j.coph.2014.08.005. Epub 2014 Sep 18. Review.
Valgt (abstract)

Abstract
Regulatory risk assessment is traditionally based primarily on toxicity studies conducted according to standardized and internationally validated test guidelines. However, health risk assessment of endocrine disrupting chemicals (EDCs) is argued to rely on the efficient integration of findings from academic research. The aim of this review was to provide an overview of current developments to facilitate the use of academic research in regulatory risk assessment of chemicals and how certain aspects of study design and reporting are particularly important for the risk assessment process. By bridging the gap between academic research and regulatory health risk assessment of EDCs, scientific uncertainty in risk assessment conclusions can be reduced, allowing for better targeted policy decisions for chemical risk reduction.

Bruttoliste

Plastic derivatives (BPA, Phthalates and others)

BPA (and alternatives)

1. Developmental programming: prenatal BPA treatment disrupts timing of LH surge and ovarian follicular wave dynamics in adult sheep.
Veiga-Lopez A, Beckett EM, Abi Salloum B, Ye W, Padmanabhan V.
Toxicol Appl Pharmacol. 2014 Sep 1;279(2):119-28. doi: 10.1016/j.taap.2014.05.016. Epub 2014 Jun 9.

2. Sperm impairments in adult vesper mice (Calomys laucha) caused by in utero exposure tobisphenol A.
Vilela J, Hartmann A, Silva EF, Cardoso T, Corcini CD, Varela-Junior AS, Martinez PE, Colares EP.
Andrologia. 2014 Nov;46(9):971-8. doi: 10.1111/and.12182. Epub 2013 Oct 23.

3. Adolescent bisphenol-A exposure decreases dendritic spine density: role of sex and age.
Bowman RE, Luine V, Khandaker H, Villafane JJ, Frankfurt M.
Synapse. 2014 Nov;68(11):498-507. doi: 10.1002/syn.21758. Epub 2014 Jul 15.

4. Bisphenol a regulates the estrogen receptor alpha signaling in developing hippocampus of male rats through estrogen receptor.
Xu XB, He Y, Song C, Ke X, Fan SJ, Peng WJ, Tan R, Kawata M, Matsuda K, Pan BX, Kato N.
Hippocampus. 2014 Dec;24(12):1570-80. doi: 10.1002/hipo.22336. Epub 2014 Aug 13

5. Food intolerance at adulthood after perinatal exposure to the endocrine disruptor bisphenol A.
Menard S, Guzylack-Piriou L, Leveque M, Braniste V, Lencina C, Naturel M, Moussa L, Sekkal S, Harkat C, Gaultier E, Theodorou V, Houdeau E.
FASEB J. 2014 Nov;28(11):4893-900. doi: 10.1096/fj.14-255380. Epub 2014 Aug 1.

6. Perinatal exposure to bisphenol A exacerbates nonalcoholic steatohepatitis-like phenotype in male rat offspring fed on a high-fat diet.
Wei J, Sun X, Chen Y, Li Y, Song L, Zhou Z, Xu B, Lin Y, Xu S.
J Endocrinol. 2014 Sep;222(3):313-25. doi: 10.1530/JOE-14-0356.

7. Bisphenol A, oocyte maturation, implantation, and IVF outcome: review of animal and human data.
Machtinger R, Orvieto R.
Reprod Biomed Online. 2014 Oct;29(4):404-10. doi: 10.1016/j.rbmo.2014.06.013. Epub 2014 Jul 10.

8. Adverse effects of long-term exposure to bisphenol A during adulthood leading to hyperglycaemia and hypercholesterolemia in mice.
Marmugi A, Lasserre F, Beuzelin D, Ducheix S, Huc L, Polizzi A, Chetivaux M, Pineau T, Martin P, Guillou H, Mselli-Lakhal L.
Toxicology. 2014 Nov 5;325:133-43. doi: 10.1016/j.tox.2014.08.006. Epub 2014 Aug 26.

9. Adsorption of bisphenol A to a carbon nanotube reduced its endocrine disrupting effect in mice male offspring.
Wang W, Jiang C, Zhu L, Liang N, Liu X, Jia J, Zhang C, Zhai S, Zhang B.
Int J Mol Sci. 2014 Sep 10;15(9):15981-93. doi: 10.3390/ijms150915981.

10. Soy but not bisphenol A (BPA) induces hallmarks of polycystic ovary syndrome (PCOS) and related metabolic co-morbidities in rats.
Patisaul HB, Mabrey N, Adewale HB, Sullivan AW.
Reprod Toxicol. 2014 Sep 19;49C:209-218. doi: 10.1016/j.reprotox.2014.09.003. [Epub ahead of print]

11. Estrogens in the wrong place at the wrong time: fetal BPA exposure and mammary cancer.
Paulose T, Speroni L, Sonnenschein C, Soto AM.
Reprod Toxicol. 2014 Sep 29. pii: S0890-6238(14)00249-4. doi: 10.1016/j.reprotox.2014.09.012. [Epub ahead of print]

12. Evidence that bisphenol A (BPA) can be accurately measured without contamination in human serum and urine and that BPA causes numerous hazards from multiple routes of exposure.
Vom Saal FS, Welshons WV.

13. Prenatal Bisphenol A Exposure and maternally reported behavior in boys and girls.
Evans SF, Kobrosly RW, Barrett ES, Thurston SW, Calafat AM, Weiss B, Stahlhut R, Yolton K, Swan SH.
Neurotoxicology. 2014 Oct 9. pii: S0161-813X(14)00171-5. doi: 10.1016/j.neuro.2014.10.003. [Epub ahead of print]

15. Inhibitory Effects of Bisphenol-A on Neural Stem Cells Proliferation and Differentiation in the Rat Brain Are Dependent on Wnt/β-Catenin Pathway.
Tiwari SK, Agarwal S, Seth B, Yadav A, Ray RS, Mishra VN, Chaturvedi RK.
Mol Neurobiol. 2014 Nov 9. [Epub ahead of print]

16. Bisphenol A Exposure Enhances Atherosclerosis in WHHL Rabbits.
Fang C, Ning B, Waqar AB, Niimi M, Li S, Satoh K, Shiomi M, Ye T, Dong S, Fan J.
PLoS One. 2014 Oct 21;9(10):e110977. doi: 10.1371/journal.pone.0110977. eCollection 2014.

