Center for Hormonforstyrrende Stoffer

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Indhold

Humane studier ved Afd. for Vækst og Reproduktion, Rigshospitalet

Søgning er udført på PubMed og dækker perioden 10. marts 2015 - 30. juni 2015

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

Udvalgte publikationer

DDT Exposure in Utero and Breast Cancer

J Clin Endocrinol Metab. 2015 Jun 16:jc20151841. [Epub ahead of print]
Cohn BA, La Merrill M, Krigbaum NY, Yeh G, Park JS, Zimmermann L, Cirillo PM

CONTEXT: Currently no direct evidence links in utero dichlorodiphenyltrichloroethane (DDT) exposure to human breast cancer. However, in utero exposure to another xenoestrogen, diethylstilbestrol, predicts an increased breast cancer risk. If this finding extends to DDT, it could have far-reaching consequences. Many women were heavily exposed in utero during widespread DDT use in the 1960s. They are now reaching the age of heightened breast cancer risk. DDT exposure persists and use continues in Africa and Asia without clear knowledge of the consequences for the next generation.
HYPOTHESIS: In utero exposure to DDT is associated with an increased risk of breast cancer.
DESIGN: This was a case-control study nested in a prospective 54-year follow-up of 9300 daughters in the Child Health and Development Studies pregnancy cohort (n = 118 breast cancer cases, diagnosed by age 52 y and 354 controls matched on birth year).
SETTING AND PARTICIPANTS: Kaiser Foundation Health Plan members who received obstetric care in Alameda County, California, from 1959 to 1967, and their adult daughters participated in the study.
MAIN OUTCOME MEASURE: Daughters' breast cancer diagnosed by age 52 years as of 2012 was measured.
RESULTS: Maternal o,p'-DDT predicted daughters' breast cancer (odds ratio fourth quartile vs first = 3.7, 95% confidence interval 1.5-9.0). Mothers' lipids, weight, race, age, and breast cancer history did not explain the findings.
CONCLUSIONS: This prospective human study links measured DDT exposure in utero to risk of breast cancer. Experimental studies are essential to confirm results and discover causal mechanisms. Findings support classification of DDT as an endocrine disruptor, a predictor of breast cancer, and a marker of high risk.

Transdermal Uptake of Diethyl Phthalate and Di(n-butyl) Phthalate Directly from Air: Experimental Verification

Weschler CJ, Bekö G, Koch HM, Salthammer T, Schripp T, Toftum J, Clausen G.
Environ Health Perspect. 2015 Apr 7. [Epub ahead of print]

BACKGROUND: Fundamental considerations indicate that, for certain phthalate esters, dermal absorption from air is an uptake pathway that is comparable to or larger than inhalation. Yet this pathway has not been experimentally evaluated and has been largely overlooked when assessing uptake of phthalate esters.
OBJECTIVES: This study investigated transdermal uptake, directly from air, of diethyl phthalate (DEP) and di(n-butyl) phthalate (DnBP) in humans.
METHODS: In a series of experiments, six human participants were exposed for six hours in a chamber containing deliberately elevated air concentrations of DEP and DnBP. The participants either wore a hood and breathed air with phthalate concentrations substantially below those in the chamber or did not wear a hood and breathed chamber air. All urinations were collected from initiation of exposure until 54 hours later. Metabolites of DEP and DnBP were measured in these samples and extrapolated to parent phthalate intakes, corrected for background and hood air exposures.
RESULTS: For DEP the median dermal uptake directly from air was 4.0 μg/(μg/m(3) in air) compared with an inhalation intake of 3.8 μg/(μg/m(3) in air). For DnBP the median dermal uptake from air was 3.1 μg/(μg/m(3) in air) compared with an inhalation intake of 3.9 μg/(μg/m(3) in air).
CONCLUSIONS: This study shows that dermal uptake directly from air can be a meaningful exposure pathway for DEP and DnBP. For other semivolatile organic compounds (SVOCs) whose molecular weight and Kow are in the appropriate range, direct absorption from air is also anticipated to be significant.

Relationship between urinary concentrations of di(2-ethylhexyl) phthalate (DEHP) metabolites and reproductive hormones in polyvinyl chloride production workers

Fong JP, Lee FJ, Lu IS, Uang SN, Lee CC.

Occup Environ Med. 2015 May;72(5):346-53.

OBJECTIVES: We investigated the relationship between urinary metabolites of di(2-ethylhexyl) phthalate (DEHP) and reproductive hormones in workers of polyvinyl chloride (PVC) production plants. After exposure, most of the DEHP is rapidly metabolised to mono(2-ethylhexyl) phthalate (MEHP), mono(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) and mono(2-ethyl-5-oxohexyl) phthalate (MEOHP), which may be associated with reproductive hormone interruption and testicular toxicity. Some studies report that urinary concentrations of phthalate metabolites for plastics workers are significantly higher than for the general population. However, little is known about the disruption of reproductive hormones for DEHP exposure workers.
METHODS: This cross-sectional study of 82 male workers measured the biomarkers for their reproductive hormones and their exposure to DEHP. Relationships between urinary concentrations of DEHP metabolites were estimated using multivariate linear regression and quartile analysis models.
RESULTS: The geometric means of urinary creatinine-adjusted (μg/g-Cre) concentrations of MEHP, MEOHP and MEHHP during the post-shift period were 23.9, 66.9 and 84.6, respectively. In multiple regression models adjusted for potential confounders, there were significant positive associations between urinary concentrations of DEHP metabolites and estradiol (E2) ($p<0.01$), and in the ratio of E2 to testosterone ($p<0.05$). Moreover, quartile analysis showed significant positive relationships between the total urinary concentration of DEHP metabolites and E2 (ptrend=0.024), and in the ratio of E2 to testosterone (ptrend=0.031).
CONCLUSIONS: Relationships between reproductive hormones and the total urinary concentration of DEHP metabolites in male PVC production workers were significantly positive. This indicated that aromatase activity had increased in male workers exposed to DEHP, which is consistent with animal studies.

Prenatal and postnatal exposure to phthalate esters and asthma: a 9-year follow-up study of a Taiwanese birth cohort.

Ku HY, Su PH, Wen HJ, Sun HL, Wang CJ, Chen HY, Jaakkola JJ, Wang SL; TMICS Group.

PLoS One. 2015 Apr 13;10(4):e0123309. doi: 10.1371/journal.pone.0123309. eCollection 2015.

Previous studies have shown that phthalate exposure in childhood is associated with the development of respiratory problems. However, few studies have assessed the relative impact of prenatal and postnatal exposure to phthalates on the development of asthma later in childhood. Therefore, we assessed the impact of prenatal and postnatal phthalate exposure on the development of asthma and wheezing using a Taiwanese birth cohort. A total of 430 pregnant women were recruited, and 171 (39.8%) of them had their children followed when they were aged 2, 5, and 8 years. The International Study of Asthma and Allergies in Childhood questionnaire was used to assess asthma and wheezing symptoms and serum total immunoglobulin E levels were measured at 8 years of age. Urine samples were obtained from 136 women during their third trimester of pregnancy, 99 children at 2 years of age, and 110 children at 5 years. Four common phthalate monoester metabolites in maternal and children's urine were measured using liquid chromatography-electrospray ionization-tandem mass spectrometry. Maternal urinary mono-benzyl phthalate [MBzP] concentrations were associated with an increased occurrence of wheezing in boys at 8 years of age (odds ratio [OR] = 4.95 (95% CI 1.08-22.63)), for upper quintile compared to the others) after controlling for parental allergies and family members' smoking status. Urinary mono-2-ethylhexyl

phthalate [MEHP] levels over the quintile at 2-year-old were associated with increased asthma occurrence (adjusted OR = 6.14 (1.17-32.13)) in boys. Similarly, the sum of di-2-ethyl-hexyl phthalate [DEHP] metabolites at 5 years was associated with asthma in boys (adjusted OR = 4.36 (1.01-18.86)). Urinary MEHP in maternal and 5-year-old children urine were significantly associated with increased IgE in allergic children at 8 years. Prenatal and postnatal exposure to phthalate was associated with the occurrence of asthma in children, particularly for boys.

Bruttoliste

1: Long M, Knudsen AK, Pedersen HS, Bonefeld-Jørgensen EC. Food intake and serum persistent organic pollutants in the Greenlandic pregnant women: The ACCEPT sub-study. Sci Total Environ. 2015 Oct 1;529:198-212.

2: Lei HL, Wei HJ, Chen PH, Hsi HC, Chien LC. Preliminary study of blood methylmercury effects on reproductive hormones and relevant factors among infertile and pregnant women in Taiwan. Chemosphere. 2015 Sep;135:411-7.

3: Wu H, Yoon M, Verner MA, Xue J, Luo M, Andersen ME, Longnecker MP, Clewell HJ 3rd. Can the observed association between serum perfluoroalkyl substances and delayed menarche be explained on the basis of puberty-related changes in physiology and pharmacokinetics? Environ Int. 2015 Sep;82:61-8.

4: Maisonet M, Näyhä S, Lawlor DA, Marcus M. Prenatal exposures to perfluoroalkyl acids and serum lipids at ages 7 and 15 in females. Environ Int. 2015 Sep;82:49-60.

5: Salihovic S, Kärrman A, Lind L, Lind PM, Lindström G, van Bavel B. Perfluoroalkyl substances (PFAS) including structural PFOS isomers in plasma from elderly men and women from Sweden: Results from the Prospective Investigation of the Vasculature in Uppsala Seniors (PIVUS). Environ Int. 2015 Sep;82:21-7.

6: Kassotis CD, Alvarez DA, Taylor JA, Vom Saal FS, Nagel SC, Tillitt DE. Characterization of Missouri surface waters near point sources of pollution reveals potential novel atmospheric route of exposure for bisphenol A and wastewater hormonal activity pattern. Sci Total Environ. 2015 Aug 15;524-525:384-93.

7: He CT, Zheng J, Qiao L, Chen SJ, Yang JZ, Yuan JG, Yang ZY, Mai BX. Occurrence of organophosphorus flame retardants in indoor dust in multiple microenvironments of southern China and implications for human exposure. Chemosphere. 2015 Aug;133:47-52.

8: Bae J, Kim S, Schisterman EF, Boyd Barr D, Buck Louis GM. Maternal and paternal serum concentrations of perfluoroalkyl and polyfluoroalkyl substances and the secondary sex ratio. Chemosphere. 2015 Aug;133:31-40.

9: Miyashita C, Sasaki S, Saijo Y, Okada E, Kobayashi S, Baba T, Kajiwara J, Todaka T, Iwasaki Y, Nakazawa H, Hachiya N, Yasutake A, Murata K, Kishi R. Demographic, behavioral, dietary, and socioeconomic characteristics related to persistent organic pollutants and mercury levels in pregnant women in Japan. Chemosphere. 2015 Aug;133:13-21.

10: Ho KL, Yau MS, Murphy MB, Wan Y, Fong BM, Tam S, Giesy JP, Leung KS, Lam MH. Urinary bromophenol glucuronide and sulfate conjugates: Potential human exposure molecular markers for polybrominated diphenyl ethers. Chemosphere. 2015 Aug;133:6-12.

11: Huygh J, Clotman K, Malarvannan G, Covaci A, Schepens T, Verbrugghe W, Dirinck E, Van Gaal L, Jorens PG. Considerable exposure to the endocrine disrupting chemicals phthalates and bisphenol-A in intensive care unit (ICU) patients. Environ Int. 2015 Aug;81:64-72.

12: Wang J, Chen G, Christie P, Zhang M, Luo Y, Teng Y. Occurrence and risk assessment of phthalate esters (PAEs) in vegetables and soils of suburban plastic film greenhouses. Sci Total Environ. 2015 Aug 1;523:129-37.

13: Nellis G, Metsvaht T, Varendi H, Toompere K, Lass J, Mesek I, Nunn AJ, Turner MA, Lutsar I; ESNEE consortium. Potentially harmful excipients in neonatal medicines: a pan-European observational study. Arch Dis Child. 2015 Jul;100(7):694-9.

14: LaKind JS, Goodman M, Barr DB, Weisel CP, Schoeters G. Lessons learned from the application of BEES-C: Systematic assessment of study quality of epidemiologic research on BPA, neurodevelopment, and respiratory health. Environ Int. 2015 Jul;80:41-71.

15: Fasano E, Esposito F, Scognamiglio G, Di Francesco F, Montuori P, Amodio Cocchieri R, Cirillo T. Bisphenol A contamination in soft drinks as a risk for children's health in Italy. Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2015 Jul;32(7):1207-14.

16: Kopelovich L, Perez AL, Jacobs N, Mendelsohn E, Keenan JJ. Screening-level human health risk assessment of toluene and dibutyl phthalate in nail lacquers. Food Chem Toxicol. 2015 Jul;81:46-53.

17: Hartmann C, Uhl M, Weiss S, Koch HM, Scharf S, König J. Human biomonitoring of phthalate exposure in Austrian children and adults and cumulative risk assessment. Int J Hyg Environ Health. 2015 Jul;218(5):489-99.

18: Tsai MS, Lin CY, Lin CC, Chen MH, Hsu SH, Chien KL, Sung FC, Chen PC, Su TC. Association between perfluoroalkyl substances and reproductive hormones in adolescents and young adults. Int J Hyg Environ Health. 2015 Jul;218(5):437-43.

19: Ait Bamai Y, Araki A, Kawai T, Tsuboi T, Yoshioka E, Kanazawa A, Cong S, Kishi R. Comparisons of urinary phthalate metabolites and daily phthalate intakes among Japanese families. Int J Hyg Environ Health. 2015 Jul;218(5):461-70.

20: Lioy PJ, Hauser R, Gennings C, Koch HM, Mirkes PE, Schwetz BA, Kortenkamp A. Assessment of phthalates/phthalate alternatives in children's toys and childcare articles: Review of the report including conclusions and recommendation of the Chronic Hazard Advisory Panel of the Consumer Product Safety Commission. J Expo Sci Environ Epidemiol. 2015 Jul;25(4):343-353.

21: Nachman RM, Fox SD, Golden WC, Sibinga E, Groopman JD, Lees PS. Serial Free Bisphenol A and Bisphenol A Glucuronide Concentrations in Neonates. J Pediatr. 2015 Jul;167(1):64-9.

22: Del Pup L, Mantovani A, Luce A, Cavaliere C, Facchini G, Di Francia R, Caraglia M, Berretta M. Endocrine disruptors and female cancer: Informing the patients (Review). Oncol Rep. 2015 Jul;34(1):3-11.

23: Marty MS, Papineni S, Coady KK, Rasoulpour RJ, Pottenger LH, Eisenbrandt DL. Pronamide: Weight of evidence for potential estrogen, androgen or thyroid effects. Regul Toxicol Pharmacol. 2015 Jul;72(2):405-22.

24: Philippat C, Bennett DH, Krakowiak P, Rose M, Hwang HM, Hertz-Picciotto I. Phthalate concentrations in house dust in relation to autism spectrum disorder and developmental delay in the CHildhood Autism Risks from Genetics and the Environment (CHARGE) study. Environ Health. 2015 Jun 26;14(1):56.

25: Lenters V, Portengen L, Rignell-Hydbom A, Jönsson BA, Lindh CH, Piersma AH, Toft G, Bonde JP, Heederik D, Rylander L, Vermeulen R. Prenatal Phthalate, Perfluoroalkyl Acid, and Organochlorine Exposures and Term Birth Weight in Three Birth Cohorts: Multi-Pollutant Models Based on Elastic Net Regression. Environ Health Perspect. 2015 Jun 26. [Epub ahead of print]

26: Shiue I. Are urinary polyaromatic hydrocarbons associated with adult hypertension, heart attack, and cancer? USA NHANES, 2011-2012. Environ Sci Pollut Res Int. 2015 Jun 26. [Epub ahead of print]

27: Takeuchi S, Tanaka-Kagawa T, Saito I, Kojima H, Jin K, Satoh M, Kobayashi S, Jinno H. Differential determination of plasticizers and organophosphorus flame retardants in residential indoor air in Japan. Environ Sci Pollut Res Int. 2015 Jun 24. [Epub ahead of print]

28: Valentino R, D'Esposito V, Ariemma F, Cimmino I, Beguinot F, Formisano P. Bisphenol A environmental exposure and the detrimental effects on human metabolic health: is it necessary to revise the risk assessment in vulnerable population? J Endocrinol Invest. 2015 Jun 24. [Epub ahead of print]

29: Thayer KA, Doerge DR, Hunt D, Schurman SH, Twaddle NC, Churchwell MI, Garantziotis S, Kissling GE, Easterling MR, Bucher JR, Birnbaum LS. Pharmacokinetics of bisphenol A in humans following a single oral administration. Environ Int. 2015 Jun 23;83:107-115.

30: Adgent MA, Rogan WJ. Triclosan and prescription antibiotic exposures and enterolactone production in adults. Environ Res. 2015 Jun 23;142:66-71.

31: Lin CY, Shen FY, Lian GW, Chien KL, Sung FC, Chen PC, Su TC. Association between levels of serum bisphenol A, a potentially harmful chemical in plastic containers, and carotid artery intima-media thickness in adolescents and young adults. Atherosclerosis. 2015 Jun 20;241(2):657-663.

32: LaRocca J, Binder AM, McElrath TF, Michels KB. First-Trimester Urine Concentrations of Phthalate Metabolites and Phenols and Placenta miRNA Expression in a Cohort of U.S. Women. Environ Health Perspect. 2015 Jun 19. [Epub ahead of print]

33: Shapiro GD, Dodds L, Arbuckle TE, Ashley-Martin J, Fraser W, Fisher M, Taback S, Keely E, Bouchard MF, Monnier P, Dallaire R, Morisset A, Ettinger AS. Exposure to phthalates, bisphenol A and metals in pregnancy and the association with impaired glucose tolerance and gestational diabetes mellitus: The MIREC study. Environ Int. 2015 Jun 19;83:63-71.

34: Ejaredar M, Nyanza EC, Ten Eycke K, Dewey D. Phthalate exposure and childrens neurodevelopment: A systematic review. Environ Res. 2015 Jun 19;142:51-60.

35: He M, Yang C, Geng R, Zhao X, Hong L, Piao X, Chen T, Quinto M, Li D. Monitoring of phthalates in foodstuffs using gas purge microsyringe extraction coupled with GC-MS. Anal Chim Acta. 2015 Jun 16;879:63-8.

36: Zhou Y, Chen M, Zhao F, Mu D, Zhang Z, Hu J. Ubiquitous Occurrence of Chlorinated Byproducts of Bisphenol A and Nonylphenol in Bleached Food Contacting Papers and Their Implications for Human Exposure. Environ Sci Technol. 2015 Jun 16;49(12):7218-26.

37: Cohn BA, La Merrill M, Krigbaum NY, Yeh G, Park JS, Zimmermann L, Cirillo PM. DDT Exposure in Utero and Breast Cancer. J Clin Endocrinol Metab. 2015 Jun 16:jc20151841. [Epub ahead of print]

38: Wang YX, You L, Zeng Q, Sun Y, Huang YH, Wang C, Wang P, Cao WC, Yang P, Li YF, Lu WQ. Phthalate exposure and human semen quality: Results from an infertility clinic in China. Environ Res. 2015 Jun 15;142:1-9.

