

317e Comparison of 3d and 2d Cell Culture Models for Toxicology Assays

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In vitro toxicology assays that mimic in vivo behavior are critical to expedite drug discovery and to minimize the effort and cost associated with animal and human studies. To date, most studies on drug sensitivity have used monolayer cell cultures, though it is well known that cells often function differently when grown in an extra-cellular matrix. To this end, we have employed a breast cancer cell line, MCF7, in three-dimensional (3D) collagen-gel cell culture system to evaluate the chemosensitivity of cancer drugs doxorubicin and 5-fluorouracil and compared the results with conventional two-dimensional (2D) monolayer culture. Our results demonstrate the feasibility and reproducibility of using image density as the basis for determining and comparing the growth inhibitory effects of the drugs for 3D and 2D cultures. We have also used the methodology to test the cytotoxicity of drug metabolites using a miniaturized 3D collagen gel cell culture system and are working towards optimizing the technique as an easy and reliable tool for high-throughput screening of drug candidates.