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MODIFIED SLOW DIGESTION TECHNIQUE FOR THE ISOLATION OF PATIENT-DERIVED CELLS: AN IN VITRO MODEL FOR THE DESIGN OF BREAST CANCER-ASSOCIATED STROMA

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Objective: Highly prevalent cancer-associated fibroblasts (CAFs) are understood to play a key role in tumorigenesis. Understanding of CAFs and tumor-associated stroma is considered to be essential in novel cancer therapies. Patient-derived cells (PDCs) more closely resemble tumor microenvironment compared with commercial cell lines that are subjected to genetic and phenotypic changes. However, PDCs use can be limited by challenges in isolating high-yield viable cultures. Overcoming these challenges would benefit novel personalized cancer research. In this study, we aimed to investigate the effectiveness of modified tissue digestion processing techniques of isolation of PDCs. **Methodology:** PDCs were isolated from breast tissues collected from patients who had previously been diagnosed with breast cancer. Modification of slow and fast digestion processing techniques was used, followed by analysis for morphology and protein marker expression. **Results:** Isolated PDCs were presented with different morphologies and functions compared with breast cancer cell lines. Higher growth potential was observed with a combination of maintenance and filtered conditioned medium. High expression of Vimentin and morphological characteristics of spindle-shaped large cells confirmed the PDCs as fibroblasts. The modified slow digestion approach used in this study was successful in isolating fibroblasts from retrieved breast tissue. The fast digestion approach was not viable and was abandoned early due to poor production of cells. **Conclusions:** PDCs were isolated using a modified slow digestion approach. PDC cultures can more effectively represent breast cancer stroma and are becoming an essential platform for research as a personalized in vitro model for molecular breast cancer research. This study presents a highly successful method of isolating PDCs from breast cancer patients.

Keywords: Patient-Derived Cells; Cancer-Associated Fibroblasts; In Vitro Breast Cancer Stroma; Modified Slow Digestion Processing Technique.