39: Kucharska A, Cequier E, Thomsen C, Becher G, Covaci A, Voorspoels S. Assessment of human hair as an indicator of exposure to organophosphate flame retardants. Case study on a Norwegian mother-child cohort. Environ Int. 2015 Jun 13;83:50-57.

40: Maresca MM, Hoepner LA, Hassoun A, Oberfield SE, Mooney SJ, Calafat AM, Ramirez J, Freyer G, Perera FP, Whyatt RM, Rundle AG. Prenatal Exposure to Phthalates and Childhood Body Size in an Urban Cohort. Environ Health Perspect. 2015 Jun 12. [Epub ahead of print]

41: Gyllenhammar I, Berger U, Sundström M, McCleaf P, Eurén K, Eriksson S, Ahlgren S, Lignell S, Aune M, Kotova N, Glynn A. Influence of contaminated drinking water on perfluoroalkyl acid levels in human serum - A case study from Uppsala, Sweden. Environ Res. 2015 Jun 12;140:673-683.

42: Genskow KR, Bradner JM, Hossain MM, Richardson JR, Michael Caudle W. Selective damage to dopaminergic transporters following exposure to the brominated flame retardant, HBCDD. Neurotoxicol Teratol. 2015 Jun 12. pii: S0892-0362(15)30005-2

43: Zhang Y, Cao Y, Shi H, Jiang X, Zhao Y, Fang X, Xie C. Could exposure to phthalates speed up or delay pubertal onset and development? A 1.5-year follow-up of a school-based population. Environ Int. 2015 Jun 11;83:41-49.

44: Erren TC, Groß JV, Steffany F, Meyer-Rochow VB. "Plastic ocean": What about cancer? Environ Pollut. 2015 Jun 11. pii: S0269-7491(15)00259-6.

45: Patel S, Zhou C, Rattan S, Flaws JA. The Effects of Endocrine Disrupting Chemicals on the Ovary. Biol Reprod. 2015 Jun 10. pii: biolreprod.115.130336. [Epub ahead of print]

46: Myridakis A, Fthenou E, Balaska E, Vakinti M, Kogevinas M, Stephanou EG. Phthalate esters, parabens and bisphenol-A exposure among mothers and their children in Greece (Rhea cohort). Environ Int. 2015 Jun 10;83:1-10.

47: Jornet-Martínez N, Antón-Soriano C, Campíns-Falcó P. Estimation of the presence of unmetabolized dialkyl phthalates in untreated human urine by an on-line miniaturized reliable method. Sci Total Environ. 2015 Jun 10;532:239-244.

48: Khalil N, Chen A, Lee M, Czerwinski SA, Ebert JR, DeWitt JC, Kannan K. Association of Perfluoroalkyl Substances, Bone Mineral Density, and Osteoporosis in the U.S. Population in NHANES 2009-2010. Environ Health Perspect. 2015 Jun 9. [Epub ahead of print]

49: Enault J, Robert S, Schlosser O, de Thé C, Loret JF. Drinking water, diet, indoor air: Comparison of the contribution to environmental micropollutants exposure. Int J Hyg Environ Health. 2015 Jun 8. pii: S1438-4639(15)00080-2. doi: 10.1016/j.ijheh.2015.06.001. [Epub ahead of print]

50: Faroon O, Ruiz P. Polychlorinated biphenyls: New evidence from the last decade. Toxicol Ind Health. 2015 Jun 8. pii: 0748233715587849. [Epub ahead of print]

51: Mogensen UB, Grandjean P, Heilmann C, Nielsen F, Weihe P, Budtz-Jørgensen E. Structural equation modeling of immunotoxicity associated with exposure to sperfluorinated alkylates. Environ Health. 2015 Jun 5;14(1):47. [Epub ahead of print]

52: Marshall NB, Lukomska E, Long CM, Kashon ML, Sharpnack DD, Nayak AP, Anderson KL, Meade BJ, Anderson SE. Triclosan induces thymic stromal lymphopoietin in skin promoting Th2 allergic responses. Toxicol Sci. 2015 Jun 5. pii: kfv113. [Epub ahead of print]

53: Malarvannan G, Belpaire C, Geeraerts C, Eulaers I, Neels H, Covaci A. Organophosphorus flame retardants in the European eel in Flanders, Belgium: Occurrence, fate and human health risk. Environ Res. 2015 Jun 4;140:604-610.

54: Exley K, Aerts D, Biot P, Casteleyn L, Kolossa-Gehring M, Schwedler G, Castaño A, Angerer J, Koch HM, Esteban M, Schindler BK, Schoeters G, Den Hond E, Horvat M, Bloemen L, Knudsen LE, Joas R, Joas A, Sepai O. Pilot study testing a European human biomonitoring framework for biomarkers of chemical exposure in children and their mothers: experiences in the UK. Environ Sci Pollut Res Int. 2015 Jun 4. [Epub ahead of print]

55: Yang Q, Zhao Y, Qiu X, Zhang C, Li R, Qiao J. Association of serum levels of typical organic pollutants with polycystic ovary syndrome (PCOS): a case-control study. Hum Reprod. 2015 Jun 3. pii: dev123. [Epub ahead of print]

56: Maisonet M, Calafat AM, Marcus M, Jaakkola JJ, Lashen H. Prenatal Exposure to Perfluoroalkyl Acids and Serum Testosterone Concentrations at 15 Years of Age in Female ALSPAC Study Participants. Environ Health Perspect. 2015 Jun 2. [Epub ahead of print]

57: Eriksson U, Kärrman A. World-Wide Indoor Exposure to Polyfluoroalkyl Phosphate Esters (PAPs) and other PFASs in Household Dust. Environ Sci Technol. 2015 Jun 2. [Epub ahead of print]

58: Mao P, Wang D. Biomonitoring of perfluorinated compounds in a drop of blood. Environ Sci Technol. 2015 Jun 2;49(11):6808-14.

59: Gao Y, Fu J, Cao H, Wang Y, Zhang A, Liang Y, Wang T, Zhao C, Jiang G. Differential accumulation and elimination behavior of perfluoroalkyl Acid isomers in occupational workers in a manufactory in china. Environ Sci Technol. 2015 Jun 2;49(11):6953-62.

60: Schütze A, Gries W, Kolossa-Gehring M, Apel P, Schröter-Kermani C, Fiddicke U, Leng G, Brüning T, Koch HM. Bis-(2-propylheptyl)phthalate (DPHP) metabolites emerging in 24h urine samples from the German Environmental Specimen Bank (1999-2012). Int J Hyg Environ Health. 2015 Jun 2. pii: S1438-4639(15)00079-6.

61: Kundakovic M, Gudsnuk K, Herbstman JB, Tang D, Perera FP, Champagne FA. DNA methylation of BDNF as a biomarker of early-life adversity. Proc Natl Acad Sci U S A. 2015 Jun 2;112(22):6807-13.

62: Smit LA, Lenters V, Høyer BB, Lindh CH, Pedersen HS, Liermontova I, Jönsson BA, Piersma AH, Bonde JP, Toft G, Vermeulen R, Heederik D. Prenatal exposure to environmental chemical contaminants and asthma and eczema in school-age children. Allergy. 2015 Jun;70(6):653-60.

63: Stein TP, Schluter MD, Steer RA, Guo L, Ming X. Bisphenol A Exposure in Children With Autism Spectrum Disorders. Autism Res. 2015 Jun;8(3):272-83.

64: Langie SA, Koppen G, Desaulniers D, Al-Mulla F, Al-Temaimi R, Amedei A, Azqueta A, Bisson WH, Brown D, Brunborg G, Charles AK, Chen T, Colacci A, Darroudi F, Forte S, Gonzalez L, Hamid RA, Knudsen LE, Leyns L, Lopez de Cerain Salsamendi A, Memeo L, Mondello C, Mothersill C, Olsen AK, Pavanello S, Raju J, Rojas E, Roy R, Ryan E, Ostrosky-Wegman P, Salem HK, Scovassi I, Singh N, Vaccari M, Van Schooten FJ, Valverde M, Woodrick J, Zhang L, van Larebeke N, Kirsch-Volders M, Collins AR. Causes of genome instability: the effect of low dose chemical exposures in modern society. Carcinogenesis. 2015 Jun;36 Suppl 1:S61-88.

65: Thompson PA, Khatami M, Baglole CJ, Sun J, Harris S, Moon EY, Al-Mulla F, Al-Temaimi R, Brown D, Colacci A, Mondello C, Raju J, Ryan E, Woodrick J, Scovassi I, Singh N, Vaccari M, Roy R, Forte S, Memeo L, Salem HK, Amedei A, Hamid RA, Lowe L, Guarnieri T, Bisson WH. Environmental immune disruptors, inflammation and cancer risk. Carcinogenesis. 2015 Jun;36 Suppl 1:S232-53.

66: Kravchenko J, Corsini E, Williams MA, Decker W, Manjili MH, Otsuki T, Singh N, Al-Mulla F, Al-Temaimi R, Amedei A, Colacci AM, Vaccari M, Mondello C, Scovassi AI, Raju J, Hamid RA, Memeo L, Forte S, Roy R, Woodrick J, Salem HK, Ryan EP, Brown DG, Bisson WH, Lowe L, Lyerly HK. Chemical compounds from anthropogenic environment and immune evasion mechanisms: potential interactions. Carcinogenesis. 2015 Jun;36 Suppl 1:S111-27.

67: Schlummer M, Sölch C, Meisel T, Still M, Gruber L, Wolz G. Emission of perfluoroalkyl carboxylic acids (PFCA) from heated surfaces made of polytetrafluoroethylene (PTFE) applied in food contact materials and consumer products. Chemosphere. 2015 Jun;129:46-53.

68: 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. 2015 Jun;129:232-8.

69: Mørck TA, Nielsen F, Nielsen JK, Siersma VD, Grandjean P, Knudsen LE. PFAS concentrations in plasma samples from Danish school children and their mothers. Chemosphere. 2015 Jun;129:203-9.

70: Schug TT, Blawas AM, Gray K, Heindel JJ, Lawler CP. Elucidating the links between endocrine disruptors and neurodevelopment. Endocrinology. 2015 Jun;156(6):1941-51.

71: Erkin-Cakmak A, Harley KG, Chevrier J, Bradman A, Kogut K, Huen K, Eskenazi B. In Utero and Childhood Polybrominated Diphenyl Ether Exposures and Body Mass at Age 7 Years: The CHAMACOS Study. Environ Health Perspect. 2015 Jun;123(6):636-42.

72: La Guardia MJ, Hale RC. Halogenated flame-retardant concentrations in settled dust, respirable and inhalable particulates and polyurethane foam at gymnastic training facilities and residences. Environ Int. 2015 Jun;79:106-14.

73: García-Pérez J, Lope V, López-Abente G, González-Sánchez M, Fernández-Navarro P. Ovarian cancer mortality and industrial pollution. Environ Pollut. 2015 Jun 1;205:103-110.

74: Lee MR, Kim JH, Choi YH, Bae S, Park C, Hong YC. Association of bisphenol A exposure with overweight in the elderly: a panel study. Environ Sci Pollut Res Int. 2015 Jun;22(12):9370-7.

75: Gong Y, Wen S, Zheng C, Peng X, Li Y, Hu D, Peng L. Potential risk assessment of polybrominated diphenyl ethers (PBDEs) by consuming animal-derived foods collected from interior areas of China. Environ Sci Pollut Res Int. 2015 Jun;22(11):8349-58.

76: Xu X, Zeng X, Boezen HM, Huo X. E-waste environmental contamination and harm to public health in China. Front Med. 2015 Jun;9(2):220-8.

77: Sahlström LM, Sellström U, de Wit CA, Lignell S, Darnerud PO. Estimated intakes of brominated flame retardants via diet and dust compared to internal concentrations in a Swedish mother-toddler cohort. Int J Hyg Environ Health. 2015 Jun;218(4):422-32.

78: Góralczyk K, Struciński P, Wojtyniak B, Rabczenko D, Lindh CH, Jönsson BA, Toft G, Lenters V, Czaja K, Hernik A, Bonde JP, Pedersen HS, Zvyezday V, Ludwicki JK. Is the fact of parenting couples cohabitation affecting the serum levels of persistent organohalogen pollutants? Int J Hyg Environ Health. 2015 Jun;218(4):392-400.

79: Li S, Zhao J, Wang G, Zhu Y, Rabito F, Krousel-Wood M, Chen W, Whelton PK. Urinary triclosan concentrations are inversely associated with body mass index and waist circumference in the US general population: Experience in NHANES 2003-2010. Int J Hyg Environ Health. 2015 Jun;218(4):401-6.

80: Yaghjyan L, Sites S, Ruan Y, Chang SH. Associations of urinary phthalates with body mass index, waist circumference and serum lipids among females: National Health and Nutrition Examination Survey 1999-2004. Int J Obes (Lond). 2015 Jun;39(6):994-1000.

81: Wise LA, Troisi R, Hatch EE, Titus LJ, Rothman KJ, Harlow BL. Prenatal diethylstilbestrol exposure and reproductive hormones in premenopausal women. J Dev Orig Health Dis. 2015 Jun;6(3):208-16.

82: Hatch EE, Troisi R, Palmer JR, Wise LA, Titus L, Strohsnitter WC, Ricker W, Hyer M, Hoover RN. Prenatal diethylstilbestrol exposure and risk of obesity in adult women. J Dev Orig Health Dis. 2015 Jun;6(3):201-7.

83: Menale C, Piccolo MT, Cirillo G, Calogero RA, Papparella A, Mita L, Giudice EM, Diano N, Crispi S, Mita DG. Bisphenol A effects on gene expression in adipocytes from children: association with metabolic disorders. J Mol Endocrinol. 2015 Jun;54(3):289-303.

84: 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. 2015 Jun;72(6):385-93.

85: Wang C, Zhan Y, Wang F, Li H, Xie L, Liu B, Li Y, Mu D, Zheng H, Zhou K, Hua Y. Parental occupational exposures to endocrine disruptors and the risk of simple isolated congenital heart defects. Pediatr Cardiol. 2015 Jun;36(5):1024-37.

86: 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. 2015 Jun;45(8):1601-12.

87: Miyaguchi T, Suemizu H, Shimizu M, Shida S, Nishiyama S, Takano R, Murayama N, Yamazaki H. Human urine and plasma concentrations of bisphenol A extrapolated from pharmacokinetics established in in vivo experiments with chimeric mice with humanized liver and semi-physiological pharmacokinetic modeling. Regul Toxicol Pharmacol. 2015 Jun;72(1):71-6.

88: Chen CY, Chou YY, Lin SJ, Lee CC. Developing an intervention strategy to reduce phthalate exposure in Taiwanese girls. Sci Total Environ. 2015 Jun 1;517:125-31.

89: Dunnick JK, Sanders JM, Kissling GE, Johnson CL, Boyle MH, Elmore SA. Environmental chemical exposure may contribute to uterine cancer development: studies with tetrabromobisphenol a. Toxicol Pathol. 2015 Jun;43(4):464-73.

90: Rancière F, Lyons JG, Loh VH, Botton J, Galloway T, Wang T, Shaw JE, Magliano DJ. Bisphenol A and the risk of cardiometabolic disorders: a systematic review with meta-analysis of the epidemiological evidence. Environ Health. 2015 May 31;14(1):46.

91: Lewis RC, Johns LE, Meeker JD. Serum Biomarkers of Exposure to Perfluoroalkyl Substances in Relation to Serum Testosterone and Measures of Thyroid Function among Adults and Adolescents from NHANES 2011-2012. Int J Environ Res Public Health. 2015 May 29;12(6):6098-114.

92: Savastano S, Tarantino G, D'Esposito V, Passaretti F, Cabaro S, Liotti A, Liguoro D, Perruolo G, Ariemma F, Finelli C, Beguinot F, Formisano P, Valentino R. Bisphenol-A plasma levels are related to inflammatory markers, visceral obesity and insulin-resistance: a cross-sectional study on adult male population. J Transl Med. 2015 May 29;13:169.

93: Suvorov A, Waxman DJ. Early programing of uterine tissue by bisphenol A: Critical evaluation of evidence from animal exposure studies. Reprod Toxicol. 2015 May 28. pii: S0890-6238(15)00076-3.

94: Xin F, Susiarjo M, Bartolomei MS. Multigenerational and transgenerational effects of endocrine disrupting chemicals: A role for altered epigenetic regulation? Semin Cell Dev Biol. 2015 May 28. pii: S1084-9521(15)00105-6.

95: Porucznik CA, Cox KJ, Wilkins DG, Anderson DJ, Bailey NM, Szczotka KM, Stanford JB. A Preliminary Study of Biomonitoring for Bisphenol-A in Human Sweat. J Anal Toxicol. 2015 May 25. pii: bkv055. [Epub ahead of print]

96: Kalfa N, Paris F, Philibert P, Orsini M, Broussous S, Fauconnet-Servant N, Audran F, Gaspari L, Lehors H, Haddad M, Guys JM, Reynaud R, Alessandrini P, Merrot T, Wagner K, Kurzenne JY, Bastiani F, Bréaud J, Valla JS, Lacombe GM, Dobremez E, Zahhaf A, Daures JP, Sultan C. Is Hypospadias Associated with Prenatal Exposure to Endocrine Disruptors? A French Collaborative Controlled Study of a Cohort of 300 Consecutive Children Without Genetic Defect. Eur Urol. 2015 May 23. pii: S0302-2838(15)00409-1.

97: Dallongeville A, Costet N, Zmirou-Navier D, Le Bot B, Chevrier C, Deguen S, Annesi-Maesano I, Blanchard O. Volatile and semi-volatile organic compounds of respiratory health relevance in French dwellings. Indoor Air. 2015 May 23.

98: Trasande L, Attina TM. Association of Exposure to Di-2-Ethylhexylphthalate Replacements with Increased Insulin Resistance in Adolescents from NHANES 2009-2012. J Clin Endocrinol Metab. 2015 May 20:jc20151686. [Epub ahead of print]

99: Gascon M, Valvi D, Forns J, Casas M, Martínez D, Júlvez J, Monfort N, Ventura R, Sunyer J, Vrijheid M. Prenatal exposure to phthalates and neuropsychological development during childhood. Int J Hyg Environ Health. 2015 May 19. pii: S1438-4639(15)00068-1.

100: Hyland KC, Blaine AC, Dickenson ER, Higgins CP. Accumulation of contaminants of emerging concern in food crops, part one: Edible strawberries and lettuce grown in reclaimed water. Environ Toxicol Chem. 2015 May 18.

101: Berger E, Potouridis T, Haeger A, Püttmann W, Wagner M. Effect-directed identification of endocrine disruptors in plastic baby teethers. J Appl Toxicol. 2015 May 18.

102: Xie C, Zhao Y, Gao L, Chen J, Cai D, Zhang Y. Elevated phthalates' exposure in children with constitutional delay of growth and puberty. Mol Cell Endocrinol. 2015 May 15;407:67-73.

