

Polychlorobiphenyls (PCBs)
 $C_{12}H_{(10-n)}Cl_n$
Reproductive toxicant: Group 1

Epidemiological studies indicate that PCB exposure is associated with reduced sperm quality and increased implantation failure following *in vitro* fertilization and that it is detrimental to the development of fetuses¹⁻⁵. There are also many reports of animal studies revealing that PCBs induce reduced fetal development, lowered testosterone and thyroxin concentrations in the blood of offspring, delayed development of reproductive events, ototoxicity, and aberrations in spontaneous behavior⁶⁻¹². Based on this evidence, PCBs are classified as Group 1 reproductive toxicants.

References

- 1) Govarts E, Nieuwenhuijsen M, Schoeters G, Ballester F, Bloemen K, de Boer M, Chevrier C, Eggesbø M, Guxens M, Krämer U, Legler J, Martínez D, Palkovicova L, Patelarou E, Ranft U, Rautio A, Petersen MS, Slama R, Stigum H, Toft G, Trnovec T, Vandentorren S, Weihe P, Kuperus NW, Wilhelm M, Wittsiepe J, Bonde JP; OBELIX; ENRIECO. Birth weight and prenatal exposure to polychlorinated biphenyls (PCBs) and dichlorodiphenyldichloroethylene (DDE): a meta-analysis within 12 European Birth Cohorts. *Environ Health Perspect* 2012; 120: 162–70.
- 2) Hertz-Picciotto I, Charles MJ, James RA, Keller JA, Willman E, Teplin S. In utero polychlorinated biphenyl exposures in relation to fetal and early childhood growth. *Epidemiology* 2005; 16: 648–56.
- 3) Valvi D, Mendez MA, Martinez D, Grimalt JO, Torrent M, Sunyer J, Vrijheid M. Prenatal concentrations of polychlorinated biphenyls, DDE, and DDT and overweight in children: a prospective birth cohort study. *Environ Health Perspect* 2012; 120: 451–7.
- 4) Meeker JD, Maity A, Missmer SA, Williams PL, Mahalingaiah S, Ehrlich S, Berry KF, Altshul L, Perry MJ, Cramer DW, Hauser R. Serum concentrations of polychlorinated biphenyls in relation to *in vitro* fertilization outcomes. *Environ Health Perspect* 2011; 119: 1010–6.
- 5) Hauser R, Chen Z, Pothier L, Ryan L, Altshul L. The relationship between human semen parameters and environmental exposure to polychlorinated biphenyls and p,p'-DDE. *Environ Health Perspect* 2003; 111: 1505–11.
- 6) Bushnell PJ, Rice DC. Behavioral assessments of learning and attention in rats exposed perinatally to 3,3',4,4',5-pentachlorobiphenyl (PCB126). *Neurotoxicol Teratol* 1999; 21: 381–92.
- 7) Crofton KM, Kodavanti PRS, Casey AC, Kehn LS. PCBs, thyroid hormones, and ototoxicity in rats: cross-fostering experiments demonstrate the impact of postnatal lactation exposure. *Toxicol Sci* 2000; 57: 131–40.
- 8) Hany J, Lilienthal H, Sarasin A, Roth-Harer A, Fastabend A, Dunemann L, Lichtensteiger W, Winneke G. Developmental exposure of rats to a reconstituted PCB mixture or Aroclor 1254: effects on organ weights, aromatase activity, sex hormone levels, and sweet preference behavior. *Toxicol Appl Pharmacol* 1999; 158: 231–43.
- 9) Faqi AS, Dalsenter PR, Merker HJ, Chahoud I. Effects on developmental landmarks and reproductive capability of 3,3',4,4'-tetrachlorobiphenyl and 3,3',4,4',5-pentachlorobiphenyl in offspring of rats exposed during pregnancy. *Hum Exp Toxicol* 1998; 17: 365–72.
- 10) Wolf C, Lambright C, Mann P, Price M, Cooper RL, Ostby J, Gray LE Jr. Administration of potentially antiandrogenic pesticides (procymidone, linuron, iprodione, chlozolinate, p,p'-DDE, and ketoconazole) and toxic substances (dibutyl- and diethylhexyl phthalate, PCB 169, and ethane dimethane sulphonate) during sexual differentiation produces diverse profiles of reproductive malformations in the male rat. *Toxicol Ind Health* 1999; 15: 94–118.
- 11) Pocar P, Fiandanese N, Secchi C, Berrini A, Fischer B, Schmidt JS, Schaedlich K, Rhind SM, Zhang Z, Borromeo V. Effects of polychlorinated biphenyls in CD-1 mice: reproductive toxicity and intergenerational transmission. *Toxicol Sci* 2012; 126: 213–26.
- 12) Eriksson P, Fredriksson A. Neurotoxic effects in adult mice neonatally exposed to 3,3',4,4',5-pentachlorobiphenyl or 2,3,3',4,4'-pentachlorobiphenyl: changes in brain nicotinic receptors and behaviour. *Environ Toxicol Pharmacol* 1998; 5: 17–27.