Center for Hormonforstyrrende Stoffer

**Litteraturgennemgang for perioden juli 2015 – september 2015**

## Indhold

## Humane studier ved Afd. for Vækst og Reproduktion, Rigshospitalet

Søgning er udført på PubMed og dækker perioden 1. juli 2015 - 20. september 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

I den listede bruttoliste er dobbeltgængere fjernet, ligesom hits der hører under kategorierne in vivo studier, in vitro studier eller wildlife er frasorteret. De kommenterede artikler er highlightet.

De fem udvalgte artikler omhandler phthalater og sammenhæng med pubertetsudvikling og mandlig reproduktionsudvikling. For sidstnævnte er der både medtaget et metastudie og et originalstudie. Endelig er der en artikel, der handler om overførsel via modermælken af per- og polyflourerede stoffer.

God læselyst!

## Udvalgte publikationer

**Association Between Urinary Phthalates and Pubertal Timing in Chinese Adolescents**
Shi H, Cao Y, Shen Q, Zhao Y, Zhang Z, Zhang Y
J Epidemiol. 2015 Sep 5;25(9):574-82

BACKGROUND: Phthalates are synthetic chemicals and ubiquitous environmental contaminants, with hormonal activity that may alter the course of pubertal development in children.
OBJECTIVES: To determine whether exposure to phthalate metabolites is associated with timing of pubertal development in a cross-sectional study of a school-based clustered sample of 503 children from a suburban district in Shanghai, China, who were 7-14 years of age at enrollment (2010 October to November).
METHODS: We analyzed six phthalate metabolites in urine samples by isotope-dilution liquid chromatography tandem mass spectrometry. The associations of exposures to phthalates with pubertal timing of testes, breast, and pubic hair development (represented as Tanner stages) were evaluated using an ordered logistic regression model adjusted for chronological age, body fat proportion (BF%), and parental education.
RESULTS: In boys, urinary mono-n-butyl phthalate (MBP) levels were negatively associated with testicular volume, and mono (2-ethyl-5-hydroxyhexyl) phthalate (MEHHP) and mono (2-ethyl-5-oxohexyl) phthalate (MEOHP) levels were negatively associated with pubic hair stages. The odds of being in an advanced stage were decreased by 43%-51%. In girls, mono (2-ethylhexyl) phthalate (MEHP), MEHHP, and MEOHP levels, as well as the sum of these levels, were positively associated with breast stages, and the association was much stronger in girls with high BF%; the odds of being in an advanced stage were increase by 29% to 50%.
CONCLUSIONS: Phthalate metabolites investigated in this study show significant associations with pubertal timing both in boys and in girls, especially among girls with high BF%.

**Human urinary/seminal phthalates or their metabolite levels and semen quality: A meta-analysis**
Cai H, Zheng W, Zheng P, Wang S, Tan H, He G, Qu W.
Environ Res. 2015 Aug 10;142:486-494

Health concerns surrounding human exposure to phthalates include diminished semen quality. Epidemiological findings remain inconsistent. We have performed a quality appraisal and meta-analysis to quantitatively summarize evidence for associations between phthalate exposures and human semen quality. Pubmed and Web of Science were searched for pertinent studies through October 2014. Cited references were reviewed to identify secondary studies. Studies that reported quantitative estimates of the association between phthalates or their metabolite levels in humans and semen quality were eligible. Random effects models were used to calculate pooled effects estimates. Overall, 20 studies met our inclusion criteria. Subsequently, 14 studies were included in the meta-analysis. Urinary monobutyl phthalate (MBP) and monobenzyl phthalate (MBzP) were associated with reduced sperm concentration (MBP [7.4-25.3μg/L], pooled odds ratio [OR]=2.60, 95% confidence interval [CI]=1.32-5.15; MBzP [14.0-540.2μg/L], pooled OR=2.23, 95% CI=1.16-4.30). Both MBP (24.6-14,459.0μg/L) and MEHP (3.1-208.1μg/L) were inversely associated with straight line velocity (VSL; MBP, pooled β=-2.51, 95% CI=-4.44, -0.59; MEHP, pooled β=-1.06, 95% CI=-1.99, -0.12). An IQR increase in MBzP and MEP levels (MBzP, IQR=11.35μg/L; MEP, IQR=449.4μg/L) was associated with an increase in comet extent (CE; MBzP, pooled β=3.57, 95% CI=0.89-6.25; MEP, pooled β=4.22, 95% CI=1.66-6.77). No associations were observed between monomethyl phthalate and any semen parameters. Our meta-analysis strengthens the evidence that specific phthalates or their metabolite levels may affect semen quality.

**Phthalate exposure and reproductive parameters in young men from the general Swedish population**
Axelsson J, Rylander L, Rignell-Hydbom A, Jönsson BA, Lindh CH, Giwercman A.
Environ Int. 2015 Aug 25;85:54-60.

BACKGROUND: In animals, exposure to certain phthalates negatively affects the male reproductive function. Human results are conflicting and mostly based on subfertile males, in whom the association between exposure and reproductive function may differ from the general population.
OBJECTIVES: To study if levels of phthalate metabolites were associated with semen quality and reproductive hormones in general Swedish men.
METHODS: We recruited 314 young men delivering semen, urine and blood samples at the same visit. We analyzed reproductive hormones and several semen parameters including progressive motility and high DNA stainability (HDS)-a marker for sperm immaturity. In urine, we analyzed metabolites of phthalates, including diethylhexyl phthalate (DEHP). We studied associations between urinary levels of the metabolites and seminal as well as serum reproductive parameters, accounting for potential confounders.
RESULTS: DEHP metabolite levels, particularly urinary mono-(2-ethyl-5-carboxypentyl) phthalate (MECPP), were negatively associated with progressive sperm motility, which was 11 (95% CI: 5.0-17) percentage points lower in the highest quartile of MECPP than in the lowest. Further, men in the highest quartile of the DEHP metabolite monoethylhexyl phthalate had 27% (95% CI: 5.5%-53%) higher HDS than men in the lowest quartile.
CONCLUSIONS: DEHP metabolite levels seemed negatively associated with sperm motility and maturation.

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

Critical care medicine has largely benefited from plastic-containing medical devices. However, bisphenol-A (BPA) and phthalates present in the plastics can leach from such devices. We hypothesized that intensive care unit (ICU) patients are exposed to BPA and phthalates through (plastic) medical devices. Serum (n = 118) and urine (n= 102) samples of adult ICU patients (n = 35) were analyzed for total BPA and phthalate metabolites (PMs). Our results showed that adult ICU patients are continuously exposed to phthalates, such as di(2-ethylhexyl)phthalate (DEHP), as well as to BPA, albeit to a lesser extent. This exposure resulted in detectable high serum and urinary levels in almost every patient and at every studied time point. Moreover, these levels were significantly higher than in controls or compared to referenced literature. The chronology of exposure was demonstrated: pre-operative urinary and serum levels of the DEHP metabolites were often below the detection limit. Plastic-containing medical devices were the main source of DEHP exposure: post-operative patients on hemofiltration, extracorporeal membrane oxygenation or both showed serum levels 100-or 1000-fold higher than the levels in the general population reported in the literature. The serum and some of the urinary levels of the DEHP metabolites are the highest ever reported in humans; some at biologically highly relevant concentrations of ≥ 10-50 µM. Despite the continuously tightening regulations, BPA and DEHP appear to be still present in (some) medical devices. Because patient safety is a concern in the ICU, further research into the (possibly toxic and clinical) effects of these chemicals released from medical devices is imperiously necessary.

**Breastfeeding as an Exposure Pathway for Perfluorinated Alkylates**
Mogensen UB, Grandjean P, Nielsen F, Weihe P, Budtz-Jørgensen E.
Environ Sci Technol. 2015 Sep 1;49(17):10466-73.

Perfluorinated alkylate substances (PFASs) are widely used and have resulted in human exposures worldwide. PFASs occur in breast milk, and the duration of breastfeeding is associated with serum-PFAS concentrations in children. To determine the time-dependent impact of this exposure pathway, we examined the serum concentrations of five major PFASs in a Faroese birth cohort at birth, and at ages 11, 18, and 60 months. Information about the children's breastfeeding history was obtained from the mothers. The trajectory of serum-PFAS concentrations during months with and without breastfeeding was examined by linear mixed models that accounted for the correlations of the PFAS measurements for each child. The models were adjusted for confounders such as body size. The duration of exclusive breastfeeding was associated with increases of most PFAS concentrations by up to 30% per month, with lower increases during partial breast-feeding. In contrast to this main pattern, perfluorohexanesulfonate was not affected by breast-feeding. After cessation of breastfeeding, all serum concentrations decreased. This finding supports the evidence of breastfeeding being an important exposure pathway to some PFASs in infants.

## Bruttoliste

1. Bisphenol-A and Female Infertility: A Possible Role of Gene-Environment Interactions.
Huo X, Chen D, He Y, Zhu W, Zhou W, Zhang J.
Int J Environ Res Public Health. 2015 Sep 7;12(9):11101-16. doi: 10.3390/ijerph120911101. Review.

2. Parental urinary biomarkers of preconception exposure to bisphenol A and phthalates in relation to birth outcomes.
Smarr MM, Grantz KL, Sundaram R, Maisog JM, Kannan K, Louis GM.
Environ Health. 2015 Sep 11;14(1):73. doi: 10.1186/s12940-015-0060-5.

3. Urinary Concentrations of Bisphenol A and Three Other Bisphenols in Convenience Samples of U.S. Adults during 2000-2014.
Ye X, Wong LY, Kramer J, Zhou X, Jia T, Calafat AM.
Environ Sci Technol. 2015 Sep 11. [Epub ahead of print]

4. Preimplantation Exposure to Bisphenol A and Triclosan May Lead to Implantation Failure in Humans.
Yuan M, Bai MZ, Huang XF, Zhang Y, Liu J, Hu MH, Zheng WQ, Jin F.
Biomed Res Int. 2015;2015:184845. doi: 10.1155/2015/184845. Epub 2015 Aug 19. Review.

5. Bisphenol A exposure pathways in early childhood: Reviewing the need for improved risk assessment models.
Healy BF, English KR, Jagals P, Sly PD.
J Expo Sci Environ Epidemiol. 2015 Sep 9. doi: 10.1038/jes.2015.49. [Epub ahead of print] Review.

6. A fetal whole ovarian culture model for the evaluation of CrVI-induced developmental toxicity during germ cell nest breakdown.
Stanley JA, Arosh JA, Burghardt RC, Banu SK.
Toxicol Appl Pharmacol. 2015 Sep 5. pii: S0041-008X(15)30076-4. doi: 10.1016/j.taap.2015.09.002. [Epub ahead of print]

7. Genome-wide microRNA expression profiling in placentas from pregnant women exposed to BPA.
De Felice B, Manfellotto F, Palumbo A, Troisi J, Zullo F, Di Carlo C, Di Spiezio Sardo A, De Stefano N, Ferbo U, Guida M, Guida M.
BMC Med Genomics. 2015 Sep 7;8(1):56. doi: 10.1186/s12920-015-0131-z.

8. N-acetyl cysteine protects human oral keratinocytes from Bis-GMA-induced apoptosis and cell cycle arrest by inhibiting reactive oxygen species-mediated mitochondrial dysfunction and the PI3K/Akt pathway.
Zhu Y, Gu YX, Mo JJ, Shi JY, Qiao SC, Lai HC.
Toxicol In Vitro. 2015 Sep 3. pii: S0887-2333(15)00215-5. doi: 10.1016/j.tiv.2015.09.002. [Epub ahead of print]

9. Exposure to bisphenol A during pregnancy and child neuropsychological development in the INMA-Sabadell cohort.
Casas M, Forns J, Martínez D, Avella-García C, Valvi D, Ballesteros-Gómez A, Luque N, Rubio S, Julvez J, Sunyer J, Vrijheid M.
Environ Res. 2015 Sep 4;142:671-679. doi: 10.1016/j.envres.2015.07.024. [Epub ahead of print]

10. Trends in Exposure to Chemicals in Personal Care and Consumer Products.
Calafat AM, Valentin-Blasini L, Ye X.
Curr Environ Health Rep. 2015 Sep 5. [Epub ahead of print]

11. The Impact of Bisphenol A and Phthalates on Allergy, Asthma, and Immune Function: a Review of Latest Findings.
Robinson L, Miller R.
Curr Environ Health Rep. 2015 Sep 4. [Epub ahead of print]

12. Environmental phenols and pubertal development in girls.
Wolff MS, Teitelbaum SL, McGovern K, Pinney SM, Windham GC, Galvez M, Pajak A, Rybak M, Calafat AM, Kushi LH, Biro FM; Breast Cancer and Environment Research Program. Electronic address: http://www.bcerp.org/index.htm.
Environ Int. 2015 Nov;84:174-80. doi: 10.1016/j.envint.2015.08.008. Epub 2015 Aug 31.

13. Bisphenol A, Bisphenol S, and 4-Hydroxyphenyl 4-Isoprooxyphenylsulfone (BPSIP) in Urine and Blood of Cashiers.
Thayer KA, Taylor KW, Garantziotis S, Schurman S, Kissling GE, Hunt D, Herbert B, Church R, Jankowich R, Churchwell MI, Scheri RC, Birnbaum LS, Bucher JR.
Environ Health Perspect. 2015 Aug 25. [Epub ahead of print]

14. Estrogenic Activity Data Extraction and in Silico Prediction Show the Endocrine Disruption Potential of Bisphenol A Replacement Compounds.
Ng HW, Shu M, Luo H, Ye H, Ge W, Perkins R, Tong W, Hong H.
Chem Res Toxicol. 2015 Sep 2. [Epub ahead of print]

15. Human exposure to endocrine disrupting chemicals and fertility: A case-control study in male subfertility patients.
Den Hond E, Tournaye H, De Sutter P, Ombelet W, Baeyens W, Covaci A, Cox B, Nawrot TS, Van Larebeke N, D'Hooghe T.
Environ Int. 2015 Nov;84:154-60. doi: 10.1016/j.envint.2015.07.017. Epub 2015 Aug 24.

16. Bisphenol A and child and youth behaviour: Canadian Health Measures Survey 2007 to 2011.
Findlay LC, Kohen DE.
Health Rep. 2015 Aug 19;26(8):3-9.