103: Agay-Shay K, Martinez D, Valvi D, Garcia-Esteban R, Basagaña X, Robinson O, Casas M, Sunyer J, Vrijheid M. Exposure to Endocrine-Disrupting Chemicals during Pregnancy and Weight at 7 Years of Age: A Multi-pollutant Approach. Environ Health Perspect. 2015 May 8. [Epub ahead of print]

104: De Felip E, Abballe A, Albano FL, Battista T, Carraro V, Conversano M, Franchini S, Giambanco L, Iacovella N, Ingelido AM, Maiorana A, Maneschi F, Marra V, Mercurio A, Nale R, Nucci B, Panella V, Pirola F, Porpora MG, Procopio E, Suma N, Valentini S, Valsenti L, Vecchiè V. Current exposure of Italian women of reproductive age to PFOS and PFOA: A human biomonitoring study. Chemosphere. 2015 May 7;137:1-8.

105: Canbaz D, van Velzen MJ, Hallner E, Zwinderman AH, Wickman M, Leonards PE, van Ree R, van Rijt LS. Exposure to organophosphate and polybrominated diphenyl ether flame retardants via indoor dust and childhood asthma. Indoor Air. 2015 May 7.

106: Webber MA, Whitehead RN, Mount M, Loman NJ, Pallen MJ, Piddock LJ. Parallel evolutionary pathways to antibiotic resistance selected by biocide exposure. J Antimicrob Chemother. 2015 May 7. pii: dkv109. [Epub ahead of print]

107: Papadopoulou E, Haug LS, Sabaredzovic A, Eggesbø M, Longnecker MP. Reliability of perfluoroalkyl substances in plasma of 100 women in two consecutive pregnancies. Environ Res. 2015 May 6;140:421-429.

108: Towers CV, Terry PD, Lewis D, Howard B, Chambers W, Armistead C, Weitz B, Porter S, Borman CJ, Kennedy RC, Chen J. Transplacental passage of antimicrobial paraben preservatives. J Expo Sci Environ Epidemiol. 2015 May 6.

109: Wang J, Majkova Z, Bever CR, Yang J, Gee SJ, Li J, Xu T, Hammock BD. One-step immunoassay for tetrabromobisphenol a using a camelid single domain antibody-alkaline phosphatase fusion protein. Anal Chem. 2015 May 5;87(9):4741-8.

110: Berghuis SA, Bos AF, Sauer PJ, Roze E. Developmental neurotoxicity of persistent organic pollutants: an update on childhood outcome. Arch Toxicol. 2015 May;89(5):687-709.

111: Jia X, Harada Y, Tagawa M, Naito H, Hayashi Y, Yetti H, Kato M, Sasaki S, Araki A, Miyashita C, Ikeno T, Kishi R, Nakajima T. Prenatal maternal blood triglyceride and fatty acid levels in relation to exposure to di(2-ethylhexyl)phthalate: a cross-sectional study. Environ Health Prev Med. 2015 May;20(3):168-78.

112: Wang L, Asimakopoulos AG, Kannan K. Accumulation of 19 environmental phenolic and xenobiotic heterocyclic aromatic compounds in human adipose tissue. Environ Int. 2015 May;78:45-50.

113: Zheng X, Xu F, Chen K, Zeng Y, Luo X, Chen S, Mai B, Covaci A. Flame retardants and organochlorines in indoor dust from several e-waste recycling sites in South China: composition variations and implications for human exposure. Environ Int. 2015 May;78:1-7.

114: Wang X, Jiang L, Ge L, Chen M, Yang G, Ji F, Zhong L, Guan Y, Liu X. Oxidative DNA damage induced by di-(2-ethylhexyl) phthalate in HEK-293 cell line. Environ Toxicol Pharmacol. 2015 May;39(3):1099-106.

115: Liu R, Nelson DO, Hurley S, Hertz A, Reynolds P. Residential exposure to estrogen disrupting hazardous air pollutants and breast cancer risk: the California Teachers Study. Epidemiology. 2015 May;26(3):365-73.

116: Barrett ES, Chen C, Thurston SW, Haug LS, Sabaredzovic A, Fjeldheim FN, Frydenberg H, Lipson SF, Ellison PT, Thune I. Perfluoroalkyl substances and ovarian hormone concentrations in naturally cycling women. Fertil Steril. 2015 May;103(5):1261-70.e3.

117: Robledo CA, Peck JD, Stoner J, Calafat AM, Carabin H, Cowan L, Goodman JR. Urinary phthalate metabolite concentrations and blood glucose levels during pregnancy. Int J Hyg Environ Health. 2015 May;218(3):324-30.

118: Albouy-Llaty M, Dupuis A, Grignon C, Strezlec S, Pierre F, Rabouan S, Migeot V. Estimating drinking-water ingestion and dermal contact with water in a French population of pregnant women: the EDDS cohort study. J Expo Sci Environ Epidemiol. 2015 May;25(3):308-16.

119: Christensen KL, Lorber M, Ye X, Calafat AM. Reconstruction of bisphenol A intake using a simple pharmacokinetic model. J Expo Sci Environ Epidemiol. 2015 May;25(3):240-8.

120: Cunha GR, Sinclair A, Risbridger G, Hutson J, Baskin LS. Current understanding of hypospadias: relevance of animal models. Nat Rev Urol. 2015 May;12(5):271-280.

121: Holahan MR, Smith CA. Phthalates and neurotoxic effects on hippocampal network plasticity. Neurotoxicology. 2015 May;48:21-34.

122: Fong JP, Lee FJ, Lu IS, Uang SN, Lee CC. Relationship between urinary concentrations of di(2-ethylhexyl) phthalate (DEHP) metabolites and reproductive hormones in polyvinyl chloride production workers. Occup Environ Med. 2015 May;72(5):346-53.

123: Muñoz A, Chervona Y, Hall M, Kluz T, Gamble MV, Costa M. Sex-specific patterns and deregulation of endocrine pathways in the gene expression profiles of Bangladeshi adults exposed to arsenic contaminated drinking water. Toxicol Appl Pharmacol. 2015 May 1;284(3):330-8.

124: Sofo V, Götte M, Laganà AS, Salmeri FM, Triolo O, Sturlese E, Retto G, Alfa M, Granese R, Abrão MS. Correlation between dioxin and endometriosis: an epigenetic route to unravel the pathogenesis of the disease. Arch Gynecol Obstet.2015 Apr 29. [Epub ahead of print]

125: Gao S, Wan Y, Zheng G, Luo K, Kannan K, Giesy JP, Lam MH, Hu J. Organobromine compound profiling in human adipose: Assessment of sources of bromophenol. Environ Pollut. 2015 Apr 29;204:81-89.

126: Luongo G, Östman C. Organophosphate and phthalate esters in settled dust from apartment buildings in Stockholm. Indoor Air. 2015 Apr 29.

127: Weiss L, Arbuckle TE, Fisher M, Ramsay T, Mallick R, Hauser R, LeBlanc A, Walker M, Dumas P, Lang C. Temporal variability and sources of triclosan exposure in pregnancy. Int J Hyg Environ Health. 2015 Apr 29. pii: S1438-4639(15)00061-9.

128: Fénichel P, Brucker-Davis F, Chevalier N. The history of Distilbène(®) (Diethylstilbestrol) told to grandchildren - the transgenerational effect. Ann Endocrinol (Paris). 2015 Apr 28. pii: S0003-4266(15)00029-3.

129: Iughetti L, Lucaccioni L, Predieri B. Childhood obesity and environmental pollutants: a dual relationship. Acta Biomed. 2015 Apr 27;86(1):5-16.

130: Philippat C, Bennett D, Calafat AM, Picciotto IH. Exposure to select phthalates and phenols through use of personal care products among Californian adults and their children. Environ Res. 2015 Apr 27;140:369-376.

131: Vafeiadi M, Georgiou V, Chalkiadaki G, Rantakokko P, Kiviranta H, Karachaliou M, Fthenou E, Venihaki M, Sarri K, Vassilaki M, Kyrtopoulos SA, Oken E, Kogevinas M, Chatzi L. Association of Prenatal Exposure to Persistent Organic Pollutants with Obesity and Cardiometabolic Traits in Early Childhood: The Rhea Mother-Child Cohort (Crete, Greece). Environ Health Perspect. 2015 Apr 24. [Epub ahead of print]

132: Ashley-Martin J, Dodds L, Levy AR, Platt RW, Marshall JS, Arbuckle TE. Prenatal exposure to phthalates, bisphenol A and perfluoroalkyl substances and cord blood levels of IgE, TSLP and IL-33. Environ Res. 2015 Apr 23;140:360-368.

133: Xie C, Jin R, Zhao Y, Lin L, Li L, Chen J, Zhang Y. Paraoxonase 2 gene polymorphisms and prenatal phthalates' exposure in Chinese newborns. Environ Res. 2015 Apr 23;140:354-359.

134: Nakao T, Akiyama E, Kakutani H, Mizuno A, Aozasa O, Akai Y, Ohta S. Levels of tetrabromobisphenol A, tribromobisphenol A, dibromobisphenol A, monobromobisphenol A, and bisphenol a in Japanese breast milk. Chem Res Toxicol. 2015 Apr 20;28(4):722-8.

135: Rovira J, Nadal M, Schuhmacher M, Domingo JL. Human exposure to trace elements through the skin by direct contact with clothing: Risk assessment. Environ Res. 2015 Apr 15;140:308-316.

136: Ma TT, Wu LH, Chen L, Zhang HB, Teng Y, Luo YM. Phthalate esters contamination in soils and vegetables of plastic film greenhouses of suburb Nanjing, China and the potential human health risk. Environ Sci Pollut Res Int. 2015 Apr 15. [Epub ahead of print]

137: Zeng XW, Qian Z, Emo B, Vaughn M, Bao J, Qin XD, Zhu Y, Li J, Lee YL, Dong GH. Association of polyfluoroalkyl chemical exposure with serum lipids in children. Sci Total Environ. 2015 Apr 15;512-513:364-70.

138: Strakovsky RS, Wang H, Engeseth NJ, Flaws JA, Helferich WG, Pan YX, Lezmi S. Developmental bisphenol A (BPA) exposure leads to sex-specific modification of hepatic gene expression and epigenome at birth that may exacerbate high-fat diet-induced hepatic steatosis. Toxicol Appl Pharmacol. 2015 Apr 15;284(2):101-12.

139: Weschler CJ, Bekö G, Koch HM, Salthammer T, Schripp T, Toftum J, Clausen G. Transdermal Uptake of Diethyl Phthalate and Di(n-butyl) Phthalate Directly from Air: Experimental Verification. Environ Health Perspect. 2015 Apr 7. [Epub ahead of print]

140: Valvi D, Casas M, Romaguera D, Monfort N, Ventura R, Martinez D, Sunyer J, Vrijheid M. Prenatal Phthalate Exposure and Childhood Growth and Blood Pressure: Evidence from the Spanish INMA-Sabadell Birth Cohort Study. Environ Health Perspect. 2015 Apr 7. [Epub ahead of print]

141: Net S, Sempéré R, Delmont A, Paluselli A, Ouddane B. Occurrence, fate, behavior and ecotoxicological state of phthalates in different environmental matrices. Environ Sci Technol. 2015 Apr 7;49(7):4019-35.

142: Kishi R, Nakajima T, Goudarzi H, Kobayashi S, Sasaki S, Okada E, Miyashita C, Itoh S, Araki A, Ikeno T, Iwasaki Y, Nakazawa H. The Association of Prenatal Exposure to Perfluorinated Chemicals with Maternal Essential and Long-Chain Polyunsaturated Fatty Acids during Pregnancy and the Birth Weight of their Offspring: The Hokkaido Study. Environ Health Perspect. 2015 Apr 3. [Epub ahead of print]

143: Schantz MM, Benner BA Jr, Heckert NA, Sander LC, Sharpless KE, Vander Pol SS, Vasquez Y, Villegas M, Wise SA, Alwis KU, Blount BC, Calafat AM, Li Z, Silva MJ, Ye X, Gaudreau É, Patterson DG Jr, Sjödin A. Development of urine standard reference materials for metabolites of organic chemicals including polycyclic aromatic hydrocarbons, phthalates, phenols, parabens, and volatile organic compounds. Anal Bioanal Chem. 2015 Apr;407(11):2945-54.

144: Tran TM, Kannan K. Occurrence of phthalate diesters in particulate and vapor phases in indoor air and implications for human exposure in Albany, New York, USA. Arch Environ Contam Toxicol. 2015 Apr;68(3):489-99.

145: Nahar MS, Liao C, Kannan K, Harris C, Dolinoy DC. In utero bisphenol A concentration, metabolism, and global DNA methylation across matched placenta, kidney, and liver in the human fetus. Chemosphere. 2015 Apr;124:54-60.

146: Liew Z, Ritz B, von Ehrenstein OS, Bech BH, Nohr EA, Fei C, Bossi R, Henriksen TB, Bonefeld-Jørgensen EC, Olsen J. Attention deficit/hyperactivity disorder and childhood autism in association with prenatal exposure to perfluoroalkyl substances: a nested case-control study in the Danish National Birth Cohort. Environ Health Perspect. 2015 Apr;123(4):367-73.

147: Arbuckle TE, Marro L, Davis K, Fisher M, Ayotte P, Bélanger P, Dumas P, LeBlanc A, Bérubé R, Gaudreau É, Provencher G, Faustman EM, Vigoren E, Ettinger AS, Dellarco M, MacPherson S, Fraser WD. Exposure to free and conjugated forms of bisphenol A and triclosan among pregnant women in the MIREC cohort. Environ Health Perspect. 2015 Apr;123(4):277-84.

148: Emeville E, Giusti A, Coumoul X, Thomé JP, Blanchet P, Multigner L. Associations of plasma concentrations of dichlorodiphenyldichloroethylene and polychlorinated biphenyls with prostate cancer: a case-control study in Guadeloupe (French West Indies). Environ Health Perspect. 2015 Apr;123(4):317-23.

149: Miralles-Marco A, Harrad S. Perfluorooctane sulfonate: a review of human exposure, biomonitoring and the environmental forensics utility of its chirality and isomer distribution. Environ Int. 2015 Apr;77:148-59.

150: Cruz R, Cunha SC, Casal S. Brominated flame retardants and seafood safety: a review. Environ Int. 2015 Apr;77:116-31.

151: Berg V, Nøst TH, Hansen S, Elverland A, Veyhe AS, Jorde R, Odland JØ, Sandanger TM. Assessing the relationship between perfluoroalkyl substances, thyroid hormones and binding proteins in pregnant women; a longitudinal mixed effects approach. Environ Int. 2015 Apr;77:63-9.

152: Lorber M, Schecter A, Paepke O, Shropshire W, Christensen K, Birnbaum L. Exposure assessment of adult intake of bisphenol A (BPA) with emphasis on canned food dietary exposures. Environ Int. 2015 Apr;77:55-62.

153: Campagna M, Satta G, Fadda D, Pili S, Cocco P. Male fertility following occupational exposure to dichlorodiphenyltrichloroethane (DDT). Environ Int. 2015 Apr;77:42-7.

154: Cooperstock M. Interactions of phthalates with preterm birth. Environ Int. 2015 Apr;77:160.

155: 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. 2015 Apr;56(3):286-92.

156: Fujii Y, Sakurada T, Harada KH, Koizumi A, Kimura O, Endo T, Haraguchi K. Long-chain perfluoroalkyl carboxylic acids in Pacific cods from coastal areas in northern Japan: a major source of human dietary exposure. Environ Pollut. 2015 Apr;199:35-41.

157: Romano ME, Webster GM, Vuong AM, Thomas Zoeller R, Chen A, Hoofnagle AN, Calafat AM, Karagas MR, Yolton K, Lanphear BP, Braun JM. Gestational urinary bisphenol A and maternal and newborn thyroid hormone concentrations: the HOME Study. Environ Res. 2015 Apr;138:453-60.

158: Petersen MS, Halling J, Weihe P, Jensen TK, Grandjean P, Nielsen F, Jørgensen N. Spermatogenic capacity in fertile men with elevated exposure to polychlorinated biphenyls. Environ Res. 2015 Apr;138:345-51.

159: Llop S, Lopez-Espinosa MJ, Murcia M, Alvarez-Pedrerol M, Vioque J, Aguinagalde X, Julvez J, Aurrekoetxea JJ, Espada M, Santa-Marina L, Rebagliato M, Ballester F. Synergism between exposure to mercury and use of iodine supplements on thyroid hormones in pregnant women. Environ Res. 2015 Apr;138:298-305.

160: Cordier S, Bouquet E, Warembourg C, Massart C, Rouget F, Kadhel P, Bataille H, Monfort C, Boucher O, Muckle G, Multigner L. Perinatal exposure to chlordecone, thyroid hormone status and neurodevelopment in infants: the Timoun cohort study in Guadeloupe (French West Indies). Environ Res. 2015 Apr;138:271-8.

161: Axelsson J, Rylander L, Rignell-Hydbom A, Lindh CH, Jönsson BA, Giwercman A. Prenatal phthalate exposure and reproductive function in young men. Environ Res. 2015 Apr;138:264-70.

162: Careghini A, Mastorgio AF, Saponaro S, Sezenna E. Bisphenol A, nonylphenols, benzophenones, and benzotriazoles in soils, groundwater, surface water, sediments, and food: a review. Environ Sci Pollut Res Int. 2015 Apr;22(8):5711-41.

163: Xu F, Liu Y, Wang J, Zhang G, Zhang W, Liu L, Wang J, Pan B, Lin K. Characterization of heavy metals and brominated flame retardants in the indoor and outdoor dust of e-waste workshops: implication for on-site human exposure. Environ Sci Pollut Res Int. 2015 Apr;22(7):5469-80.

164: Chen D, Hale RC, Letcher RJ. Photochemical and microbial transformation of emerging flame retardants: cause for concern? Environ Toxicol Chem. 2015 Apr;34(4):687-99.

165: Vélez MP, Arbuckle TE, Fraser WD. Female exposure to phenols and phthalates and time to pregnancy: the Maternal-Infant Research on Environmental Chemicals (MIREC) Study. Fertil Steril. 2015 Apr;103(4):1011-1020.e2.

166: Ewence A, Brescia S, Johnson I, Rumsby PC. An approach to the identification and regulation of endocrine disrupting pesticides. Food Chem Toxicol. 2015 Apr;78:214-20.

167: Swan SH, Sathyanarayana S, Barrett ES, Janssen S, Liu F, Nguyen RH, Redmon JB; TIDES Study Team. First trimester phthalate exposure and anogenital distance in newborns. Hum Reprod. 2015 Apr;30(4):963-72.

168: Donat-Vargas C, Gea A, Sayon-Orea C, de la Fuente-Arrillaga C, Martinez-Gonzalez MA, Bes-Rastrollo M. Association between dietary intake of polychlorinated biphenyls and the incidence of hypertension in a Spanish cohort: the Seguimiento Universidad de Navarra project. Hypertension. 2015 Apr;65(4):714-21.

169: Desai M, Jellyman JK, Ross MG. Epigenomics, gestational programming and risk of metabolic syndrome. Int J Obes (Lond). 2015 Apr;39(4):633-41.

170: Cirillo T, Latini G, Castaldi MA, Dipaola L, Fasano E, Esposito F, Scognamiglio G, Francesco FD, Cobellis L. Exposure to di-2-ethylhexyl phthalate, di-n-butyl phthalate and bisphenol A through infant formulas. J Agric Food Chem. 2015 Apr 1;63(12):3303-10.

171: Legler J, Fletcher T, Govarts E, Porta M, Blumberg B, Heindel JJ, Trasande L. Obesity, diabetes, and associated costs of exposure to endocrine-disrupting chemicals in the European Union. J Clin Endocrinol Metab. 2015 Apr;100(4):1278-88.

