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How to detect single cancer cell? NADINE PERNODET, SUNY, JESSICA FIELDS, Princeton, LENNY SLUTSKY, Duke, TAYLOR BERNHEIM, KAUSTABH GHOSH, SHOUREN GE, MIRIAM RAFAILOVICH, SUNY — Cell mechanics is now considered as a critical parameter closely related to cell functions. Moreover, we know that cytoplasm of cancer cells compared to normal cells is disorganized; therefore this should be directly translated to their mechanical properties. Here we show that we are able to distinguish cancer cells from normal cells in a cell mixture through their mechanical properties. Advantage of our method is that we measure single cell mechanical response where any cells, cancer or normal, are attached on a surface *in situ*. When imaged in the mixture of cells, through usual microscopic imaging, cancer and normal cells did not show obvious differences and could not be identified with certitude unless using specific biochemical markers. In a mixture of cancer and normal cells, mechanical measurements were done randomly on six different cells. The relative modulus gave a bimodal distribution. These moduli were compared to the known modulus obtained from normal or cancer cell and assigned to each group of cells very precisely. This method, which is directly related to the intrinsic cytoskeleton cell mechanical properties, is a sensitive and reliable tool to detect cancer cells from a culture or a tissue at a single cell level.

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