17. Media Coverage of Pediatric Environmental Health Risks and its Effects on Mothers' Protective Behaviors.
Mello S, Hornik RC.
Risk Anal. 2015 Aug 13. doi: 10.1111/risa.12467. [Epub ahead of print]

18. Exploring the associations between microRNA expression profiles and environmental pollutants in human placenta from the National Children's Study (NCS).
Li Q, Kappil MA, Li A, Dassanayake PS, Darrah TH, Friedman AE, Friedman M, Lambertini L, Landrigan P, Stodgell CJ, Xia Y, Nanes JA, Aagaard KM, Schadt EE, Murray JC, Clark EB, Dole N, Culhane J, Swanson J, Varner M, Moye J, Kasten C, Miller RK, Chen J.
Epigenetics. 2015 Sep 2;10(9):793-802. doi: 10.1080/15592294.2015.1066960. Epub 2015 Aug 7.

19. Exposure of human prostaspheres to Bisphenol A epigenetically regulates SNORD family non-coding RNAs via histone modification.
Ho SM, Cheong A, Lam HM, Hu WY, Shi GB, Zhu X, Chen J, Zhang X, Medvedovic M, Leung YK, Prins GS.
Endocrinology. 2015 Aug 6:en20151067. [Epub ahead of print]

20. Progesterone and Overlooked Endocrine Pathways in Breast Cancer Pathogenesis.
Brisken C, Hess K, Jeitziner R.
Endocrinology. 2015 Aug 4:en20151392. [Epub ahead of print]

21. NIEHS/FDA CLARITY-BPA research program update.
Heindel JJ, Newbold RR, Bucher JR, Camacho L, Delclos KB, Lewis SM, Vanlandingham M, Churchwell MI, Twaddle NC, McLellen M, Chidambaram M, Bryant M, Woodling K, Costa GG, Ferguson SA, Flaws J, Howard PC, Walker NJ, Zoeller RT, Fostel J, Favaro C, Schug TT.
Reprod Toxicol. 2015 Jul 29;58:33-44. doi: 10.1016/j.reprotox.2015.07.075. [Epub ahead of print] Review.

22. Urinary bisphenol A concentrations and association with in vitro fertilization outcomes among women from a fertility clinic.
Mínguez-Alarcón L, Gaskins AJ, Chiu YH, Williams PL, Ehrlich S, Chavarro JE, Petrozza JC, Ford JB, Calafat AM, Hauser R; EARTH Study Team.
Hum Reprod. 2015 Sep;30(9):2120-8. doi: 10.1093/humrep/dev183. Epub 2015 Jul 24.

23. Exposure to Bisphenol A and Phthalates during Pregnancy and Ultrasound Measures of Fetal Growth in the INMA-Sabadell Cohort.
Casas M, Valvi D, Ballesteros-Gomez A, Gascon M, Fernández MF, Garcia-Esteban R, Iñiguez C, Martinez D, Murcia M, Monfort N, Luque N, Rubio S, Ventura R, Sunyer J, Vrijheid M.
Environ Health Perspect. 2015 Jul 21. [Epub ahead of print]

24. Portable Colorimetric Paper-Based Biosensing Device for the Assessment of Bisphenol A in Indoor Dust.
Alkasir RS, Rossner A, Andreescu S.
Environ Sci Technol. 2015 Aug 18;49(16):9889-97. doi: 10.1021/acs.est.5b01588. Epub 2015 Aug 4.

25. A comparative assessment of human exposure to tetrabromobisphenol A and eight bisphenols including bisphenol A via indoor dust ingestion in twelve countries.
Wang W, Abualnaja KO, Asimakopoulos AG, Covaci A, Gevao B, Johnson-Restrepo B, Kumosani TA, Malarvannan G, Minh TB, Moon HB, Nakata H, Sinha RK, Kannan K.
Environ Int. 2015 Oct;83:183-91. doi: 10.1016/j.envint.2015.06.015. Epub 2015 Jul 10.

26. Estimation of in vivo and in vitro exposure to bisphenol A as food contaminant.
Milić N, Četojević-Simin D, Milanović M, Sudji J, Milošević N, Ćurić N, Abenavoli L, Medić-Stojanoska M.
Food Chem Toxicol. 2015 Sep;83:268-74. doi: 10.1016/j.fct.2015.07.003. Epub 2015 Jul 9.

27. Estimating bisphenol A exposure levels using a questionnaire targeting known sources of exposure.
Nomura SO, Harnack L, Robien K.
Public Health Nutr. 2015 Jul 2:1-14. [Epub ahead of print]

28. Bisphenol A: Human exposure and neurobehavior.
Mustieles V, Pérez-Lobato R, Olea N, Fernández MF.
Neurotoxicology. 2015 Jul;49:174-84. doi: 10.1016/j.neuro.2015.06.002. Epub 2015 Jun 27. Review.

29. 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.
Lin CY, Shen FY, Lian GW, Chien KL, Sung FC, Chen PC, Su TC.
Atherosclerosis. 2015 Aug;241(2):657-63. doi: 10.1016/j.atherosclerosis.2015.06.038. Epub 2015 Jun 20.

30. Effects of Endocrine-Disrupting Chemicals on the Ovary.
Patel S, Zhou C, Rattan S, Flaws JA.
Biol Reprod. 2015 Jul;93(1):20. doi: 10.1095/biolreprod.115.130336. Epub 2015 Jun 10.

31. A Preliminary Study of Biomonitoring for Bisphenol-A in Human Sweat.
Porucznik CA, Cox KJ, Wilkins DG, Anderson DJ, Bailey NM, Szczotka KM, Stanford JB.
J Anal Toxicol. 2015 Sep;39(7):562-6. doi: 10.1093/jat/bkv055. Epub 2015 May 25.

32. Endocrine disruptors and female cancer: Informing the patients (Review).
Del Pup L, Mantovani A, Luce A, Cavaliere C, Facchini G, Di Francia R, Caraglia M, Berretta M.
Oncol Rep. 2015 Jul;34(1):3-11. doi: 10.3892/or.2015.3997. Epub 2015 May 20.

33. Considerable exposure to the endocrine disrupting chemicals phthalates and bisphenol-A in intensive care unit (ICU) patients.
Huygh J, Clotman K, Malarvannan G, Covaci A, Schepens T, Verbrugghe W, Dirinck E, Van Gaal L, Jorens PG.
Environ Int. 2015 Aug;81:64-72. doi: 10.1016/j.envint.2015.04.008. Epub 2015 May 4.

34. Prenatal exposure to phthalates, bisphenol A and perfluoroalkyl substances and cord blood levels of IgE, TSLP and IL-33.
Ashley-Martin J, Dodds L, Levy AR, Platt RW, Marshall JS, Arbuckle TE.

Environ Res. 2015 Jul;140:360-8. doi: 10.1016/j.envres.2015.04.010. Epub 2015 Apr 24.

35. Urinary Bisphenol A Levels during Pregnancy and Risk of Preterm Birth.
Cantonwine DE, Ferguson KK, Mukherjee B, McElrath TF, Meeker JD.
Environ Health Perspect. 2015 Sep;123(9):895-901. doi: 10.1289/ehp.1408126. Epub 2015 Mar 27.

36. 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.
Guidry VT, Longnecker MP, Aase H, Eggesbø M, Zeiner P, Reichborn-Kjennerud T, Knudsen GP, Bertelsen RJ, Ye X, Calafat AM, Engel SM.
Environ Health Perspect. 2015 Jul;123(7):705-11. doi: 10.1289/ehp.1408325. Epub 2015 Mar 17.

37. Paternal Urinary Concentrations of Parabens and Other Phenols in Relation to Reproductive Outcomes among Couples from a Fertility Clinic.
Dodge LE, Williams PL, Williams MA, Missmer SA, Toth TL, Calafat AM, Hauser R.
Environ Health Perspect. 2015 Jul;123(7):665-71. doi: 10.1289/ehp.1408605. Epub 2015 Mar 13.

38. A pilot study on the feasibility of European harmonized human biomonitoring: Strategies towards a common approach, challenges and opportunities.
Casteleyn L, Dumez B, Becker K, Kolossa-Gehring M, Den Hond E, Schoeters G, Castaño A, Koch HM, Angerer J, Esteban M, Exley K, Sepai O, Bloemen L, Horvat M, Knudsen LE, Joas A, Joas R, Biot P, Koppen G, Dewolf MC, Katsonouri A, Hadjipanayis A, Cerná M, Krsková A, Schwedler G, Fiddicke U, Nielsen JK, Jensen JF, Rudnai P, Közepésy S, Mulcahy M, Mannion R, Gutleb AC, Fischer ME, Ligocka D, Jakubowski M, Reis MF, Namorado S, Lupsa IR, Gurzau AE, Halzlova K, Jajcaj M, Mazej D, Tratnik Snoj J, Posada M, López E, Berglund M, Larsson K, Lehmann A, Crettaz P, Aerts D.
Environ Res. 2015 Aug;141:3-14. doi: 10.1016/j.envres.2014.10.028. Epub 2015 Mar 5.

39. Concentrations of environmental phenols and parabens in milk, urine and serum of lactating North Carolina women.
Hines EP, Mendola P, von Ehrenstein OS, Ye X, Calafat AM, Fenton SE.
Reprod Toxicol. 2015 Jul;54:120-8. doi: 10.1016/j.reprotox.2014.11.006. Epub 2014 Nov 22.

40. Urinary BPA measurements in children and mothers from six European member states: Overall results and determinants of exposure.
Covaci A, Hond ED, Geens T, Govarts E, Koppen G, Frederiksen H, Knudsen LE, Mørck TA, Gutleb AC, Guignard C, Cocco E, Horvat M, Heath E, Kosjek T, Mazej D, Tratnik JS, Castaño A, Esteban M, Cutanda F, Ramos JJ, Berglund M, Larsson K, Jönsson BA, Biot P, Casteleyn L, Joas R, Joas A, Bloemen L, Sepai O, Exley K, Schoeters G, Angerer J, Kolossa-Gehring M, Fiddicke U, Aerts D, Koch HM.
Environ Res. 2015 Aug;141:77-85. doi: 10.1016/j.envres.2014.08.008. Epub 2014 Oct 13.

41. Bisphenol A exposure and associations with obesity among adults: a critical review.
Oppeneer SJ, Robien K.

Public Health Nutr. 2015 Jul;18(10):1847-63. doi: 10.1017/S1368980014002213. Epub 2014 Oct 14.

42. 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.

43. Cumulative Chemical Exposures During Pregnancy and Early Development.
Mitro SD, Johnson T, Zota AR.
Curr Environ Health Rep. 2015 Sep 4. [Epub ahead of print]

44. Non-phthalate plasticizers in German daycare centers and human biomonitoring of DINCH metabolites in children attending the centers (LUPE 3).
Fromme H, Schütze A, Lahrz T, Kraft M, Fembacher L, Siewering S, Burkardt R, Dietrich S, Koch HM, Völkel W.
Int J Hyg Environ Health. 2015 Aug 7. pii: S1438-4639(15)00103-0. doi: 10.1016/j.ijheh.2015.08.002. [Epub ahead of print]

45. Phthalate exposure and reproductive parameters in young men from the general Swedish population.
Axelsson J, Rylander L, Rignell-Hydbom A, Jönsson BA, Lindh CH, Giwercman A.
Environ Int. 2015 Aug 25;85:54-60. doi: 10.1016/j.envint.2015.07.005. [Epub ahead of print]

46. Associations between Maternal Biomarkers of Phthalate Exposure and Inflammation Using Repeated Measurements across Pregnancy.
Ferguson KK, McElrath TF, Mukherjee B, Loch-Caruso R, Meeker JD.
PLoS One. 2015 Aug 28;10(8):e0135601. doi: 10.1371/journal.pone.0135601. eCollection 2015.

47. Prenatal Phthalate Exposures and Childhood Fat Mass in a New York City Cohort.
Buckley JP, Engel SM, Mendez MA, Richardson DB, Daniels JL, Calafat AM, Wolff MS, Herring AH.
Environ Health Perspect. 2015 Aug 25. [Epub ahead of print]

48. Human urinary/seminal phthalates or their metabolite levels and semen quality: A meta-analysis.
Cai H, Zheng W, Zheng P, Wang S, Tan H, He G, Qu W.
Environ Res. 2015 Aug 10;142:486-494. doi: 10.1016/j.envres.2015.07.008. [Epub ahead of print]

49. Urinary phthalate metabolite concentrations in relation to history of infertility and use of assisted reproductive technology.
Alur S, Wang H, Hoeger K, Swan SH, Sathyanarayana S, Redmon BJ, Nguyen R, Barrett ES.
Fertil Steril. 2015 Aug 11. pii: S0015-0282(15)01662-3. doi: 10.1016/j.fertnstert.2015.07.1150. [Epub ahead of print]

50. Epigenetic Regulation in Environmental Chemical Carcinogenesis and its Applicability in Human Health Risk Assessment.
Kuppusamy SP, Kaiser JP, Wesselkamper SC.

Int J Toxicol. 2015 Sep;34(5):384-92. doi: 10.1177/1091581815599350. Epub 2015 Aug 12.

51. A margin of exposure approach to assessment of non-cancerous risk of diethyl phthalate based on human exposure from bottled water consumption.
Zare Jeddi M, Rastkari N, Ahmadkhaniha R, Yunesian M, Nabizadeh R, Daryabeygi R.
Environ Sci Pollut Res Int. 2015 Aug 13. [Epub ahead of print]

52. Predictors and long-term reproducibility of urinary phthalate metabolites in middle-aged men and women living in urban Shanghai.
Starling AP, Engel LS, Calafat AM, Koutros S, Satagopan JM, Yang G, Matthews CE, Cai Q, Buckley JP, Ji BT, Cai H, Chow WH, Zheng W, Gao YT, Rothman N, Xiang YB, Shu XO.
Environ Int. 2015 Nov;84:94-106. doi: 10.1016/j.envint.2015.07.003. Epub 2015 Aug 7.

53. Comparative Cytotoxicity and Sperm Motility Using a Computer-Aided Sperm Analysis System (CASA) for Isomers of Phthalic Acid, a Common Final Metabolite of Phthalates.
Kwack SJ, Lee BM.
J Toxicol Environ Health A. 2015;78(16):1038-50. doi: 10.1080/15287394.2015.1067503. Epub 2015 Aug 7.