172: Hauser R, Skakkebaek NE, Hass U, Toppari J, Juul A, Andersson AM, Kortenkamp A, Heindel JJ, Trasande L. Male reproductive disorders, diseases, and costs of exposure to endocrine-disrupting chemicals in the European Union. J Clin Endocrinol Metab. 2015 Apr;100(4):1267-77.

173: Trasande L, Zoeller RT, Hass U, Kortenkamp A, Grandjean P, Myers JP, DiGangi J, Bellanger M, Hauser R, Legler J, Skakkebaek NE, Heindel JJ. Estimating burden and disease costs of exposure to endocrine-disrupting chemicals in the European union. J Clin Endocrinol Metab. 2015 Apr;100(4):1245-55.

174: Bellanger M, Demeneix B, Grandjean P, Zoeller RT, Trasande L. Neurobehavioral deficits, diseases, and associated costs of exposure to endocrine-disrupting chemicals in the European Union. J Clin Endocrinol Metab. 2015 Apr;100(4):1256-66.

175: Haugen AC, Schug TT, Collman G, Heindel JJ. Evolution of DOHaD: the impact of environmental health sciences. J Dev Orig Health Dis. 2015 Apr;6(2):55-64.

176: Burgio E, Lopomo A, Migliore L. Obesity and diabetes: from genetics to epigenetics. Mol Biol Rep. 2015 Apr;42(4):799-818.

177: Guida M, Troisi J, Ciccone C, Granozio G, Cosimato C, Di Spiezio Sardo A, Ferrara C, Guida M, Nappi C, Zullo F, Di Carlo C. Bisphenol A and congenital developmental defects in humans. Mutat Res. 2015 Apr;774:33-9.

178: Cardoso RC, Puttabyatappa M, Padmanabhan V. Steroidogenic versus Metabolic Programming of Reproductive Neuroendocrine, Ovarian, and Metabolic Dysfunctions. Neuroendocrinology. 2015 Apr 1. [Epub ahead of print]

179: Becker RA, Friedman KP, Simon TW, Marty MS, Patlewicz G, Rowlands JC. An exposure:activity profiling method for interpreting high-throughput screening data for estrogenic activity--proof of concept. Regul Toxicol Pharmacol. 2015 Apr;71(3):398-408.

180: Wang H, Chen H, Qin Y, Shi Z, Zhao X, Xu J, Ma B, Chen ZJ. Risks associated with premature ovarian failure in Han Chinese women. Reprod Biomed Online. 2015 Apr;30(4):401-7.

181: Xu X, Chiung YM, Lu F, Qiu S, Ji M, Huo X. Associations of cadmium, bisphenol A and polychlorinated biphenyl co-exposure in utero with placental gene expression and neonatal outcomes. Reprod Toxicol. 2015 Apr;52:62-70.

182: Poon S, Aleksa K, Carnevale A, Kapur B, Goodyer C, Koren G. Evaluating external contamination of polybrominated diphenyl ethers in human hair: clinical and research implications. Ther Drug Monit. 2015 Apr;37(2):270-4.

183: Xiao F, Simcik MF, Halbach TR, Gulliver JS. Perfluorooctane sulfonate (PFOS) and perfluorooctanoate (PFOA) in soils and groundwater of a U.S. metropolitan area: migration and implications for human exposure. Water Res. 2015 Apr 1;72:64-74.

184: Lane RF, Adams CD, Randtke SJ, Carter RE Jr. Bisphenol diglycidyl ethers and bisphenol A and their hydrolysis in drinking water. Water Res. 2015 Apr 1;72:331-9.

185: Costas L, Infante-Rivard C, Zock JP, Van Tongeren M, Boffetta P, Cusson A, Robles C, Casabonne D, Benavente Y, Becker N, Brennan P, Foretova L, Maynadié M, Staines A, Nieters A, Cocco P, de Sanjosé S. Occupational exposure to endocrine disruptors and lymphoma risk in a multi-centric European study. Br J Cancer. 2015 Mar 31;112(7):1251-6.

186: Wikoff D, Thompson C, Perry C, White M, Borghoff S, Fitzgerald L, Haws LC. Development of toxicity values and exposure estimates for tetrabromobisphenol A: application in a margin of exposure assessment. J Appl Toxicol. 2015 Mar 30.

187: Cantonwine DE, Ferguson KK, Mukherjee B, McElrath TF, Meeker JD. Urinary Bisphenol A Levels during Pregnancy and Risk of Preterm Birth. Environ Health Perspect. 2015 Mar 27. [Epub ahead of print]

188: Pennings JL, Jennen DG, Nygaard UC, Namork E, Haug LS, van Loveren H, Granum B. Cord blood gene expression supports that prenatal exposure to perfluoroalkyl substances causes depressed immune functionality in early childhood. J Immunotoxicol. 2015 Mar 27:1-8. [Epub ahead of print]

189: Høyer BB, Ramlau-Hansen CH, Vrijheid M, Valvi D, Pedersen HS, Zviezdai V, Jönsson BA, Lindh CH, Bonde JP, Toft G. Anthropometry in 5- to 9-Year-Old Greenlandic and Ukrainian Children in Relation to Prenatal Exposure to Perfluorinated Alkyl Substances. Environ Health Perspect. 2015 Mar 26. [Epub ahead of print]

190: Gribble MO, Bartell SM, Kannan K, Wu Q, Fair PA, Kamen DL. Longitudinal measures of perfluoroalkyl substances (PFAS) in serum of Gullah African Americans in South Carolina: 2003-2013. Environ Res. 2015 Mar 26. pii: S0013-9351(15)00083-3.

191: Fu J, Gao Y, Wang T, Liang Y, Zhang A, Wang Y, Jiang G. Elevated levels of perfluoroalkyl acids in family members of occupationally exposed workers: the importance of dust transfer. Sci Rep. 2015 Mar 20;5:9313.

192: Danjou AM, Fervers B, Boutron-Ruault MC, Philip T, Clavel-Chapelon F, Dossus L. Estimated dietary dioxin exposure and breast cancer risk among women from the French E3N prospective cohort. Breast Cancer Res. 2015 Mar 17;17:39.

193: Guidry VT, Longnecker MP, Aase H, Eggesbø M, Zeiner P, Reichborn-Kjennerud T, Knudsen GP, Bertelsen RJ, Ye X, Calafat AM, Engel SM. Measurement of Total and Free Urinary Phenol and Paraben Concentrations over the Course of Pregnancy: Assessing Reliability and Contamination of Specimens in the Norwegian Mother and Child Cohort Study. Environ Health Perspect. 2015 Mar 17. [Epub ahead of print]

194: Paoli D, Giannandrea F, Gallo M, Turci R, Cattaruzza MS, Lombardo F, Lenzi A, Gandini L. Exposure to polychlorinated biphenyls and hexachlorobenzene, semen quality and testicular cancer risk. J Endocrinol Invest. 2015 Mar 15. [Epub ahead of print]

195: Wu XM, Bennett DH, Moran RE, Sjödin A, Jones RS, Tancredi DJ, Tulve NS, Clifton MS, Colón M, Weathers W, Hertz-Picciotto I. Polybrominated diphenyl ether serum concentrations in a Californian population of children, their parents, and older adults: an exposure assessment study. Environ Health. 2015 Mar 14;14:23.

196: Dodge LE, Williams PL, Williams MA, Missmer SA, Toth TL, Calafat AM, Hauser R. Paternal Urinary Concentrations of Parabens and Other Phenols in Relation to Reproductive Outcomes among Couples from a Fertility Clinic. Environ Health Perspect. 2015 Mar 13. [Epub ahead of print]

197: Mokarizadeh A, Faryabi MR, Rezvanfar MA, Abdollahi M. A comprehensive review of pesticides and the immune dysregulation: mechanisms, evidence and consequences. Toxicol Mech Methods. 2015 Mar 11:1-21. [Epub ahead of print]

198: Liu X, Miao M, Zhou Z, Gao E, Chen J, Wang J, Sun F, Yuan W, Li DK. Exposure to bisphenol-A and reproductive hormones among male adults. Environ Toxicol Pharmacol. 2015 Mar;39(2):934-41.

199: Bodin J, Stene LC, Nygaard UC. Can exposure to environmental chemicals increase the risk of diabetes type 1 development? Biomed Res Int. 2015;2015:208947.

200: Ruiz-Hernandez A, Kuo CC, Rentero-Garrido P, Tang WY, Redon J, Ordovas JM, Navas-Acien A, Tellez-Plaza M. Environmental chemicals and DNA methylation in adults: a systematic review of the epidemiologic evidence. Clin Epigenetics. 2015 Apr 29;7(1):55.

201: Wang IJ, Karmaus WJ, Chen SL, Holloway JW, Ewart S. Effects of phthalate exposure on asthma may be mediated through alterations in DNA methylation. Clin Epigenetics. 2015 Mar 15;7(1):27.

202: Rouiller-Fabre V, Guerquin MJ, N'Tumba-Byn T, Muczynski V, Moison D, Tourpin S, Messiaen S, Habert R, Livera G. Nuclear receptors and endocrine disruptors in fetal and neonatal testes: a gapped landscape. Front Endocrinol (Lausanne). 2015 May 7;6:58.

203: Predieri B, Iughetti L, Guerranti C, Bruzzi P, Perra G, Focardi SE. High Levels of Perfluorooctane Sulfonate in Children at the Onset of Diabetes. Int J Endocrinol. 2015;2015:234358.

204: Huang HB, Chen HY, Su PH, Huang PC, Sun CW, Wang CJ, Chen HY, Hsiung CA, Wang SL. Fetal and Childhood Exposure to Phthalate Diesters and Cognitive Function in Children Up to 12 Years of Age: Taiwanese Maternal and Infant Cohort Study. PLoS One. 2015 Jun 29;10(6):e0131910.

205: Hansen JF, Nielsen CH, Brorson MM, Frederiksen H, Hartoft-Nielsen ML, Rasmussen ÅK, Bendtzen K, Feldt-Rasmussen U. Influence of Phthalates on in vitro Innate and Adaptive Immune Responses. PLoS One. 2015 Jun 25;10(6):e0131168.

206: Nowack N, Wittsiepe J, Kasper-Sonnenberg M, Wilhelm M, Schölmerich A. Influence of Low-Level Prenatal Exposure to PCDD/Fs and PCBs on Empathizing, Systemizing and Autistic Traits: Results from the Duisburg Birth Cohort Study. PLoS One. 2015 Jun 12;10(6):e0129906.

207: Kuo FC, Su SW, Wu CF, Huang MC, Shiea J, Chen BH, Chen YL, Wu MT. Relationship of urinary phthalate metabolites with serum thyroid hormones in pregnant women and their newborns: a prospective birth cohort in taiwan. PLoS One. 2015 Jun 4;10(6):e0123884.

208: Shen Y, Zheng Y, Jiang J, Liu Y, Luo X, Shen Z, Chen X, Wang Y, Dai Y, Zhao J, Liang H, Chen A, Yuan W. Higher urinary bisphenol a concentration is associated with unexplained recurrent miscarriage risk: evidence from a case-control study in eastern china. PLoS One. 2015 May 26;10(5):e0127886.

209: Kim S, Park J, Kim HJ, Lee JJ, Choi G, Choi S, Kim S, Kim SY, Moon HB, Kim S, Choi K. Association between Several Persistent Organic Pollutants and Thyroid Hormone Levels in Cord Blood Serum and Bloodspot of the Newborn Infants of Korea. PLoS One. 2015 May 12;10(5):e0125213.

210: Brieño-Enríquez MA, García-López J, Cárdenas DB, Guibert S, Cleroux E, Děd L, Hourcade Jde D, Pěknicová J, Weber M, Del Mazo J. Exposure to endocrine disruptor induces transgenerational epigenetic deregulation of microRNAs in primordial germ cells. PLoS One. 2015 Apr 21;10(4):e0124296.

211: Bai PY, Wittert GA, Taylor AW, Martin SA, Milne RW, Shi Z. The association of socio-demographic status, lifestyle factors and dietary patterns with total urinary phthalates in Australian men. PLoS One. 2015 Apr 15;10(4):e0122140.

212: Ku HY, Su PH, Wen HJ, Sun HL, Wang CJ, Chen HY, Jaakkola JJ, Wang SL; TMICS Group. Prenatal and postnatal exposure to phthalate esters and asthma: a 9-year follow-up study of a taiwanese birth cohort. PLoS One. 2015 Apr 13;10(4):e0123309.

213: Jensen TK, Andersen LB, Kyhl HB, Nielsen F, Christesen HT, Grandjean P. Association between perfluorinated compound exposure and miscarriage in Danish pregnant women. PLoS One. 2015 Apr 7;10(4):e0123496.

214: Specht IO, Bonde JP, Toft G, Lindh CH, Jönsson BA, Jørgensen KT. Serum phthalate levels and time to pregnancy in couples from Greenland, Poland and Ukraine. PLoS One. 2015 Mar 18;10(3):e0120070.

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 2015/03/31 to 2015/12/31 (April 2015 og fremefter)

Efter at have fjernet genganger fra forrige litteraturopdateringslister gav litteratursøgningen, med de angivne søgekriterier, tilsammen en liste med i alt 48 artikler. Artiklerne er blevet fordelt i 5 grupper:"Perflourinated and Polyflourinated compounds", "Parabens", "Plastic derivatives (BPA, Phthalates and others)","Pesticides/Fungicides/Insecticides/Biocides" og "Various EDCs, Mixtures and Other endpoints".

Udvalgte publikationer

2 artikler er blevet udvalgt til nærmere beskrivelse baseret på, at de beskriver resultater der bidrager til ny eller yderligere viden om grupper af hormonforstyrrende stoffer, samt kilder til eksponering for disse.

Den første artikel omhandler et in vitro studie med det formål, at undersøge syv udvalgte perfluorerede alkylerede stoffer (PFAS) for deres potentiale til at forsage oxidative stress (kræftfremkaldende potentiale).

Den anden artikel omhandler et studie, der har haft til formål at undersøge tilstedeværelsen af hormonforstyrrende stoffer i plastikbideringe til babyer og om disse bideringe kan udgøre en mulig eksponeringskilde for spædbørn til hormonforstyrrende stoffer.

Perfluoroalkylated substances (PFAS) affect oxidative stress biomarkers **in vitro**.
Wielsøe M, Long M, Ghisari M, Bonefeld-Jørgensen EC.
Abstract

Perfluoroalkylated substances (PFAS) have been widely used since 1950s and humans are exposed through food, drinking water, consumer products, dust, etc. The long-chained PFAS are persistent in the environment and accumulate in wildlife and humans. They are suspected carcinogens and a potential mode of action is through generation of oxidative stress. Seven long-chained PFAS found in human serum were investigated for the potential to generate reactive oxygen species (ROS), induce DNA damage and disturb the total antioxidant capacity (TAC). The tested PFAS were perfluorohexane sulfonate (PFHxS), perfluorooctane sulfonic acid (PFOS), perfluoroctanoic acid (PFOA), perfluorononanoate (PFNA), perfluorodecanoate (PFDA), perfluoroundecanoate (PFUnA), and perfluorododecanoate (PFDoA). Using the human hepatoma cell line (HepG2) and an exposure time of 24h we found that all three endpoints were affected by one or more of the compounds. PFHxS, PFOA, PFOS and PFNA showed a dose dependent increase in DNA damage in the concentration range from 2×10(-7) to 2×10(-5)M determined by the comet assay. Except for PFDoA, all the other PFAS increased ROS generation significantly. For PFHxS and PFUnA the observed ROS increases were dose-dependent. Cells exposed to PFOA were found to have a significant lower TAC compared with the solvent control, whereas a non-significant trend in TAC decrease was observed for PFOS

and PFDoA and an increase tendency for PFHxS, PFNA and PFUnA. Our results indicate a possible genotoxic and cytotoxic potential of the PFAS in human liver cells.

Effect-directed identification of **endocrine disruptors** in plastic baby teethers.
Berger E, Potouridis T, Haeger A, Püttmann W, Wagner M.

Abstract

Concerns have been raised regarding the human health effects of endocrine disrupting chemicals (EDCs), many of which are associated with and leaching from plastics. As infants are particularly vulnerable to EDCs, we have investigated whether plastic teethers for babies represent a relevant source of exposure. Applying effect-directed analysis, we use bioassays to screen teethers, toys used to soothe a baby's teething ache, for endocrine activity and chemical analysis to identify the causative compounds. We detected significant endocrine activity in two of 10 plastic teethers. Those samples leached estrogenic and/or antiandrogenic activity as detected in the Yeast Estrogen Screen and Yeast Antiandrogen Screen. After sample fractionation, gas chromatography-mass spectrometry non-target screening revealed that methyl-, ethyl- and propylparaben were responsible for the observed estrogenic and antiandrogenic activity in one product. The second product is likely to contain at least six different antiandrogenic compounds that remain so far unidentified. This study demonstrates that plastic teethers can be a source of infant exposure to well-established and unknown EDCs. Because of their limited value to the product, but potential toxicity, manufacturers should critically revisit the use of parabens in plastic teethers and further toys. Moreover, plastic teethers might leach EDCs that escape routine analysis and, thus, toxicological evaluation. The resulting uncertainty in product safety poses a problem to consumers, producers and regulators that remain to be resolved.

Bruttolisten (in vitro)

Perflourinated and Polyflourinated compounds

1.**Perfluoroalkylated** substances (PFAS) affect oxidative stress biomarkers **in vitro**.

Wielsøe M, Long M, Ghisari M, Bonefeld-Jørgensen EC. Chemosphere. 2015 Jun;129:239-45. doi: 10.1016/j.chemosphere.2014.10.014. Epub 2014 Nov 12.

2.**In vitro** evaluation of the effects of perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA) on IL-2 production in human T-cells.

Midgett K, Peden-Adams MM, Gilkeson GS, Kamen DL. J Appl Toxicol. 2015 May;35(5):459-65. doi: 10.1002/jat.3037. Epub 2014 Jul 23.

3.Mutagenic Effects of Perfluorooctanesulfonic Acid in gpt Delta Transgenic System Are Mediated by Hydrogen Peroxide.
Wang Y, Zhang X, Wang M, Cao Y, Wang X, Liu Y, Wang J, Wang J, Wu L, Hei TK, Luan Y, Xu A. Environ Sci Technol. 2015 May 19;49(10):6294-303. doi: 10.1021/acs.est.5b00530. Epub 2015 Apr 30.

4.In vivo and **in vitro** isomer-specific biotransformation of **perfluorooctane** sulfonamide in common carp (Cyprinus carpio).

Chen M, Qiang L, Pan X, Fang S, Han Y, Zhu LY. Environ Sci Technol. 2015 Jun 8. [Epub ahead of print]

Plastic derivatives" (BPA, Phthalates and others)

1.Bisphenol-A Mediated Inhibition of Hippocampal Neurogenesis Attenuated by Curcumin via Canonical Wnt Pathway.

Tiwari SK, Agarwal S, Tripathi A, Chaturvedi RK. Mol Neurobiol. 2015 May 12. [Epub ahead of print]

2.Bisphenol A effects on gene expression in children adipocytes: association to metabolic disorders.