17. Perinatal Exposure to Bisphenol-A Impairs Spatial Memory through Upregulation of Neurexin1 and Neuroligin3 Expression in Male Mouse Brain.
Kumar D, Thakur MK.
PLoS One. 2014 Oct 17;9(10):e110482. doi: 10.1371/journal.pone.0110482. eCollection 2014.

18. Effects of the environmental estrogenic contaminants bisphenol A and 17α-ethinyl estradiol on sexual development and adult behaviors in aquatic wildlife species.
Bhandari RK, Deem SL, Holliday DK, Jandegian CM, Kassotis CD, Nagel SC, Tillitt DE, Vom Saal FS, Rosenfeld CS.
Gen Comp Endocrinol. 2014 Sep 30. pii: S0016-6480(14)00371-2. doi: 10.1016/j.ygcen.2014.09.014. [Epub ahead of print] Review.

19. Probing the binding of an endocrine disrupting compound-Bisphenol F to human serum albumin: insights into the interactions of harmful chemicals with functional biomacromolecules.
Pan F, Xu T, Yang L, Jiang X, Zhang L.
Spectrochim Acta A Mol Biomol Spectrosc. 2014 Nov 11;132:795-802. doi: 10.1016/j.saa.2014.05.093. Epub 2014 Jun 11.

Phthalates and others

1. Concentrations of phthalates and bisphenol A in Norwegian foods and beverages and estimated dietary exposure in adults.

Sakhi AK, Lillegaard IT, Voorspoels S, Carlsen MH, Løken EB, Brantsæter AL, Haugen M, Meltzer HM, Thomsen C.
Environ Int. 2014 Dec;73:259-69. doi: 10.1016/j.envint.2014.08.005. Epub 2014 Aug 28.

2. The Adverse Cardiac Effects of Di(2-ethylhexyl)phthalate and Bisphenol A.
Posnack NG.
Cardiovasc Toxicol. 2014 Dec;14(4):339-57. doi: 10.1007/s12012-014-9258-y.

3. Lactational exposure of phthalate causes long-term disruption in testicular architecture by altering tight junctional and apoptotic protein expression in Sertoli cells of first filial generation pubertal Wistar rats.
Sekaran S, Balaganapathy P, Parsanathan R, Elangovan S, Gunashekar J, Bhat F, Jagadeesan A.
Hum Exp Toxicol. 2014 Oct 28. pii: 0960327114555926. [Epub ahead of print]

4. Exploring the potential association between brominated diphenyl ethers, polychlorinated biphenyls, organochlorine pesticides, perfluorinated compounds, phthalates, and bisphenol a in polycystic ovary syndrome: a case-control study.
Vagi SJ, Azziz-Baumgartner E, Sjödin A, Calafat AM, Dumesic D, Gonzalez L, Kato K, Silva MJ, Ye X, Azziz R.
BMC Endocr Disord. 2014 Oct 28;14(1):86. [Epub ahead of print]

5. Gestational exposure to di(2-ethylhexyl) phthalate (DEHP) impairs pancreatic β-cell function in F₁ rat offspring.
Rajesh P, Balasubramanian K.
Toxicol Lett. 2014 Sep 30. pii: S0378-4274(14)01359-9. doi: 10.1016/j.toxlet.2014.09.025. [Epub ahead of print]

6. The impact of low molecular weight phthalates in inducing reproductive malfunctions of male mice: Special emphasis on Sertoli cell functions.
Kumar N, Srivastava S, Roy P.
Gen Comp Endocrinol. 2014 Sep 28. pii: S0016-6480(14)00369-4. doi: 10.1016/j.ygcen.2014.09.012. [Epub ahead of print]

7. Phthalate exposure in utero causes epigenetic changes and impairs insulin signalling.
Rajesh P, Balasubramanian K.
J Endocrinol. 2014 Oct;223(1):47-66. doi: 10.1530/JOE-14-0111.

8. Mixture effects of nonylphenol and di-n-butyl phthalate (monobutyl phthalate) on the tight junctions between Sertoli cells in male rats in vitro and in vivo.
Hu Y, Wang R, Xiang Z, Qian W, Han X, Li D.
Exp Toxicol Pathol. 2014 Sep 4. pii: S0940-2993(14)00093-1. doi: 10.1016/j.etp.2014.07.003. [Epub ahead of print]

9. Di-(2-ethylhexyl) phthalate inhibits DNA replication leading to hyperPARylation, SIRT1 attenuation, and mitochondrial dysfunction in the testis.
Li X, Fang EF, Scheibye-Knudsen M, Cui H, Qiu L, Li J, He Y, Huang J, Bohr VA, Ng TB, Guo H.
Sci Rep. 2014 Sep 22;4:6434. doi: 10.1038/srep06434.

10. Disruption of rat testis development following combined in utero exposure to the phytoestrogen genistein and antiandrogenic plasticizer di-(2-ethylhexyl) phthalate.

Jones S, Boisvert A, Duong TB, Francois S, Thrane P, Culty M.

Parabens

1. Rapid determination of nine parabens and seven other environmental phenols in urine samples of German children and adults.
Moos RK, Angerer J, Wittsiepe J, Wilhelm M, Brüning T, Koch HM.
Int J Hyg Environ Health. 2014 Nov;217(8):845-53. doi: 10.1016/j.ijheh.2014.06.003. Epub 2014 Jun 20.

2. Parabens can enable hallmarks and characteristics of cancer in human breast epithelial cells: a review of the literature with reference to new exposure data and regulatory status.
Darbre PD, Harvey PW.
J Appl Toxicol. 2014 Sep;34(9):925-38. doi: 10.1002/jat.3027. Epub 2014 Jul 22.

