

Chapter 1

1. Why are malformations of amphibians insufficient evidence for chemical toxicity?

Answer: Malformations may come from parasites and other influences that are not necessarily related to pollutants. Also a one low concentration effect of a compound like atrazine does not mean that malformations found in the wild are due to that agent.

2. How is toxicogenomics a form of cellular toxicology?

Answer: Toxicogenomics involves changes in DNA structure, expression and translation into protein (via mRNA transcription and tRNA/ribosomal protein synthesis) that are cellular functions of the nucleus (for eukaryotic organisms) and the cytoplasm/endoplasmic reticulum. A cancer cell may indeed be one aberrant cell whose genomics has been sufficiently altered to be a grave danger to the entire organism but started as a focus.

3. What toxicological information does the whole organism give toxicologists as exemplified by the injection of ^{14}C –labeled esophageal carcinogen N-nitrosomethylbenzylamine?

Answer: The distribution and activation by biotransformation was highest in the target organ which cannot be determined by exposing just one cell fraction from one tissue.

Chapter 2

1. Why did Paracelsus believe that everything was poisonous?

Answer: He discerned that anything given in excess is poisonous. It is the dosage that determines what effect a chemical will have on an organism.

2. How did the Pure Food and Drug Act open the way for the field of toxicology in the U.S.?

Answer: The isolation of the substances that had pharmacological and toxicological properties were investigated as adulteration of foods, medicines and cosmetics had led to many untoward effects (morbidity and mortality).

3. What did the book *Silent Spring* precede?

Answer: The book indicated the carcinogenicity and toxicity of environmental chemicals such as the pesticide DDT. The U.S. EPA and OSHA came into being in 1970 as there was a growing awareness that environmental exposure to pesticides and occupational exposure to substances like asbestos led to human disease.