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Nuclear stiffness and chromatin condensation as markers for aggressive prostate cancer ZEINA KHAN, JULIANNA SANTOS, FAZLE HUSSAIN, Texas Tech University — Previous studies have demonstrated that nuclear rheology parameters - stiffness and fluidity - depend on expression levels of nuclear membrane proteins lamin A/C and lamin B. No quantitative nuclear rheology has been studied to compare cancers of different aggressiveness. Our nuclear creep experiments using a microfluidic channel with a narrow constriction show that aggressive prostate cancer cell nuclei have a lower stiffness than benign cell nuclei; thus nuclear stiffness can be easily used as a cancer malignancy marker. We also find that nuclear stiffness and fluidity, contrary to prior claims, do not strongly depend on lamin A/C or B expression levels of prostate cancer cells. Rather, we find that nuclear stiffness depends on chromatin condensation.

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