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# Fusion Genes: A Promising Tool Combating Against Cancer

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## ABSTRACT

The driving roles of fusion genes during tumorigenesis have been recognized for decades, with efficacies demonstrated in clinical diagnosis and targeted therapy. With advances in sequencing technologies and computational biology, a surge in the identification of fusion genes has been witnessed during the past decade. The discovery and presence of splicing based fusions in normal tissues have challenged our canonical conceptions on fusion genes and offered us novel medical opportunities. The specificity of fusion genes to neoplastic tissues and their diverse functionalities during carcinogenesis foster them as promising tools in the battle against cancer. It is time to re-visit and comb through our cutting-edge knowledge on fusion genes to accelerate clinical translation of these internal markers. Urged as such, we are encouraged to categorize fusion events according to mechanisms leading to their generation, oncological consequences and clinical implications, offer insights on fusion occurrence across tumors from the system level, highlight feasible practices in fusion-related pharmaceutical development, and identify understudied yet important niches that may lead future research trend in this field.

## KEY WORDS

Fusion, cancer, chromosome rearrangement, non-structural rearrangement, diagnosis, targeted medicine

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