

## A REVIEW

# The hidden poison - microplastic : Inflammatory catalyst of cancer development

■ Naveen Kumar, Alok Shukla, Anil Kumar, Ashok Kumar Pachar, Harman, Neetu Sharda, Sonal Yadav, Mridul Lamba and Arbind Acharya

### SUMMARY

Microplastics, tiny plastic particles less than 5 millimeters in diameter, have become a growing concern due to their widespread presence in various ecosystems and their potential health impacts, particularly their role in inducing inflammation and contributing to cancer development. This paper explores the mechanisms through which microplastics trigger inflammatory responses in biological systems, leading to oxidative stress, cellular damage, and disruptions in cellular signaling pathways. These processes not only sustain chronic inflammation but also create a microenvironment conducive to tumor initiation and progression. The paper further discusses the global prevalence of microplastic pollution, the specific inflammatory pathways activated by microplastics, and the resulting implications for various types of cancer, including gastrointestinal, lung, liver, skin, and breast cancers. The study highlights the urgent need for standardized research methodologies, long-term studies, and effective remediation strategies to mitigate the health risks posed by microplastic exposure.

**Key Words :** Microplastics, Inflammation, Carcinogenesis, Oxidative Stress, Cellular signaling pathways

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Microplastics, tiny plastic particles less than 5 millimeters in diameter, have infiltrated various ecosystems and have become a focal point of scientific research due to their potential to exacerbate inflammatory processes. These particles have been detected across marine and freshwater environments, soil, and air. The ingestion and inhalation of microplastics by humans and animals are well-documented, raising concerns about their long-term health impacts, especially regarding cancer development.

A critical aspect of microplastic toxicity is their ability to induce inflammation, which is a key factor in