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MULTI-BIO-MARKER SPATIAL INTERACTIONS REQUIRE HIGH DIMENSIONAL TISSUE ANALYSIS

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The interaction of tumor cells and their associated tumor microenvironment (TME) is a highly complex and usually heterogenous system, individual for each patient. Simple scores as used for scoring programmed death-ligand 1 (PD-L1) expression related to Immuno-Oncology (IO) treatment decisions are of limited value, as they capture an incomplete picture of the patients' tumor-TME interactions. Developing a multiplexed seven marker IHC, a biomarker panel (IO-Panel), we were able to unlock the heterogeneity of the TME in mesothelioma and NSCLC with our unique TissuePhenomics® approach. In first step, the results categorized the samples into hot or cold tumors, based on the presence of tumor infiltrating lymphocytes. In a second step, the combined analysis of all seven biomarkers allowed us to sub-classify patient tumor samples into six IO-related categories. These six categories are based on the currently available literature and published clinical outcome data and can be associated with patient response to IO treatments. Furthermore, the categorization allows the recommendation of patient-specific treatment decisions. Machine learning revealed spatial TME heterogeneity in those tumors. In a data driven clustering approach, we could decipher 12 distinct IO-patterns. Some of these patterns showed a clear overlap with the hypothesis-generated six IO-categories. Others revealed currently non-considered tumor immune-phenotypes, providing a more detailed description of the tissue architecture, than the initial six IO-categories. In summary, our standardized IO-Panel showed that patients with hot and cold tumors can be classified into six distinct IO-categories and tumor tissue into six distinct local IO-phenotypes. Future studies with increased patient sample cohorts and available outcome data are needed to prove their clinical relevance.

Biography

Fabian Schneider has completed his PhD from Johann Wolfgang V Goethe University Frankfurt a Main, Germany and Postdoctoral studies from Karolinska Insitutet, Stockholm Sweden and Technical University Hospital Rechts der Isar, Munich, Germany. He worked at Roche Pathology Penzberg, Germany from 2015-2018 as a Clinical Scientist responsible for project management and tissue sample analysis in several Immuno-Oncology studies. Currently, he is working as a Translational Clinical Scientist at Definiens AG, Munich, Germany.

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