

Biomechanical alterations in breast cancer cells

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Understanding how the tumour microenvironment shapes cellular biomechanics is key to explaining cancer progression [1]. Using AFM, we examined how cell–cell contact, culture time and dimensionality (2D vs. 3D) influence the mechanics of breast cancer cells.

Cell–cell contact produced no major differences, though small sample sizes may limit preliminary conclusions. Time showed a crucial role causing a reduction in the young's modulus of the cells when cultured longer periods of time. Dimensionality was assessed comparing the cells in monolayers to the cells in the upper stratum of the spheroid, Spheroids displayed a reduction in the young's modulus compared to the cells in monolayers.

Overall, cellular biomechanics are highly context-dependent and strongly shaped by microenvironmental cues, underscoring the importance of physiologically relevant models.

Keywords:

Breast cancer, 2D, 3D, Cell mechanics

References:

[1] - Ghosh, D., & Dawson, M. R. (2018). *Microenvironment influences cancer cell mechanics from tumor growth to metastasis*. In *Biomechanics in Oncology* (**Advances in Experimental Medicine and Biology** , Vol. 1092, pp. 69–90). Springer. https://doi.org/10.1007/978-3-319-95294-9_5

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