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Spatial Distribution of B Cells and Lymphocyte Clusters as Biomarkers in Non-Small Cell Lung Cancer Treatment (NSCLC)

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Statement of the Problem. The presence of tertiary lymphoid structure (TLS) in tumor tissues has been reported to be a factor associated with a good prognosis in several types of cancers including non-small cell lung cancer (NSCLC). However, the relationship between TLS spatial organization and the treatment response remains unknown in NSCLC who received ant-PD-1 antibody. The purpose of this study was to evaluate the effect of the various stages of the spatial organization of the TLS from locally concentrated aggregates of immune cells, through clearly defined B cell follicles to mature follicles in NSCLC and its relationship with the tumor microenvironment on anti-PD1 treatment response. Methodology & Theoretical Orientation: Frozen sections from retrospectively collected surgically resected NSCLC tumors treated with adjuvant pembrolizumab therapy were used. The TLS in tumor tissues was detected by high-plex imaging mass cytometry staining and the difference in TLS spatial organization was compared to the features of the tumor microenvironment and the objective response rate of the patients. Findings: TLS identified and characterized according to their spatial organization within or adjacent to the tumor showed that the presence of tumor-associated TLS (TA-TLS) correlated with favorable response to anti-PD-1 therapy. The abundance and the spatial distribution of B cells allowed a better definition of the correlation between B cell subsets with clinical outcomes showing that the heterogeneity in these TA-TLS influences the predictivity significance to anti-PD-1 therapy. Conclusion & Significance: Identifying the phenotypic heterogeneity of intratumor B cells and their functional connection to CD8 T cell helps optimally guide the anti-PD-1 treatment strategy. This spatial mechanistic insight also provides an exciting opportunity for translation of B cell-based immunotherapies into clinics complementary to existing T cells centric strategies.

Biography

Corinne Ramos earned a Ph.D. in Molecular Biology from the University Paul Sabatier (Toulouse, France) and an MBA from Johns Hopkins University-Carey Business School. She has over 20 years of experience in biomarker development, molecular oncology, and imaging, with a focus on clinical assay validation and diagnostics. Since joining Aliri in 2020 as Director of R&D, she has driven innovative research and strategic business initiatives. Corinne has overseen R&D, product development, and clinical laboratory operations, and has authored 35 publications.

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