

Luo, J., Watson, W. H., Gripshover, T. C., Qaissi, Z., Wahlang, B. (2023). Sex-specific effects of acute chlordane exposure in the context of steatotic liver disease, energy metabolism, and endocrine disruption. *Food and Chemical Toxicology*, 180, 114024. <https://doi.org/10.1016/j.fct.2023.114024>

## **Definitions**

- **Chlordane:** A pesticide used in the past for agriculture and termite control, known to persist in the environment.
- **Steatotic Liver Disease (SLD):** A liver condition characterized by fat accumulation in the liver.
- **Energy Metabolism:** The process by which the body converts food into energy.
- **Endocrine Disruption:** Interference with hormone systems, which can affect health.
- **Hepatocytes:** Liver cells responsible for maintaining various metabolic processes.

## **Key Findings**

- Female mice exposed to chlordane had more fat in their liver but lower body fat overall.
- Chlordane exposure affected liver genes involved in fat metabolism and glucose processing differently in male and female mice.
- Males showed increased testosterone levels after chlordane exposure.
- Chlordane activated certain liver receptors in a sex-dependent manner.

## **Introduction**

The study investigates the effects of chlordane, a persistent pesticide, on liver disease, energy metabolism, and hormone disruption in male and female mice. The focus is on understanding how these effects differ between sexes.

## **Main Content**

### **Background**

Chlordane is an organochlorine pesticide that remains in the environment long after its use has been discontinued. It accumulates in living organisms and has been linked to various health issues, including liver disease and metabolic disorders. The study aims to understand how chlordane affects liver health and metabolism differently in male and female mice.

### **Methods**

- **Animal Model:** Male and female mice were given a single dose of chlordane and observed for two weeks.

- **Measurements:** Body weight, food intake, and various liver and blood parameters were recorded. Liver tissues were analyzed for fat content and gene expression related to metabolism and hormone regulation.

## **Results**

- **Body Composition:** Female mice had lower body fat but higher liver fat content compared to males.
- **Liver Health:** Chlordane exposure led to increased liver weight in both sexes, but females showed more significant changes in liver fat and cholesterol levels.
- **Gene Expression:** Chlordane affected the expression of genes involved in fat metabolism and glucose processing, with different impacts observed in males and females.
- **Hormone Levels:** Male mice had higher testosterone levels after chlordane exposure, while no significant changes were observed in female hormone levels.
- **Receptor Activation:** Chlordane activated liver receptors involved in detoxification processes differently in males and females.

## **Conclusion**

Chlordane exposure leads to sex-specific changes in liver metabolism and hormone regulation. Female mice showed more liver fat accumulation, while males had increased testosterone levels. These findings highlight the need to consider sex differences when assessing the health risks of environmental pollutants like chlordane. Reducing exposure to such chemicals could help prevent liver diseases and related metabolic disorders.

Word Count: 416

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