



2025 Finalist Fena Ochs

Illuminating the cohesin complex during cell division

»Cell division is the foundation of life, responsible for constructing our tissues, organs, and entire bodies. Each cell division is a delicate process, ensuring the accurate distribution of our genetic code from one mother cell to two daughter cells. This critical task is orchestrated by a group of proteins known as the cohesin complex.

Cohesin holds together newly duplicated sister chromatids from their genesis during DNA replication until their segregation during mitosis, in a process called sister chromatid cohesion. Despite its discovery nearly three decades ago, the molecular mechanism underlying sister chromatid cohesion remains incompletely understood. Utilizing single molecule super-resolution imaging in human cells, I have discovered the nature of cohesin mediating sister chromatid cohesion. Monomers of cohesin, in conjunction with an accessory factor called Sororin, entrap identical chromosomes and facilitate their symmetrical distribution to daughter cells. These mechanistic insights advance our understanding of how sister chromatid cohesion is established and have implications for conditions where this process is impaired, such as age-related infertility.«

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