54. Levels of Phthalate Metabolites in Urine of Pregnant Women and Risk of Clinical Pregnancy Loss.
Mu D, Gao F, Fan Z, Shen H, Peng H, Hu J.
Environ Sci Technol. 2015 Sep 1;49(17):10651-7. doi: 10.1021/acs.est.5b02617. Epub 2015 Aug 13.

55. Stress and Androgen Activity During Fetal Development.
Barrett ES, Swan SH.
Endocrinology. 2015 Aug 4:en20151335. [Epub ahead of print]

56. Temporal variability of urinary concentrations of phthalate metabolites, parabens and benzophenone-3 in a Belgian adult population.
Dewalque L, Pirard C, Vandepaer S, Charlier C.
Environ Res. 2015 Jul 30;142:414-423. doi: 10.1016/j.envres.2015.07.015. [Epub ahead of print]

57. Association Between Urinary Phthalates and Pubertal Timing in Chinese Adolescents.
Shi H, Cao Y, Shen Q, Zhao Y, Zhang Z, Zhang Y.
J Epidemiol. 2015 Sep 5;25(9):574-82. doi: 10.2188/jea.JE20140205. Epub 2015 Jul 25.

58. Age and Gender Differences in Urinary Levels of Eleven Phthalate Metabolites in General Taiwanese Population after a DEHP Episode.
Huang PC, Tsai CH, Liang WY, Li SS, Pan WH, Chiang HC.
PLoS One. 2015 Jul 24;10(7):e0133782. doi: 10.1371/journal.pone.0133782. eCollection 2015.

59. Human Chorionic Gonadotropin Partially Mediates Phthalate Association With Male and Female Anogenital Distance.
Adibi JJ, Lee MK, Naimi AI, Barrett E, Nguyen RH, Sathyanarayana S, Zhao Y, Thiet MP, Redmon JB, Swan SH.

J Clin Endocrinol Metab. 2015 Sep;100(9):E1216-24. doi: 10.1210/jc.2015-2370. Epub 2015 Jul 22.

60. Vaginal douching and racial/ethnic disparities in phthalates exposures among reproductive-aged women: National Health and Nutrition Examination Survey 2001-2004.
Branch F, Woodruff TJ, Mitro SD, Zota AR.
Environ Health. 2015 Jul 15;14:57. doi: 10.1186/s12940-015-0043-6.

61. The effects of phthalate and nonylphenol exposure on body size and secondary sexual characteristics during puberty.
Hou JW, Lin CL, Tsai YA, Chang CH, Liao KW, Yu CJ, Yang W, Lee MJ, Huang PC, Sun CW, Wang YH, Lin FR, Wu WC, Lee MC, Pan WH, Chen BH, Wu MT, Chen CC, Wang SL, Lee CC, Hsiung CA, Chen ML.
Int J Hyg Environ Health. 2015 Oct;218(7):603-15. doi: 10.1016/j.ijheh.2015.06.004. Epub 2015 Jul 2.

62. Association of exposure to di-2-ethylhexylphthalate replacements with increased blood pressure in children and adolescents.
Trasande L, Attina TM.
Hypertension. 2015 Aug;66(2):301-8. doi: 10.1161/HYPERTENSIONAHA.115.05603.

63. The effect of prenatal exposure to phthalates on food allergy and early eczema in inner-city children.
Stelmach I, Majak P, Jerzynska J, Podlecka D, Stelmach W, Polańska K, Ligocka D, Hanke W.
Allergy Asthma Proc. 2015 Jul-Aug;36(4):72-8. doi: 10.2500/aap.2015.36.3867.

64. Prenatal exposure to phthalates and neuropsychological development during childhood.
Gascon M, Valvi D, Forns J, Casas M, Martínez D, Júlvez J, Monfort N, Ventura R, Sunyer J, Vrijheid M.
Int J Hyg Environ Health. 2015 Aug;218(6):550-8. doi: 10.1016/j.ijheh.2015.05.006. Epub 2015 May 19.

65. Bis-(2-propylheptyl)phthalate (DPHP) metabolites emerging in 24h urine samples from the German Environmental Specimen Bank (1999-2012).
Schütze A, Gries W, Kolossa-Gehring M, Apel P, Schröter-Kermani C, Fiddicke U, Leng G, Brüning T, Koch HM.
Int J Hyg Environ Health. 2015 Aug;218(6):559-63. doi: 10.1016/j.ijheh.2015.05.007. Epub 2015 Jun 2.

66. Association of Exposure to Di-2-Ethylhexylphthalate Replacements With Increased Insulin Resistance in Adolescents From NHANES 2009-2012.
Attina TM, Trasande L.
J Clin Endocrinol Metab. 2015 Jul;100(7):2640-50. doi: 10.1210/jc.2015-1686. Epub 2015 May 20.

67. Human biomonitoring of phthalate exposure in Austrian children and adults and cumulative risk assessment.
Hartmann C, Uhl M, Weiss S, Koch HM, Scharf S, König J.
Int J Hyg Environ Health. 2015 Jul;218(5):489-99. doi: 10.1016/j.ijheh.2015.04.002. Epub 2015 Apr 21.

68. 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.
Lioy PJ, Hauser R, Gennings C, Koch HM, Mirkes PE, Schwetz BA, Kortenkamp A.
J Expo Sci Environ Epidemiol. 2015 Jul;25(4):343-53. doi: 10.1038/jes.2015.33. Epub 2015 May 6. Review.

69. Exposure to select phthalates and phenols through use of personal care products among Californian adults and their children.
Philippat C, Bennett D, Calafat AM, Picciotto IH.
Environ Res. 2015 Jul;140:369-76. doi: 10.1016/j.envres.2015.04.009. Epub 2015 May 2.

70. Comparisons of urinary phthalate metabolites and daily phthalate intakes among Japanese families.
Ait Bamai Y, Araki A, Kawai T, Tsuboi T, Yoshioka E, Kanazawa A, Cong S, Kishi R.
Int J Hyg Environ Health. 2015 Jul;218(5):461-70. doi: 10.1016/j.ijheh.2015.03.013. Epub 2015 Apr 3.

71. Phthalate esters contamination in soils and vegetables of plastic film greenhouses of suburb Nanjing, China and the potential human health risk.
Ma TT, Wu LH, Chen L, Zhang HB, Teng Y, Luo YM.
Environ Sci Pollut Res Int. 2015 Aug;22(16):12018-28. doi: 10.1007/s11356-015-4401-2. Epub 2015 Apr 15.

72. Reducing Prenatal Phthalate Exposure Through Maternal Dietary Changes: Results from a Pilot Study.
Barrett ES, Velez M, Qiu X, Chen SR.
Matern Child Health J. 2015 Sep;19(9):1936-42. doi: 10.1007/s10995-015-1707-0.

73. Case study: Possible differences in phthalates exposure among the Czech, Hungarian, and Slovak populations identified based on the DEMOCOPHES pilot study results.
Černá M, Malý M, Rudnai P, Középesy S, Náray M, Halzlová K, Jajcaj M, Grafnetterová A, Krsková A, Antošová D, Forysová K, Hond ED, Schoeters G, Joas R, Casteleyn L, Joas A, Biot P, Aerts D, Angerer J, Bloemen L, Castaño A, Esteban M, Koch HM, Kolossa-Gehring M, Gutleb AC, Pavloušková J, Vrbík K.
Environ Res. 2015 Aug;141:118-24. doi: 10.1016/j.envres.2014.10.025. Epub 2014 Dec 19.

74. Interpreting biomarker data from the COPHES/DEMOCOPHES twin projects: Using external exposure data to understand biomarker differences among countries.
Smolders R, Den Hond E, Koppen G, Govarts E, Willems H, Casteleyn L, Kolossa-Gehring M, Fiddicke U, Castaño A, Koch HM, Angerer J, Esteban M, Sepai O, Exley K, Bloemen L, Horvat M, Knudsen LE, Joas A, Joas R, Biot P, Aerts D, Katsonouri A, Hadjipanayis A, Cerna M, Krskova A, Schwedler G, Seiwert M, Nielsen JK, Rudnai P, Közepesy S, Evans DS, Ryan MP, Gutleb AC, Fischer ME, Ligocka D, Jakubowski M, Reis MF, Namorado S, Lupsa IR, Gurzau AE, Halzlova K, Fabianova E, Mazej D, Tratnik Snoj J, Gomez S, González S, Berglund M, Larsson K, Lehmann A, Crettaz P, Schoeters G.
Environ Res. 2015 Aug;141:86-95. doi: 10.1016/j.envres.2014.08.016. Epub 2014 Oct 14.

75. The Danish contribution to the European DEMOCOPHES project: A description of cadmium, cotinine and mercury levels in Danish mother-child pairs and the perspectives of supplementary sampling and measurements.
Mørck TA, Nielsen F, Nielsen JK, Jensen JF, Hansen PW, Hansen AK, Christoffersen LN, Siersma VD, Larsen IH, Hohlmann LK, Skaanild MT, Frederiksen H, Biot P, Casteleyn L, Kolossa-Gehring M, Schwedler G, Castaño A, Angerer J, Koch HM, Esteban M, Schoeters G, Den Hond E, Exley K, Sepai O, Bloemen L, Joas R, Joas A, Fiddicke U, Lopez A, Cañas A, Aerts D, Knudsen LE.
Environ Res. 2015 Aug;141:96-105. doi: 10.1016/j.envres.2014.07.028. Epub 2014 Oct 14.

76. Use of pooled samples to assess human exposure to parabens, benzophenone-3 and triclosan in Queensland, Australia.
Heffernan AL, Baduel C, Toms LM, Calafat AM, Ye X, Hobson P, Broomhall S, Mueller JF.
Environ Int. 2015 Sep 11;85:77-83. doi: 10.1016/j.envint.2015.09.001. [Epub ahead of print]

77. Parabens in 24h urine samples of the German Environmental Specimen Bank from 1995 to 2012.
Moos RK, Koch HM, Angerer J, Apel P, Schröter-Kermani C, Brüning T, Kolossa-Gehring M.
Int J Hyg Environ Health. 2015 Oct;218(7):666-74. doi: 10.1016/j.ijheh.2015.07.005. Epub 2015 Jul 29.

78. Analytical method for the determination and a survey of parabens and their derivatives in pharmaceuticals.
Moreta C, Tena MT, Kannan K.
Environ Res. 2015 Aug 4;142:452-460. doi: 10.1016/j.envres.2015.07.014. [Epub ahead of print]

79. Occurrence and human exposure of parabens and their chlorinated derivatives in swimming pools.
Li W, Shi Y, Gao L, Liu J, Cai Y.
Environ Sci Pollut Res Int. 2015 Jul 15. [Epub ahead of print]

80. Perfluoroalkyl Acid Concentrations in Blood Samples Subjected to Transportation and Processing Delay.
Bach CC, Henriksen TB, Bossi R, Bech BH, Fuglsang J, Olsen J, Nohr EA.
PLoS One. 2015 Sep 10;10(9):e0137768. doi: 10.1371/journal.pone.0137768. eCollection 2015.

81. Neutral polyfluorinated compounds in indoor air in Germany - The LUPE 4 study.
Fromme H, Dreyer A, Dietrich S, Fembacher L, Lahrz T, Völkel W.
Chemosphere. 2015 Sep 1;139:572-578. doi: 10.1016/j.chemosphere.2015.07.024. [Epub ahead of print]

82. Organic anion transporter 4 (OAT 4) modifies placental transfer of perfluorinated alkyl acids PFOS and PFOA in human placental ex vivo perfusion system.
Kummu M, Sieppi E, Koponen J, Laatio L, Vähäkangas K, Kiviranta H, Rautio A, Myllynen P.
Placenta. 2015 Aug 6. pii: S0143-4004(15)30013-8. doi: 10.1016/j.placenta.2015.07.119. [Epub ahead of print]

83. Breastfeeding as an Exposure Pathway for Perfluorinated Alkylates.
Mogensen UB, Grandjean P, Nielsen F, Weihe P, Budtz-Jørgensen E.

Environ Sci Technol. 2015 Sep 1;49(17):10466-73. doi: 10.1021/acs.est.5b02237. Epub 2015 Aug 20.

84. Serum perfluoroalkyl acids and time to pregnancy in nulliparous women.
Bach CC, Bech BH, Nohr EA, Olsen J, Matthiesen NB, Bossi R, Uldbjerg N, Bonefeld-Jørgensen EC, Henriksen TB.
Environ Res. 2015 Aug 14;142:ER15950. doi: 10.1016/j.envres.2015.08.007. [Epub ahead of print]

85. Transfer of perfluoroalkyl substances from mother to fetus in a Spanish birth cohort.
Manzano-Salgado CB, Casas M, Lopez-Espinosa MJ, Ballester F, Basterrechea M, Grimalt JO, Jiménez AM, Kraus T, Schettgen T, Sunyer J, Vrijheid M.
Environ Res. 2015 Aug 6;142:471-478. doi: 10.1016/j.envres.2015.07.020. [Epub ahead of print]

86. Perfluoroalkyl acid (PFAA) levels and profiles in breast milk, maternal and cord serum of French women and their newborns.
Cariou R, Veyrand B, Yamada A, Berrebi A, Zalko D, Durand S, Pollono C, Marchand P, Leblanc JC, Antignac JP, Le Bizec B.
Environ Int. 2015 Nov;84:71-81. doi: 10.1016/j.envint.2015.07.014. Epub 2015 Jul 29.

87. Perfluoroalkyl acids in children and their mothers: Association with drinking water and time trends of inner exposures-Results of the Duisburg birth cohort and Bochum cohort studies.
Wilhelm M, Wittsiepe J, Völkel W, Fromme H, Kasper-Sonnenberg M.
Int J Hyg Environ Health. 2015 Oct;218(7):645-55. doi: 10.1016/j.ijheh.2015.07.001. Epub 2015 Jul 9.

88. Prenatal exposure to perfluroalkyl substances and children's IQ: The Taiwan maternal and infant cohort study.
Wang Y, Rogan WJ, Chen HY, Chen PC, Su PH, Chen HY, Wang SL.
Int J Hyg Environ Health. 2015 Oct;218(7):639-44. doi: 10.1016/j.ijheh.2015.07.002. Epub 2015 Jul 9.