Perflourinated and Polyflourinated compounds

1. **Perfluorooctanoic** Acid (PFOA)-induced Liver Lesions in Two Strains of Mice Following Developmental Exposures: PPARα Is Not Required.
Filgo AJ, Quist EM, Hoenerhoff MJ, Brix AE, Kissling GE, Fenton SE.
Toxicol Pathol. 2014 Nov 14. pii: 0192623314558463. [Epub ahead of print]

2. Hepatic Mitochondrial Alteration in CD-1 Mice Associated with Prenatal Exposures to Low Doses of **Perfluorooctanoic** Acid (PFOA).
Quist EM, Filgo AJ, Cummings CA, Kissling GE, Hoenerhoff MJ, Fenton SE.
Toxicol Pathol. 2014 Oct 16. pii: 0192623314551841. [Epub ahead of print]

3. Prenatal exposure to **perfluoroalkyl** substances and the risk of congenital cerebral palsy in children.
Liew Z, Ritz B, Bonefeld-Jørgensen EC, Henriksen TB, Nohr EA, Bech BH, Fei C, Bossi R, von Ehrenstein OS, Streja E, Uldall P, Olsen J.
Am J Epidemiol. 2014 Sep 15;180(6):574-81. doi: 10.1093/aje/kwu179. Epub 2014 Aug 19.

4. The Navigation Guide - evidence-based medicine meets environmental health: integration of animal and human evidence for PFOA effects on fetal growth.
Lam J, Koustas E, Sutton P, Johnson PI, Atchley DS, Sen S, Robinson KA, Axelrad DA, Woodruff TJ.
Environ Health Perspect. 2014 Oct;122(10):1040-51. doi: 10.1289/ehp.1307923. Epub 2014 Jun 20.

5. PBPK modeling for PFOS and PFOA: validation with human experimental data.
Fàbrega F, Kumar V, Schuhmacher M, Domingo JL, Nadal M.
Toxicol Lett. 2014 Oct 15;230(2):244-51. doi: 10.1016/j.toxlet.2014.01.007. Epub 2014 Jan 17.

Pesticides/Fungicides/Insecticides

1. Prenatal exposure to a low fipronil dose disturbs maternal behavior and reflex development in rats.
Udo MS, Sandini TM, Reis TM, Bernardi MM, Spinosa HS.
Neurotoxicol Teratol. 2014 Sep-Oct;45:27-33. doi: 10.1016/j.ntt.2014.05.010. Epub 2014 Jun 28.

2. Pesticides in mixture disrupt metabolic regulation: in silico and in vivo analysis of cumulative toxicity of mancozeb and imidacloprid on body weight of mice.
Bhaskar R, Mohanty B.

Gen Comp Endocrinol. 2014 Sep 1;205:226-34. doi: 10.1016/j.ygcen.2014.02.007. Epub 2014 Feb 14.

3. Sex-dimorphic effects of gestational exposure to the organophosphate insecticide chlorpyrifos on social investigation in mice.
De Felice A, Venerosi A, Ricceri L, Sabbioni M, Scattoni ML, Chiarotti F, Calamandrei G.
Neurotoxicol Teratol. 2014 Sep 28;46C:32-39. doi: 10.1016/j.ntt.2014.09.002. [Epub ahead of print]

4. Assessment of 3-Nitro-1,2,4-triazol-5-one as a Potential Endocrine Disrupting Chemical in Rats Using the Hershberger and Uterotrophic Bioassays.
Quinn MJ Jr, Bannon DI, Jackovitz AM, Hanna TL, Shiflett AA, Johnson MS.
Int J Toxicol. 2014 Sep;33(5):367-72. doi: 10.1177/1091581814548729. Epub 2014 Sep 2.

Various EDCs, Mixtures and Other endpoints

1. Perinatal exposure to mixtures of anti-androgenic chemicals causes proliferative lesions in rat prostate.
Boberg J, Johansson HK, Hadrup N, Dreisig K, Berthelsen L, Almstrup K, Vinggaard AM, Hass U.
Prostate. 2014 Oct 18. doi: 10.1002/pros.22897. [Epub ahead of print] **valgt**

2. Effect of estrogenic binary mixtures in the yeast estrogen screen (YES).
Ramirez T, Buechse A, Dammann M, Melching-Kollmuß S, Woitkowiak C, van Ravenzwaay B.
Regul Toxicol Pharmacol. 2014 Oct;70(1):286-96. doi: 10.1016/j.yrtph.2014.07.006. Epub 2014 Jul 11.

3. Mixtures of environmentally relevant endocrine disrupting chemicals affect mammary gland development in female and male rats.
Mandrup KR, Johansson HK, Boberg J, Pedersen AS, Mortensen MS, Jørgensen JS, Vinggaard AM, Hass U.
Reprod Toxicol. 2014 Oct 8. pii: S0890-6238(14)00253-6. doi: 10.1016/j.reprotox.2014.09.016. [Epub ahead of print] **valgt**

4. Mixture effects of nonylphenol and di-n-butyl phthalate (monobutyl phthalate) on the tight junctions between Sertoli cells in male rats in vitro and in vivo.
Hu Y, Wang R, Xiang Z, Qian W, Han X, Li D.
Exp Toxicol Pathol. 2014 Sep 4. pii: S0940-2993(14)00093-1. doi: 10.1016/j.etp.2014.07.003. [Epub ahead of print]

5. Additive and synergistic antiandrogenic activities of mixtures of azol fungicides and vinclozolin.
Christen V, Crettaz P, Fent K.
Toxicol Appl Pharmacol. 2014 Sep 15;279(3):455-66. doi: 10.1016/j.taap.2014.06.025. Epub 2014 Jul 11.

6. Human Sex Hormone-Binding Globulin Binding Affinities of 125 Structurally Diverse Chemicals and Comparison with Their Binding to Androgen Receptor, Estrogen Receptor, and α-Fetoprotein.
Hong H, Branham WS, Ng HW, Moland CL, Dial SL, Fang H, Perkins R, Sheehan D, Tong W.
Toxicol Sci. 2014 Oct 27. pii: kfu231. [Epub ahead of print]

7. Adverse effects of 4-tert-octylphenol on the production of oxytocin and hCG in pregnant rats.
Kim J, Kang EJ, Park MN, Lee JE, Hong SH, An SM, Kim SC, Hwang DY, An BS.
Lab Anim Res. 2014 Sep;30(3):123-30. doi: 10.5625/lar.2014.30.3.123. Epub 2014 Sep 29.

