Masquerading Malignancy: How Cancer Cells May Disguise as Immune Cells

Sankirth Madabhushi¹,², Louise Aguarin¹, Samuel Jean-Baptiste¹, Saad Sheikh¹, Deeksha Saxena¹, Gary Kao¹. ¹Department of Radiation Oncology, Perelman School of Medicine, University of Pennsylvania, ²Brandeis University

Pleural Effusion is a serious lung condition whose origin can be malignant or benign. A growing body of data suggests that white blood cells (WBCs) in the tumor microenvironment may contribute to tumor aggression and poorer prognoses in patients. Therefore, an assay to identify cancer cells and WBCs in pleural effusions and other fluids can guide more specific treatments. We validated an experimental workflow for identifying cancer cells and white blood cells that include: microfluidic processing technology (Celsee chip), an adenoviral vector detecting unregulated telomerase activity, immunofluorescence, and western blotting. This workflow was tested on WBCs from donors, lung cancer cell lines, and patient samples. We discovered that at least one lung cancer cell line (H2030) expresses CD14, a standard monocyte marker. We subsequently found other published examples of solid tumors expressing CD14. These observations suggest that some cancer cells may masquerade as white blood cells by aberrantly expressing surface markers. Future studies may need to incorporate large size or rigidity as a criterion to distinguish cancer cells from monocytes and other WBCs, and confirm if CD14 expression on cancer cells enables them to evade immunity. Ultimately, these experiments should pave the way to a comprehensive assay that identifies the etiology of pleural effusions in patients and offer them more personalized, effective treatments.