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Robert H. Lurie Comprehensive Cancer Center of Northwestern University

Lurie Cancer Center's Basic Research Seminar Series

# Exploiting Mitotic Defects for Cancer Therapy

Tuesday, November 12, 2024

11:00 a.m.- 12:00 p.m. CT

Baldwin Auditorium, 1st Floor

Robert H. Lurie Medical Research Center

303 E. Superior St., Chicago, IL

Hosted by: Marcelo Bonini

Chromosome segregation defects during mitosis rarely occur in nontransformed cells but are a hallmark of cancer cells. This realization in the late 1800s led to the hypothesis that chromosome missegregation drives tumorigenesis. Since then, it has become clear that the rate of chromosome missegregation substantially influences the effect of mitotic defects on tumors. Low rates of chromosome missegregation can be tumor promoting, while high rates of missegregation cause cell death and tumor suppression. We recently discovered that microtubule-targeting agents, which are standard-of-care treatment for multiple cancer types, exert their anti-cancer activity by increasing the rate of chromosome missegregation over a maximally tolerated threshold, rather than by causing mitotic arrest as had long been expected. I will discuss our recent findings 1) defining the impact of low rates of mitotic errors on tumorigenesis and 2) leveraging our newfound understanding of the anti-cancer mechanism of microtubule-targeted agents to develop a predictive biomarker of response and methods to sensitize resistant cancers.



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