8. Exposures, mechanisms, and impacts of endocrine-active flame retardants.
V Dishaw L, J Macaulay L, Roberts SC, Stapleton HM.
Curr Opin Pharmacol. 2014 Oct 9;19C:125-133. doi: 10.1016/j.coph.2014.09.018. [Epub ahead of print] Review.

9. Transgenerational impaired male fertility with an Igf2 epigenetic defect in the rat are induced by the endocrine disruptor p,p'-DDE.
Song Y, Wu N, Wang S, Gao M, Song P, Lou J, Tan Y, Liu K.
Hum Reprod. 2014 Nov;29(11):2512-21. doi: 10.1093/humrep/deu208. Epub 2014 Sep 3.

10. Disruption of thyroid hormone functions by low dose exposure of tributyltin: an in vitro and in vivo approach.
Sharan S, Nikhil K, Roy P.
Gen Comp Endocrinol. 2014 Sep 15;206:155-65. doi: 10.1016/j.ygcen.2014.07.027. Epub 2014 Aug 4.

11. The effect of tetrabromobisphenol A on protamine content and DNA integrity in mouse spermatozoa.
Zatecka E, Castillo J, Elzeinova F, Kubatova A, Ded L, Peknicova J, Oliva R.
Andrology. 2014 Nov;2(6):910-917. doi: 10.1111/j.2047-2927.2014.00257.x. Epub 2014 Aug 22.

12. Neurodevelopmental and behavioral effects of nonylphenol exposure during gestational and breastfeeding period on F1 rats.
Couderc M, Gandar A, Kamari A, Allain Y, Zalouk-Vergnoux A, Herrenknecht C, Le Bizec B, Mouneyrac C, Poirier L.
Neurotoxicology. 2014 Sep;44:237-49. doi: 10.1016/j.neuro.2014.07.002. Epub 2014 Jul 21.

13. Endocrine-disrupting actions of PCBs on brain development and social and reproductive behaviors.
Bell MR.
Curr Opin Pharmacol. 2014 Oct 10;19C:134-144. doi: 10.1016/j.coph.2014.09.020. [Epub ahead of print] Review.

14. Anogenital distance (AGD) plasticity in adulthood: Implications for its use as a biomarker of fetal androgen action.
Mitchell RT, Mungall W, McKinnell C, Sharpe RM, Cruickshanks L, Milne L, Smith LB.

15. Bridging the gap between academic research and regulatory health risk assessment of Endocrine Disrupting Chemicals.
Beronius A, Hanberg A, Zilliacus J, Rudén C.
Curr Opin Pharmacol. 2014 Dec;19C:99-104. doi: 10.1016/j.coph.2014.08.005. Epub 2014 Sep 18. Review.
Valgt (abstract)

16. Obesogenic effects of endocrine disruptors, what do we know from animal and human studies?
de Cock M, van de Bor M.
Environ Int. 2014 Sep;70:15-24. doi: 10.1016/j.envint.2014.04.022. Epub 2014 May 28. Review.

17. Occurrences, toxicities, and ecological risks of benzophenone-3, a common component of organic sunscreen products: a mini-review.
Kim S, Choi K.
Environ Int. 2014 Sep;70:143-57. doi: 10.1016/j.envint.2014.05.015. Epub 2014 Jun 14. Review

Wildlife studier ved Biologisk Institut, Syddansk Universitet

Søgningen er udført på Web of Knowledge (all databases) og dækker perioden 16/8 - 1/12 2014.

Søgeprofilen kombinerer:	Endocrine disrupt* and	Fish*
		Amphibia*
		Bird* OR Avia*
		Invertebrat*
		Mollus*
		Gastropod*
		Insect*
		Crustacea*
		Echinoderm*
		Ursus
		Reptil* OR Alligator
		Whal* OR seal* OR dolphin*

Udvalgte publikationer

Fra bruttolisten (længere nede i dokumentet) er udvalgt tre artikler til medtagelse af abstract og yderligere kommentarer.
Kriterierne for udvælgelsen af publikationer til kommentering er, at de bidrager til ny viden omkring effekter af og virkningsmekanismer for hormonforstyrrende stoffer i 'wildlife' og/eller at de repræsenterer vigtig viden, som vurderes at have særlig interesse for Miljøstyrelsen bl.a. i forbindelse med styrelsens fokus på udvikling af testmetoder. Desuden kommenteres artikler, der omhandler 'nye' stoffer og miljøfaktorer, der har vist sig hormonforstyrrende; specielt hvis disse har relevans for danske forhold. Endelig medtages efter Miljøstyrelsens ønske artikler omhandlende parabener.

Artikel 1: Direct and indirect responses of a freshwater food web to a potent synthetic oestrogen. Kidd, K. A.; Paterson, M. J.; Rennie, M. D.; Podemski, C. L.; Findlay, D. L.; Blanchfield, P. J.; and Liber, K. 2014. Philosophical Transactions of the Royal Society B-Biological Sciences 369

Abstract: Endocrine-disrupting chemicals (EDCs) in municipal effluents directly affect the sexual development and reproductive success of fishes, but indirect effects on invertebrate prey or fish predators through reduced predation or prey availability, respectively, are unknown. At the Experimental Lakes Area in northwestern Ontario, Canada, a long-term, whole-lake experiment was conducted using a before-after-control-impact design to determine both direct and indirect effects of the synthetic oestrogen used in the birth control pill, 17α-ethynyloestradiol (EE2). Algal, microbial, zooplankton and benthic invertebrate communities showed no declines in abundance during three summers of EE2 additions (5–6 ng l^{-1}), indicating no direct toxic effects. Recruitment of fathead minnow (Pimephales promelas) failed, leading to a near-extirpation of this species both 2 years during (young-of-year, YOY) and 2 years following (adults and YOY) EE2 additions. Body condition of male lake trout (Salvelinus namaycush) and male and female white sucker (Catostomus commersonii) declined before changes in prey abundance, suggesting direct effects of EE2 on this endpoint. Evidence of indirect effects of EE2 was also observed. Increases in zooplankton, Chaoborus, and emerging insects were observed after 2 or 3 years of EE2 additions, strongly suggesting indirect effects mediated through the reduced abundance of several small-bodied fishes. Biomass of top predator lake trout declined by 23–42% during and after EE2 additions, most probably an indirect effect from the loss of its prey species, the fathead minnow and slimy sculpin (Cottus cognatus). Our results demonstrate that small-scale studies focusing solely on direct effects are likely to underestimate the true environmental impacts of oestrogens in municipal wastewaters and provide further evidence of the value of whole-ecosystem experiments for understanding indirect effects of EDCs and other aquatic stressors.

