IARC MONOGRAPHS ON THE EVALUATION OF CARCINOGENIC RISKS TO HUMANS
VOLUME 107: POLYCHLORINATED BIPHENYLS (PCBS) AND POLYBROMINATED BIPHENYLS (PBBS)

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The IARC Monographs are a series of scientific reviews that identify the causes of human cancer. Each Monograph reviews all pertinent epidemiological studies and cancer bioassays in experimental animals, as well as other data relevant to the carcinogenicity of the agent(s) under review.

PCBs and PBBs were evaluated by the IARC Monographs Programme in 19781 and 19872. Commercial mixtures of PCBs and of PBBs induced liver tumours in rodents, thus providing sufficient evidence in experimental animals for their carcinogenicity. In humans, while the first case reports suggested a relationship between exposure to PCBs and malignant melanoma1, later mortality studies suggested an association with hepatobiliary cancer2; overall the evidence in humans for the carcinogenicity of PCBs was considered limited. PCBs were not genotoxic in rodents (in vitro and in vivo) and were not mutagenic in bacteria. As a result, PCBs were classified in Group 2A (probably carcinogenic to humans). For PBBs, no epidemiological data in humans were available, and these were classified in Group 2B (possibly carcinogenic to humans).

In the context of the recent reevaluation of the pleiotropic carcinogen 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD)3, 3,3′,4,4′,5-pentachlorobiphenyl (PCB126) was also classified in Group 1 (carcinogenic to humans), based upon extensive evidence that its activity is identical to that of TCDD for every step of the TCDD-associated mechanism of carcinogenesis in humans. The mechanism involves binding to the Ah receptor, leading primarily to promotion of tumour development by modification of cell replication and apoptosis, as well as to increased oxidative stress causing DNA damage. In view of this evaluation, the Working Group recommended an in-depth reevaluation of all PCBs.

The IARC Monographs Programme will review PCBs and PBBs in February 2013. The scientific community can contribute to this re-evaluation by ensuring that new data are published in time to be considered at the meeting (http://monographs.iarc.fr/ENG/Meetings/index.php).

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