Epigenetic regulators as driver of tumor heterogeneity

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The epigenome functions as a critical regulator of cellular physiology through dynamic, reversible modifications that govern gene expression. Our laboratory investigates chromatin readers/effectors, which recognize specific epigenetic landscapes and regulate gene expression programs. Our findings demonstrate these proteins' pivotal roles in regulating cancer hallmarks, offering insights into tumor heterogeneity. The tumor microenvironment significantly influences cancer progression through interactions between resident cells and the extracellular matrix (ECM). We show that epigenetic regulators program ECM gene expression, thereby altering ECM stiffness leading to cell free DNA release from the exosomes of the cancer cells. Further, immune signalling pathways are also deregulated by the epigenetic factors directly impacting the metastatic potential of the cancer cells. Our research illuminates how specific chromatin readers interpret the epigenetic code in cancer, emerging as promising therapeutic targets for future interventions.