

## Chronic Effects of Pesticide Exposure on Gene Polymorphism — Literature Review —

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The Gene testing techniques have made a remarkable development in recent years. The number of studies on an association between chronic effects rapidly of pesticide exposure and gene polymorphism has increased. This tendency is probably because some genes are related to the metabolism and transport through the cell membrane of the toxic chemicals.

Many studies on the cancer risk have found the significant interactions between pesticide exposure and gene polymorphism. The cancers associated with pesticides included gallbladder cancer, prostate cancer, renal cell carcinoma, breast cancer, bladder cancer, childhood leukemia, childhood brain tumor and so forth. The interactive factors of the pesticide exposure have been given as follows : The serum DDT level, the agricultural use of malathion or dichlorvos, the pesticide exposure indices representing the job history, the history of prenatal or postnatal insecticide exposure, among others. The genes of significant interaction with polymorphism have been given as follows: Cytochrome P450, glutathione-S-transferase, P-glycoprotein, flavin-containing monooxygenase, quinone oxidoreductase, among others.

The risk of Parkinson's disease was reported to have the interaction with pesticide exposure and paraoxonase or dopamine transporter polymorphism.

Some studies on birth defect and neurodevelopmental retardation have reported the significant interactive relations. For example : Preterm delivery with organochlorine pesticide exposure and cytochrome P450 polymorphism, reduction of head circumference or retardation of neurobehavioral development with organophosphorous insecticide exposure and paraoxonase polymorphism.

When it comes to multiple chemical sensitivity, some gene polymorphisms were reported to have significant relations. Further research is needed to gain a deeper insight into multiple chemical sensitivity including the interaction between gene polymorphism and chemical exposure epidemiologically.

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