Immunometabolic Reprogramming Platform to Sensitize Pancreatic Cancer to Anti-Tumor Immunity

A first-in-class small-molecule strategy designed to convert immunologically "cold" pancreatic tumors into immune-responsive tumors by activating endogenous inflammatory signaling.

Technology

Dr. Possemato's lab identified a novel immunometabolic therapeutic approach that simultaneously inhibits Salt-Inducible Kinases (SIKs) and the Nonsense-Mediated Decay (NMD) pathway to induce a pro-inflammatory tumor state in pancreatic ductal adenocarcinoma (PDAC). Preclinical studies demonstrate that dual pathway inhibition activates cytokine expression, including IL36G, promoting $CD8^+$ immune cell infiltration and suppressing tumor progression in vivo.

Rather than directly targeting tumor proliferation, this approach reprograms tumor intrinsic biology to stimulate immune engagement, representing a differentiated mechanism versus checkpoint blockade or cytotoxic therapies. The strategy is particularly attractive for PDAC, a disease known for increased immune exclusion and resistance to existing immunotherapies.

Background

Pancreatic ductal adenocarcinoma remains one of the most aggressive and treatment-refractory solid tumors, with poor survival outcomes and limited therapeutic innovation. Current therapies provide modest benefit, and immunotherapy has largely failed due to an immunosuppressive tumor microenvironment.

Industry interest has shifted toward approaches that can sensitize immune-cold tumors and enable combination immunotherapy strategies, paving the way for novel immune-modulating mechanisms.

The global pancreatic cancer therapeutics market is expanding rapidly, driven by high unmet need and growing investment in immune-oncology innovation.

Development Stage

This technology is supported by preclinical proof-of-concept data demonstrating immune activation and suppression of tumor progression in mouse models. NYU is seeking strategic partners to advance optimization, translational studies, IND-enabling work, and clinical development.

Applications

Technology ID

POS01-11

Category

Life Sciences/Therapeutics/Oncology

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- **Immune sensitization:** Reprogramming immune-excluded pancreatic tumors to promote T-cell infiltration.
- **Combination immunotherapy:** Potential synergy with checkpoint inhibitors or next-generation IO agents.
- **Platform expansion:** Potential applicability to other immune-cold tumors such as TNBC and endometrial cancer.

Advantages

- **First-in-class biology: Dual SIK + NMD inhibition not previously applied as an anti-cancer immune strategy.**
- **Tumor microenvironment reprogramming: Induces IL36G and inflammatory signaling linked to immune infiltration.**
- **Small-molecule approach: Attractive for oral administration, scalability, and combination use.**
- **Mechanistically differentiated: Targets tumor-intrinsic immune suppression rather than external immune checkpoints.**
- **Combination-friendly asset: Fits current pharma strategies around IO sensitization.**

Intellectual Property

NYU has provisional patent applications filed in the US covering the therapeutic combination of SIK and NMD inhibition for cancer treatment, including compositions and methods of use.