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Building Better Tumor Models In Vitro: An Investigation into the Improvement of 3D Cell Culture Techniques

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Et al.

BUILDING BETTER TUMOR MODELS IN VITRO: AN INVESTIGATION INTO THE IMPROVEMENT OF 3D CELL CULTURE TECHNIQUES

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In cancer drug discovery, 3D cell culture is a segue between monolayer cell culture and animal testing, offering better predictive modelling of drug performance before animal testing commences. However, even though cell spheroids in 3D cultures superficially resemble tumors, they typically lack the complexity and scale of tumors formed in vivo. Spheroids typically consist of a single cell type whereas tumors contain a whole ecosystem of cells. Also, most 3D protocols stop at day 10, where the spheroids are roughly 500-600 μm in diameter at the largest, whereas tumors that develop in the body are, on average, 7.5 cm in diameter. This study investigates the effects of coculturing cell lines in 3D cultures, the effect of growth factors like Epidermal Growth Factor (EGF) on spheroids, and works on developing methods to increase the size of spheroids to more macroscopic levels. Applications for use of these 3D culture models for imaging and treatment with drug-encapsulating nanoparticles will also be presented.

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