Mice sometimes develop lung tumors when exposed to styrene. Is this relevant to human health? SIRC believes the answer is no, and cites research from more than 25 published studies to show why.

Here’s a brief summary of how some of the key studies were conducted, and what the results show:

1. Rats that are exposed to styrene do not develop tumor cells in their lungs. However, mice exposed to styrene sometimes do develop tumors. SIRC has directed a number of studies to learn why.

2. Mice typically have an enzyme in their lungs identified as CYP2F. Rats have less of this enzyme in their lungs, and humans have even less. To see if this enzyme was affecting the growth of tumors, a special group of mice were bred with no CYP2F enzyme. This group of mice, along with a group of regular mice, were exposed to styrene.

3. In mice with CYP2F, the enzyme added an oxygen atom to styrene’s benzene ring creating toxic metabolites in their lungs. The metabolites were toxic to certain lung cells, leading to a cycle of cell death and replacement, and, over time, the formation of tumor cells.

4. In mice without CYP2F, styrene’s benzene ring was unchanged in their lungs. No toxicity to lung cells. No tumor cells formed. Other enzymes changed styrene to styrene oxide and harmless metabolites, which are excreted in urine.

Exposure to styrene is not associated with any cause of death or any kind of serious illness, including cancer, in humans. The findings that mice develop tumors are not relevant to human health since mouse lung tissues process styrene differently than do the lung tissues of rats or humans.