89. Antibody response to booster vaccination with tetanus and diphtheria in adults exposed to perfluorinated alkylates.
Kielsen K, Shamim Z, Ryder LP, Nielsen F, Grandjean P, Budtz-Jørgensen E, Heilmann C.
J Immunotoxicol. 2015 Jul 16:1-4. [Epub ahead of print]

90. Perfluoroalkyl substances measured in breast milk and child neuropsychological development in a Norwegian birth cohort study.
Forns J, Iszatt N, White RA, Mandal S, Sabaredzovic A, Lamoree M, Thomsen C, Haug LS, Stigum H, Eggesbø M.
Environ Int. 2015 Oct;83:176-82. doi: 10.1016/j.envint.2015.06.013. Epub 2015 Jul 6.

91. Levels of perfluoroalkyl substances and risk of coronary heart disease: Findings from a population-based longitudinal study.
Mattsson K, Rignell-Hydbom A, Holmberg S, Thelin A, Jönsson BA, Lindh CH, Sehlstedt A, Rylander L.
Environ Res. 2015 Jul 2;142:148-154. doi: 10.1016/j.envres.2015.06.033. [Epub ahead of print]

92. Involvement of NRF2 in Perfluorooctanoic Acid-Induced Testicular Damage in Male Mice.
Liu W, Yang B, Wu L, Zou W, Pan X, Zou T, Liu F, Xia L, Wang X, Zhang D.
Biol Reprod. 2015 Aug;93(2):41. doi: 10.1095/biolreprod.115.128819. Epub 2015 Jun 24.

93. Influence of contaminated drinking water on perfluoroalkyl acid levels in human serum--A case study from Uppsala, Sweden.
Gyllenhammar I, Berger U, Sundström M, McCleaf P, Eurén K, Eriksson S, Ahlgren S, Lignell S, Aune M, Kotova N, Glynn A.
Environ Res. 2015 Jul;140:673-83. doi: 10.1016/j.envres.2015.05.019. Epub 2015 Jun 14.

94. Can the observed association between serum perfluoroalkyl substances and delayed menarche be explained on the basis of puberty-related changes in physiology and pharmacokinetics?
Wu H, Yoon M, Verner MA, Xue J, Luo M, Andersen ME, Longnecker MP, Clewell HJ 3rd.
Environ Int. 2015 Sep;82:61-8. doi: 10.1016/j.envint.2015.05.006. Epub 2015 May 29.

95. Prenatal exposures to perfluoroalkyl acids and serum lipids at ages 7 and 15 in females.
Maisonet M, Näyhä S, Lawlor DA, Marcus M.
Environ Int. 2015 Sep;82:49-60. doi: 10.1016/j.envint.2015.05.001. Epub 2015 May 23.

96. 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).
Salihovic S, Kärrman A, Lind L, Lind PM, Lindström G, van Bavel B.
Environ Int. 2015 Sep;82:21-7. doi: 10.1016/j.envint.2015.05.003. Epub 2015 May 22.

97. Reliability of perfluoroalkyl substances in plasma of 100 women in two consecutive pregnancies.
Papadopoulou E, Haug LS, Sabaredzovic A, Eggesbø M, Longnecker MP.
Environ Res. 2015 Jul;140:421-9. doi: 10.1016/j.envres.2015.04.022. Epub 2015 May 15.

98. Association between perfluoroalkyl substances and reproductive hormones in adolescents and young adults.
Tsai MS, Lin CY, Lin CC, Chen MH, Hsu SH, Chien KL, Sung FC, Chen PC, Su TC.
Int J Hyg Environ Health. 2015 Jul;218(5):437-43. doi: 10.1016/j.ijheh.2015.03.008. Epub 2015 Mar 26.

99. Demographic, behavioral, dietary, and socioeconomic characteristics related to persistent organic pollutants and mercury levels in pregnant women in Japan.
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.
Chemosphere. 2015 Aug;133:13-21. doi: 10.1016/j.chemosphere.2015.02.062. Epub 2015 Mar 28.

100. Anthropometry in 5- to 9-Year-Old Greenlandic and Ukrainian Children in Relation to Prenatal Exposure to Perfluorinated Alkyl Substances.

Høyer BB, Ramlau-Hansen CH, Vrijheid M, Valvi D, Pedersen HS, Zviezdai V, Jönsson BA, Lindh CH, Bonde JP, Toft G.
Environ Health Perspect. 2015 Aug;123(8):841-6. doi: 10.1289/ehp.1408881. Epub 2015 Mar 26.

101. Fetal growth and maternal glomerular filtration rate: a systematic review.
Vesterinen HM, Johnson PI, Atchley DS, Sutton P, Lam J, Zlatnik MG, Sen S, Woodruff TJ.
J Matern Fetal Neonatal Med. 2015 Sep 4:1-6. [Epub ahead of print]

102. An immunoassay for the detection of triclosan-O-glucuronide, a primary human urinary metabolite of triclosan.
Ranganathan A, Gee SJ, Hammock BD.
Anal Bioanal Chem. 2015 Sep;407(24):7263-73. doi: 10.1007/s00216-015-8918-5. Epub 2015 Aug 9.

103. From consumption to harvest: Environmental fate prediction of excreted ionizable trace organic chemicals.
Polesel F, Plósz BG, Trapp S.
Water Res. 2015 Jul 3;84:85-98. doi: 10.1016/j.watres.2015.06.033. [Epub ahead of print]

104. Reproductive endocrine-disrupting effects of triclosan: Population exposure, present evidence and potential mechanisms.
Wang CF, Tian Y.
Environ Pollut. 2015 Jul 13;206:195-201. doi: 10.1016/j.envpol.2015.07.001. [Epub ahead of print] Review.

105. Temporal variability and sources of triclosan exposure in pregnancy.
Weiss L, Arbuckle TE, Fisher M, Ramsay T, Mallick R, Hauser R, LeBlanc A, Walker M, Dumas P, Lang C.
Int J Hyg Environ Health. 2015 Aug;218(6):507-13. doi: 10.1016/j.ijheh.2015.04.003. Epub 2015 Apr 29.

106. Parallel evolutionary pathways to antibiotic resistance selected by biocide exposure.
Webber MA, Whitehead RN, Mount M, Loman NJ, Pallen MJ, Piddock LJ.
J Antimicrob Chemother. 2015 Aug;70(8):2241-8. doi: 10.1093/jac/dkv109. Epub 2015 May 7.

107. Polybrominated Diphenyl Ether Exposure and Thyroid Function Tests in North American Adults.
Makey CM, McClean MD, Braverman LE, Pearce EN, He XM, Sjödin A, Weinberg JM, Webster TF.
Environ Health Perspect. 2015 Sep 15. [Epub ahead of print]

108. Prenatal exposure to polybrominateds diphenyl ethers and child attention problems at 3-7years.
Cowell WJ, Lederman SA, Sjödin A, Jones R, Wang S, Perera FP, Wang R, Rauh VA, Herbstman JB.
Neurotoxicol Teratol. 2015 Sep 4. pii: S0892-0362(15)30027-1. doi: 10.1016/j.ntt.2015.08.009. [Epub ahead of print]

109. Pilot study on the dietary habits and lifestyles of girls with idiopathic precocious puberty from the city of Rome: potential impact of exposure to flame retardant polybrominated diphenyl ethers.
Tassinari R, Mancini FR, Mantovani A, Busani L, Maranghi F.

J Pediatr Endocrinol Metab. 2015 Jul 30. pii: /j/jpem.ahead-of-print/jpem-2015-0116/jpem-2015-0116.xml. doi: 10.1515/jpem-2015-0116. [Epub ahead of print]

110. Environmental Pollutant Polybrominated Diphenyl Ether, a Flame Retardant, Induces Primary Amnion Cell Senescence.
Behnia F, Peltier MR, Saade GR, Menon R.
Am J Reprod Immunol. 2015 Jul 17. doi: 10.1111/aji.12414. [Epub ahead of print]

111. Effect of tributyltin on mammalian endothelial cell integrity.
Botelho G, Bernardini C, Zannoni A, Ventrella V, Bacci ML, Forni M.
Comp Biochem Physiol C Toxicol Pharmacol. 2015 Oct-Nov;176-177:79-86. doi: 10.1016/j.cbpc.2015.07.012. Epub 2015 Aug 6.

## 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 2015/06/30 to 2015/12/31 (Juli 2015 og fremefter)
Efter at have fjernet genganger fra forrige litteraturopdateringslister, samt artikler der ikke hørte til under kategorien "in vitro" gav litteratursøgningen, med de angivne søgekriterier, tilsammen en liste med i alt 35 artikler(bruttolisten).

## Udvalgte publikationer

2 artikler er blevet udvalgt til nærmere beskrivelse baseret på, at resultaterne 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 etablere et nyt link mellem faktiske interne niveauer af persistente organiske miljøgifte (POPs) i mennesker og den koncentration, hvor de udviser hormonforstyrrende aktivitet *in vitro*.

Den anden artikel omhandler et studie af de potentielle hormonforstyrrende egenskaber af ekstrakter fra tre forskellige såkaldt "medicinske planter": Ginkgo biloba, Elettaria cardamoum og Plantago ovata.

**Endocrine activity of persistent organic pollutants accumulated in human silicone implants - Dosing in vitro assays by partitioning from silicone.**
Gilbert D, Mayer P, Pedersen M, Vinggaard AM.
Environ Int. 2015 Nov;84:107-14. doi: 10.1016/j.envint.2015.07.008. Epub 2015 Aug 8.

Persistent organic pollutants (POPs) accumulated in human tissues may pose a risk for human health by interfering with the endocrine system. This study establishes a new link between actual human internal POP levels and the endocrine active dose in vitro, applying partitioning-controlled dosing from silicone to the H295R steroidogenesis assay: (1) Measured concentrations of POPs in silicone breast implants were taken from a recent study and silicone disks were loaded according to these measurements. (2) Silicone disks were transferred into H295R cell culture plates in order to control exposure of the adrenal cells by equilibrium partitioning. (3) Hormone production of the adrenal cells was measured as toxicity endpoint. 4-Nonylphenol was used for method development, and the new dosing method was compared to conventional solvent-dosing. The two dosing modes yielded similar dose-dependent hormonal responses of H295R cells. However, with the partitioning-controlled freely dissolved concentrations (Cfree) as dose metrics, dose-response curves were left-shifted by two orders of magnitude relative to spiked concentrations. Partitioning-controlled dosing of POPs resulted in up to 2-fold increases in progestagen and corticosteroid levels at $C_{free}$ of individual POPs in or below the femtomolar range. Silicone acted not only as source of the POPs but also as a sorption sink for lipophilic hormones, stimulating the cellular hormone production. Methodologically, the study showed that silicone can be used as reference partitioning phase to transfer in vivo exposure in humans (silicone implants) to in vitro assays (partition-controlled dosing). The main finding was that POPs at the levels at which they are found in humans can interfere with steroidogenesis in a human adrenocortical cell line.

**Assessment of hormone-like activities in Ginkgo biloba, Elettaria cardamomum and Plantago ovata extracts using in vitro receptor-specific bioassays**.
Real M, Molina-Molina JM, Jimenez J, Diéguez HR, Fernández MF, Olea N.
Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2015 Sep;32(9):1531-41. doi: 10.1080/19440049.2015.1071922. Epub 2015 Aug 4.

Medicinal plants are widely used for the treatment of diseases and for the development of new drugs. This study was designed to determine the presence of hormone-like activities dependent on the activation of human estrogen receptor alpha (hERa) and/or androgen receptor (hAR) in methanol extracts prepared from three medicinal plants historically and currently used for therapeutic purposes: Ginkgo biloba leaves (GBL), Elettaria cardamomum seeds (ECS) and Plantago ovata seeds (POS). After a solid-liquid extraction (SLE) step, their effects on hERa function were assessed in MCF-7 breast cancer cells using the E-Screen bioassay, and their ability to induce hAR-mediated reporter gene expression was evaluated using the androgen-sensitive stable prostatic PALM cell line. Unlike POS extracts, GBL and ECS extracts showed estrogenic (0.07 and 0.20 nM E2Eq $mg^{-1}$, respectively) and anti-estrogenic (0.01 and 0.02 µM ICI182780Eq $mg^{-1}$, respectively) activities. ECS extracts evidenced androgenic activity (0.30 nM R1881Eq $mg^{-1}$) and POS extracts anti-androgenic activity (22.30 µM ProcEq $mg^{-1}$). According to these findings, these plant extracts may interfere with the endocrine system via one or more hormonal receptors, and further investigation is warranted into their role as endocrine disrupters in humans.

## Bruttolisten (in vitro)

1. Development of an In Vitro Ovary Culture System to Evaluate Endocrine Disruption in Wood Frog Tadpoles.
Vu M, Navarro-Martín L, Gutierrez-Villagomez JM, Trudeau VL.
J Toxicol Environ Health A. 2015 Sep 18:1-5. [Epub ahead of print]

2. Assessment of estrogenic activity in $PM_{10}$ air samples with the ERE-CALUX bioassay: Method optimization and implementation at an urban location in Flanders (Belgium).
Croes K, Debaillie P, Van den Bril B, Staelens J, Vandermarken T, Van Langenhove K, Denison MS, Leermakers M, Elskens M.
Chemosphere. 2015 Sep 15;144:392-398. doi: 10.1016/j.chemosphere.2015.09.020. [Epub ahead of print]

3. Bisphenol A stimulates the epithelial mesenchymal transition of estrogen negative breast cancer cells via FOXA1 signals.
Zhang XL, Wang HS, Liu N, Ge LC.
Arch Biochem Biophys. 2015 Sep 9. pii: S0003-9861(15)30057-6. doi: 10.1016/j.abb.2015.09.006. [Epub ahead of print]

4. A fetal whole ovarian culture model for the evaluation of CrVI-induced developmental toxicity during germ cell nest breakdown.
Stanley JA, Arosh JA, Burghardt RC, Banu SK.
Toxicol Appl Pharmacol. 2015 Sep 5. pii: S0041-008X(15)30076-4. doi: 10.1016/j.taap.2015.09.002. [Epub ahead of print]

5. The Impact of Bisphenol A and Phthalates on Allergy, Asthma, and Immune Function: a Review of Latest Findings.
Robinson L, Miller R.
Curr Environ Health Rep. 2015 Sep 4. [Epub ahead of print]

6. The endocrine disruptor cadmium alters human osteoblast-like Saos-2 cells homeostasis in vitro by alteration of Wnt/β-catenin pathway and activation of caspases.
Papa V, Bimonte VM, Wannenes F, D'Abusco AS, Fittipaldi S, Scandurra R, Politi L, Crescioli C, Lenzi A, Di Luigi L, Migliaccio S.
J Endocrinol Invest. 2015 Sep 3. [Epub ahead of print]

7. The brominated flame retardants TBP-AE and TBP-DBPE antagonize the chicken androgen receptor and act as potential endocrine disrupters in chicken LMH cells.
Asnake S, Pradhan A, Kharlyngdoh JB, Modig C, Olsson PE.
Toxicol In Vitro. 2015 Aug 28;29(8):1993-2000. doi: 10.1016/j.tiv.2015.08.009. [Epub ahead of print]

8. Reprint of "In silico methods in the discovery of endocrine disrupting chemicals".
Vuorinen A, Odermatt A, Schuster D.
J Steroid Biochem Mol Biol. 2015 Sep;153:93-101. doi: 10.1016/j.jsbmb.2015.08.015. Epub 2015 Aug 19. Review.

