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Chromosome instability in cancer: Mechanisms and therapeutic consequences

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Cancer cells frequently missegregate chromosomes during cell division. This phenomenon termed chromosome instability leads to the formation of aneuploid cells i.e., cells with abnormal chromosome numbers. Chromosome instability is among the most malignant features of cancer cells because it can initiate cancer development, it accelerates cancer progression and it is an important mechanism for cancer cells to become resistant to cancer therapies. Even though more than a century has passed since we learned that chromosome instability is a common trait of tumor cells, we are now only beginning to understand how cancer cells become aneuploid. Work from our and other laboratories has provided important new insights into the molecular and cellular mechanisms of chromosome instability. Here, we will provide an overview of these mechanisms. We will also discuss the consequences of chromosome instability on the cellular and organismal levels as well as the profound impact of chromosome instability on the diagnosis and treatment of cancer.

Biography

Duijf obtained a PhD degree in Human Genetics from the Radboud University Nijmegen in the Netherlands. His postdoctoral studies at Memorial Sloan-Kettering Cancer Center in New York, NY, USA focused on how chromosome instability, the missegregation of chromosomes during cell division, contributes to cancer development and progression. In 2013, Dr Duijf established his independent research group at the University of Queensland Diamantina Institute and the Translational Research Institute in Brisbane, Australia. With an interest in breast and other cancers, his group studies chromosome instability in mouse models in order to develop new strategies to improve cancer diagnosis and treatment.

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