Emphasis on Cancer-Associated Adipocytes in Breast Cancer Progression

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Current literature on adipocytes in the tumor microenvironment (TME) to elucidate the connection between obesity and tumor progression remains relatively limited. Here, we explore the impact of adipocytes in governing the TME status and tumor malignancy. Our previous work involved establishing adipocyte-specific BECN1 KO (BaKO) mice, which develop dysfunctional adipocytes due to impaired autophagy. We found that BECN1-deficient adipocytes were sufficient to promote breast and colon cancer growth by activating YAP/TAZ signaling. Notably, additional deletion of YAP/TAZ from BaKO mice restored the lipodystrophy and inflammatory phenotypes, leading to tumor regression. Further, treatment with the YAP/TAZ inhibitor, verteporfin, could suppress tumor progression in both BaKO and HFD-fed mice, highlighting its efficacy against mice with metabolic dysregulation. Our study offers insights into the role of cancer-associated adipocytes (CAA) in promoting tumor progression and forming a malignant TME. Moreover, we exert to understand CAA transformation mediated by cancer-derived factors. We believe that implementing spatial transcriptomics will significantly advance our knowledge of CAAs, providing a viable strategy to retain healthy adipocytes to maintain 'inactive' TME.