9. Effect of chronic exposure to two components of Tritan™ copolyester on Daphnia magna, Moina macrocopa, and Oryzias latipes, and potential mechanisms of endocrine disruption using H295R cells.
Jang S, Ji K.
Ecotoxicology. 2015 Aug 20. [Epub ahead of print]

10. In vitro evaluation of oestrogenic/androgenic activity of the serum organochlorine pesticide mixtures previously described in a breast cancer case-control study.
Rivero J, Luzardo OP, Henríquez-Hernández LA, Machín RP, Pestano J, Zumbado M, Boada LD, Camacho M, Valerón PF.
Sci Total Environ. 2015 Dec 15;537:197-202. doi: 10.1016/j.scitotenv.2015.08.016. Epub 2015 Aug 15.

11. Endocrine activity of persistent organic pollutants accumulated in human silicone implants - Dosing in vitro assays by partitioning from silicone.

Gilbert D, Mayer P, Pedersen M, Vinggaard AM.
Environ Int. 2015 Nov;84:107-14. doi: 10.1016/j.envint.2015.07.008. Epub 2015 Aug 8.

12. Investigation of potential endocrine disrupting effects of mosquito larvicidal Bacillus thuringiensis israelensis (Bti) formulations.
Maletz S, Wollenweber M, Kubiak K, Müller A, Schmitz S, Maier D, Hecker M, Hollert H.
Sci Total Environ. 2015 Dec 1;536:729-38. doi: 10.1016/j.scitotenv.2015.07.053. Epub 2015 Aug 4.

13. The role of PPARγ in TBBPA-mediated endocrine disrupting effects in human choriocarcinoma JEG-3 cells.
Honkisz E, Wójtowicz AK.
Mol Cell Biochem. 2015 Aug 8. [Epub ahead of print]

14. The Role of Epigenetics in the Latent Effects of Early Life Exposure to Obesogenic Endocrine Disrupting Chemicals.
Stel J, Legler J.
Endocrinology. 2015 Oct;156(10):3466-72. doi: 10.1210/en.2015-1434. Epub 2015 Aug 4.

15. Perfluorinated chemicals, PFOS and PFOA, enhance the estrogenic effects of 17β-estradiol in T47D human breast cancer cells.
Sonthithai P, Suriyo T, Thiantanawat A, Watcharasit P, Ruchirawat M, Satayavivad J.
J Appl Toxicol. 2015 Aug 3. doi: 10.1002/jat.3210. [Epub ahead of print]

16. Directed Differentiation of Human Embryonic Stem Cells into Prostate Organoids In Vitro and its Perturbation by Low-Dose Bisphenol A Exposure.
Calderon-Gierszal EL, Prins GS.
PLoS One. 2015 Jul 29;10(7):e0133238. doi: 10.1371/journal.pone.0133238. eCollection 2015.

17. Zearalenone metabolism in human placental subcellular organelles, JEG-3 cells, and recombinant CYP19A1.
Huuskonen P, Auriola S, Pasanen M.
Placenta. 2015 Sep;36(9):1052-5. doi: 10.1016/j.placenta.2015.06.014. Epub 2015 Jul 7.

18. Selective Aptamers for Detection of Estradiol and Ethynylestradiol in Natural Waters.
Akki SU, Werth CJ, Silverman SK.
Environ Sci Technol. 2015 Aug 18;49(16):9905-13. doi: 10.1021/acs.est.5b02401. Epub 2015 Jul 31.

19. Interlaboratory comparison of in vitro bioassays for screening of endocrine active chemicals in recycled water.
Mehinto AC, Jia A, Snyder SA, Jayasinghe BS, Denslow ND, Crago J, Schlenk D, Menzie C, Westerheide SD, Leusch FD, Maruya KA.
Water Res. 2015 Oct 15;83:303-9. doi: 10.1016/j.watres.2015.06.050. Epub 2015 Jul 6.

20. Estimation of in vivo and in vitro exposure to bisphenol A as food contaminant.
Milić N, Četojević-Simin D, Milanović M, Sudji J, Milošević N, Ćurić N, Abenavoli L, Medić-Stojanoska M.
Food Chem Toxicol. 2015 Sep;83:268-74. doi: 10.1016/j.fct.2015.07.003. Epub 2015 Jul 9.

21. Effects of selective serotonin reuptake inhibitors on three sex steroids in two versions of the aromatase enzyme inhibition assay and in the H295R cell assay.
Jacobsen NW, Hansen CH, Nellemann C, Styrishave B, Halling-Sørensen B.
Toxicol In Vitro. 2015 Oct;29(7):1729-35. doi: 10.1016/j.tiv.2015.07.005. Epub 2015 Jul 7.

22. Assessment of hormone-like activities in Ginkgo biloba, Elettaria cardamomum and Plantago ovata extracts using in vitro receptor-specific bioassays.
Real M, Molina-Molina JM, Jimenez J, Diéguez HR, Fernández MF, Olea N.
Food Addit Contam Part A Chem Anal Control Expo Risk Assess. 2015 Sep;32(9):1531-41. doi: 10.1080/19440049.2015.1071922. Epub 2015 Aug 4.

23. Alteration of cellular lipids and lipid metabolism markers in RTL-W1 cells exposed to model endocrine disrupters.

Dimastrogiovanni G, Córdoba M, Navarro I, Jáuregui O, Porte C.
Aquat Toxicol. 2015 Aug;165:277-85. doi: 10.1016/j.aquatox.2015.06.005. Epub 2015 Jun 17.

24. Bisphenol S and F: A Systematic Review and Comparison of the Hormonal Activity of Bisphenol A Substitutes.
Rochester JR, Bolden AL.
Environ Health Perspect. 2015 Jul;123(7):643-50. doi: 10.1289/ehp.1408989. Epub 2015 Mar 16.

25. Effective attenuation of atrazine-induced histopathological changes in testicular tissue by antioxidant N-phenyl-4-aryl-polyhydroquinolines.
Chandak N, Bhardwaj JK, Zheleva-Dimitrova D, Kitanov G, Sharma RK, Sharma PK, Saso L.
J Enzyme Inhib Med Chem. 2015 Oct;30(5):722-9. doi: 10.3109/14756366.2014.960864.

26. Development of a Single Ion Pair HPLC Method for Analysis of Terbinafine, Ofloxacin, Ornidazole, Clobetasol, and Two Preservatives in a Cream Formulation: Application to In Vitro Drug Release in Topical Simulated Media-Phosphate Buffer Through Rat Skin.
Dewani AP, Bakal RL, Kokate PG, Chandewar AV, Patra S.
J AOAC Int. 2015 Jul-Aug;98(4):913-20. doi: 10.5740/jaoacint.14-189.

27. Targeted Mesoporous Iron Oxide Nanoparticles-Encapsulated Perfluorohexane and a Hydrophobic Drug for Deep Tumor Penetration and Therapy.
Su YL, Fang JH, Liao CY, Lin CT, Li YT, Hu SH.
Theranostics. 2015 Aug 9;5(11):1233-48. doi: 10.7150/thno.12843. eCollection 2015.

28. Antiangiogenic and Anticancer Properties of Bifunctional Ruthenium(II)-p-Cymene Complexes: Influence of Pendant Perfluorous Chains.
Nowak-Sliwinska P, Clavel CM, Păunescu E, Te Winkel MT, Griffioen AW, Dyson PJ.
Mol Pharm. 2015 Aug 3;12(8):3089-96. doi: 10.1021/acs.molpharmaceut.5b00417. Epub 2015 Jul 21.

29. In vitro evaluation of the cytotoxicity and modulation of mechanisms associated with inflammation induced by perfluorooctanesulfonate and perfluorooctanoic acid in human colon myofibroblasts CCD-18Co.
Giménez-Bastida JA, Surma M, Zieliński H.
Toxicol In Vitro. 2015 Oct;29(7):1683-91. doi: 10.1016/j.tiv.2015.07.001. Epub 2015 Jul 2.

30. Optical Verification of Microbubble Response to Acoustic Radiation Force in Large Vessels With In Vivo Results.
Wang S, Wang CY, Unnikrishnan S, Klibanov AL, Hossack JA, Mauldin FW Jr.
Invest Radiol. 2015 Jul 2. [Epub ahead of print]

31. The plasticizer dibutyl phthalate (DBP) potentiates chemical allergen-induced THP-1 activation.
Lourenço AC, Galbiati V, Corti D, Papale A, Martino-Andrade AJ, Corsini E.
Toxicol In Vitro. 2015 Aug 28;29(8):2001-2008. doi: 10.1016/j.tiv.2015.08.011. [Epub ahead of print]

32. Comparative Cytotoxicity and Sperm Motility Using a Computer-Aided Sperm Analysis System (CASA) for Isomers of Phthalic Acid, a Common Final Metabolite of Phthalates.
Kwack SJ, Lee BM.
J Toxicol Environ Health A. 2015;78(16):1038-50. doi: 10.1080/15287394.2015.1067503. Epub 2015 Aug 7.

33. Enteric trimethyl chitosan nanoparticles containing hepatitis B surface antigen for oral delivery.
Farhadian A, Dounighi NM, Avadi M.
Hum Vaccin Immunother. 2015 Jul 9:1-8. [Epub ahead of print]

34. Evaluation of an alternative in vitro test battery for detecting reproductive toxicants in a grouping context.
Kroese ED, Bosgra S, Buist HE, Lewin G, van der Linden SC, Man HY, Piersma AH, Rorije E, Schulpen SH, Schwarz M, Uibel F, van Vugt-Lussenburg BM, Wolterbeek AP, van der Burg B.
Reprod Toxicol. 2015 Aug 1;55:11-9. doi: 10.1016/j.reprotox.2014.10.003. Epub 2014 Oct 14.

35. In-vitro and in-vivo assessment of dextran-appended cellulose acetate phthalate nanoparticles for transdermal delivery of 5-fluorouracil.
Garg A, Rai G, Lodhi S, Jain AP, Yadav AK.
Drug Deliv. 2015 Jul 14:1-11. [Epub ahead of print]

Herudover er der yderligere 1 artikel, som ikke blev fanget af de valgte søgekriterier:
Effects of Common Pesticides on Prostaglandin D2 (PGD2) Inhibition in SC5 Mouse Sertoli Cells, Evidence of Binding at the COX2 Active Site, and Implications for Endocrine Disruption.
Kugathas S, Audouze K, Ermler S, Orton F, Rosivatz E, Scholze M, Kortenkamp A.
Environ Health Perspect. 2015 Sep 11. [Epub ahead of print]

## In vivo studier ved DTU Fødevareinstituttet

**Søgning er udført på PubMed og dækker perioden juli - ultimo september 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 44 artikler (Bruttolisten).

To artikler er blevet udvalgt til nærmere beskrivelse (abstrakt og konklusion). Disse artikler er valgt fordi vi mener de bidrager til ny viden om hormonforstyrrende stoffer og her er der særligt fokus på Anilins effekter (Holm et al. 2015) og Bisphenol A adfærd (Rebuli 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.

## Udvalgte publikationer

**Aniline is rapidly converted into paracetamol impairing male reproductive development.**
Holm JB, Chalmey C, Modick H, Jensen LS, Dierkes G, Weiss T, Jensen B, Nørregård MM, Borkowski K, Styrishave B, Koch HM, Mazaud-Guittot S, Jegou B, Kristiansen K, Kristensen DM.
Toxicol Sci. 2015 Aug 10. pii: kfv179. [Epub ahead of print]

Industrial use of aniline is increasing worldwide with production estimated to surpass 5.6 million metric tons in 2016. Exposure to aniline occurs via air, diet and water augmenting the risk of exposing a large number of individuals. Early observations suggest that aniline is metabolised to paracetamol/acetaminophen, likely explaining the omnipresence of low concentrations of paracetamol in European populations. This is of concern as recent studies implicate paracetamol as a disrupter of reproduction. Here we show through steroidogenic profiling that exposure to aniline led to increased levels of the Δ4 steroids, suggesting that the activity of CYP21 was decreased. By contrast, paracetamol decreased levels of androgens likely through inhibition of CYP17A1 activity. We confirm that aniline in vivo is rapidly converted to paracetamol by the liver. Intrauterine exposure to aniline and paracetamol in environmental and pharmaceutical relevant doses resulted in shortening of the anogenital distance in mice, a sensitive marker of fetal androgen levels that in humans is associated with reproductive malformations and later life reproductive disorders. In conclusion, our results provide evidence for a scenario where aniline, through its conversion into anti-androgenic paracetamol, impairs male reproductive development.

**Impact of Low Dose Oral Exposure to Bisphenol A (BPA) on Juvenile and Adult Rat Exploratory and Anxiety Behavior: A CLARITY-BPA Consortium Study.**
Rebuli ME, Camacho L, Adonay ME, Reif DM, Aylor DL, Patisaul HB.
Toxicol Sci. 2015 Jul 23. pii: kfv163. [Epub ahead of print]

Bisphenol A (BPA) is a high volume production chemical and has been identified as an endocrine disruptor, prompting concern that developmental exposure could impact brain development and behavior. Rodent and human studies suggest that early life BPA exposure may result in an anxious, hyperactive phenotype, but results are conflicting and data from studies using multiple doses below the no-observed-adverse-effect level (NOAEL) are limited. To address this, the present studies were conducted as part of the CLARITY-BPA (Consortium Linking Academic and Regulatory Insights on BPA Toxicity) program. The impact of perinatal BPA exposure (2.5, 25, or 2500 µg/kg body weight (bw)/day) on behaviors related to anxiety and exploratory activity was assessed in juvenile (pre-pubertal) and adult NCTR Sprague-Dawley rats of both sexes. Ethinyl estradiol (EE; 0.5 µg/kg bw/day) was used as a reference estrogen. Exposure spanned gestation and lactation with dams gavaged from gestational day 6 until birth, and then the offspring gavaged directly through weaning (n = 12/sex/group). Behavioral assessments included open field, elevated plus maze, and zero maze. Anticipated sex differences in behavior were statistically identified or suggested in most cases. No consistent effects of BPA were observed for any endpoint, in either sex, at either age compared to vehicle controls; however, significant differences between BPA-exposed and EE-exposed groups were identified for some endpoints. Limitations of the present study are discussed and include sub-optimal statistical power and low concordance across behavioral tasks. These data do not indicate BPA-related effects on anxiety or exploratory activity in these developmentally exposed rats.

