2024

Taipei International Breast Cancer Symposium

台北國際乳癌研討會

Speech Abstract

Topic:
Precision immunotherapy for TNBC, from clinical factors to tumor microenvironment
Abstract
Immune checkpoint inhibitors (ICIs) have revolutionized cancer therapy and now represent the mainstay of treatment for many tumor types, including triple-negative breast cancer in both early and advanced setting. However, not all the patients benefit from immunotherapy. The identification of predictive biomarkers of response to ICIs may play a pivotal role in optimizing the therapeutic use of these compounds. In this presentation will be discussed the current landscape of tissue and blood biomarkers that could serve as predictive factors for ICI treatment in breast cancer. In particular, it will be highlighted the groundbreaking findings from our recent study published on Nature (Wang XQ Nature 2023) on the predictive power of tumor microenvironment (TME) spatial organization in determining the efficacy of immune checkpoint blockade (ICB) in triple-negative breast cancer (TNBC). Utilizing Imaging Mass Cytometry, we meticulously quantified the expression of 43 proteins at subcellular resolution in TNBC samples, drawing from three crucial timepoints during a randomized neoadjuvant trial. Our analysis uncovers that specific spatial arrangements and phenotypic states of immune and cancer cells within the TME—particularly proliferating CD8+ TCF1+ T cells and MHCII+ cancer cells—strongly predict treatment response. These cellular interactions are not static; instead, they evolve dynamically under the selective pressure of immunotherapy, as evidenced by the varied landscapes of immune and cancer cell interactions from pre- to post-treatment samples. The study's insights extend far beyond the technical achievements of high-plex tissue imaging. By linking these spatial biomarkers with treatment outcomes, our work significantly advances the concept of precision immunology. It suggests that a detailed, spatially-resolved view of the tumor ecosystem can guide more effective personalized immunotherapy strategies, ultimately enhancing therapeutic outcomes in TNBC and potentially other cancers. This research not only reinforces the importance of early and precise biomarker identification but also highlights the need for adaptive therapeutic approaches based on detailed, real-time mapping of cellular interactions within tumors. The integration of these biomarkers in a “holistic” comprehensive panels of multiple predictive factors could be a major step forward towards precision immune-oncology.