Centrosome abnormalities as biomarkers in human cancer

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Abstract

Centrosome abnormalities are a hallmark of human cancers and are therefore an emerging appealing feature for diagnostic and targeted therapies. However, the current poor understanding of the origins and consequences of centrosome abnormalities in humans limits their clinical use. Using a unique human cancer model that has a multistep pathway of progression, from the premalignant condition to the metastatic disease, we determined for the first time, the timing and incidence of centrosome abnormalities during human tumorigenesis. Surprisingly, we found that centrosome abnormalities can occur as early as the premalignant condition and that its incidence is dynamic during progression, suggesting important roles for centrosome deregulation at different stages of disease. Using relevant cell culture models that mimic the human physiology, we study how centrosome abnormalities arise, how they affect progression, and which cellular vulnerabilities they generate in human cancer. As a result, we aim to identify molecular biomarkers for diagnosis and prognosis, and provide clearer directions in using centrosome deregulation in therapeutic approaches and patient stratification.

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