## Bruttolisten (in vivo)

1. Sex-dependent effects of developmental exposure to bisphenol A and ethinyl estradiol on metabolic parameters and voluntary physical activity.
Johnson SA, Painter MS, Javurek AB, Ellersieck MR, Wiedmeyer CE, Thyfault JP, Rosenfeld CS.
J Dev Orig Health Dis. 2015 Sep 18:1-14. [Epub ahead of print]

2. Effect of bisphenol A on blood glucose, lipid profile and oxidative stress indices in adult male mice.
Moghaddam HS, Samarghandian S, Farkhondeh T.
Toxicol Mech Methods. 2015 Sep 16:1-7. [Epub ahead of print]

3. Cross-Talk in the Female Rat Mammary Gland: Influence of Aryl Hydrocarbon Receptor on Estrogen Receptor Signaling.
Helle J, Bader MI, Keiler AM, Zierau O, Vollmer G, Chittur SV, Tenniswood M, Kretzschmar G.
Environ Health Perspect. 2015 Sep 15. [Epub ahead of print]

4. Toxicological evaluation of isopropylparaben and isobutylparaben mixture in Sprague-Dawley ratsfollowing 28 days of dermal exposure.
Kim MJ, Kwack SJ, Lim SK, Kim YJ, Roh TH, Choi SM, Kim HS, Lee BM.
Regul Toxicol Pharmacol. 2015 Sep 7. pii: S0273-2300(15)30045-3. doi: 10.1016/j.yrtph.2015.08.005. [Epub ahead of print]

5. Dose addition models based on biologically-relevant reductions in fetal testosterone accurately predict postnatal reproductive tract alterations by a phthalate mixture in rats.
Howdeshell KL, Rider CV, Wilson VS, Furr J, Lambright CR, Gray LE Jr.
Toxicol Sci. 2015 Sep 8. pii: kfv196. [Epub ahead of print]

6. Bisphenol A Effects on Mammalian Oogenesis and Epigenetic Integrity of Oocytes: A Case Study Exploring Risks of Endocrine Disrupting Chemicals.
Eichenlaub-Ritter U, Pacchierotti F.
Biomed Res Int. 2015;2015:698795. doi: 10.1155/2015/698795. Epub 2015 Aug 3. Review.

7. In Utero Exposure to Di-(2-Ethylhexyl) Phthalate Induces Testicular Effects in Neonatal Rats That Are Antagonized by Genistein Co-Treatment.
Jones S, Boisvert A, Francois S, Zhang L, Culty M.
Biol Reprod. 2015 Aug 26. pii: biolreprod.115.129098. [Epub ahead of print]

8. Strain-Specific Induction of Endometrial Periglandular Fibrosis in Mice Exposed During Adulthood to the Endocrine Disrupting Chemical Bisphenol A.
Kendziorski JA, Belcher SM.
Reprod Toxicol. 2015 Aug 22. pii: S0890-6238(15)30013-7. doi: 10.1016/j.reprotox.2015.08.001. [Epub ahead of print]

9. Paternal BPA exposure in early life alters Igf2 epigenetic status in sperm and induces pancreatic impairment in rat offspring.
Mao Z, Xia W, Chang H, Huo W, Li Y, Xu S.
Toxicol Lett. 2015 Aug 11;238(3):30-38. doi: 10.1016/j.toxlet.2015.08.009. [Epub ahead of print]

10. Aniline is rapidly converted into paracetamol impairing male reproductive development.
Holm JB, Chalmey C, Modick H, Jensen LS, Dierkes G, Weiss T, Jensen B, Nørregård MM, Borkowski K, Styrishave B, Koch HM, Mazaud-Guittot S, Jegou B, Kristiansen K, Kristensen DM.
Toxicol Sci. 2015 Aug 10. pii: kfv179. [Epub ahead of print] **VALGT**

11. Maternal Transfer of Bisphenol A During Nursing Causes Sperm Impairment in Male Offspring.
Kalb AC, Kalb AL, Cardoso TF, Fernandes CG, Corcini CD, Junior AS, Martínez PE.

Arch Environ Contam Toxicol. 2015 Aug 7. [Epub ahead of print]

12. Varicocele-Induced Infertility in Animal Models.
Razi M, Malekinejad H.
Int J Fertil Steril. 2015 Jul-Sep;9(2):141-9. Epub 2015 Jul 27. Review.

13. Prenatal Exposure to DEHP Affects Spermatogenesis and Sperm DNA Methylation in a Strain-Dependent Manner.
Prados J, Stenz L, Somm E, Stouder C, Dayer A, Paoloni-Giacobino A.
PLoS One. 2015 Aug 5;10(7):e0132136. doi: 10.1371/journal.pone.0132136. eCollection 2015.

14. Endocrine disruptors alter social behaviors and indirectly influence social hierarchies via changes in body weight.
Kim B, Colon E, Chawla S, Vandenberg LN, Suvorov A.
Environ Health. 2015 Aug 5;14(1):64. doi: 10.1186/s12940-015-0051-6.

15. The Role of Epigenetics in the Latent Effects of Early Life Exposure to Obesogenic Endocrine Disrupting Chemicals.
Stel J, Legler J.
Endocrinology. 2015 Oct;156(10):3466-72. doi: 10.1210/en.2015-1434. Epub 2015 Aug 4.

16. Progesterone and Overlooked Endocrine Pathways in Breast Cancer Pathogenesis.
Brisken C, Hess K, Jeitziner R.
Endocrinology. 2015 Oct;156(10):3442-50. doi: 10.1210/en.2015-1392. Epub 2015 Aug 4.

17. Expanding the therapeutic spectrum of metformin: from diabetes to cancer.
Coperchini F, Leporati P, Rotondi M, Chiovato L.
J Endocrinol Invest. 2015 Oct;38(10):1047-55. doi: 10.1007/s40618-015-0370-z. Epub 2015 Aug 2.

18. Soy but not bisphenol A (BPA) or the phytoestrogen genistin alters developmental weight gain and food intake in pregnant rats and their offspring.
Cao J, Echelberger R, Liu M, Sluzas E, McCaffrey K, Buckley B, Patisaul HB.
Reprod Toxicol. 2015 Jul 26. pii: S0890-6238(15)30009-5. doi: 10.1016/j.reprotox.2015.07.077. [Epub ahead of print]

19.Impact of Low Dose Oral Exposure to Bisphenol A (BPA) on Juvenile and Adult Rat Exploratory and Anxiety Behavior: A CLARITY-BPA Consortium Study.
Rebuli ME, Camacho L, Adonay ME, Reif DM, Aylor D, Patisaul HB.
Toxicol Sci. 2015 Jul 23. pii: kfv163. [Epub ahead of print] **VALGT**

20. Pre- and postnatal bisphenol A treatment does not alter the number of tyrosine hydroxylase-positive cells in the anteroventral periventricular nucleus (AVPV) of weanling male and female rats.
Ferguson SA, Paule MG, He Z.
Brain Res. 2015 Jul 20. pii: S0006-8993(15)00540-5. doi: 10.1016/j.brainres.2015.07.013. [Epub ahead of print]

21. Delayed adverse effects of neonatal exposure to polymeric nanoparticle poly(ethylene glycol)-block-polylactide methyl ether on hypothalamic-pituitary-ovarian axis development and function in Wistar rats.
Rollerova E, Jurcovicova J, Mlynarcikova A, Sadlonova I, Bilanicova D, Wsolova L, Kiss A, Kovriznych J, Kronek J, Ciampor F, Vavra I, Scsukova S.
Reprod Toxicol. 2015 Nov;57:165-75. doi: 10.1016/j.reprotox.2015.07.072. Epub 2015 Jul 17.

22. Bisphenol A, bisphenol F and bisphenol S affect differently 5α-reductase expression and dopamine-serotonin systems in the prefrontal cortex of juvenile female rats.
Castro B, Sánchez P, Torres JM, Ortega E.
Environ Res. 2015 Jul 14;142:281-287. doi: 10.1016/j.envres.2015.07.001. [Epub ahead of print]

23. Exposure of male mice to two kinds of organophosphate flame retardants (OPFRs) induced oxidative stress and endocrine disruption.
Chen G, Jin Y, Wu Y, Liu L, Fu Z.

Environ Toxicol Pharmacol. 2015 Jul;40(1):310-8. doi: 10.1016/j.etap.2015.06.021. Epub 2015 Jun 24.

24. Impact of diethylhexyl phthalate on gene expression and development of mammary glands of pregnant mouse.
Li L, Liu JC, Zhao Y, Lai FN, Yang F, Ge W, Dou CL, Shen W, Zhang XF, Chen H.
Histochem Cell Biol. 2015 Oct;144(4):389-402. doi: 10.1007/s00418-015-1348-9. Epub 2015 Jul 14.

25. Evaluation of the reproductive toxicity of fungicide propiconazole in male rats.
Costa NO, Vieira ML, Sgarioni V, Pereira MR, Montagnini BG, Mesquita Sde F, Gerardin DC.
Toxicology. 2015 Sep 1;335:55-61. doi: 10.1016/j.tox.2015.06.011. Epub 2015 Jul 10.

26. Estimation of in vivo and in vitro exposure to bisphenol A as food contaminant.
Milić N, Četojević-Simin D, Milanović M, Sudji J, Milošević N, Ćurić N, Abenavoli L, Medić-Stojanoska M.
Food Chem Toxicol. 2015 Sep;83:268-74. doi: 10.1016/j.fct.2015.07.003. Epub 2015 Jul 9.

27. The adverse effect of 4-tert-octylphenol on fat metabolism in pregnant rats via regulation of lipogenic proteins.
Kim J, Kang EJ, Park MN, Kim JE, Kim SC, Jeung EB, Lee GS, Hwang DY, An BS.
Environ Toxicol Pharmacol. 2015 Jul;40(1):284-91. doi: 10.1016/j.etap.2015.06.020. Epub 2015 Jun 22.

28. Prenatal Exposure to Bisphenol A Disrupts Mouse Fetal Liver Maturation in a Sex-Specific Manner.
DeBenedictis B, Guan H, Yang K.
J Cell Biochem. 2015 Jul 3. doi: 10.1002/jcb.25276. [Epub ahead of print]

29. Generational reproductive outcomes in Wistar rats maternally exposed to Ricinus communis oil at different stages of gestation.
Salami SA, Raji Y.
J Dev Orig Health Dis. 2015 Jun 29:1-11. [Epub ahead of print]

30. 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 Jul;73:47-55. doi: 10.1016/j.yhbeh.2015.06.002. Epub 2015 Jun 18.

31. 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 Nov 15;298:232-40. doi: 10.1016/j.jhazmat.2015.05.052. Epub 2015 Jun 1.

32. 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. Erratum in: PLoS One. 2015;10(7):e0132749.

33. Perinatal exposure to benzyl butyl phthalate induces alterations in neuronal development/maturation protein expression, estrogen responses, and fear conditioning in rodents.
DeBartolo D, Jayatilaka S, Yan Siu N, Rose M, Ramos RL, Betz AJ.
Behav Pharmacol. 2015 Sep 15. [Epub ahead of print]

34. Analysis of Phthalate Esters in Mammalian Cell Culture Using a Microfluidic Channel Coupled with an Electrochemical Sensor.
Noh HB, Gurudatt NG, Won MS, Shim YB.
Anal Chem. 2015 Jul 21;87(14):7069-77. doi: 10.1021/acs.analchem.5b00358. Epub 2015 Jul 1.

35. Effects of Endocrine-Disrupting Chemicals on the Ovary.
Patel S, Zhou C, Rattan S, Flaws JA.
Biol Reprod. 2015 Jul;93(1):20. doi: 10.1095/biolreprod.115.130336. Epub 2015 Jun 10.

36. Assessment of sex specific endocrine disrupting effects in the prenatal and pre-pubertal rodent brain.
Rebuli ME, Patisaul HB.
J Steroid Biochem Mol Biol. 2015 Aug 22. pii: S0960-0760(15)30053-4. doi: 10.1016/j.jsbmb.2015.08.021. [Epub ahead of print] Review.

37. NIEHS/FDA CLARITY-BPA research program update.
Heindel JJ, Newbold RR, Bucher JR, Camacho L, Delclos KB, Lewis SM, Vanlandingham M, Churchwell MI, Twaddle NC, McLellen M, Chidambaram M, Bryant M, Woodling K, Costa GG, Ferguson SA, Flaws J, Howard PC, Walker NJ, Zoeller RT, Fostel J, Favaro C, Schug TT.
Reprod Toxicol. 2015 Jul 29;58:33-44. doi: 10.1016/j.reprotox.2015.07.075. [Epub ahead of print] Review.

38. Commentary: "Estrogenic and Anti-Androgenic Endocrine Disrupting Chemicals and Their Impact on the Male Reproductive System".
Paumgartten FJ.
Front Public Health. 2015 Jun 22;3:165. doi: 10.3389/fpubh.2015.00165. eCollection 2015. No abstract available.

39. 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]

40. Examining the feasibility of mixture risk assessment: A case study using a tiered approach with data of 67 pesticides from the Joint FAO/WHO Meeting on Pesticide Residues (JMPR).
Evans RM, Scholze M, Kortenkamp A.
Food Chem Toxicol. 2015 Sep 4;84:260-269. doi: 10.1016/j.fct.2015.08.015. [Epub ahead of print]

41. 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.
Lioy PJ, Hauser R, Gennings C, Koch HM, Mirkes PE, Schwetz BA, Kortenkamp A.
J Expo Sci Environ Epidemiol. 2015 Jul;25(4):343-53. doi: 10.1038/jes.2015.33. Epub 2015 May 6. Review.