Menale C, Piccolo MT, Cirillo G, Calogero RA, Papparella A, Mita L, Del Giuduce EM, Diano N, Crispi S, Mita DG.
J Mol Endocrinol. 2015 Apr 15. pii: JME-14-0282. [Epub ahead of print]

3.Bisphenol-a treatment during pregnancy in mice: a new window of susceptibility for the development of diabetes in mothers later in life.

Alonso-Magdalena P, García-Arévalo M, Quesada I, Nadal Á. Endocrinology. 2015 May;156(5):1659-70. doi: 10.1210/en.2014-1952. Epub 2015 Apr 1.

4.The **endocrine disruptor** bisphenol A may play a role in the aetiopathogenesis of polycystic ovary syndrome in adolescent girls.

Akın L, Kendirci M, Narin F, Kurtoglu S, Saraymen R, Kondolot M, Koçak S, Elmali F. Acta Paediatr. 2015 Apr;104(4):e171-7. doi: 10.1111/apa.12885. Epub 2015 Feb 3.

5.Bisphenol A exposure inhibits germ cell nest breakdown by reducing apoptosis in cultured neonatal mouse ovaries.

Zhou C, Wang W, Peretz J, Flaws JA. Reprod Toxicol. 2015 Jun 4. pii: S0890-6238(15)00103-3. doi: 10.1016/j.reprotox.2015.05.012. [Epub ahead of print]

6.Bisphenol-A modulates receptivity and secretory function of human decidual cells: an **in vitro** study.

Mannelli C, Szóstek AZ, Lukasik K, Carotenuto C, Ietta F, Romagnoli R, Ferretti C, Paulesu L, Wołczyński S, Skarzynski DJ. Reproduction. 2015 May 28. pii: REP-14-0601. [Epub ahead of print]

7.Effects of mono(2-ethylhexyl)**phthalate** on cytoplasmic maturation of oocytes - The bovine model.
Kalo D, Roth Z. Reprod Toxicol. 2015 Apr 18. pii: S0890-6238(15)00062-3. doi: 10.1016/j.reprotox.2015.04.007. [Epub ahead of print]

8.Effects of Diisodecyl **Phthalate** on PPAR:RXR-Dependent Gene Expression Pathways in Sea Bream Hepatocytes.

Cocci P, Mosconi G, Arukwe A, Mozzicafreddo M, Angeletti M, Aretusi G, Palermo FA. Chem Res Toxicol. 2015 May 18;28(5):935-47. doi: 10.1021/tx500529x. Epub 2015 Apr 15.

9.A monograph on the remediation of hazardous phthalates.

Benjamin S, Pradeep S, Sarath Josh M, Kumar S, Masai E. J Hazard Mater. 2015 May 6;298:58-72. doi: 10.1016/j.jhazmat.2015.05.004. [Epub ahead of print] Review.

10.Targeting protein kinase and DNA molecules by diimine-**phthalate** complexes in antiproliferative activity.

Pravin N, Devaraji V, Raman N. Int J Biol Macromol. 2015 Jun 6;79:837-855. doi: 10.1016/j.ijbiomac.2015.06.001. [Epub ahead of print]

11.Human biofluid concentrations of mono(2-ethylhexyl)**phthalate** extrapolated from pharmacokinetics in chimeric mice with humanized liver administered with di(2-ethylhexyl)**phthalate** and physiologically based pharmacokinetic modeling.

Adachi K, Suemizu H, Murayama N, Shimizu M, Yamazaki H. Environ Toxicol Pharmacol. 2015 May;39(3):1067-73. doi: 10.1016/j.etap.2015.02.011. Epub 2015 Mar 20.

12.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. 2015 Jul;35(7):861-9. doi: 10.1002/jat.3085. Epub 2014 Oct 29.

13.Adjuvant effect of an alternative plasticizer, diisopropyl adipate, on a contact hypersensitivity mouse model: link with sensory ion channel TRPA1 activation.

Kurohane K, Kimura A, Terasawa R, Sahara Y, Kobayashi K, Suzuki W, Matsuoka T, Watanabe T, Imai Y. Biol Pharm Bull. 2015 May 9. [Epub ahead of print]

Parabens

1.A case study on quantitative **in vitro** to in vivo extrapolation for environmental esters: Methyl-, propyl- and butylparaben.

Campbell JL, Yoon M, Clewell HJ. Toxicology. 2015 Mar 31. pii: S0300-483X(15)00061-X. doi: 10.1016/j.tox.2015.03.010. [Epub ahead of print]

Pesticides/Fungicides/Insecticides/Biocides

1.A Comparison of ToxCast Test Results with In Vivo and Other **In Vitro** Endpoints for Neuro, Endocrine, and Developmental Toxicities: A Case Study Using Endosulfan and Methidathion.

Silva M, Pham N, Lewis C, Iyer S, Kwok E, Solomon G, Zeise L. Birth Defects Res B Dev Reprod Toxicol. 2015 May 27. doi: 10.1002/bdrb.21140. [Epub ahead of print]

Various EDCs, Mixtures and Other endpoints

1.Mycobacterium smegmatis synthesizes **in vitro** androgens and estrogens from different steroid precursors.

Dlugovitzky DG, Fontela MS, Martinel Lamas DJ, Valdez RA, Romano MC. Can J Microbiol. 2015 Apr 10:1-5. [Epub ahead of print]

2.Effect-directed identification of **endocrine disruptors** in plastic baby teethers.

Berger E, Potouridis T, Haeger A, Püttmann W, Wagner M. J Appl Toxicol. 2015 May 18. doi: 10.1002/jat.3159. [Epub ahead of print]

3.Hazard assessment through hybrid **in vitro** / in silico approach: The case of zearalenone.

Ehrlich VA, Dellafiora L, Mollergues J, Dall'Asta C, Serrant P, Marin-Kuan M, Lo Piparo E, Schilter B, Cozzini P.
ALTEX. 2015 May 18. doi: http://dx.doi.org/10.14573/altex.1412232. [Epub ahead of print]

4.**In Vitro**, Ex Vivo, and In Vivo Determination of Thyroid Hormone Modulating Activity of Benzothiazoles.

Hornung MW, Kosian PA, Haselman JT, Korte JJ, Challis K, Macherla C, Nevalainen E, Degitz SJ. Toxicol Sci. 2015 May 7. pii: kfv090. [Epub ahead of print]

5.Scientific and Regulatory Policy Committee (SRPC) Points to Consider : Histopathology Evaluation of the Pubertal Development and Thyroid Function Assay (OPPTS 890.1450, OPPTS 890.1500) in Rats to Screen for **Endocrine Disruptors**.

Keane KA, Parker GA, Regan KS, Picut C, Dixon D, Creasy D, Giri D, Hukkanen RR. Toxicol Pathol. 2015 May 6. pii: 0192623315579943. [Epub ahead of print]

6.Chlordecone exposure and adverse effects in French West Indies populations.

Multigner L, Kadhel P, Rouget F, Blanchet P, Cordier S. Environ Sci Pollut Res Int. 2015 May 5. [Epub ahead of print]

7.Tracking multiple modes of endocrine activity in Australia's largest inland sewage treatment plant and effluent-receiving environment using a panel of **in vitro** bioassays.

Roberts J, Bain PA, Kumar A, Hepplewhite C, Ellis DJ, Christy AG, Beavis SG.
Environ Toxicol Chem. 2015 May 2. doi: 10.1002/etc.3051. [Epub ahead of print]

8.A nonradioactive uptake assay for rapid analysis of thyroid hormone transporter function.

Jayarama-Naidu R, Johannes J, Meyer F, Wirth EK, Schomburg L, Köhrle J, Renko K.
Endocrinology. 2015 Apr 24:en20151016. [Epub ahead of print]

9.Comparative endpoint sensitivity of **in vitro** estrogen agonist assays.

Dreier DA, Connors KA, Brooks BW.
Regul Toxicol Pharmacol. 2015 Apr 17;72(2):185-193. doi: 10.1016/j.yrtph.2015.04.009. [Epub ahead of print]

10. Advances in the analytical methodologies: Profiling steroids in familiar pathways-challenging dogmas.

Bloem LM, Storbeck KH, Swart P, du Toit T, Schloms L, Swart AC.
J Steroid Biochem Mol Biol. 2015 Apr 11. pii: S0960-0760(15)00106-5. doi: 10.1016/j.jsbmb.2015.04.009. [Epub ahead of print] Review.

11. Nortestosterone-derived synthetic progestogens do not activate the progestogen receptor of Murray-Darling rainbowfish (Melanotaenia fluviatilis) but are potent agonists of androgen receptors alpha and beta.

Bain PA, Kumar A, Ogino Y, Iguchi T.
Aquat Toxicol. 2015 Jun;163:97-101. doi: 10.1016/j.aquatox.2015.03.021. Epub 2015 Mar 31.

12. Assessing reproductive toxicity of two environmental toxicants with a novel **in vitro** human spermatogenic model.

Easley CA 4th, Bradner JM, Moser A, Rickman CA, McEachin ZT, Merritt MM, Hansen JM, Caudle WM.
Stem Cell Res. 2015 May;14(3):347-55. doi: 10.1016/j.scr.2015.03.002. Epub 2015 Mar 25.

13. PCB 77 action in ovary cells - toxic effects, apoptosis induction and cell cycle analysis.

Murati T, Šimić B, Brozovic A, Kniewald J, Miletić Gospić A, Bilandžić N, Kmetič I.
Toxicol Mech Methods. 2015 Apr 2:1-10. [Epub ahead of print]

14. **In vitro** assessment of **endocrine disrupting** potential of naphthenic Acid fractions derived from oil sands-influenced water.

Leclair LA, Pohler L, Wiseman SB, He Y, Arens CJ, Giesy JP, Scully S, Wagner BD, van den Heuvel MR, Hogan NS.
Environ Sci Technol. 2015 May 5;49(9):5743-52. doi: 10.1021/acs.est.5b00077. Epub 2015 Apr 22.

15. In silico and biological analysis of anti-androgen activity of the brominated flame retardants ATE, BATE and DPTE in zebrafish.

Pradhan A, Asnake S, Kharlyngdoh JB, Modig C, Olsson PE.
Chem Biol Interact. 2015 May 25;233:35-45. doi: 10.1016/j.cbi.2015.03.023. Epub 2015 Mar 27.

16. Screening breeding sites of the common toad (Bufo bufo) in England and Wales for evidence of **endocrine disrupting** activity.

Pickford DB, Jones A, Velez-Pelez A, Iguchi T, Mitsui N, Tooi O. Ecotoxicol Environ Saf. 2015 Jul;117:7-19. doi: 10.1016/j.ecoenv.2015.03.006. Epub 2015 Mar 25.

17. Intestinal pregnane x receptor links xenobiotic exposure and hypercholesterolemia.

Sui Y, Helsley RN, Park SH, Song X, Liu Z, Zhou C.
Mol Endocrinol. 2015 May;29(5):765-76. doi: 10.1210/me.2014-1355. Epub 2015 Mar 26.

18. The adverse effects of aldrin and dieldrin on both myometrial contractions and the secretory functions of bovine ovaries and uterus **in vitro**.

Wrobel MH, Grzeszczyk M, Mlynarczuk J, Kotwica J.
Toxicol Appl Pharmacol. 2015 May 15;285(1):23-31. doi: 10.1016/j.taap.2015.03.005. Epub 2015 Mar 11.

19. Investigation on the toxic potential of Tribulus terrestris **in vitro**.

Abudayyak M, Jannuzzi AT, Özhan G, Alpertunga B.
Pharm Biol. 2015 Apr;53(4):469-76. doi: 10.3109/13880209.2014.924019. Epub 2014 Dec 4.

20. **Endocrine disruptors**: New players in the pathophysiology of type 2 diabetes?

Chevalier N, Fénichel P. Diabetes Metab. 2015 Apr;41(2):107-115. doi: 10.1016/j.diabet.2014.09.005. Epub 2014 Nov 20. Review.

21. Targeted tumor theranostics using folate-conjugated and camptothecin-loaded acoustic nanodroplets in a mouse xenograft model.

Chen WT, Kang ST, Lin JL, Wang CH, Chen RC, Yeh CK.
Biomaterials. 2015 Jun;53:699-708. doi: 10.1016/j.biomaterials.2015.02.122. Epub 2015 Mar 25.

22. Controlling oxygen release from hollow microparticles for prolonged cell survival under hypoxic environment.

Lee HY, Kim HW, Lee JH, Oh SH. Biomaterials. 2015 Jun;53:583-91. doi: 10.1016/j.biomaterials.2015.02.117. Epub 2015 Mar 23.

23. Thrombolytic efficacy and enzymatic activity of rt-PA-loaded echogenic liposomes.

Bader KB, Bouchoux G, Peng T, Klegerman ME, McPherson DD, Holland CK. J Thromb Thrombolysis. 2015 Apr 2. [Epub ahead of print]

24. Modulating the Anticancer Activity of Ruthenium(II)-Arene Complexes.

Clavel CM, Păunescu E, Nowak-Sliwinska P, Griffioen AW, Scopelliti R, Dyson PJ. J Med Chem. 2015 Apr 23;58(8):3356-65. doi: 10.1021/jm501655t. Epub 2015 Apr 7.

25. Revealing signal from noisy (19) F MR images by chemical shift artifact correction.

Meissner M, Reisert M, Hugger T, Hennig J, von Elverfeldt D, Leupold J. Magn Reson Med. 2015 Jun;73(6):2225-33. doi: 10.1002/mrm.25370. Epub 2014 Jul 17.

26. Disruption of endocrine function in H295R cell **in vitro** and in zebrafish in vivo by naphthenic acids.

Wang J, Cao X, Sun J, Huang Y, Tang X. J Hazard Mater. 2015 Jun 4;299:1-9. doi: 10.1016/j.jhazmat.2015.06.004. [Epub ahead of print]

27. Understanding the Molecular Basis for Differences in Responses of Fish Estrogen Receptor Subtypes to Environmental Estrogens.

Tohyama S, Miyagawa S, Lange A, Ogino Y, Mizutani T, Tatarazako N, Katsu Y, Ihara M, Tanaka H, Ishibashi H, Kobayashi T, Tyler CR, Iguchi T. Environ Sci Technol. 2015 Jun 16;49(12):7439-47. doi: 10.1021/acs.est.5b00704. Epub 2015 Jun 2.

28. **In vitro** and in vivo studies of the **endocrine disrupting** potency of cadmium in roach (Rutilus rutilus) liver.

Gerbron M, Geraudie P, Xuereb B, Marie S, Minier C. Mar Pollut Bull. 2015 Jun 30;95(2):582-9. doi: 10.1016/j.marpolbul.2015.03.043. Epub 2015 May 27.

29. Disruption of Type 2 Iodothyronine Deiodinase Activity in Cultured Human Glial Cells by Polybrominated Diphenyl Ethers.

Roberts SC, Bianco AC, Stapleton HM. Chem Res Toxicol. 2015 Jun 15;28(6):1265-74. doi: 10.1021/acs.chemrestox.5b00072. Epub 2015 Jun 2

In vivo studier ved DTU Fødevareinstituttet

Søgning er udført på PubMed og dækker perioden April 2015- ultimo Juni 2015

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 (endocrine disrupt*) AND risk assessment

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 76 artikler (Bruttolisten).

Disse er efter Miljøstyrelsens ønske blevet fordelt i grupper efter stofnavne: ”Plastic derivatives” (BPA, Phthalates and others), Perflourinated and Polyflourinated compounds, ”Pesticides/fungicides”, ” Endocrine disruption and risk assessment” og Various EDCs, Mixtures and Other endpoints”.

Udvalgte publikationer

To artikler er blevet udvalgt til nærmere beskrivelse (abstrakt og konklusion) og 2 andre blot til abstract. Disse artikler er valgt fordi vi mener de bidrager til ny viden om hormonforstyrrende stoffer og her er der særligt fokus på brystvævsmetoder (Stanko et al. 2015) og Non-monoton dosis respons (Lagarde et al. 2015) samt debat om kriterier for hormonforstyrrende stoffer (hhv. Zoeller et al. 2014 og Autrup et al. 2015). **Rigtig God læselyst.**

Ud fra bruttolisten (se længere nede i dokumentet) er udvalgt følgende 2 artikler til engelsk abstrakt og dansk resume og kommentarer samt 2 artikler til engelsk abstrakt.

Application of Sholl analysis to quantify changes in growth and development in rat mammary gland whole mounts.
Stanko JP, Easterling MR, Fenton SE.
Reprod Toxicol. 2015 Jul;54:129-35. doi: 10.1016/j.reprotox.2014.11.004. Epub 2014 Nov 15.

Abstract
Studies that utilize the rodent mammary gland (MG) as an endpoint for assessing the developmental toxicity of chemical exposures typically employ either basic dimensional measurements or developmental scoring of morphological characteristics as a means to quantify MG development. There are numerous means by which to report these developmental changes, leading to inconsistent translation across laboratories. The Sholl analysis is a method historically used for quantifying neuronal dendritic patterns. The present study describes the use of the Sholl analysis to quantify MG branching characteristics. Using this method, we were able to detect significant differences in branching density in MG of peripubertal female Sprague Dawley rats that had been exposed to vehicle or a potent estrogen. These data suggest the Sholl analysis can be an effective tool for quantitatively measuring an important characteristic of MG development and for examining associations between MG growth and density and adverse effects in the breast.

Non-monotonic dose-response relationships and **endocrine disruptors**: a qualitative method of **assessment**.

Lagarde F, Beausoleil C, Belcher SM, Belzunces LP, Emond C, Guerbet M, Rousselle C.
Environ Health. 2015 Feb 11;14:13. doi: 10.1186/1476-069X-14-13.

Abstract:

Experimental studies investigating the effects of endocrine disruptors frequently identify potential unconventional dose-response relationships called non-monotonic dose-response (NMDR) relationships. Standardized approaches for investigating NMDR relationships in a risk assessment context are missing. The aim of this work was to develop criteria for assessing the strength of NMDR relationships. A literature search was conducted to identify published studies that report NMDR relationships with endocrine disruptors. Fifty-one experimental studies that investigated various effects associated with endocrine disruption elicited by many substances were selected. Scoring criteria were applied by adaptation of an approach previously used for identification of hormesis-type dose-response relationships. Out of the 148 NMDR relationships analyzed, 82 were categorized with this method as having a "moderate" to "high" level of plausibility for various effects. Numerous modes of action described in the literature can explain such phenomena. NMDR can arise from numerous molecular mechanisms such as opposing effects induced by multiple receptors differing by their affinity, receptor desensitization, negative feedback with increasing dose, or dose-dependent metabolism modulation. A stepwise decision tree was developed as a tool to standardize the analysis of NMDR relationships observed in the literature with the final aim to use these results in a Risk Assessment purpose. This decision tree was finally applied to studies focused on the effects of bisphenol A.

A path forward in the debate over health impacts of **endocrine disrupting** chemicals.

Zoeller RT, Bergman Å, Becher G, Bjerregaard P, Bornman R, Brandt I, Iguchi T, Jobling S, Kidd KA, Kortenkamp A, Skakkebaek NE, Toppari J, Vandenberg LN.
Environ Health. 2014 Dec 22;14:118. doi: 10.1186/1476-069X-13-118.

