

# TRANSFER RATE DIFFERENCE ACCORDING TO THE CONGENERS AND ISOMERS SHOULD BE CONSIDERED IN RISK ASSESSMENT OF FETAL EXPOSURE TO PBDEs AND POPs

Yoshiharu Matsuno, *Chiba University, Japan*  
Takeyoshi Fujisaki, *Chiba University, Japan*  
Emiko Todaka, *Chiba University, Japan*  
Michiko Shimoda, *Chiba University, Japan*  
Hiroko Nakaoka, *Chiba University, Japan*  
Masamichi Hanazato, *Chiba University, Japan*  
Noriko Nakamura, *Marshall University, USA*  
Chisato Mori, *Chiba University, Japan*

**Background and Aims:** Polybrominated Diphenyl Ethers (PBDEs) and Persistent Organic Pollutants (POPs) have been reported to have toxicity and endocrine disrupting effects. However, the health effects of PBDEs, PCBs and Dioxins have been reported to be different among the congeners and isomers. The purposes in the current study were; 1) to see the current exposure level of PBDEs and POPs in human adults and fetuses by using maternal blood (MB), cord blood (CB) and umbilical cord tissue (UC), 2) to see the difference of trans placental transfer situation of PBDEs, PCBs and Dioxins, and 3) to see the correlations among the POPs in fetus by using UC.

**Methods:** Eighty set samples (MB, CB and UC) and 86 UCs were collected at deliveries in Chiba University Hospital and some other obstetrics in Japan. The congeners and isomers of PBDEs, PCBs and Dioxins(PCDDs+PCDFs+Co-PCBs) were measured in 10 set samples, 29 set samples and 41 set samples, respectively. Also, PCBs and POPs (p,p'-DDE, trans-Nonachlor, cis-Nonachlor, Oxychlorane, HCB, Mirex, •-HCH) were measured in 86 UCs. All the measurements were done by GC/MS.

**Results:** PBDEs, PCBs and Dioxins were found from all the set samples. Also, PCBs and POPs were found from all the UC. Transfer rates of each congener and isomer of PBDEs, PCBs and Dioxins from MB to CB and from MB to UC were different. Also, a negative correlation was found between transfer rates of each congener and isomer and molecular weight (MW). It was found that the congeners and isomers larger than 1000MW didn't transfer from mother to fetus. Also, significant correlation between PCBs and other POPs was found in UC.

**Conclusions:** In risk assessment of chemicals, it is important to consider the difference of exposure level and the difference of transfer rate among congeners and isomers between adults and fetuses.