Artikel 2: Endocrine disrupting effects of benzotriazole in rare minnow (Gobiocypris rarus) in a sex-dependent manner. Liang, X.; Wang, M.; Chen, X.; Zha, J.; Chen, H.; Zhu, L.; and Wang, Z. 2014. Chemosphere 112, 154-162.

Abstract: Benzotriazole (BT), an anticorrosive agent, is widely used in industrial applications and household dishwashing agents. Despite its reported toxicity to aquatic organisms, little is known about its endocrine disrupting effects. In this study, adult Chinese rare minnows (Gobiocypris rarus)

were exposed to 0.05, 0.5, and 5 mg L^{-1} BT for 28 d. The pathological damage in liver was associated with hypertrophy of the hepatocytes,
nuclei pyknosis and vacuolization at 5 mg L^{-1} groups. Additionally, the degeneration of the ovary and the stimulation of spermatogenesis were observed at 5 mg L^{-1} groups. The plasma 17β-estradiol level was significantly increased in the males but decreased in the females at 5 mg L^{-1} ($p < 0.05$). In the brain, the up-regulation of CYP19B, GnRHs, and LHβ mRNA was detected across all doses ($p < 0.05$). In the gonad, the transcriptional levels of StAR, CYP11A, 3βHSD, CYP17, 17βHSD, and CYP19A were generally
decreased in the males at 5 mg L^{-1} ($p < 0.05$), whereas these genes, except for 3βHSD, were significantly increased in females at all concentrations ($p < 0.05$). Moreover, the expression level of VTG in the livers from all exposure groups was significantly increased compared with controls ($p < 0.05$). Taken together, our results indicate that BT could adversely affect the rare minnows in a sex-dependent manner.

Artikel 3: Development and validation of an OECD reproductive toxicity test guideline with the pond snail Lymnaea stagnalis (Mollusca, Gastropoda). Ducrot, V.; Askem, C.; Azam, D.; Brettschneider, D.; Brown, R.; Charles, S.; Coke, M.; Collinet, M.; Delignette-Muller, M.L.; Forfait-Dubuc, C.; Holbech, H.; Hutchinson, T.; Jach, A.; Kinnberg, K.L.; Lacoste, C.; Le Page, G.; Matthiessen, P.; Oehlmann, J.; Rice, L.; Roberts, E.; Ruppert, K.; Davis, J.E.; Veauvy, C.; Weltje, L.; Wortham, R.; Lagadic L. 2014. Regul Toxicol Pharmacol. [Epub ahead of print].

Abstract: The OECD test guideline development program has been extended in 2011 to establish a partial life-cycle protocol for assessing the reproductive toxicity of chemicals to several mollusk species, including the great pond snail Lymnaea stagnalis. In this paper, we summarize the standard draft protocol for a reproduction test with this species, and present inter-comparison results obtained in a 56-day prevalidation ring-test using this protocol. Seven European laboratories performed semi-static tests with cultured snails of the strain Renilys® exposed to nominal concentrations of cadmium chloride (from 53 to 608μgCdL^{-1}). Cd concentrations in test solutions were analytically determined to confirm accuracy in the metal exposure concentrations in all laboratories. Physico-chemical and biological validity criteria (namely dissolved oxygen content >60% ASV, water temperature 20±1°C, control snail survival >80% and control snail fecundity >8 egg-masses per snail over the test period) were met in all laboratories which consistently demonstrated the reproductive toxicity of Cd in snails using the proposed draft protocol. Effect concentrations for fecundity after 56days were reproducible between laboratories ($68<EC_{50\text{-}56d}<124\mu gL^{-1}$) and were consistent with literature data. $EC_{50\text{-}56d}$ and $EC_{10\text{-}56d}$ values were comprised within a factor of 1.8 and 3.6, respectively, which is in the range of acceptable variation defined for reference chemicals in OECD test guidelines for invertebrates. The inter-laboratory reproducibility coefficient of variation (CV) for the Cd $LC_{50\text{-}56d}$ values was 8.19%. The inter-laboratory comparison of fecundity within the controls gave a CV of 29.12%, while exposure to Cd gave a CV of 25.49% based on the $EC_{50\text{-}56d}$ values. The OECD has acknowledged the success of this prevalidation exercise and a validation ring-test involving 14 laboratories in Europe, North- and South-America is currently being implemented using four chemicals (Cd, prochloraz, trenbolone and tributyltin).

Bruttoliste

Alkylphenoler

Alkylphenolic contaminants in the diet: Sparus aurata juveniles hepatic response.
Traversi, I.; Gioacchini, G.; Scorolli, A.; Mita, D.; Carnevali, O.; and Mandich, A. 2014. General and Comparative Endocrinology 205, 185-196.

Bisphenol A

A developmental hepatotoxicity study of dietary bisphenol A in Sparus aurata juveniles.
Maradonna, F.; Nozzi, V.; Valle, L. D.; Traversi, I.; Gioacchini, G.; Benato, F.; Colletti, E.; Gallo, P.; Pisciottano, I. D. M.; Mita, D. G.; Hardiman, G.; Mandich, A.; and Carnevali, O. 2014. Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 166, 1-13.

Low-dose bisphenol A disrupts gonad development and steroidogenic genes expression in adult female rare minnow Gobiocypris rarus.
Zhang, Y.; Gao, J.; Xu, P.; Yuan, C.; Qin, F.; Liu, S.; Zheng, Y.; Yang, Y.; and Wang, Z. 2014. Chemosphere 112, 435-442.

Histological Changes in Zebrafish (Danio rerio) Ovaries Following Administration of Bisphenol A.
Yon, N. D. and Akbulut, C. 2014. Pakistan Journal of Zoology 46, 1153-1159.
Toxic Effects of Bisphenol A on Early Life Stages of Japanese Medaka (Oryzias latipes).
Sun, L.; Lin, X.; Jin, R.; Peng, T.; Peng, Z.; and Fu, Z. 2014. Bulletin of Environmental Contamination and Toxicology 93, 222-227.

