



## TECHNOLOGY

# SMALL MOLECULE STAT3 INHIBITOR FOR TREATING TRIPLE NEGATIVE BREAST CANCER

## OVERVIEW

### Summary

The patent application describes the molecule LLL12B which targets STAT3 protein. STAT3 is pivotal in cancer progression. LLL12B is novel therapy that addresses an unmet need in TNBC and pancreatic cancer treatment. The breast cancer therapeutics market, valued at \$28.8 billion in 2022, is projected to grow to \$73.68 billion by 2032, highlighting the substantial potential and need for such targeted therapies.

### Market

The market for breast cancer therapeutics, particularly focusing on triple-negative breast cancer (TNBC), is undergoing significant evolution, driven by the development of targeted therapies like the small molecule STAT3 inhibitor. This innovation, designed to specifically inhibit a key protein involved in cancer progression, represents a novel treatment for aggressive cancers such as TNBC and pancreatic cancer.

The breast cancer therapeutics market was valued at \$28.8 billion in 2022, and projections suggest a growth to \$73.68 billion by 2032 (CAGR 9.9%). The market's expansion is fueled by the increasing prevalence of breast cancer and the continuous search for treatments that offer better efficacy and fewer side effects, particularly for challenging subtypes like TNBC.

Current market trends in breast cancer therapeutics emphasize a focus on metastatic settings, especially in TNBC, and an increasing shift towards therapeutic interventions in the early stages of breast cancer. This trend aligns with the broader movement in oncology towards precision medicine and targeted therapy, underscoring the need for treatments that are tailored to specific cancer subtypes and stages.

Despite significant advancements, the market still faces gaps, particularly in the treatment of TNBC. Current treatments for TNBC heavily rely on chemotherapy, which can be highly toxic and ineffective for certain patient groups. There is a pressing need for targeted therapies that can address a broader range of TNBC cases without being limited to specific biomarkers. Furthermore, there are unmet needs in the treatment of pre-treated metastatic hormone receptor (HR)-positive, HER2-negative breast cancer, and in addressing brain metastasis in HER2-positive breast cancer.

The development of the STAT3 inhibitor for TNBC treatment addresses these gaps, offering a new, targeted approach to a previously underserved patient population.

## Technology

The patent titled "Small Molecule STAT3 Inhibitor for Treating Triple Negative Breast Cancer" describes a therapeutic for treatment of triple-negative breast cancer (TNBC) and pancreatic cancer. The patent details the development and application of a novel small molecule, LLL12B, designed to inhibit the Signal Transducer and Activator of Transcription 3 (STAT3) protein, a critical player in tumorigenesis. STAT3 is part of the STAT protein family, known for their roles in cell growth and apoptosis. The aberrant activation of STAT3 has been implicated in various cancers, making it a prime target for therapeutic intervention. However, the challenge has been the development of a molecule that can selectively inhibit STAT3 without affecting other STAT proteins. LLL12B, as detailed in this patent, addresses this challenge by specifically targeting STAT3, thereby offering a new avenue for cancer treatment.

One of the key aspects of this technology is its specificity. Unlike broad-spectrum cancer treatments, LLL12B's targeted approach minimizes potential side effects and increases its effectiveness against cancers where STAT3 plays a pivotal role. This is particularly relevant for TNBC, a subtype of breast cancer that lacks estrogen, progesterone, and HER2 receptors, and thus, is more challenging to treat with conventional therapies.

The technical advantages of LLL12B include its potential to be used both as a standalone treatment and in combination with other therapeutic agents, such as PARP inhibitors and CDK inhibitors. This flexibility in application broadens the scope of LLL12B's utility in various therapeutic regimes. Furthermore, the patent describes the pharmaceutical composition of LLL12B, which can be formulated for oral delivery, enhancing patient compliance and ease of administration.

## References

1. "Evaluating the Breast Cancer Therapeutics Market," PharmaNewsIntelligence, [Link](#).

## Additional Information

- Potential Fields of Application:
  - Treatment of Triple-Negative Breast Cancer
  - Treatment of Pancreatic Cancer
  - Personalized Cancer Therapy
  - Combination Therapy in Oncology
- Keywords:
  - STAT3 Inhibitor
  - LLL12B
  - Triple-Negative Breast Cancer
  - Pancreatic Cancer
  - Targeted Cancer Therapy
- Advantages:
  - Specificity to STAT3
  - Potential Reduced Side Effects
  - Applicability in Hard-to-Treat Cancers
  - Versatility in Combination Therapies
  - Oral Formulation

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## Additional Information

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### LICENSE STATUS

Available

### CATEGORIES

- Therapeutics
- Small molecules

### INVESTIGATOR(S)

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### ATTACHMENTS

-  [Download JL-2022-040 \(Lin\) Small Molecule STAT3 inhibitor.pdf](#)

### EXTERNAL RESOURCES

- [Evaluating the Breast Cancer Therapeutics Market, PharmaNewsIntelligence](#)

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