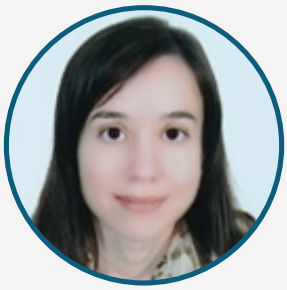

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Brachyury iselevated in the adipose tissue of individuals with overweight or obesity

Abstract:

Overweight and obesity are well-established risk factors for cancer. The embryonic developmental gene brachyury is typically absent in non-neoplastic tissues but expressed in malignant tumors, particularly epithelial malignancies. Brachyury regulates genes involved in the cell cycle, extracellular matrix remodeling, growth factor production, and cytokine signaling. Its overexpression promotes epithelial-to-mesenchymal transition (EMT) and tumor metastasis. Adipocytes have been implicated in EMT processes, and emerging evidence suggests that metastatic cancer cells can differentiate into adipocytes, potentially altering classical EMT pathways. Obesity is characterized by pathological expansion of white adipose tissue (AT), prompting the question of whether brachyury is overexpressed in obese AT and contributes to adipose-derived stem cell differentiation into preadipocytes, as well as to preadipocyte proliferation and maturation. In this study, we investigated brachyury expression in human subcutaneous abdominal AT and assessed whether its levels are elevated in overweight and obese individuals compared to normal-weight controls. A total of 108 adults with varying body mass indexes (BMI) and glycemic statuses were included. Anthropometric and biochemical parameters were evaluated, and brachyury expression was quantified in subcutaneous abdominal AT. Brachyury mRNA expression was significantly higher in overweight ($P = 0.0098$) and obese ($P = 0.026$) individuals compared to normal-weight controls. Among overweight participants, those with diabetes exhibited higher brachyury expression than those with prediabetes ($P = 0.0135$). Interestingly, overweight individuals with diabeteshad greater brachyuryexpression than obese individuals with diabetes ($P = 0.0084$). Confocal microscopy confirmed that brachyury protein levels increased with adiposity. We propose an obesity-associated model in which the reactivation of embryonic developmental programs in adipose tissue promotes preadipocyte proliferation and cancer-like cellular behaviors.

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Biography

I have a background in human cellular immunology, with expertise in characterizing cellular immune responses across both experimental and clinical settings, particularly in allergic, infectious, and metabolic diseases. My current research focuses on elucidating the underlying mechanisms of autoimmune type 1 diabetes and developing strategies for its prevention.