Abstract

Several recent publications reflect debate on the issue of "endocrine disrupting chemicals" (EDCs), indicating that two seemingly mutually exclusive perspectives are being articulated separately and independently. Considering this, a group of scientists with expertise in basic science, medicine and risk assessment reviewed the various aspects of the debate to identify the most significant areas of dispute and to propose a path forward. We identified four areas of debate. The first is about the definitions for terms such as "endocrine disrupting chemical", "adverse effects", and "endocrine system". The second is focused on elements of hormone action including "potency", "endpoints", "timing", "dose" and "thresholds". The third addresses the information needed to establish sufficient evidence of harm. Finally, the fourth focuses on the need to develop and the characteristics of transparent, systematic methods to review the EDC literature. Herein we identify areas of general consensus and propose resolutions for these four areas that would allow the field to move beyond the current and, in our opinion, ineffective debate.

Principles of Pharmacology and Toxicology Also Govern Effects of Chemicals on the Endocrine System.

Autrup H, Barile FA, Blaauboer BJ, Degen GH, Dekant W, Dietrich D, Domingo JL, Gori GB, Greim H, Hengstler JG, Kacew S, Marquardt H, Pelkonen O, Savolainen K, Vermeulen NP.
Toxicol Sci. 2015 Jul;146(1):11-5. doi: 10.1093/toxsci/kfv082. Epub 2015 May 30.

Abstract

The present debate on chemicals with Hormonal activity, often termed 'endocrine disruptors', is highly controversial and includes challenges of the present paradigms used in toxicology and in hazard identification and risk characterization. In our opinion, chemicals with hormonal activity can be subjected to the well-evaluated health risk characterization approach used for many years including adverse outcome pathways. Many of the points arguing for a specific approach for risk characterization of chemicals with hormonal activity are based on highly speculative conclusions. These conclusions are not well supported when evaluating the available information.

Bruttolisten (in vivo)

Plastic derivatives (BPA, Phthalates and others)

BPA (and alternatives)

1. Bisphenol A affects placental layers morphology and angiogenesis during early pregnancy phase in **mice**.
Tait S, Tassinari R, Maranghi F, Mantovani A.
J Appl Toxicol. 2015 Jun 9. doi: 10.1002/jat.3176. [Epub ahead of print]

2. Bisphenol A exposure inhibits germ cell nest breakdown by reducing apoptosis in cultured neonatal mouse ovaries.
Zhou C, Wang W, Peretz J, Flaws JA.
Reprod Toxicol. 2015 Jun 4. pii: S0890-6238(15)00103-3. doi: 10.1016/j.reprotox.2015.05.012. [Epub ahead of print]

3. Early programing of uterine tissue by bisphenol A: Critical evaluation of evidence from animal exposure studies.
Suvorov A, Waxman DJ.
Reprod Toxicol. 2015 May 28. pii: S0890-6238(15)00076-3. doi: 10.1016/j.reprotox.2015.05.008. [Epub ahead of print] Review.

4. Physiological response of cardiac tissue to Bisphenol A: alterations in ventricular pressure and contractility.
Posnack NG, Brooks D, Chandra A, Jaimes R 3rd, Sarvazyan N, Kay MW.
Am J Physiol Heart Circ Physiol. 2015 May 15:ajpheart.00272.2015. doi: 10.1152/ajpheart.00272.2015. [Epub ahead of print]

5. Long-term oral exposure to bisphenol A induces glucose intolerance and insulin resistance.
Moon MK, Jeong IK, Jung Oh T, Ahn HY, Kim HH, Park YJ, Jang HC, Park KS.
J Endocrinol. 2015 Jul;226(1):35-42. doi: 10.1530/JOE-14-0714. Epub 2015 May 13.

6. Correction: An Investigation of the **Endocrine-Disruptive** Effects of Bisphenol A in Human and **Rat** Fetal Testes.
PLOS ONE Staff.
PLoS One. 2015 May 4;10(5):e0128051. doi: 10.1371/journal.pone.0128051. eCollection 2015.

7. Neurochemical impact of bisphenol A in the hippocampus and cortex of adult male albino **rats**.
Khadrawy YA, Noor NA, Mourad IM, Ezz HS.
Toxicol Ind Health. 2015 Apr 22. pii: 0748233715579803. [Epub ahead of print]

8. Perinatal exposure to low-dose of bisphenol A causes anxiety-like alteration in adrenal axis regulation and behaviors of **rat** offspring: a potential role for metabotropic glutamate 2/3 receptors.
Zhou R, Chen F, Feng X, Zhou L, Li Y, Chen L.
J Psychiatr Res. 2015 May;64:121-9. doi: 10.1016/j.jpsychires.2015.02.018. Epub 2015 Mar 11.

9. Developmental bisphenol A (BPA) exposure leads to sex-specific modification of hepatic gene expression and epigenome at birth that may exacerbate high-fat diet-induced hepatic steatosis.
Strakovsky RS, Wang H, Engeseth NJ, Flaws JA, Helferich WG, Pan YX, Lezmi S.

Toxicol Appl Pharmacol. 2015 Apr 15;284(2):101-12. doi: 10.1016/j.taap.2015.02.021. Epub 2015 Mar 5.

10.Prenatal Bisphenol A exposure delays the development of the male **rat** mammary gland.
Kass L, Durando M, Altamirano GA, Manfroni-Ghibaudo GE, Luque EH, Muñoz-de-Toro M.
Reprod Toxicol. 2015 Jul;54:37-46. doi: 10.1016/j.reprotox.2014.02.001. Epub 2014 Feb 22.

11.Low circulating levels of bisphenol-A induce cognitive deficits and loss of asymmetric spine synapses in dorsolateral prefrontal cortex and hippocampus of adult male monkeys.
Elsworth JD, Jentsch JD, Groman SM, Roth RH, Redmond ED Jr, Leranth C.
J Comp Neurol. 2015 Jun 1;523(8):1248-57. doi: 10.1002/cne.23735. Epub 2015 Feb 17.

12. Neurochemical impact of **bisphenol A** in the hippocampus and cortex of adult male albino rats.
Khadrawy YA, Noor NA, Mourad IM, Ezz HS.
Toxicol Ind Health. 2015 Apr 22. pii: 0748233715579803. [Epub ahead of print]

13.**Bisphenol-A** treatment during pregnancy in mice: a new window of susceptibility for the development of diabetes in mothers later in life.
Alonso-Magdalena P, García-Arévalo M, Quesada I, Nadal Á.
Endocrinology. 2015 May;156(5):1659-70. doi: 10.1210/en.2014-1952. Epub 2015 Apr 1.

14.**Bisphenol-A** induces expression of HOXC6, an estrogen-regulated homeobox-containing gene associated with breast cancer.
Hussain I, Bhan A, Ansari KI, Deb P, Bobzean SA, Perrotti LI, Mandal SS.
Biochim Biophys Acta. 2015 Jun;1849(6):697-708. doi: 10.1016/j.bbagrm.2015.02.003. Epub 2015 Feb 25.

15.**Bisphenol A** and nonylphenol have the potential to stimulate the migration of ovarian cancer cells by inducing epithelial-mesenchymal transition via an estrogen receptor dependent pathway.
Kim YS, Hwang KA, Hyun SH, Nam KH, Lee CK, Choi KC.
Chem Res Toxicol. 2015 Apr 20;28(4):662-71. doi: 10.1021/tx500443p. Epub 2015 Mar 3.

16.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. 2015 Jul;54:58-65. doi: 10.1016/j.reprotox.2014.09.012. Epub 2014 Sep 30.

17.**Bisphenol A** environmental exposure and the detrimental effects on human metabolic health: is it necessary to revise the risk assessment in vulnerable population?
Valentino R, D'Esposito V, Ariemma F, Cimmino I, Beguinot F, Formisano P.
J Endocrinol Invest. 2015 Jun 24. [Epub ahead of print]

18.Weak activity of UDP-glucuronosyltransferase toward Bisphenol analogs in mouse perinatal development.
Yabusaki R, Iwano H, Tsuahima S, Koike N, Ohtani N, Tanemura K, Inoue H, Yokota H.
J Vet Med Sci. 2015 Jun 15. [Epub ahead of print]

Phthalates and others

1. Phthalate metabolites and **bisphenol-A** in association with circulating angiogenic biomarkers across pregnancy.
Ferguson KK, McElrath TF, Cantonwine DE, Mukherjee B, Meeker JD.

Placenta. 2015 Jun;36(6):699-703. doi: 10.1016/j.placenta.2015.04.002. Epub 2015 Apr 14.

2.Influence of phthalates on glucose homeostasis and atherosclerosis in hyperlipidemic **mice**.
Zhou W, Chen MH, Shi W.
BMC Endocr Disord. 2015 Apr 2;15:13. doi: 10.1186/s12902-015-0015-4.

3.Effects of uterine and lactational exposure to di-(2-ethylhexyl) phthalate on spatial memory and NMDA receptor of hippocampus in **mice**.
Dai Y, Yang Y, Xu X, Hu Y.
Horm Behav. 2015 May;71:41-8. doi: 10.1016/j.yhbeh.2015.03.008. Epub 2015 Apr 11.

4.Di(2-ethylhexyl) phthalate inhibits antral follicle growth, induces atresia, and inhibits steroid hormone production in cultured mouse antral follicles.
Hannon PR, Brannick KE, Wang W, Gupta RK, Flaws JA.
Toxicol Appl Pharmacol. 2015 Apr 1;284(1):42-53. doi: 10.1016/j.taap.2015.02.010. Epub 2015 Feb 18.

5.A monograph on the remediation of hazardous **phthalates**.
Benjamin S, Pradeep S, Sarath Josh M, Kumar S, Masai E.
J Hazard Mater. 2015 May 6;298:58-72. doi: 10.1016/j.jhazmat.2015.05.004. [Epub ahead of print] Review.

6.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 FA, Jagadeesan A.
Hum Exp Toxicol. 2015 Jun;34(6):575-90. doi: 10.1177/0960327114555926. Epub 2014 Oct 28.

7.Impact of low molecular weight **phthalates** in inducing reproductive malfunctions in male mice: Special emphasis on Sertoli cell functions.
Kumar N, Srivastava S, Roy P.
Gen Comp Endocrinol. 2015 May 1;215:36-50. doi: 10.1016/j.ygcen.2014.09.012. Epub 2014 Sep 28.

8.Perinatal exposure to di-(2-ethylhexyl) phthalate affects anxiety- and depression-like **behaviors** in mice.
Xu X, Yang Y, Wang R, Wang Y, Ruan Q, Lu Y.
Chemosphere. 2015 Apr;124:22-31. doi: 10.1016/j.chemosphere.2014.10.056. Epub 2014 Nov 28.

9.The Mechanism of Environmental **Endocrine Disruptors** (DEHP) Induces Epigenetic Transgenerational Inheritance of Cryptorchidism.
Chen J, Wu S, Wen S, Shen L, Peng J, Yan C, Cao X, Zhou Y, Long C, Lin T, He D, Hua Y, Wei G.
PLoS One. 2015 Jun 2;10(6):e0126403. doi: 10.1371/journal.pone.0126403. eCollection 2015.

10.DEHP exposure impairs mouse oocyte cyst breakdown and primordial follicle assembly through estrogen receptor-dependent and independent mechanisms.
Mu X, Liao X, Chen X, Li Y, Wang M, Shen C, Zhang X, Wang Y, Liu X, He J.
J Hazard Mater. 2015 Jun 1;298:232-240. doi: 10.1016/j.jhazmat.2015.05.052. [Epub ahead of print]

11. Cyclohexane-1,2-dicarboxylic acid diisononyl ester and metabolite effects on **rat** epididymal stromal vascular fraction differentiation of adipose tissue.
Campioli E, Duong TB, Deschamps F, Papadopoulos V.
Environ Res. 2015 Apr 7;140:145-156. doi: 10.1016/j.envres.2015.03.036. [Epub ahead of print]

Perflourinated and Polyflourinated compounds

1.**Perfluorinated** Alkyl Substances: Emerging Insights Into Health Risks.
Grandjean P, Clapp R.
New Solut. 2015 Jun 17. pii: 1048291115590506. [Epub ahead of print]

2.**Perfluorononanoic** acid disturbed the metabolism of lipid in the liver of streptozotocin-induced diabetic rats.
Fang X, Gao G, Zhang X, Wang H.
Toxicol Mech Methods. 2015 Jun 9:1-6. [Epub ahead of print]

3.Prenatal exposure to the contaminant **perfluorooctane** sulfonate elevates lipid peroxidation during mouse fetal development but not in the pregnant dam.
Lee YY, Wong CK, Oger C, Durand T, Galano JM, Lee JC.
Free Radic Res. 2015 Apr 24:1-11. [Epub ahead of print]

4.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. 2015 Jun;43(4):546-57. doi: 10.1177/0192623314551841. Epub 2014 Oct 16.

5. Programming of metabolic effects in C57BL/6JxFVB **mice** by in utero and lactational exposure to perfluorooctanoic acid.
van Esterik JC, Sales LB, Dollé ME, Håkansson H, Herlin M, Legler J, van der Ven LT.
Arch Toxicol. 2015 Apr 1. [Epub ahead of print]

Parabens

1.A case study on quantitative in vitro to in vivo extrapolation for environmental esters: Methyl-, propyl- and butylparaben.
Campbell JL, Yoon M, Clewell HJ.
Toxicology. 2015 Jun 5;332:67-76. doi: 10.1016/j.tox.2015.03.010. Epub 2015 Mar 31.

Pesticides/Fungicides/Insecticides

1.Molecular Mechanisms of Amitraz **Mammalian** Toxicity: A Comprehensive Review of Existing Data.
Del Pino J, Moyano-Cires PV, Anadon MJ, Díaz MJ, Lobo M, Capo MA, Frejo MT.
Chem Res Toxicol. 2015 Jun 15;28(6):1073-94. doi: 10.1021/tx500534x. Epub 2015 May 26.

2.Peri-pubertal administration of 3-nitro-1,2,4-triazol-5-one (NTO) affects reproductive organ development in male but not female Sprague Dawley **rats**.
Lent EM, Crouse LC, Wallace SM, Carroll EE.
Reprod Toxicol. 2015 May 9. pii: S0890-6238(15)00068-4. doi: 10.1016/j.reprotox.2015.04.013. [Epub ahead of print]

3.Oral exposure of **mice** to carbendazim induces hepatic lipid metabolism disorder and gut microbiota dysbiosis.
Jin Y, Zeng Z, Wu Y, Zhang S, Fu Z.
Toxicol Sci. 2015 Jun 11. pii: kfv115. [Epub ahead of print]

4.A Comparison of ToxCast Test Results with **In Vivo** and Other In Vitro Endpoints for Neuro, Endocrine, and Developmental Toxicities: A Case Study Using Endosulfan and Methidathion.
Silva M, Pham N, Lewis C, Iyer S, Kwok E, Solomon G, Zeise L.
Birth Defects Res B Dev Reprod Toxicol. 2015 May 27. doi: 10.1002/bdrb.21140. [Epub ahead of print]

5.In Vitro, Ex Vivo, and **In Vivo** Determination of Thyroid Hormone Modulating Activity of Benzothiazoles.
Hornung MW, Kosian PA, Haselman JT, Korte JJ, Challis K, Macherla C, Nevalainen E, Degitz SJ.
Toxicol Sci. 2015 May 7. pii: kfv090. [Epub ahead of print]

6.Dietary exposure in utero and during lactation to a mixture of genistein and an anti-androgen fungicide in a **rat** mammary carcinogenesis model.
Phrakonkham P, Brouland JP, Saad Hel S, Bergès R, Pimpie C, Pocard M, Canivenc-Lavier MC, Perrot-Applanat M.
Reprod Toxicol. 2015 Jul;54:101-9. doi: 10.1016/j.reprotox.2014.05.016. Epub 2014 Jun 8.

7.Enantioselective disruption of the endocrine system by Cis-Bifenthrin in the male **mice**.
Jin Y, Wang J, Pan X, Miao W, Lin X, Wang L, Fu Z.
Environ Toxicol. 2015 Jul;30(7):746-54. doi: 10.1002/tox.21954. Epub 2014 Jan 21.

8.Peri-pubertal administration of 3-nitro-1,2,4-triazol-5-one (NTO) affects reproductive organ development in male but not female Sprague Dawley **rats**.
Lent EM, Crouse LC, Wallace SM, Carroll EE.
Reprod Toxicol. 2015 May 9. pii: S0890-6238(15)00068-4. doi: 10.1016/j.reprotox.2015.04.013. [Epub ahead of print]

EDC and risk assessment

1.A path forward in the debate over health impacts of **endocrine disrupting** chemicals.
Zoeller RT, Bergman Å, Becher G, Bjerregaard P, Bornman R, Brandt I, Iguchi T, Jobling S, Kidd KA, Kortenkamp A, Skakkebaek NE, Toppari J, Vandenberg LN.
Environ Health. 2014 Dec 22;14:118. doi: 10.1186/1476-069X-13-118. **(abstract)**

2. Principles of Pharmacology and Toxicology Also Govern Effects of Chemicals on the Endocrine System.
Autrup H, Barile FA, Blaauboer BJ, Degen GH, Dekant W, Dietrich D, Domingo JL, Gori GB, Greim H, Hengstler JG, Kacew S, Marquardt H, Pelkonen O, Savolainen K, Vermeulen NP.
Toxicol Sci. 2015 Jul;146(1):11-5. doi: 10.1093/toxsci/kfv082. Epub 2015 May 30. **(abstract)**

3. Non-monotonic dose-response relationships and **endocrine disruptors**: a qualitative method of **assessment**.
Lagarde F, Beausoleil C, Belcher SM, Belzunces LP, Emond C, Guerbet M, Rousselle C.
Environ Health. 2015 Feb 11;14:13. doi: 10.1186/1476-069X-14-13.**(valgt)**

4. Assessing dose-response relationships for **endocrine disrupting** chemicals (EDCs): a focus on non-monotonicity.
Zoeller RT, Vandenberg LN.
Environ Health. 2015 May 15;14:42. doi: 10.1186/s12940-015-0029-4.

5. An approach to the identification and regulation of **endocrine disrupting** pesticides.
Ewence A, Brescia S, Johnson I, Rumsby PC.
Food Chem Toxicol. 2015 Apr;78:214-20. doi: 10.1016/j.fct.2015.01.011. Epub 2015 Feb 7. Review.

6. Why **endocrine disrupting** chemicals (EDCs) challenge traditional **risk assessment** and how to respond.
Futran Fuhrman V, Tal A, Arnon S.
J Hazard Mater. 2015 Apr 9;286:589-611. doi: 10.1016/j.jhazmat.2014.12.012. Epub 2014 Dec 12. Review.

