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Editorial on Genotoxicity

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Editorial

In genetics, genotoxicity refers to a chemical agent's ability to damage a cell's genetic code, resulting in mutations that can lead to cancer. Although genotoxicity and mutagenicity are often misunderstood, all mutagens are genotoxic, although not all mutagenic compounds are genotoxic. Inductionof mutations, mistimed event activation, and direct DNA damage leading to mutations are all examples of changes that can have direct or indirect effects on DNA. Permanent, heritable changes can affect the organism's somatic cells or germ cells, which will be passed down to future generations.Cells use DNA repair or apoptosis to prevent the genotoxic mutation frombeing expressed; however, the damage cannot always be repaired, resultingin mutagenesis. Interactions with the DNA sequence and structure, genotoxic substances cause damage to the genetic material in cells.

Test techniques

The aim of genotoxicity research is to see whether a substance has the potential to harm genetic material or cause cancer. Bacterial, yeast, and mammalian cells can all be used. With the information gained from the experiments, it is possible to monitor the early development of species thatare susceptible to genotoxic substances.

Bacterial Reverse Mutation Assay

The Bacterial Reverse Mutation Assay, also known as the Ames Assay, is a procedure for gene mutation used in laboratories. To compare the variousvariations in the genetic material, the procedure employs a variety of bacterialstrains. The test identifies the majority of genotoxic carcinogens and genetic alterations.

Genotoxic chemotherapy

The use of one or more genotoxic drugs in the treatment of cancer is known as genotoxic chemotherapy. Traditionally, the therapy has been a part of a systematic regimen. Treatments that use the destructive properties of genotoxins seek to cause DNA damage in cancer cells. As cancer cells proliferate, any damage done to them is passed on to descendent cancer cells. If this damage is severe enough then it will induce cells to undergo apoptosis.

Risks

One disadvantage of treatment is that certain genotoxic drugs are successful onboth cancerous and non-cancerous cells. The sensitivity of the cells themselves determines the selectivity of a drug's action. As a result, although rapidly dividing cancer cells are especially susceptible to many drug therapies; normal functioning cells are often affected as well.

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