Analysis of Epithelial-Mesenchymal Transition Biomarkers, E-Cadherin and Vimentin, in Colorectal Cancer

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Colorectal cancer is the third most common cancer. Starting as polyps of abnormal growth in the epithelium, cancerous tissue can rapidly grow, invade surrounding tissue, reach the cardiovascular system, and metastasize to form multiple secondary tumor sites. In order to metastasize, it must leave the epithelium by transitioning from a differentiated Epithelial stage to an undifferentiated Mesenchymal Stage. The expression of biomarkers, E-Cadherin, a surface protein of Epithelial cells, and Vimentin, a cellular filament of Mesenchymal cells, were used to track the Epithelial-Mesenchymal Transition in colorectal cancer. Paraffin-embedded formalin-fixed tissue sections were obtained on slides, from non-cancerous, pre-cancerous, and cancerous tissue samples taken as colonoscopy biopsies; histopathological evaluations were recorded. Tissue sections were rehydrated, antigen epitopes unmasked, and an Immunofluorescence Assay was conducted to label E-Cadherin and Vimentin. The slides were mounted with DAPI-nuclei stain and viewed. E-Cadherin expression was observed in the epithelial cells in the gastric pits and vimentin expression was observed in the mesenchymal cells in the stroma in non-cancerous sections. However, foci with epithelial cells expressing vimentin were observed in some precancerous and cancerous specimens, which may signify the epithelial to mesenchymal transition that is required for metastasis suggesting appropriate modification in treatment plans. The use of these biomarkers to supplement histopathological evaluation is promising and would provide more predictive and detailed analysis of cancer progression in tissue samples. The accurate pre-treatment patient evaluation based on such markers is pivotal to the modern push for personalized therapy.

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