Phthalater

The effects on steroidogenesis and histopathology of adult male Japanese quails (Coturnix coturnix japonica) testis following pre-pubertal exposure to di(n-butyl) phthalate (DBP).
Bello, U. M.; Madekurozwa, M. C.; Groenewald, H. B.; Aire, T. A.; and Arukwe, A. 2014. Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 166, 24-33.

Identification of Drosophila-Based Endpoints for the Assessment and Understanding of Xenobiotic-Mediated Male Reproductive Adversities.
Misra, S.; Singh, A.; Ratnasekhar, C.; Sharma, V.; Mudiam, M. K. R.; and Ram, K. R. 2014. Toxicological Sciences 141, 278-291.

Impact of Butyl Benzyl Phthalate on Development of the Reproductive System of European Pikeperch, Sander Lucioperca (L.).
Jarmolowicz, S.; Demska-Zakes, K.; and Zakes, Z. 2014. Acta Veterinaria Hungarica 62, 397-407.

UV-filtre

Effects of benzophenone-3 exposure on endocrine disruption and reproduction of Japanese medaka (Oryzias latipes)-A two generation exposure study.
Kim, S.; Jung, D.; Kho, Y.; and Choi, K. 2014. Aquatic Toxicology 155, 244-252.

Occurrences, toxicities, and ecological risks of benzophenone-3, a common component of organic sunscreen products: A mini-review.
Kim, S. and Choi, K. 2014. Environment International 70, 143-157.

Perfluorerede forbindelser

Fish consumption as a source of human exposure to perfluorinated alkyl substances in Italy: Analysis of two edible fish from Lake Maggiore.
Squadrone, S.; Ciccotelli, V.; Favaro, L.; Scanzio, T.; Prearo, M.; and Abete, M. 2014. Chemosphere 114, 181-186.

Effects of elevated dissolved carbon dioxide and perfluorooctane sulfonic acid, given singly and in combination, on steroidogenic and biotransformation pathways of Atlantic cod.
Preus-Olsen, G.; Olufsen, M. O.; Pedersen, S. A.; Letcher, R. J.; and Arukwe, A. 2014. Aquatic Toxicology 155, 222-235.

TBT

Ultrastructural Changes During Spermatogenesis, Biochemical and Hormonal Evidences of Testicular Toxicity Caused by TBT in Freshwater Prawn Macrobrachium rosenbergii (De Man, 1879).
Revathi, P.; Iyapparaj, P.; Vasanthi, L. A.; Munuswamy, N.; and Krishnan, M. 2014. Environmental Toxicology 29, 1171-1181.

Influence of Short Term Exposure of TBT on the Male Reproductive Activity in Freshwater Prawn Macrobrachium rosenbergii (De Man).
Revathi, P.; Iyapparaj, P.; Vasanthi, L. A.; Munuswamy, N.; Prasanna, V. A.; Pandiyarajan, J.; and Krishnan, M. 2014. Bulletin of Environmental Contamination and Toxicology 93, 446-451.

Pesticider

Alternations in neuroendocrine and endocrine regulation of reproduction in male goldfish (Carassius auratus) following an acute and chronic exposure to vinclozolin, in vivo.
Golshan, M.; Hatef, A.; Zare, A.; Socha, M.; Milla, S.; Gosiewski, G.; Fontaine, P.; Sokolowska-Mikolajczyk, M.; Habibi, H. R.; and Alavi, S. M. H. 2014. Aquatic Toxicology 155, 73-83.

Agrichemicals chronically inhibit the cortisol response to stress in fish.
Koakoski, G.; Quevedo, R. M.; Ferreira, D.; Oliveira, T. A.; Santos da Rosa, J. G.; de Abreu, M. S.; Gusso, D.; Marqueze, A.; Kreutz, L. C.; Vendrameto Giacomini, A. C.; Fagundes, M.; and Gil Barcellos, L. J. 2014. Chemosphere 112, 85-91.

Assessing Multiple Endpoints of Atrazine Ingestion on Gravid Northern Watersnakes (Nerodia sipedon) and Their Offspring.
Neuman-Lee, L. A.; Gaines, K. F.; Baumgartner, K. A.; Voorhees, J. R.; Novak, J. M.; and Mullin, S. J. 2014. Environmental Toxicology 29, 1072-1082.

Atrazine reduces reproduction in Japanese medaka (Oryzias latipes).

Papoulias, D. M.; Tillitt, D. E.; Talykina, M. G.; Whyte, J. J.; and Richter, C. A. 2014. Aquatic Toxicology 154, 230-239.

Effects of glyphosate-based herbicides on survival, development, growth and sex ratios of wood frogs (Lithobates sylvaticus) tadpoles. I: Chronic laboratory exposures to VisionMax (R).
Navarro-Martin, L.; Lanctot, C.; Jackman, P.; Park, B.; Doe, K.; Pauli, B.; and Trudeau, V. 2014. Aquatic Toxicology 154, 278-290.

[Cloning of full-length cDNA of HMGR from Gobiocypris rarus and analysis of its expression profiles in male exposed to pentachlorophenol].
Deng, C.; Mao, S. Y.; Xiong, L.; Zhang, X. Z.; Li, W.; Gao, X.; Liu, Q. P.; Chen, Y.; and Liu, Y. 2014. Huan jing ke xue= Huanjing kexue / [bian ji, Zhongguo ke xue yuan huan jing ke xue wei yuan hui "Huan jing ke xue" bian ji wei yuan hui.] 35, 3183-3191.

Lægemidler og syntetiske hormoner

Direct and indirect responses of a freshwater food web to a potent synthetic oestrogen.
Kidd, K. A.; Paterson, M. J.; Rennie, M. D.; Podemski, C. L.; Findlay, D. L.; Blanchfield, P. J.; and Liber, K. 2014. Philosophical Transactions of the Royal Society B-Biological Sciences 369

Risks of hormonally active pharmaceuticals to amphibians: a growing concern regarding progestagens.
Safholm, M.; Ribbenstedt, A.; Fick, J.; and Berg, C. 2014. Philosophical Transactions of the Royal Society B-Biological Sciences 369

Environmental Designer Drugs: When Transformation May Not Eliminate Risk.
Cwiertny, D. M.; Snyder, S. A.; Schlenk, D.; and Kolodziej, E. P. 2014. Environmental science & technology 48, 11737-11745.

