New immunotherapy targets polyamine metabolism in tumors.

Researchers at UCF and the Lankenau Institute for Medical Research have synthesized new anti-cancer small molecules that block polyamine uptake and activate the anti-tumor immune response. Many tumors require high levels of polyamines to support their growth and survival. Additionally, high levels of polyamines can suppress the immune system, allowing tumors to evade the immune response. Polyamine blockade therapy, which inhibits both polyamine transport and polyamine biosynthesis, simultaneously suppresses tumor growth and activates immunity by reversing polyamine-mediated tumor immunosuppression.

Technical details

The lead compound is a polyamine transport inhibitor that out-competes native polyamines for binding to the polyamine transport system. Polyamine blockade therapy with this compound, and the FDA-approved polyamine biosynthesis inhibitor, DFMO, significantly lowered intracellular tumor polyamine levels in a mouse tumor model. As a result, tumor growth was significantly reduced and the anti-tumor immune response was activated. This anti-tumor effect was T-cell dependent and included an increase in granzyme B+ CD8+ T-cells and a decrease in immunosuppressive tumor infiltrating cells.

Benefits

• Depletes tumors of polyamine growth factors
• Increases cytotoxic T-cell activity
• Low toxicity
• Targeting to tumors with high polyamine transport activity

Applications

• Anti-cancer immunotherapy

Publications

A novel polyamine blockade therapy activates an anti-tumor immune response


Technology #34180

• US Patent Pending

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