

CHROMOSOME FRAGMENTATION

Stephens et al. (1) introduced the term *chromothripsis* in their paper titled “*Massive genomic rearrangement acquired in a single catastrophic event during cancer development.*” This phenomenon describes an abrupt, extensive fragmentation and rearrangement of chromosomes. Since then, additional mechanisms of large-scale chromosomal reorganization have been identified, including chromoplexy, chromoanasythesis, and chromoanagenesis, each arising from distinct molecular processes. These events are commonly observed in cancer due to the absence, in somatic cells, of the stringent constraints imposed by the delicate embryonic development.

Two articles in *Science* explore the molecular mechanisms and specific genes associated with these complex rearrangements (2, 3), with a commentary offering further perspective (4).

Occasionally, such genomic shifts may drive significant evolutionary innovations, acting as mechanisms for rapid adaptation and diversification. This concept is supported by Vargas-Chávez et al. in their BioRxiv study, “*A punctuated burst of massive genomic rearrangements and the origin of non-marine annelids*” (5), which inspired a commentary in *Science* (6).

1. <https://www.cell.com/action/showPdf?pii=S0092-8674%2810%2901377-2>
2. https://www.science.org/doi/10.1126/science.adj7446?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed
3. https://www.science.org/doi/10.1126/science.adj8691?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed
4. <https://www.science.org/doi/10.1126/science.adr7417>
5. <https://www.biorxiv.org/content/10.1101/2024.05.16.594344v3>
6. <https://www.science.org/content/article/earthworms-have-completely-scrambled-genomes-did-help-their-ancestors-leave-sea#:~:text=Scrambled%20genes,water%2C%20and%20then%20onto%20land.>