Various EDCs, Mixtures and Other endpoints

1. Application of Sholl analysis to quantify changes in growth and development in **rat** mammary gland whole mounts.
Stanko JP, Easterling MR, Fenton SE.
Reprod Toxicol. 2015 Jul;54:129-35. doi: 10.1016/j.reprotox.2014.11.004. Epub 2014 Nov 15.**Valgt**

2.The effects of prenatal PCBs on adult social behavior in **rats**.
Reilly MP, Weeks CD, Topper VY, Thompson LM, Crews D, Gore AC.
Horm Behav. 2015 Jun 17. pii: S0018-506X(15)00107-5. doi: 10.1016/j.yhbeh.2015.06.002. [Epub ahead of print]

3. Polychlorinated biphenyls: New evidence from the last decade.
Faroon O, Ruiz P.
Toxicol Ind Health. 2015 Jun 8. pii: 0748233715587849. [Epub ahead of print]

4. Accumulation of organotins in seafood leads to reproductive tract abnormalities in female **rats**.
Podratz PL, Merlo E, Sena GC, Morozesk M, Bonomo MM, Matsumoto ST, da Costa MB, Zamprogno GC, Brandão PA, Carneiro MT, Miguel EC, Miranda-Alves L, Silva IV, Graceli JB.
Reprod Toxicol. 2015 Jun 4. pii: S0890-6238(15)00071-4. doi: 10.1016/j.reprotox.2015.05.003. [Epub ahead of print]

5. Disruption of parenting behaviors in california **mice**, a monogamous rodent species, by **endocrine disrupting** chemicals.
Johnson SA, Javurek AB, Painter MS, Peritore MP, Ellersieck MR, Roberts RM, Rosenfeld CS.
PLoS One. 2015 Jun 3;10(6):e0126284. doi: 10.1371/journal.pone.0126284. eCollection 2015.

6. Phototherapeutic Effect of Low-Level Laser on Thyroid Gland of Gamma-Irradiated **Rats**.
Morcos N, Omran M, Ghanem H, Elahdal M, Kamel N, Attia E.
Photochem Photobiol. 2015 May 14. doi: 10.1111/php.12465. [Epub ahead of print]

7. Scientific and Regulatory Policy Committee (SRPC) Points to Consider : Histopathology Evaluation of the Pubertal Development and Thyroid Function Assay (OPPTS 890.1450, OPPTS 890.1500) in **Rats** to Screen for **Endocrine Disruptors**.
Keane KA, Parker GA, Regan KS, Picut C, Dixon D, Creasy D, Giri D, Hukkanen RR.
Toxicol Pathol. 2015 May 6. pii: 0192623315579943. [Epub ahead of print]

8. In Vitro, Ex Vivo, and **In Vivo** Determination of Thyroid Hormone Modulating Activity of Benzothiazoles.
Hornung MW, Kosian PA, Haselman JT, Korte JJ, Challis K, Macherla C, Nevalainen E, Degitz SJ.
Toxicol Sci. 2015 May 7. pii: kfv090. [Epub ahead of print]

9. Effects of tributyltin chloride on developing mouse oocytes and preimplantation embryos.
Huang XJ, Shen M, Wang L, Yu F, Wu W, Liu HL.
Microsc Microanal. 2015 Apr;21(2):358-67. doi: 10.1017/S1431927615000161.

10. Exposure to **endocrine disruptor** induces transgenerational epigenetic deregulation of microRNAs in primordial germ cells.
Brieño-Enríquez MA, García-López J, Cárdenas DB, Guibert S, Cleroux E, Děd L, Hourcade Jde D, Pěknicová J, Weber M, Del Mazo J.
PLoS One. 2015 Apr 21;10(4):e0124296. doi: 10.1371/journal.pone.0124296. eCollection 2015.

11. Comparative endpoint sensitivity of in vitro estrogen agonist assays.
Dreier DA, Connors KA, Brooks BW.
Regul Toxicol Pharmacol. 2015 Jul;72(2):185-93. doi: 10.1016/j.yrtph.2015.04.009. Epub 2015 Apr 17.

12. Current understanding of hypospadias: relevance of animal models.
Cunha GR, Sinclair A, Risbridger G, Hutson J, Baskin LS.
Nat Rev Urol. 2015 May;12(5):271-280. doi: 10.1038/nrurol.2015.57. Epub 2015 Apr 7. Review.

13. Pronamide: Weight of evidence for potential estrogen, androgen or thyroid effects.
Marty MS, Papineni S, Coady KK, Rasoulpour RJ, Pottenger LH, Eisenbrandt DL.
Regul Toxicol Pharmacol. 2015 Jul;72(2):405-22. doi: 10.1016/j.yrtph.2015.03.016. Epub 2015 Apr 4.

14.[Corrigendum] Alterations in gene expression during sexual differentiation in androgen receptor knockout **mice** induced by environmental **endocrine disruptors**.
Liu D, Shen L, Tao Y, Kuang Y, Cai L, Wang D, He M, Tong X, Zhou S, Sun J, Shi C, Wang C, Wu Y.
Int J Mol Med. 2015 Apr;35(4):1147. doi: 10.3892/ijmm.2015.2097. Epub 2015 Feb 11.

15. The ChemScreen project to design a pragmatic alternative approach to predict reproductive toxicity of chemicals.
van der Burg B, Wedebye EB, Dietrich DR, Jaworska J, Mangelsdorf I, Paune E, Schwarz M, Piersma AH, Kroese ED.
Reprod Toxicol. 2015 Aug 1;55:114-23. doi: 10.1016/j.reprotox.2015.01.008. Epub 2015 Feb 2.

16. Persistent organic pollutants and obesity: are they potential mechanisms for breast cancer promotion?
Reaves DK, Ginsburg E, Bang JJ, Fleming JM.
Endocr Relat Cancer. 2015 Apr;22(2):R69-86. doi: 10.1530/ERC-14-0411. Epub 2015 Jan 26. Review.

17. Development of phenotypic and transcriptional biomarkers to evaluate relative activity of potentially estrogenic chemicals in ovariectomized **mice**.
Hewitt SC, Winuthayanon W, Pockette B, Kerns RT, Foley JF, Flagler N, Ney E, Suksamrarn A, Piyachaturawat P, Bushel PR, Korach KS.
Environ Health Perspect. 2015 Apr;123(4):344-52. doi: 10.1289/ehp.1307935. Epub 2015 Jan 9.

18. Effect of maternal exposure to **endocrine disrupting** chemicals on reproduction and mammary gland development in female Sprague-Dawley **rats**.
Manservisi F, Gopalakrishnan K, Tibaldi E, Hysi A, Iezzi M, Lambertini L, Teitelbaum S, Chen J, Belpoggi F.
Reprod Toxicol. 2015 Jul;54:110-9. doi: 10.1016/j.reprotox.2014.12.013. Epub 2014 Dec 29.

19. **Endocrine disruptors**: new players in the pathophysiology of type 2 diabetes?
Chevalier N, Fénichel P.
Diabetes Metab. 2015 Apr;41(2):107-15. doi: 10.1016/j.diabet.2014.09.005. Epub 2014 Nov 20. Review.

20. Postnatal development of the testis in the **rat**: morphologic study and correlation of morphology to neuroendocrine parameters.
Picut CA, Remick AK, de Rijk EP, Simons ML, Stump DG, Parker GA.
Toxicol Pathol. 2015 Apr;43(3):326-42. doi: 10.1177/0192623314547279. Epub 2014 Sep 11.

21. The Effects of **Endocrine Disrupting** Chemicals on the Ovary.
Patel S, Zhou C, Rattan S, Flaws JA.
Biol Reprod. 2015 Jun 10. pii: biolreprod.115.130336. [Epub ahead of print]

22. Multigenerational and transgenerational effects of **endocrine disrupting** chemicals: A role for altered epigenetic regulation?
Xin F, Susiarjo M, Bartolomei MS.
Semin Cell Dev Biol. 2015 May 28. pii: S1084-9521(15)00105-6. doi: 10.1016/j.semcdb.2015.05.008. [Epub ahead of print] Review.

23. Nuclear receptors and **endocrine disruptors** in fetal and neonatal testes: a gapped landscape.
Rouiller-Fabre V, Guerquin MJ, N'Tumba-Byn T, Muczynski V, Moison D, Tourpin S, Messiaen S, Habert R, Livera G.
Front Endocrinol (Lausanne). 2015 May 7;6:58. doi: 10.3389/fendo.2015.00058. eCollection 2015. Review.

24. Disruption of parenting **behaviors** in california mice, a monogamous rodent species, by **endocrine disrupting** chemicals.
Johnson SA, Javurek AB, Painter MS, Peritore MP, Ellersieck MR, Roberts RM, Rosenfeld CS.
PLoS One. 2015 Jun 3;10(6):e0126284. doi: 10.1371/journal.pone.0126284. eCollection 2015.

25. The Effects of **Endocrine Disrupting** Chemicals on the Ovary.
Patel S, Zhou C, Rattan S, Flaws JA.
Biol Reprod. 2015 Jun 10. pii: biolreprod.115.130336. [Epub ahead of print]

26. Multigenerational and transgenerational effects of **endocrine disrupting** chemicals: A role for altered epigenetic regulation?
Xin F, Susiarjo M, Bartolomei MS.
Semin Cell Dev Biol. 2015 May 28. pii: S1084-9521(15)00105-6. doi: 10.1016/j.semcdb.2015.05.008. [Epub ahead of print] Review.

27. Targeted tumor theranostics using folate-conjugated and camptothecin-loaded acoustic nanodroplets in a mouse xenograft model.
Chen WT, Kang ST, Lin JL, Wang CH, Chen RC, Yeh CK.
Biomaterials. 2015 Jun;53:699-708. doi: 10.1016/j.biomaterials.2015.02.122. Epub 2015 Mar 25.

Wildlife studier ved Biologisk Institut, Syddansk Universitet (SDU)

Søgningen er udført på Web of Knowledge (all databases) og dækker perioden 21/3 – 24/6 2015.

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*

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.

Udvalgte artikler

Artikel 1: Dicamba affects sex steroid hormone level and mRNA expression of related genes in adult rare minnow (Gobiocypris rarus) at environmentally relevant concentrations.
Zhu, L.; Li, W.; Zha, J.; and Wang, Z. 2015. Environmental Toxicology 30, 693-703.

Abstract: Dicamba is a benzoic acid herbicide that has been detected in surface and ground water. The herbicide has been shown to have cytogeneic and DNA damaging effects and to cause organ damage in mammals; however, little is known about the endocrine disrupting effects of dicamba in fish. In this study, histological changes, plasma vitellogenin (VTG) and sex hormone levels, and mRNA expression of sex steroid hormone-related genes were determined in adult rare minnow exposed to environmentally relevant concentrations of dicamba (0, 0.05, 0.5, 5, and 50 μg/L) for 40 days. The results showed inhibition of spermatogenesis in male testes and ovarian degeneration in females. Plasma 17β-estradiol (E2) levels were significantly increased in both genders, and plasma VTG levels were significantly increased in males ($p<0.05$). These results indicate that sex hormone homeostasis and normal reproduction of fish could be affected by dicamba. Moreover, the mRNA levels of vtg were significantly upregulated in the livers and gonads of both male and female rare minnows ($p < 0.05$). The downregulation of cytochrome P450c19a (cyp19a) and steroidogenic acute regulatory protein (star) mRNA levels, and the upregulation of cytochrome P450c17 (cyp17)

mRNA levels were observed in the livers and ovaries ($p<0.05$). The results of the mRNA analysis suggest that changes in steroid hormone-related gene expression could serve as a regulatory mechanism to maintain sex hormone homeostasis. Overall, dicamba exposure could result in histological lesions, plasma VTG increases, changes in sex hormone levels, and alterations of hormonerelated gene expression. Therefore, dicamba should be considered to be a potential endocrine disruptor.

Artikel 2: Emerging wastewater contaminant metformin causes intersex and reduced fecundity in fish.
Niemuth, N. J. and Klaper, R. D. 2015. Chemosphere 135, 38-45.

Abstract: The occurrence of intersex fish, where male reproductive tissues show evidence of feminization, have been found in freshwater systems around the world, indicating the potential for significant endocrine disruption across species in the ecosystem. Estrogens from birth control medications in wastewater treatment plant effluent have been cited as the likely cause, but research has shown that endocrine disruption is not solely predictable based on hormone receptor interactions. Many other non-hormone pharmaceuticals are found in effluent at concentrations orders of magnitude higher than estrogens, yet there is little data indicating the impacts of these other medications. The widely prescribed anti-diabetic metformin is among the most abundant of pharmaceuticals found in effluent and is structurally dissimilar from hormones. However, we show here that exposing fathead minnows (Pimephales promelas) to a concentration of metformin found in wastewater effluent causes the development of intersex gonads in males, reduced size of treated male fish, and reduction in fecundity for treated pairs. Our results demonstrate that metformin acts as an endocrine disruptor at environmentally relevant concentrations.

Artikel 3: Long-term effects of Bisphenol AF (BPAF) on hormonal balance and genes of hypothalamus-pituitary-gonad axis and liver of zebrafish (Danio rerio), and the impact on offspring.
Shi, J.; Jiao, Z.; Zheng, S.; Li, M.; Zhang, J.; Feng, Y.; Yin, J.; and Shao, B. 2015. Chemosphere 128, 252-257.

Abstract: Bisphenol AF (BPAF) is one of the analogues of bisphenol A (BPA) and is widely used as a raw material in the plastics industry. The potential toxicity to fish from exposure to BPAF in the aquatic environment is largely unknown. In this study, zebrafish (Danio rerio) were exposed to BPAF at 5, 25 and 125 μg/L, from 4 hour-post-fertilization (hpf) to 120 day-post-fertilization (dpf), representing the period from embryo to adult. The levels of plasma hormones were measured and the expression of selected representative genes along the hypothalamus-pituitary-gonad (HPG) axis and liver were examined. The concentration of 17β-estradiol (E2) was significantly increased in male and female fish and a significant decrease of testosterone (T) was observed in male fish. The mRNA expression of genes along the HPG axis and in liver tissues in F0 generation fish demonstrated that the steroid hormonal balances of zebrafish were modulated through the alteration of steroidgenesis. The significant decrease of egg fertilization among offspring indicates the possibility of sperm deterioration of parent following exposure to BPAF. The higher occurrence of malformation and lower survival rate in the offspring from the exposure group suggested a possibility of maternal transfer of BPAF, which could be responsible for the increased prevalence of

adverse health signs in the offspring. The hatching delay in 5 lg L_1 BPAF indicated that parental exposure to environmentally relevant concentration of BPAF would result in delayed hatching of the offspring. A potential consequence of adverse effects in the offspring by BPAF deserves further investigation.

Bruttoliste

Alkylphenoler

Endocrine disrupting alkylphenolic chemicals and other contaminants in wastewater treatment plant effluents, urban streams, and fish in the Great Lakes and Upper Mississippi River Regions.
Barber, L. B.; Loyo-Rosales, J. E.; Rice, C. P.; Minarik, T. A.; and Oskouie, A. K. 2015. Science of the Total Environment 517, 195-206.

Interferences of an environmental pollutant with estrogen-like action in the male reproductive system of the terrestrial vertebrate Podarcis sicula.
Verderame, M. and Limatola, E. 2015. General and Comparative Endocrinology 213, 9-15.

Estrogenic environmental contaminants alter the mRNA abundance profiles of genes involved in gonadal differentiation of the American bullfrog.
Wolff, S. E.; Veldhoen, N.; Helbing, C. C.; Ramirez, C. A.; Malpas, J. M.; and Propper, C. R. 2015. Science of the Total Environment 521, 380-387.

Bisphenoler

Effects of the environmental estrogenic contaminants bisphenol A and 17 alpha-ethinyl estradiol on sexual development and adult behaviors in aquatic wildlife species.
Bhandari, R. K.; Deem, S. L.; Holliday, D. K.; Jandegian, C. M.; Kassotis, C. D.; Nagel, S. C.; Tillitt, D. E.; Saal, F. S. V.; and Rosenfeld, C. S. 2015. General and Comparative Endocrinology 214, 195-219.

Bisphenol A accumulation in eggs disrupts the endocrine regulation of growth in rainbow trout larvae.
Birceanu, O.; Servos, M. R.; and Vijayan, M. M. 2015. Aquatic Toxicology 161, 51-60.

Developmental exposure to bisphenol A (BPA) alters sexual differentiation in painted turtles (Chrysemys picta).
Jandegian, C. M.; Deem, S. L.; Bhandari, R. K.; Holliday, C. M.; Nicks, D.; Rosenfeld, C. S.; Selcer, K. W.; Tillitt, D. E.; Vom Saal, F. S.; Velez-Rivera, V.; Yang, Y.; and Holliday, D. K. 2015. General and Comparative Endocrinology 216, 77-85.

Adverse effects of bisphenol A on water louse (Asellus aquaticus).
Plahuta, M.; Tisler, T.; Pintar, A.; and Toman, M. J. 2015. Ecotoxicology and Environmental Safety 117, 81-88.

Endogenous and exogenous estrogens during embryonic development affect timing of hatch and growth in the American alligator (Alligator mississippiensis).
Cruze, L.; Roark, A. M.; Rolland, G.; Younas, M.; Stacy, N.; and Guillette, L. J. 2015. Comparative Biochemistry and Physiology B-Biochemistry & Molecular Biology 184, 10-18.

Long-term effects of Bisphenol AF (BPAF) on hormonal balance and genes of hypothalamus-pituitary-gonad axis and liver of zebrafish (Danio rerio), and the impact on offspring.

Shi, J.; Jiao, Z.; Zheng, S.; Li, M.; Zhang, J.; Feng, Y.; Yin, J.; and Shao, B. 2015. Chemosphere 128, 252-257.

Phthalater

Environmental occurrence and biota concentration of phthalate esters in Epe and Lagos Lagoons, Nigeria.
Adeogun, A. O.; Ibor, O. R.; Omogbemi, E. D.; Chukwuka, A. V.; Adegbola, R. A.; Adewuyi, G. A.; and Arukwe, A. 2015. Marine environmental research 108, 24-32.

Long-term exposures to di-n-butyl phthalate inhibit body growth and impair gonad development in juvenile Murray rainbowfish (Melanotaenia fluviatilis).
Bhatia, H.; Kumar, A.; Chapman, J. C.; and McLaughlin, M. J. 2015. Journal of Applied Toxicology 35, 806-816.

Effects of Diisodecyl Phthalate on PPAR:RXR-Dependent Gene Expression Pathways in Sea Bream Hepatocytes.
Cocci, P.; Mosconi, G.; Arukwe, A.; Mozzicafreddo, M.; Angeletti, M.; Aretusi, G.; and Palermo, F. A. 2015. Chemical Research in Toxicology 28, 935-947.

Di-(2-ethylhexyl)-phthalate disrupts pituitary and testicular hormonal functions to reduce sperm quality in mature goldfish.
Golshan, M.; Hatef, A.; Socha, M.; Milla, S.; Butts, I. A.; Carnevali, O.; Rodina, M.; Sokolowska-Mikolajczyk, M.; Fontaine, P.; Linhart, O.; and Alavi, S. M. H. 2015. Aquatic Toxicology 163, 16-26.

The impact of long term exposure to phthalic acid esters on reproduction in Chinese rare minnow (Gobiocypris rarus).
Guo, Y.; Yang, Y.; Gao, Y.; Wang, X.; and Zhou, B. 2015. Environmental pollution (Barking, Essex : 1987) 203, 130-136.

Occurrence, Fate, Behavior and Ecotoxicological State of Phthalates in Different Environmental Matrices.
Net, S.; Sempere, R.; Delmont, A.; Paluselli, A.; and Ouddane, B. 2015. Environmental Science & Technology 49, 4019-4035.

Flammehæmmere

Bioaccumulation and biomagnification of classical flame retardants, related halogenated natural compounds and alternative flame retardants in three delphinids from Southern European waters.
Baron, E.; Gimenez, J.; Verborgh, P.; Gauffier, P.; De Stephanis, R.; Eljarrat, E.; and Barcelo, D. 2015. Environmental pollution (Barking, Essex : 1987) 203, 107-115.