42. A novel biomarker for anti-androgenic activity in placenta reveals risks of urogenital malformations.
Arrebola JP, Molina-Molina JM, Fernández MF, Sáenz JM, Amaya E, Indiveri P, Hill EM, Scholze M, Orton F, Kortenkamp A, Olea N.
Reproduction. 2015 Jun;149(6):605-13. doi: 10.1530/REP-14-0525. Epub 2015 Mar 17.

43. 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.

44. Advancing research on endocrine disrupting chemicals in breast cancer: Expert panel recommendations.
Teitelbaum SL, Belpoggi F, Reinlib L.
Reprod Toxicol. 2015 Jul;54:141-7. doi: 10.1016/j.reprotox.2014.12.015. Epub 2014 Dec 27.

## Wildlife studier ved Biologisk Institut, Syddansk Universitet (SDU)

Søgningen er udført på Web of Knowledge (all databases) og dækker perioden 24/6 - 29/9 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 publikationer

**In vivo and in silico analyses of estrogenic potential of bisphenol analogs in medaka (Oryzias latipes) and common carp (Cyprinus carpio).**
Yamaguchi A, Ishibashi H, Arizono K, Tominaga N.
Ecotoxicology and Environmental Safety 120: 198-205.

ABSTRACT: Various studies have demonstrated the estrogenic effect of bisphenol A (BPA), a member of bisphenol analogs (BPs), in in vitro and in vivo assays. However, limited data are available on the estrogenic potentials and risks of other BPs in aquatic organisms. In addition, the estrogenic effect of chemicals is known to have species-specific responses in teleost fish. The objective of this study was to evaluate the potential estrogenic effects of BPs on the medaka (Oryzias latipes) and common carp (Cyprinus carpio) using in vivo and in silico assays. Our quantitative real-time PCR analyses revealed that the expression levels of several hepatic estrogen-responsive biomarker genes in male medaka responded to various types and concentrations of BPs in a dose-response manner. The order of in vivo estrogenic potencies of BPs was as follows: BPC≈BPAF>BPB>BPA⋙BPP. To further investigate the interaction potential of BPs with medaka estrogen receptor α (ERα) in silico, a three-dimensional model of the ERα ligand-binding domain (LBD) was built and docking simulations were performed. The docking simulation analysis revealed that BPC interaction potential for medaka ERα LBD was the most potent, followed by BPAF and BPA. Comparing this with carp ERα LBD revealed that the interaction potentials of these BPs to medaka ERα LBD were more stable than to carp ERα LBD. Furthermore, we identified key amino acid residues in medaka ERα LBD that interacted with BPC (Glu356, Arg397, and Cys533), BPAF (Thr350 and Glu356), and BPA (Glu356 and Met424), and found some differences in these key amino acid residues between medaka and carp ERα LBDs. These results of in vivo and in silico analyses showed potential estrogenic effects of BPs in teleost fish, and they also indicated that the differences in interaction potentials and key amino acid residues between medaka and carp ERα LBDs may be due to the differences between the species and estrogenic potencies of the selected BPs.

**Suburbanization, estrogen contamination, and sex ratio in wild amphibian populations.**
Lambert M, Giller G, Barber L, Fitzgerald K, Skelly D.
Proc Natl Acad Sci USA 112(38): 11881-11886.

ABSTRACT: Research on endocrine disruption in frog populations, such as shifts in sex ratios and feminization of males, has predominantly focused on agricultural pesticides. Recent evidence suggests that suburban landscapes harbor amphibian populations exhibiting similar levels of endocrine disruption; however the endocrine disrupting chemical (EDC) sources are unknown. Here, we show that sex ratios of metamorphosing frogs become increasingly female-dominated along a suburbanization gradient. We further show that suburban ponds are frequently contaminated by the classical estrogen estrone and a variety of EDCs produced by plants (phytoestrogens), and that the diversity of organic EDCs is correlated with the extent of developed land use and cultivated lawn and gardens around a pond. Our work also raises the possibility that trace-element contamination associated with human land use around suburban ponds may be contributing to the estrogenic load within suburban freshwaters and constitutes another source of estrogenic exposure for wildlife. These data suggest novel, unexplored pathways of EDC contamination in human-altered environments. In particular, we propose that vegetation changes associated with suburban neighborhoods (e.g., from forests to lawns and ornamental plants) increase the distribution of phytoestrogens in surface waters. The result of frog sex ratios varying as a function of human land use implicates a role for environmental modulation of sexual differentiation in amphibians, which are assumed

to only have genetic sex determination. Overall, we show that endocrine disruption is widespread in suburban frog populations and that the causes are likely diverse.

**Intersex in the clam Scrobicularia plana (Da Costa): Widespread occurrence in English Channel estuaries and surrounding areas.**

Pope N, Childs K, Dang C, Davey M, O'Hara S, Langston K, Minier C, Pascoe P, Shortridge E, Langston W. Marine Pollution Bulletin 95(2): 598-609.

ABSTRACT: Estuarine clams Scrobicularia plana were sampled from 108 intertidal locations around the English Channel and adjacent areas. Although S. plana is believed to be a strict gonochorist, 58% of the populations sampled included intersexed individuals (described as male clams exhibiting ovotestis). Over the entire region, on average, 8.6% of male clams exhibited intersex, although proportions of affected males ranged from 0% to 53% depending on location. The severity of intersex was assessed using a simple classification scale, with the majority of individuals showing low levels of impact. Sex ratios were significantly skewed at some sites. There were no significant relationships between incidence or severity of intersex; or with size or parasitism of individual clams. Intersex in S. plana is a useful tool to assess endocrine disruptive effects in estuaries, although mechanisms of impact and causative agents remain uncertain.

## Bruttoliste

1. Ovarian structure protein 1: A sensitive molecular biomarker of gonadal intersex in female Japanese medaka after androgen exposure.
Abdel-Moneim A, Mahapatra CT, Hatef A, Sepulveda MS.
Environmental Toxicology and Chemistry 34(9): 2087-2094.

2. Environmental occurrence and biota concentration of phthalate esters in Epe and Lagos Lagoons, Nigeria.
Adeogun AO, Ibor OR, Omogbemi ED, Chukwuka AV, Adegbola RA, Adewuyi GA, Arukwe A.
Marine Environmental Research 108: 24-32.

3. Occurrence, Species, and Organ Differences in Bioaccumulation Patterns of Phthalate Esters in Municipal Domestic Water Supply Lakes in Ibadan, Nigeria.
Adeogun AO, Ibor OR, Omiwole RA, Hassan T, Adegbola RA, Adewuyi GO, Arukwe A.
Journal of Toxicology and Environmental Health-Part A-Current Issues 78(12): 761-777.

4. Bioindicator Thais carinifera (mollusca, gastropoda): imposex response and consequences along the Pakistan coast during the period from 1993 to 2012.
Afsar N, Siddiqui G, Ayub Z.
Brazilian Journal of Oceanography 63(2): 115-124.

5. Environmental assessment of fate, transport and persistent behavior of dichlorodiphenyltrichloroethanes and hexachlorocyclohexanes in land and water ecosystems.
Ahmed G, Anawar H, Takuwa D, Chibua I, Singh G, Sichilongo K.
International Journal of Environmental Science and Technology 12(8): 2741-2756.

6. 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 R, Gauffier P, De Stephanis R, Eljarrat E, Barcelo D.
Environmental Pollution 203: 107-115.

7. Direct injection of tissue extracts in liquid chromatography/tandem mass spectrometry for the determination of pharmaceuticals and other contaminants of emerging concern in mollusks.
Bayen S, Estrada ES, Juhel G, Kelly BC.
Analytical and Bioanalytical Chemistry 407(19): 5553-5558.

8. Mercury and cortisol in Western Hudson Bay polar bear hair.
Bechshoft T, Derocher A, Richardson E, Mislan P, Lunn N, Sonne C, Dietz R, Janz D, Louis V.
Ecotoxicology 24(6): 1315-1321.

9. 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 JC, McLaughlin MJ.
Journal of Applied Toxicology 35(7): 806-816.

10. Plasma levels of pollutants are much higher in loggerhead turtle populations from the Adriatic Sea than in those from open waters (Eastern Atlantic Ocean).
Bucchia M, Camacho M, Santos MR, Boada LD, Roncada P, Mateo R, Ortiz-Santaliestra ME, Rodriguez-Estival J, Zumbado M, Oros J, Henriquez-Hernandez LA, Garcia-Alvarez N, Luzardo OP.
Science of the Total Environment 523: 161-169.

11. Multiple Stressors in a Top Predator Seabird: Potential Ecological Consequences of Environmental Contaminants, Population Health and Breeding Conditions.

Bustnes JO, Bourgeon S, Leat EH, Magnusdottir E, Strom H, Hanssen SA, Petersen A, Olafsdottir K, Borga K, Gabrielsen GW, Furness RW.
Plos One 10(7)

12. Occurrence, fate and ecological risk of five typical azole fungicides as therapeutic and personal care products in the environment: A review.
Chen ZF and Ying GG.
Environment International 84: 142-153.

13. Alkylphenol ethoxylates and brominated flame retardants in water, fish (carp) and sediment samples from the Vaal River, South Africa.
Chokwe T, Okonkwo J, Sibali L, Ncube E.
Environmental Science and Pollution Research 22(15): 11922-11929.

14. Intersex related gene expression profiles in clams Scrobicularia plana: Molecular markers and environmental application.
Ciocan CM, Cubero-Leon E, Langston WJ, Pope N, Cornelius K, Hill E, Alvarez-Munoz D, Indiveri P, Lerebours A, Minier C, Rotchell JM.
Marine Pollution Bulletin 95(2): 610-617.

15. Inhibition of spawning in zebrafish (Danio rerio): Adverse outcome pathways of quinacrine and ethinylestradiol.
Cosme MM, Lister AL, Van Der Kraak G.
General and Comparative Endocrinology 219: 89-101.

16. Bisphenol A alters the cardiovascular response to hypoxia in Danio rerio embryos.
Cypher AD, Ickes JR, Bagatto B.
Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 174: 39-45.

17. Applications of biological tools or biomarkers in aquatic biota: A case study of the Tamar estuary, South West England.
Dallas LJ and Jha AN.
Marine Pollution Bulletin 95(2): 618-633.

18. Estrogenicity and Genotoxicity Detection in Different Contaminated Waters.
de Sa Salomao AL and Marques M.
Human and Ecological Risk Assessment 21(7): 1793-1809.

19. Alteration of cellular lipids and lipid metabolism markers in RTL-W1 cells exposed to model endocrine disrupters.
Dimastrogiovanni G, Cordoba M, Navarro I, Jauregui O, Porte C.
Aquatic Toxicology 165: 277-285.

20. Mycobacterium smegmatis synthesizes in vitro androgens and estrogens from different steroid precursors.
Dlugovitzky DG, Sol Fontela M, Martinel Lamas DJ, Valdez RA, Romano MC.
Canadian Journal of Microbiology 61(7): 451-455.

21. Imposex in Plicopurpura pansa (Neogastropoda: Thaididae) in Nayarit and Sinaloa, Mexico.
Dominguez-Ojeda D, Araceli Patron-Soberano O, Trinidad Nieto-Navarro J, de Lourdes Robledo-Marenco M, Bernardino Velazquez-Fernandez J.
Revista Mexicana De Biodiversidad 86(2): 531-534.

22. Evidence of ectoparasite-induced endocrine disruption in an imperiled giant salamander, the eastern hellbender (Cryptobranchus alleganiensis).
DuRant SE, Hopkins WA, Davis AK, Romero L.
Journal of Experimental Biology 218(14): 2297-2304.

23. Transcriptomic Changes in Zebrafish Embryos and Larvae Following Benzo[a]pyrene Exposure.
Fang X, Corrales J, Thornton C, Clerk T, Scheffler BE, Willett KL.
Toxicological Sciences 146(2): 395-411.

24. Progestins as endocrine disrupters in aquatic ecosystems: Concentrations, effects and risk assessment.
Fent K.
Environment International 84: 115-130.

25. Larval Exposure to the Juvenile Hormone Analog Pyriproxyfen Disrupts Acceptance of and Social Behavior Performance in Adult Honeybees.
Fourrier J, Deschamps M, Droin L, Alaux C, Fortini D, Beslay D, Le Conte Y, Devillers J, Aupinel P, Decourtye A.
Plos One 10(7)

26. Developmental timing of sodium perchlorate exposure alters angiogenesis, thyroid follicle proliferation and sexual maturation in stickleback.
Furin CG, von Hippel FA, Postlethwait JH, Buck C, Cresko WA, O'Hara TM.
General and Comparative Endocrinology 219: 24-35.

27. Thyroid hormones and deiodinase activities in plasma and tissues from East Greenland polar bears (Ursus maritimus) during winter season.
Gabrielsen KM, Krokstad JS, Obregon MJ, Villanger GD, Sonne C, Dietz R, Jenssen BM.
Polar Biology 38(8): 1285-1296.

28. Perchlorate exposure does not modulate temporal variation of whole-body thyroid and androgen hormone content in threespine stickleback.
Gardell AM, Dillon DM, Smayda LC, von Hippel FA, Cresko WA, Postlethwait JH, Buck C.
General and Comparative Endocrinology 219: 45-52.

29. Are endocrine and reproductive biomarkers altered in contaminant-exposed wild male Largemouth Bass (Micropterus salmoides) of Lake Mead, Nevada/Arizona, USA?
Goodbred SL, Patino R, Torres L, Echols KR, Jenkins JA, Rosen MR, Orsak E.
General and Comparative Endocrinology 219: 125-135.

30. 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, Zhou B.
Environmental Pollution 203: 130-136.

31. Influence of temperature on thyroid hormone signaling and endocrine disruptor action in Rana (Lithobates) catesbeiana tadpoles.
Hammond SA, Veldhoen N, Helbing CC.
General and Comparative Endocrinology 219: 6-15.

32. Rapid Effects of Estradiol on Aggression in Birds and Mice: The Fast and the Furious.
Heimovics SA, Trainor BC, Soma KK.
Integrative and Comparative Biology 55(2): 281-293.

33. Phytoestrogens and mycoestrogens in surface waters - Their sources, occurrence, and potential contribution to estrogenic activity.
Jarosova B, Javurek J, Adamovsky O, Hilscherova K.
Environment International 81: 26-44.

