



## Dual Wnt Signaling Pathway Inhibitors and AMPK Activators for Treatments of Disease

### Key Investigator

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### Field

Oncology  
Endocrinology  
Metabolic disease

### Technology

Wnt signaling inhibitors  
AMPK activators  
Cancer  
Metabolic disease  
Therapeutic

### Advantages

Dual-action approach: The compounds inhibit the Wnt/beta-catenin pathway and activate the AMPK pathway, potentially providing more effective treatment options.

Broad applicability: The technology could be used to treat a wide range of diseases, including various types of cancer and metabolic diseases.

### Status

Available for licensing

### Patent Status

PCT/US2021/035892

### UMB Docket Reference

FX-2021-051

### Summary

The technology presents a novel approach to treating diseases such as various types of cancer and metabolic diseases. Disclosed is a series of compounds that simultaneously inhibit the Wnt/beta-catenin pathway and activate the AMPK pathway, both of which play crucial roles in cell growth and energy homeostasis. This dual-action approach provides unique possibilities for therapeutic interventions in diseases where these pathways are implicated.

### Market

The market for cancer therapeutics is vast and continues to grow due to the increasing global incidence of cancer. According to a report by Markets and Markets, the global oncology drugs market is projected to reach \$394.24 billion by 2027, growing at a CAGR of 7.0% from 2020 to 2027. This growth is driven by factors such as the high prevalence of cancer, increasing demand for personalized medicine, and advancements in drug discovery and development technologies.

The market for metabolic disease therapeutics is also substantial. Metabolic diseases such as type 2 diabetes and obesity are becoming increasingly prevalent due to lifestyle changes and aging populations. The global diabetes drugs market is expected to grow significantly, driven by the increasing prevalence of diabetes worldwide, particularly in emerging economies such as India and China.

The dual-action approach of the compounds could offer more effective treatment options for patients and could be particularly beneficial for patients with diseases that implicate both the Wnt/beta-catenin and AMPK pathways.

### Technology

The disclosed compounds inhibit the Wnt/beta-catenin pathway and activate the AMPK pathway. The Wnt/beta-catenin pathway is a cellular signaling pathway that plays a crucial role in cell growth and differentiation. Aberrant activity in this pathway can lead to diseases, including metabolic diseases and cancer. The AMPK pathway, on the other hand, is involved in maintaining energy homeostasis at the cellular and whole-body levels.

The patent provides compounds of a specific formula, where the compounds include a 5-membered substituted or unsubstituted heterocycle or heteroaryl. The compounds can be further modified with various substituents, providing a broad range of potential therapeutic agents.

The diseases that may be treated by these compounds include various types of cancer such as adrenocortical cancer, hepatocellular cancer, hepatoblastoma, malignant melanoma, ovarian cancer, Wilm's tumor, Barrett's esophageal cancer, prostate cancer, colon cancer, colorectal cancer, rectal cancer, pancreatic cancer, bladder cancer, breast cancer (e.g., triple negative breast cancer), gastric cancer, head & neck cancer, lung cancer, mesothelioma, cervical cancer, uterine cancer, myeloid leukemia cancer, lymphoid leukemia cancer, pilometricoma cancer, medulloblastoma cancer, glioblastoma, and familial adenomatous polyposis. Metabolic diseases that may be treated include type 2 diabetes, obesity, hyperlipidemia, alcoholic or non-alcoholic fatty liver disease, and liver fibrosis.