Identification of a group of brominated flame retardants as novel androgen receptor antagonists and potential neuronal and endocrine disrupters.
Kharlyngdoh, J. B.; Pradhan, A.; Asnake, S.; Walstad, A.; Ivarsson, P.; and Olsson, P. E. 2015. Environment International 74, 60-70.

Polybrominated diphenyl ethers (PBDEs) in sediment and fish tissues from Lake Chaohu, central eastern China.
Yang, S.; Fu, Q.; Teng, M.; and Yang, J. 2015. Archives of Environmental Protection 41, 12-20.

Bioconcentration and Transfer of the Organophorous Flame Retardant 1,3-Dichloro-2-propyl Phosphate Causes Thyroid Endocrine Disruption and Developmental Neurotoxicity in Zebrafish Larvae.
Wang, Q.; Lai, N. L.-S.; Wang, X.; Guo, Y.; Lam, P. K.-S.; Lam, J. C.-W.; and Zhou, B. 2015. Environmental Science & Technology 49, 5123-5132.

Perfluorerede forbindelser

PCB og dioxin

Hydroxylated polychlorinated biphenyls decrease circulating steroids in female polar bears (Ursus maritimus).
Gustayson, L.; Ciesielski, T. M.; Bytingsvik, J.; Styrishave, B.; Hansen, M.; Lie, E.; Aars, J.; and Jenssen, B. M. 2015. Environmental Research 138, 191-201.

Polychlorinated biphenyl exposure and corticosterone levels in seven polar seabird species.
Tartu, S.; Angelier, F.; Bustnes, J.; Moe, B.; Hanssen, S.; Herzke, D.; Gabrielsen, G.; Verboven, N.; Verreault, J.; Labadie, P.; Budzinski, H.; Wingfield, J.; and Chastel, O. 2015. Environmental Pollution 197, 173-180.

Contaminants reduce male contribution to reproduction at the population scale.
Hillis, J. J.; Garvey, J. E.; and Lydy, M. J. 2015. Ecosphere 6.

Developmental Exposure to Aroclor 1254 Alters Migratory Behavior in Juvenile European Starlings (Sturnus vulgaris).
Flahr, L. M.; Michel, N. L.; Zahara, A. R.; Jones, P. D.; and Morrissey, C. A. 2015. Environmental Science & Technology 49, 6274-6283.

Comparison of the in vitro effects of TCDD, PCB 126 and PCB 153 on thyroid-restricted gene expression and thyroid hormone secretion by the chicken thyroid gland.
Katarzynska, D.; Hrabia, A.; Kowalik, K.; and Sechman, A. 2015. Environmental Toxicology and Pharmacology 39, 496-503.

TBT

Disruptions in aromatase expression in the brain, reproductive behavior, and secondary sexual characteristics in male guppies (Poecilia reticulata) induced by tributyltin.
Tian, H.; Wu, P.; Wang, W.; and Ru, S. 2015. Aquatic Toxicology 162, 117-125.

Pesticider

Dicamba affects sex steroid hormone level and mRNA expression of related genes in adult rare minnow (Gobiocypris rarus) at environmentally relevant concentrations.

Zhu, L.; Li, W.; Zha, J.; and Wang, Z. 2015. Environmental Toxicology 30, 693-703.

Morphological alterations in the freshwater rotifer Brachionus calyciflorus Pallas 1766 (Rotifera: Monogononta) caused by vinclozolin chronic exposure.
Alvarado-Flores, J.; Rico-Martinez, R.; Adabache-Ortiz, A.; and Silva-Briano, M. 2015. Ecotoxicology 24, 915-925.

Adverse effects of thiram-treated seed ingestion on the reproductive performance and the offspring immune function of the red-legged partridge.
Lopez-Antia, A.; Ortiz-Santaliestra, M. E.; Garcia-de Blas, E.; Camarero, P. R.; Mougeot, F.; and Mateo, R. 2015. Environmental Toxicology and Chemistry 34, 1320-1329.

The neonicotinoid pesticide imidacloprid and the dithiocarbamate fungicide mancozeb disrupt the pituitary-thyroid axis of a wildlife bird.
Pandey, S. P. and Mohanty, B. 2015. Chemosphere 122, 227-234.

Endosulfan affects GnRH cells in sexually differentiated juveniles of the perciform Cichlasoma dimerus.
Piazza, Y.; Pandolfi, M.; Da Cuna, R.; Genovese, G.; and Lo Nostro, F. 2015. Ecotoxicology and Environmental Safety 116, 150-159.

Transcriptional profiling of the soil invertebrate Folsomia candida in pentachlorophenol-contaminated soil.
Qiao, M.; Wang, G. P.; Zhang, C.; Roelofs, D.; van Straalen, N. M.; and Zhu, Y. G. 2015. Environmental Toxicology and Chemistry 34, 1362-1368.

Atrazine and its degradates have little effect on the corticosteroid stress response in the zebrafish.
Van der Kraak, G.; Matsumoto, J.; Kim, M.; and Hosmer, A. J. 2015. Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 170, 1-7.

Influence of triazine herbicide exposure on guppies (poecilia sphenops) aromatase activities, altered sex steroid concentration and vitellogenin induction.
Vasanth, S.; Arul, G.; Karthikeyeni, S.; Kumar, T.; Vignesh, V.; Manimegalai, M.; Bupesh, G.; Thirumurugan, R.; and Subramanian, P. 2015. Indian Journal of Pharmaceutical Sciences 77, 156-162.

The Herbicide Linuron Inhibits Cholesterol Biosynthesis and Induces Cellular Stress Responses in Brown Trout.
Webster, T. M.; Perry, M. H.; and Santos, E. M. 2015. Environmental Science & Technology 49, 3110-3118.

Effect of trifloxystrobin on hatching, survival, and gene expression of endocrine biomarkers in early life stages of medaka (Oryzias latipes).
Zhu, L.; Wang, H.; Liu, H.; and Li, W. 2015. Environmental Toxicology 30, 648-655.

Tungmetaller

Oxidative stress in songbirds exposed to dietary methylmercury.

Henry, K. A.; Cristol, D. A.; Varian-Ramos, C. W.; and Bradley, E. L. 2015. Ecotoxicology 24, 520-526.

Lægemidler og syntetiske hormoner

Emerging wastewater contaminant metformin causes intersex and reduced fecundity in fish. Niemuth, N. J. and Klaper, R. D. 2015. Chemosphere 135, 38-45.

Occurrence, bioaccumulation and risk assessment of lipophilic pharmaceutically active compounds in the downstream rivers of sewage treatment plants.
Liu, J.; Lu, G.; Xie, Z.; Zhang, Z.; Li, S.; and Yan, Z. 2015. Science of the Total Environment 511, 54-62.

Pharmaceuticals and personal care products: A critical review of the impacts on fish reproduction.
Overturf, M. D.; Anderson, J. C.; Pandelides, Z.; Beyger, L.; and Holdway, D. A. 2015. Critical reviews in toxicology 45, 469-491.

Responses to various exposure durations of levonorgestrel during early-life stages of fathead minnows (Pimephales promelas).
Overturf, M. D. and Huggett, D. B. 2015. Aquatic Toxicology 161, 33-40.

Nortestosterone-derived synthetic progestogens do not activate the progestogen receptor of Murray-Darling rainbowfish (Melanotaenia fluviatilis) but are potent agonists of androgen receptors alpha and beta.
Bain, P. A.; Kumar, A.; Ogino, Y.; and Iguchi, T. 2015. Aquatic Toxicology 163, 97-101.

Recovery of a Wild Fish Population from Whole-Lake Additions of a Synthetic Estrogen.
Blanchfield, P. J.; Kidd, K. A.; Docker, M. F.; Palace, V. P.; Park, B. J.; and Postma, L. D. 2015. Environmental Science & Technology 49, 3136-3144.

Timescale effects of 17 alpha-ethinylestradiol on behavioral consistency in male threespine stickleback.
Dzieweczynski, T. and Forrette, L. 2015. Acta Ethologica 18, 137-144.

Acute exposure to 17 alpha-ethinylestradiol disrupts audience effect on male-female interactions in Betta splendens.
Forette, L. M.; Mannion, K. L.; and Dzieweczynski, T. L. 2015. Behavioural Processes 113, 172-178.

17 alpha-Ethinylestradiol can disrupt hemoglobin catabolism in amphibians.
Garmshausen, J.; Kloas, W.; and Hoffmann, F. 2015. Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 171, 34-40.

In Silico analysis of perturbed steroidogenesis and gonad growth in fathead minnows (P. promelas) exposed to 17alpha-ethynylestradiol.
Hala, D.; Petersen, L. H.; Martinovic, D.; and Huggett, D. B. 2015. Systems biology in reproductive medicine 61, 122-138.

The trenbolone acetate affects the immune system in rainbow trout, Oncorhynchus mykiss.
Massart, S.; Redivo, B.; Flarnion, E.; Mandiki, S.; Falisse, E.; Milla, S.; and Kestemont, P. 2015. Aquatic Toxicology 163, 109-120.

Mixture effects of levonorgestrel and ethinylestradiol: Estrogenic biomarkers and hormone receptor mRNA expression during sexual programming.
Safholm, M.; Jansson, E.; Fick, J.; and Berg, C. 2015. Aquatic Toxicology 161, 146-153.

Early Exposure of 17 alpha-Ethynylestradiol and Diethylstilbestrol Induces Morphological Changes and Alters Ovarian Steroidogenic Pathway Enzyme Gene Expression in Catfish, Clarias gariepinus.
Sridevi, P.; Chaitanya, R.; Prathibha, Y.; Balakrishna, S.; Dutta-Gupta, A.; and Senthilkumaran, B. 2015. Environmental Toxicology 30, 439-451.

Sex in troubled waters: Widespread agricultural contaminant disrupts reproductive behaviour in fish.
Bertram, M. G.; Saaristo, M.; Baumgartner, J. B.; Johnstone, C. P.; Allinson, M.; Allinson, G.; and Wong, B. B. 2015. Hormones and Behavior 70, 85-91.

Endocrine Disrupting Compounds Alter Risk-Taking Behavior in Guppies (Poecilia reticulata).
Heintz, M. M.; Brander, S. M.; and White, J. W. 2015. Ethology 121, 480-491.

Estrogen Receptor 1 (ESR1; ER alpha), not ESR2 (ER beta), Modulates Estrogen-Induced Sex Reversal in the American Alligator, a Species With Temperature-Dependent Sex Determination.
Kohno, S.; Bernhard, M. C.; Katsu, Y.; Zhu, J.; Bryan, T. A.; Doheny, B. M.; Iguchi, T.; and Guillette, L. J. 2015. Endocrinology 156, 1887-1899.

Diverse potentielt hormonforstyrrende stoffer/faktorer

Microcystin-RR exposure results in growth impairment by disrupting thyroid endocrine in zebrafish larvae.
Xie, L.; Yan, W.; Li, J.; Yu, L.; Wang, J.; Li, G.; Chen, N.; and Steinman, A. D. 2015. Aquatic toxicology (Amsterdam, Netherlands) 164, 16-22.

In Vitro Assessment of Endocrine Disrupting Potential of Naphthenic Acid Fractions Derived from Oil Sands-Influenced Water.
Leclair, L. A.; Pohler, L.; Wiseman, S. B.; He, Y.; Arens, C. J.; Giesy, J. P.; Scully, S.; Wagner, B. D.; van den Heuvel, M. R.; and Hogan, N. S. 2015. Environmental Science & Technology 49, 5743-5752.

Eksponering i miljøet (ferskvand, saltvand, spildevand, sediment mm.)

Evaluation of Estrogenic Activity of Wastewater: Comparison Among In Vitro ER alpha Reporter Gene Assay, In Vivo Vitellogenin Induction, and Chemical Analysis.
Ihara, M.; Kitamura, T.; Kumar, V.; Park, C. B.; Ihara, M. O.; Lee, S. J.; Yamashita, N.; Miyagawa, S.; Iguchi, T.; Okamoto, S.; Suzuki, Y.; and Tanaka, H. 2015. Environmental Science & Technology 49, 6319-6326.

Application of endocrine disruptor screening program fish short-term reproduction assay: Reproduction and endocrine function in fathead minnow (Pimephales promelas) and killifish (Fundulus heteroclitus) exposed to Bermuda pond sediment.
Fort, D. J.; Mathis, M.; Fort, C. E.; Fort, H. M.; and Bacon, J. P. 2015. Environmental Toxicology and Chemistry 34, 1283-1295.

Relationship between biomarkers and endocrine-disrupting compounds in wild Girardnichthys viviparus from two lakes with different degrees of pollution.
Olivares-Rubio, H. F.; Dzul-Caamal, R.; Esperanza Gallegos-Rangel, M.; Madera-Sandoval, R. L.; Lilia Dominguez-Lopez, M.; Garcia-Latorre, E.; and Vega-Lopez, A. 2015. Ecotoxicology 24, 664-685.

Screening breeding sites of the common toad (Bufo bufo) in England and Wales for evidence of endocrine disrupting activity.
Pickford, D. B.; Jones, A.; Velez-Pelez, A.; Iguchi, T.; Mitsui, N.; and Tooi, O. 2015. Ecotoxicology and Environmental Safety 117, 7-19.

Occurrence of endocrine disrupting compounds in five estuaries of the northwest coast of Spain: Ecological and human health impact.
Salgueiro-Gonzalez, N.; Turnes-Carou, I.; Vinas-Dieguez, L.; Muniategui-Lorenzo, S.; Lopez-Mahia, P.; and Prada-Rodriguez, D. 2015. Chemosphere 131, 241-247.

Integrated Assessment of Wastewater Treatment Plant Effluent Estrogenicity in the Upper Murray River, Australia, Using the Native Murray Rainbowfish (Melanotaenia Fluviatilis).
Vajda, A. M.; Kumar, A.; Woods, M.; Williams, M.; Doan, H.; Tolsher, P.; Kookana, R. S.; and Barber, L. B. 2015. Environmental Toxicology and Chemistry 34, 1078-1087.

Distribution of selected antiandrogens and pharmaceuticals in a highly impacted watershed.
Arlos, M.; Bragg, L.; Parker, W.; and Servos, M. 2015. Water Research 72, 40-50.

Intersex in the gonochoristic crustacean Tanais dulongii (Audouin, 1826) (Peracarida: Tanaidacea: Tanaididae): a comparison of external reproductive characteristics.
Enrique Rumbold, C.; Mabel Obenat, S.; Soledad Leonardi, M.; and Daniel Spivak, E. 2015. Journal of Natural History 49, 775-788.

Effects of a major municipal effluent on the St. Lawrence River: A case study.
Marcogliese, D. J.; Blaise, C.; Cyr, D.; de Lafontaine, Y.; Fournier, M.; Gagne, F.; Gagnon, C.; and Hudon, C. 2015. Ambio 44, 257-274.

Spatial patterns in markers of contaminant exposure, glucose and glycogen metabolism, and immunological response in juvenile winter flounder (Pseudoplueronectes americanus).
McElroy, A.; Hice, L.; Frisk, M.; Purcell, S.; Phillips, N.; and Fast, M. 2015. Comparative Biochemistry and Physiology D-Genomics & Proteomics 14, 53-65.

Airborne particulate matter collected near beef cattle feedyards induces androgenic and estrogenic activity in vitro.
Wooten, K. J.; Blackwell, B. R.; McEachran, A. D.; Mayer, G. D.; and Smith, P. N. 2015. Agriculture Ecosystems & Environment 203, 29-35.

Undersøgelser med flere stoffer fra flere af de ovennævnte kategorier

Effects of (Anti) Androgenic Endocrine Disruptors (DEHP and Butachlor) on Immunoglobulin M (IgM) and Leukocytes Counts of Male Rainbow Trout (Oncorhynchus mykiss).
Ahmadivand, S.; Farahmand, H.; Mirvaghefi, A.; Eagderi, S.; and Zargar, A. 2015. Bulletin of environmental contamination and toxicology 94, 695-700.

Exploring the Impacts of Two Separate Mixtures of Pesticide and Surfactants on Estrogenic Activity in Male Fathead Minnows and Rainbow Trout.
Crago, J.; Tran, K.; Budicin, A.; Schreiber, B.; Lavado, R.; and Schlenk, D. 2015. Archives of Environmental Contamination and Toxicology 68, 362-370.

Cell-Specific Biotransformation of Benzophenone-2 and Bisphenol-S in Zebrafish and Human in Vitro Models Used for Toxicity and Estrogenicity Screening.
Le Fol, V.; Ait-Aissa, S.; Cabaton, N.; Dolo, L.; Grimaldi, M.; Balaguer, P.; Perdu, E.; Debrauwer, L.; Brion, F.; and Zalko, D. 2015. Environmental Science & Technology 49, 3860-3868.

A review of the effects of azole compounds in fish and their possible involvement in masculinization of wild fish populations.
Matthiessen, P. and Weltje, L. 2015. Critical reviews in toxicology 45, 453-467.

Determination and occurrence of endocrine disrupting compounds, pharmaceuticals and personal care products in fish (Morone saxatilis).
Yu, Y. and Wu, L. 2015. Frontiers of Environmental Science & Engineering 9, 475-481.

Testmetoder, modelorganismer, endpoints, MOA og risikovurdering

Sex-related differences in steroid concentrations in the blue mussel (Mytilus edulis trossulus) from the southern Baltic Sea.
Zabrzanska, S.; Smolarz, K.; Hallmann, A.; Konieczna, L.; Baczek, T.; and Wolowicz, M. 2015. Comparative Biochemistry and Physiology A-Molecular & Integrative Physiology 183, 14-19.

The Nuclear Receptors of Biomphalaria glabrata and Lottia gigantea: Implications for Developing New Model Organisms.
Kaur, S.; Jobling, S.; Jones, C. S.; Noble, L. R.; Routledge, E. J.; and Lockyer, A. E. 2015. Plos One 10.

Temporal Changes in Biological Responses and Uncertainty in Assessing Risks of Endocrine-Disrupting Chemicals: Insights from Intensive Time-Course Studies with Fish.
Ankley, G. T. and Villeneuve, D. L. 2015. Toxicological Sciences 144, 259-275.

Estrogen alters the profile of the transcriptome in river snail Bellamya aeruginosa.
Lei, K.; Liu, R.; An, L. h.; Luo, Y. f.; and LeBlanc, G. A. 2015. Ecotoxicology 24, 330-338.

Molecular characterization of an estrogen receptor and estrogen-related receptor and their autoregulatory capabilities in two Mytilus species.

Nagasawa, K.; Treen, N.; Kondo, R.; Otoki, Y.; Itoh, N.; Rotchell, J. M.; and Osada, M. 2015. Gene 564, 153-159.

Exogenous 17 beta-oestradiol (E2) modifies thymus growth and regionalization in European sea bass Dicentrarchus labrax.
Seemann, F.; Knigge, T.; Olivier, S.; and Monsinjon, T. 2015. Journal of Fish Biology 86, 1186-1198.

Induction of the estrogen-responsive genes encoding choriogenin H and L in the liver of male medaka (Oryzias latipes) upon exposure to estrogen receptor subtype-selective ligands.
Yamaguchi, A.; Kato, K.; Arizono, K.; and Tominaga, N. 2015. Journal of Applied Toxicology 35, 752-758.