34. Background fish feminization effects in European remote sites.
Jarque S, Quiros L, Grimalt JO, Gallego E, Catalan J, Lackner R, Pina B.
Scientific Reports 5

35. Assessment of biomarkers for contaminants of emerging concern on aquatic organisms downstream of a municipal wastewater discharge.
Jasinska EJ, Goss GG, Gillis PL, Van Der Kraak GJ, Matsumoto J, de Souza Machado AA, Giacomin M, Moon TW, Massarsky A, Gagne F, Servos MR, Wilson J, Sultana T, Metcalfe CD.
Science of the Total Environment 530: 140-153.

36. Rapid activity-directed screening of estrogens by parallel coupling of liquid chromatography with a functional gene reporter assay and mass spectrometry.
Jonker W, Lamoree MH, Houtman CJ, Hamers T, Somsen GW, Kool J.
Journal of Chromatography A 1406: 165-174.

37. Disruption of the rainbow trout reproductive endocrine axis by the polycyclic aromatic hydrocarbon benzo[a]pyrene.
Kennedy CJ and Smyth KR.
General and Comparative Endocrinology 219: 102-111.

38. Ecotoxicogenomic Approaches for Understanding Molecular Mechanisms of Environmental Chemical Toxicity Using Aquatic Invertebrate, Daphnia Model Organism.
Kim HJ, Koedrith P, Seo YR.
International Journal of Molecular Sciences 16(6): 12261-12287.

39. Occurrence, fate and removal of endocrine disrupting compounds (EDCs) in Turkish wastewater treatment plants.
Komesli O, Muz M, Ak M, Bakirdere S, Gokcay C.
Chemical Engineering Journal 277: 202-208.

40. Altered levels of endocrine biomarkers in juvenile barramundi (Lates calcarifer; Bloch) following exposure to commercial herbicide and surfactant formulations.
Kroon FJ, Hook SE, Metcalfe S, Jones D.
Environmental Toxicology and Chemistry 34(8): 1881-1890.

41. Suburbanization, estrogen contamination, and sex ratio in wild amphibian populations.
Lambert M, Giller G, Barber L, Fitzgerald K, Skelly D.
Proc Natl Acad Sci USA 112(38): 11881-11886.

42. Ecotoxicological assessment of cimetidine and determination of its potential for endocrine disruption using three test organisms: Daphnia magna, Moina macrocopa, and Danio rerio.
Lee S, Jung D, Kho Y, Ji K, Kim P, Ahn B, Choi K.
Chemosphere 135: 208-216.

43. Effects of Tributyltin and Other Retinoid Receptor Agonists in Reproductive-Related Endpoints in the Zebrafish (Danio Rerio).
Lima D, Castro L, Coelho I, Lacerda R, Gesto M, Soares J, Andre A, Capela R, Torres T, Carvalho AP, Santos MM.
Journal of Toxicology and Environmental Health-Part A-Current Issues 78(12): 747-760.

44. Waterborne exposure to microcystin-LR causes thyroid hormone metabolism disturbances in juvenile Chinese rare minnow (Gobiocypris rarus).
Liu Z, Li D, Wang Y, Guo W, Gao Y, Tang R.
Environmental Toxicology and Chemistry 34(9): 2033-2040.

45. Estrogen receptor 2b deficiency impairs the antiviral response of zebrafish.
Lopez-Munoz A, Liarte S, Gomez-Gonzalez NE, Cabas I, Meseguer J, Garcia-Ayala A, Mulero V.
Developmental and Comparative Immunology 53(1): 55-62.

46. Zebrafish sex differentiation and gonad development after exposure to 17alpha-ethinylestradiol, fadrozole and their binary mixture: A stereological study.
Luzio A, Monteiro SM, Garcia-Santos S, Rocha E, Fontainhas-Fernandes AA, Coimbra AM.
Aquatic Toxicology (Amsterdam, Netherlands) 166: 83-95.

47. Label-free immunosensor for monitoring vitellogenin as a biomarker for exogenous oestrogen compounds in amphibian species.
Majer-Baranyi K, Adanyi N, Nagy A, Bukovskaya O, Szendro I, Szekacs A.
International Journal of Environmental Analytical Chemistry 95(6): 481-493.

48. Short-term fish reproduction assays with methyl tertiary butyl ether with zebrafish and fathead minnow: Implications for evaluation of potential for endocrine activity.
Mihaich E, Erler S, Le Blanc G, Gallagher S.
Environmental Toxicology and Chemistry 34(9): 2013-2022.

49. Identification and Characterization of the Androgen Receptor From the American Alligator, Alligator mississippiensis.
Miyagawa S, Yatsu R, Kohno S, Doheny BM, Ogino Y, Ishibashi H, Katsu Y, Ohta Y, Guillette LJJ, Iguchi T.
Endocrinology 156(8): 2795-2806.

50. Reproductive Failure in UK Harbour Porpoises Phocoena phocoena: Legacy of Pollutant Exposure?
Murphy S, Barber JL, Learmonth JA, Read FL, Deaville R, Perkins MW, Brownlow A, Davison N, Penrose R, Pierce GJ, Law RJ, Jepson PD.
Plos One 10(7)

51. Quantification of circulating steroids in individual zebrafish using stacking to achieve nanomolar detection limits with capillary electrophoresis and UV-visible absorbance detection.
Nyakubaya VT, Durney BC, Ellington MC, Kantes AD, Reed PA, Walter SE, Stueckle JR, Holland LA.
Analytical and Bioanalytical Chemistry 407(23): 6985-6993.

52. Pharmaceuticals and personal care products: A critical review of the impacts on fish reproduction.
Overturf MD, Anderson JC, Pandelides Z, Beyger L, Holdway DA.
Critical Reviews in Toxicology 45(6): 469-491.

53. Novel associations between contaminant body burdens and biomarkers of reproductive condition in male Common Carp along multiple gradients of contaminant exposure in Lake Mead National Recreation Area, USA.
Patino R, VanLandeghern MM, Goodbred SL, Orsak E, Jenkins JA, Echols K, Rosen MR, Torres L.
General and Comparative Endocrinology 219: 112-124.

54. Introduction to Special Issue: Disruption of thyroid, sex steroid, and adrenal hormone systems and their crosstalk in aquatic wildlife.
Patino R and Carr JA.
General and Comparative Endocrinology 219: 1-5.

55. Evaluation of the use of Olivella minuta (Gastropoda, Olividae) and Hastula cinerea (Gastropoda, Terebridae) as TBT sentinels for sandy coastal habitats.
Petracco M, Camargo RM, Berenguel TA, Patricio de Arruda NC, del Matto LA, Amado LL, Corbisier TN, Castro IB, Turra A.
Environmental Monitoring and Assessment 187(7)

56. 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.
Ecotoxicology and Environmental Safety 117: 7-19.

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

58. Intersex in the clam Scrobicularia plana (Da Costa): Widespread occurrence in English Channel estuaries and surrounding areas.
Pope N, Childs K, Dang C, Davey M, O'Hara S, Langston K, Minier C, Pascoe P, Shortridge E, Langston W.
Marine Pollution Bulletin 95(2): 598-609.

59. Toxicological relevance of endocrine disruptors in the Tagus River estuary (Lisbon, Portugal).
Rocha MJ, Cruzeiro C, Reis M, Pardal MA, Rocha E.
Environmental Monitoring and Assessment 187(8)

60. Determination of endocrine disrupting compounds and their metabolites in fish bile.
Ros O, Izaguirre JK, Olivares M, Bizarro C, Ortiz-Zarragoitia M, Cajaraville MP, Etxebarria N, Prieto A, Vallejo A.
The Science of the Total Environment 536: 261-267.

61. Occurrence, distribution and bioaccumulation of endocrine disrupting compounds in water, sediment and biota samples from a European river basin.
Salgueiro-Gonzalez N, Turnes-Carou I, Besada V, Muniategui-Lorenzo S, Lopez-Mahia P, Prada-Rodrigue D.
Science of the Total Environment 529: 121-130.

62. 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, Prada-Rodriguez D.
Chemosphere 131: 241-247.

63. Machine learning reveals sex-specific 17-estradiol-responsive expression patterns in white perch (Morone americana) plasma proteins.
Schilling J, Nepomuceno AI, Planchart A, Yoder JA, Kelly RM, Muddiman DC, Daniels HV, Hiramatsu N, Reading BJ.
Proteomics 15(15): 2678-2690.

64. Parental effects of endocrine disrupting compounds in aquatic wildlife: Is there evidence of transgenerational inheritance?
Schwindt AR.
General and Comparative Endocrinology 219: 152-164.

65. Pesticide- and sex steroid analogue-induced endocrine disruption differentially targets hypothalamo-hypophyseal-gonadal system during gametogenesis in teleosts - A review.
Senthilkumaran B.
General and Comparative Endocrinology 219: 136-142.

66. Bisphenol a reduces fertilizing ability and motility by compromising mitochondrial function of sperm.
Singh RP, Shafeeque CM, Sharma SK, Pandey NK, Singh R, Mohan J, Kolluri G, Saxena M, Sharma B, Sastry KV, Kataria JM, Azeez PA.
Environmental Toxicology and Chemistry 34(7): 1617-1622.

67. Comparative efficacy of phenoxy derivative JHAs Pyriproxyfen and Diofenolan against polyphagous pest Spodoptera litura (Fabricius) (Noctuidae: Lepidoptera).
Singh S and Kumar K.
Phytoparasitica 43(4): 553-563.

68. Effects of juvenoid Pyriproxyfen on reproduction and F1 progeny in myiasis causing flesh fly Sarcophaga ruficornis L. (Sarcophagidae: Diptera).
Singh S and Kumar K.

Parasitology Research 114(6): 2325-2331.

69. Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA): emerging contaminants of increasing concern in fish from Lake Varese, Italy.
Squadrone S, Ciccotelli V, Prearo M, Favaro L, Scanzio T, Foglini C, Abete M.
Environmental Monitoring and Assessment 187(7)

70. A very rare case of intersexuality in water mites of the genus Arrenurus Duges, 1834 (Acari, Hydrachnidia).
Stryjecki R, Czepiel-Mil K, Gryzinska M, Zawal A.
Invertebrate Reproduction & Development 59(3): 155-165.

71. Maternal transfer of emerging brominated and chlorinated flame retardants in European eels.
Suehring R, Freese M, Schneider M, Schubert S, Pohlmann JD, Alaee M, Wolschke H, Hanel R, Ebinghaus R, Marohn L.
Science of the Total Environment 530: 209-218.

72. Increased adrenal responsiveness and delayed hatching date in relation to polychlorinated biphenyl exposure in Arctic-breeding black-legged kittiwakes (Rissa tridactyla).
Tartu S, Lendvai AZ, Blevin P, Herzke D, Bustamante P, Moe B, Gabrielsen GW, Bustnes JO, Chastel O.
General and Comparative Endocrinology 219: 165-172.

73. 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.
Environmental Science & Technology 49(12): 7439-7447.

74. Endocrine-disrupting potentials of equine estrogens equilin, equilenin, and their metabolites, in the medaka Oryzias latipes: in silico and DNA microarray studies.
Uchida M, Ishibashi H, Yamamoto R, Koyanagi A, Kusano T, Tominaga N, Ishibashi Y, Arizono K.
Journal of Applied Toxicology 35(9): 1040-1048.

75. Identification of conserved hepatic transcriptomic responses to 17beta-estradiol using high-throughput sequencing in brown trout.
Uren Webster TM, Shears JA, Moore K, Santos EM.
Physiological Genomics 47(9): 420-431.

76. Developmental exposure of zebrafish (Danio rerio) to 17 alpha-ethinylestradiol affects non-reproductive behavior and fertility as adults, and increases anxiety in unexposed progeny.
Volkova K, Caspillo NR, Porseryd T, Hallgren S, Dinnetz P, Porsch-Hallstrom I.
Hormones and Behavior 73: 30-38.

77. Short-term exposure to benzo[a]pyrene disrupts reproductive endocrine status in the swimming crab Portunus trituberculatus.
Wen J and Pan L.
Comparative Biochemistry and Physiology C-Toxicology & Pharmacology 174: 13-20.

78. Estrogenic environmental contaminants alter the mRNA abundance profiles of genes involved in gonadal differentiation of the American bullfrog.
Wolff SE, Veldhoen N, Helbing CC, Ramirez CA, Malpas JM, Propper CR.
Science of the Total Environment 521: 380-387.

79. Feed-borne exposure to zearalenone leads to advanced ovarian development and limited histopathological changes in the liver of premarket size rainbow trout.
Wozny M, Dobosz S, Obremski K, Hliwa P, Gomulka P, Lakomiak A, Rozynski R, Zalewski T, Brzuzan P.
Aquaculture 448: 71-81.

80. Monitoring the contents of six steroidal and phenolic endocrine disrupting chemicals in chicken, fish and aquaculture pond water samples using pre-column derivatization and dispersive liquid-liquid microextraction with the aid of experimental design methodology.
Wu H, Li G, Liu S, Hu N, Geng D, Chen G, Sun Z, Zhao X, Xia L, You J.
Food Chemistry 192: 98-106.

81. 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, Steinman AD.
Aquatic Toxicology 164: 16-22.

82. 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, Tominaga N.
Journal of Applied Toxicology 35(7): 752-758.

83. In vivo and in silico analyses of estrogenic potential of bisphenol analogs in medaka (Oryzias latipes) and common carp (Cyprinus carpio).
Yamaguchi A, Ishibashi H, Arizono K, Tominaga N.
Ecotoxicology and Environmental Safety 120: 198-205.

84. Chlorpyrifos is estrogenic and alters embryonic hatching, cell proliferation and apoptosis in zebrafish.
Yu K, Li G, Feng W, Liu L, Zhang J, Wu W, Xu L, Yan Y.
Chemico-Biological Interactions 239: 26-33.

85. The occurrence and ecological risk assessment of phthalate esters (PAEs) in urban aquatic environments of China.
Zhang L, Liu J, Liu H, Wan G, Zhang S.
Ecotoxicology 24(5): 967-984.

86. Impact of Sediment on Agrichemical Fate and Bioavailability to Adult Female Fathead Minnows: A Field Study.
Zhang Y, Krysl RG, Ali JM, Snow DD, Bartelt-Hunt SL, Kolok AS.
Environmental Science & Technology 49(15): 9037-9047.