Histological Alterations in the Structure of the Testis in Tench (Tinca tinca) After Exposure to 17 Alpha-ethynylestradiol.
Oropesa, A.; Jimenez, B.; Gil, M.; Osswald, J.; Fallola, C.; Pula, H.; Cuesta, J.; and Gomez, L. 2014. Environmental Toxicology 29, 1182-1192.

Persistence of endocrine disruption in zebrafish (Danio rerio) after discontinued exposure to the androgen 17beta-trenbolone.
Baumann, L.; Knorr, S.; Keiter, S.; Nagel, T.; Rehberger, K.; Volz, S.; Oberrauch, S.; Schiller, V.; Fenske, M.; Holbech, H.; Segner, H.; and Braunbeck, T. 2014. Environmental toxicology and chemistry / SETAC 33, 2488-2496.

Bioavailability and fate of sediment-associated trenbolone and estradiol in aquatic systems.
Sangster, J. L.; Zhang, Y.; Hernandez, R.; Garcia, Y. A.; Sivils, J. C.; Cox, M. B.; Snow, D. D.; Kolok, A. S.; and Bartelt-Hunt, S. L. 2014. Science of the Total Environment 496, 576-584.

The in vitro interference of synthetic progestogens with carp steroidogenic enzymes.
Fernandes, D.; Pujol, S.; Acena, J.; Perez, S.; Barcelo, D.; and Porte, C. 2014. Aquatic Toxicology 155, 314-321.

Quantification of alkali-labile phosphate groups in the plasma of Oreochromis niloticus exposed to intermittent discharges of oestrogens: effect of concentration vs. load.
de Sa Salomao, A. L. and Marques, M. 2014. International Journal of Environmental Analytical Chemistry 94, 1161-1172.

Gonadal development and transcript profiling of steroidogenic enzymes in response to 17 alpha-methyltestosterone in the rare minnow Gobiocypris rarus.
Liu, S.; Wang, L.; Qin, F.; Zheng, Y.; Li, M.; Zhang, Y.; Yuan, C.; and Wang, Z. 2014. Journal of Steroid Biochemistry and Molecular Biology 143, 223-232.

Altered burst swimming in rainbow trout Oncorhynchus mykiss exposed to natural and synthetic oestrogens.
Osachoff, H.; Osachoff, K.; Wickramaratne, A.; Gunawardane, E.; Venturini, F.; and Kennedy, C. 2014. Journal of Fish Biology 85, 210-227.

Transcriptomic profiling in Silurana tropicalis testes exposed to finasteride.
Bissegger, S.; Martyniuk, C. J.; and Langlois, V. S. 2014. General and Comparative Endocrinology 203, 137-145.

Sources, concentrations, and exposure effects of environmental gestagens on fish and other aquatic wildlife, with an emphasis on reproduction.
Orlando, E. F. and Ellestad, L. E. 2014. General and Comparative Endocrinology 203, 241-249.

<u>Diverse potentielt hormonforstyrrende stoffer/faktorer</u>

Endocrine disrupting effects of benzotriazole in rare minnow (Gobiocypris rarus) in a sex-dependent manner.
Liang, X.; Wang, M.; Chen, X.; Zha, J.; Chen, H.; Zhu, L.; and Wang, Z. 2014. Chemosphere 112, 154-162.

An Emerging Water Contaminant, Semicarbazide, Exerts an Anti-estrogenic Effect in Zebrafish (Danio rerio).
Gao, S.; Wang, W.; Tian, H.; Zhang, X.; Guo, L.; and Ru, S. 2014. Bulletin of Environmental Contamination and Toxicology 93, 280-288.

Endocrine-disrupting effects and reproductive toxicity of low dose MCLR on male frogs (Rana nigromaculata) in vivo.
Jia, X.; Cai, C.; Wang, J.; Gao, N.; and Zhang, H. 2014. Aquatic Toxicology 155, 24-31.

<u>Eksponering i miljøet (ferskvand, saltvand, spildevand, sediment mm.)</u>

Identifying Non-point Sources of Endocrine Active Compounds and Their Biological Impacts in Freshwater Lakes.
Baker, B. H.; Martinovic-Weigelt, D.; Ferrey, M.; Barber, L. B.; Writer, J. H.; Rosenberry, D. O.; Kiesling, R. L.; Lundy, J. R.; and Schoenfuss, H. L. 2014. Archives of Environmental Contamination and Toxicology 67, 374-388.

Reproductive health indicators of fishes from Pennsylvania watersheds: association with chemicals of emerging concern.
Blazer, V.; Iwanowicz, D.; Walsh, H.; Sperry, A.; Iwanowicz, L.; Alvarez, D.; Brightbill, R.; Smith, G.; Foreman, W.; and Manning, R. 2014. Environmental Monitoring and Assessment 186, 6471-6491.

Early warning signs of endocrine disruption in adult fish from the ingestion of polyethylene with and without sorbed chemical pollutants from the marine environment.
Rochman, C. M.; Kurobe, T.; Flores, I.; and Teh, S. J. 2014. Science of the Total Environment 493, 656-661.

Exposure to Paper Mill Effluent at a Site in North Central Florida Elicits Molecular-Level Changes in Gene Expression Indicative of Progesterone and Androgen Exposure.
Brockmeier, E. K.; Jayasinghe, B.; Pine, W. E.; Wilkinson, K. A.; and Denslow, N. D. 2014. Plos One 9

Mugilid Fish Are Sentinels of Exposure to Endocrine Disrupting Compounds in Coastal and Estuarine Environments.
Ortiz-Zarragoitia, M.; Bizarro, C.; Rojo-Bartolome, I.; Diaz de Cerio, O.; Cajaraville, M. P.; and Cancio, I. 2014. Marine Drugs 12, 4756-4782.

