

**MEETING SUMMARY
NATIONAL TOXICOLOGY PROGRAM
CENTER FOR THE EVALUATION OF RISKS
TO HUMAN REPRODUCTION**

**EXPERT PANEL REVIEW OF STYRENE
June 1–3, 2005**

The National Toxicology Program (NTP) Center for the Evaluation of Risks to Human Reproduction (CERHR) convened an expert panel on June 1–3, 2005, in Alexandria, Virginia. The purpose of this meeting was to evaluate the scientific evidence regarding the potential reproductive and/or developmental toxicity associated with exposure to styrene. The CERHR selected styrene for expert panel evaluation because of: (1) public concern about styrene exposure and (2) recently available exposure studies.

Styrene (ethenylbenzene; CAS RN: 100-42-5) is a high production volume chemical used in the production of polystyrene resins and as a co-polymer with acrylonitrile and 1,3-butadiene. Styrene is found in items such as foam cups, dental fillings, matrices for ion exchange filters, construction materials, and boats. It is also used in protective coatings, reinforced glass fiber, agricultural products, and as a food additive. In addition to occupational exposures, the general public can be exposed to styrene by ingesting food or drink that has been in contact with styrene polymers or through inhalation of polluted air or cigarette smoke.

The expert panel, composed of 10 independent scientists, reviewed and evaluated the available scientific evidence on styrene in three primary areas: human exposure, reproductive toxicity, and developmental toxicity. They considered the quality, quantity, and strength of the evidence in their deliberations about the potential for this chemical to cause adverse effects on human reproduction and prenatal or postnatal development.

Expert Panel Conclusions on Styrene

The expert panel judged the data from studies in humans on the developmental and reproductive toxicity of styrene to be insufficient to use in reaching a conclusion. The expert panel reached the following conclusions based on its evaluation of experimental animal data.

Experimental animal data indicate developmental toxicity only at exposure levels that were toxic to the pregnant dams. Therefore, the **expert panel concluded that there is negligible concern for developmental toxicity in humans.**

Experimental animal data also indicate that styrene is not a reproductive toxicant. Therefore, the **expert panel concluded that there is negligible concern for reproductive toxicity in humans.** The panel noted that there is suggestive

evidence that exposure to styrene in occupational settings is associated with elevated prolactin levels and depletion of dopamine metabolizing enzyme activities in blood, relative to unexposed individuals. However, the clinical relevance of these findings is uncertain and they warrant further investigation.

The conclusions noted above are those of the Styrene Expert Panel and should not be construed to represent the views of the NTP.

Next Steps

The final expert panel report from the evaluation of styrene will be posted on the CERHR web site (<http://cerhr.niehs.nih.gov>) and available in printed text from the CERHR in July, 2005. The CERHR will solicit public comments on this report through an announcement in the *Federal Register*. Following this comment period, the CERHR will prepare the NTP-CERHR monograph on styrene, consisting of an NTP brief, expert panel report, and all public comments on that report. The monograph will be available to the public on the CERHR web site and in hardcopy and sent to appropriate federal health and regulatory agencies.

Background

The NTP established the CERHR in 1998 as a public resource for providing scientifically based, uniform assessments of the potential for adverse effects on reproduction and/or development caused by man-made or naturally occurring chemicals or chemical mixtures to which humans are exposed. The CERHR convenes independent panels of scientific experts to conduct its evaluations. Expert panel meetings are open to the public and the public is invited to nominate scientists to serve on CERHR expert panels. Following completion of the evaluation of a chemical, the NTP prepares an NTP-CERHR monograph that contains its opinion on the potential for the chemical to be a reproductive or developmental hazard, the expert panel report, and public comments received on the final expert panel report. NTP-CERHR monographs on other chemicals evaluated by CERHR include six phthalates, methanol, 1-bromopropane, 2-bromopropane, ethylene glycol, propylene glycol, fluoxetine (Prozac®), and acrylamide and are available on the CERHR web site.

Questions about the expert panel review or CERHR can be directed to Dr. Michael Shelby, CERHR Director at 919-541-3455 or shelby@niehs.nih.gov.