Pilot study on levels of chemical contaminants and porphyrins in Caretta caretta from the Mediterranean Sea.
Guerranti, C.; Baini, M.; Casini, S.; Focardi, S. E.; Giannetti, M.; Mancusi, C.; Marsili, L.; Perra, G.; and Fossi, M. C. 2014. Marine Environmental Research 100, 33-37.

Body size, nuptial pad size and hormone levels: potential non-destructive biomarkers of reproductive health in wild toads (Bufo bufo).
Orton, F.; Baynes, A.; Clare, F.; Duffus, A. L.; Larroze, S.; Scholze, M.; and Garner, T. W. 2014. Ecotoxicology 23, 1359-1365.

Evidence for intraspecific endocrine disruption of Geukensia demissa (Atlantic ribbed mussel) in an urban watershed.
Halem, Z. M.; Ross, D. J.; and Cox, R. L. 2014. Comparative Biochemistry and Physiology A-Molecular & Integrative Physiology 175, 1-6.

The occurrence and ecological risks of endocrine disrupting chemicals in sewage effluents from three different sewage treatment plants, and in natural seawater from a marine reserve of Hong Kong.
Xu, E. G.; Liu, S.; Ying, G. G.; Zheng, G. J.; Lee, J. H.; and Leung, K. M. 2014. Marine Pollution Bulletin 85, 352-362.

The amphibian Pelophylax bergeri (Gunther, 1986) testis poly(ADP-ribose) Polymerases: relationship to endocrine disruptors during spermatogenesis.
De Maio, A.; Trocchia, S.; and Guerriero, G. 2014. Italian Journal of Zoology 81, 256-263.

Undersøgelser med flere stoffer fra flere af de ovennævnte kategorier

Endocrine disrupting compounds affecting corticosteroid signaling pathways in czech and swiss waters: potential impact on fish.
Macikova, P.; Groh, K. J.; Ammann, A. A.; Schirmer, K.; and Suter, M. J. F. 2014. Environmental science & technology 48, 12902-12911.

Control of Transcriptional Repression of the Vitellogenin Receptor Gene in Largemouth Bass (Micropterus Salmoides) by Select Estrogen Receptors Isotypes.
Dominguez, G. A.; Bisesi, J. H.; Kroll, K. J.; Denslow, N. D.; and Sabo-Attwood, T. 2014. Toxicological Sciences 141, 423-431.

Distribution of feminizing compounds in the aquatic environment and bioaccumulation in wild tilapia tissues.
Chen, W. L.; Gwo, J. C.; Wang, G. S.; and Chen, C. Y. 2014. Environmental Science and Pollution Research 21, 11349-11360.

Complex effects of two presumably antagonistic endocrine disrupting compounds on the goldfish Carassius aumtus: A comprehensive study with multiple toxicological endpoints.
Wu, F.; Lin, L.; Qiu, J. W.; Chen, H.; Weng, S.; and Luan, T. 2014. Aquatic Toxicology 155, 43-51.

Effects of combined exposure to 17 alpha-ethynylestradiol and dibutyl phthalate on the growth and reproduction of adult male zebrafish (Danio rerio).
Xu, N.; Chen, P.; Liu, L.; Zeng, Y.; Zhou, H.; and Li, S. 2014. Ecotoxicology and Environmental Safety 107, 61-70.

Detection of immunotoxic effects of estrogenic and androgenic endocrine disrupting compounds using splenic immune cells of the female three-spined stickleback, Gasterosteus aculeatus (L.).
Bado-Nilles, A.; Techer, R.; Porcher, J. M.; Geffard, A.; Gagnaire, B.; Betoulle, S.; and Sanchez, W. 2014. Environmental toxicology and pharmacology 38, 672-683.

Spatial and seasonal distributions of estrogens and bisphenol A in the Yangtze River Estuary and the adjacent East China Sea.
Shi, J.; Liu, X.; Chen, Q.; and Zhang, H. 2014. Chemosphere 111, 336-343.

Effects of Estrogens and Estrogenic Disrupting Compounds on Fish Mineralized Tissues.
Pinto, P. I.; Estevao, M. D.; and Power, D. M. 2014. Marine Drugs 12, 4474-4494.

Testmetoder, modelorganismer, endpoints og MOA

A novel framework for interpretation of data from the fish short-term reproduction assay (FSTRA) for the detection of endocrine-disrupting chemicals.
Ankley, G. T. and Jensen, K. M. 2014. Environmental toxicology and chemistry / SETAC 33, 2529-2540.

Species-specific considerations in using the fish embryo test as an alternative to identify endocrine disruption.
Schiller, V.; Zhang, X.; Hecker, M.; Schaefers, C.; Fischer, R.; and Fenske, M. 2014. Aquatic Toxicology 155, 62-72.

Establishment and characterization of an ovarian cell line from Southern catfish (Silurus meridionalis).
Wei, J.; Qi, W.; Zhou, Y.; Zhang, X.; Dong, R.; Zhou, L.; and Wang, D. 2014. Fish Physiology and Biochemistry 40, 1383-1391.

Vitellogenin of the northern leopard frog (Rana pipiens): Development of an ELISA assay and evaluation of induction after immersion in xenobiotic estrogens.
Selcer, K. W. and Verbanic, J. D. 2014. Chemosphere 112, 348-354.

Comparative study of 17 beta-estradiol on endocrine disruption and biotransformation in fingerlings and juveniles of Japanese sea bass Lateolabrax japonicus.
Thilagam, H.; Gopalakrishnan, S.; Bo, J.; and Wang, K. J. 2014. Marine Pollution Bulletin 85, 332-337.

Development and validation of an OECD reproductive toxicity test guideline with the pond snail Lymnaea stagnalis (Mollusca, Gastropoda). Ducrot, V.; Askem, C.; Azam, D.; Brettschneider, D.; Brown, R.; Charles, S.; Coke, M.; Collinet, M.; Delignette-Muller, M.L.; Forfait-Dubuc, C.; Holbech, H.; Hutchinson, T.; Jach, A.; Kinnberg, K.L.; Lacoste, C.; Le Page, G.; Matthiessen, P.; Oehlmann, J.; Rice, L.; Roberts, E.; Ruppert, K.; Davis, J.E.; Veauvy, C.; Weltje, L.; Wortham, R.; Lagadic L. 2014. Regul Toxicol Pharmacol. [Epub ahead of print].