Fucose-Deficient Anti-Cancer Antibodies:

GlycoNet start-up Carbaform Bioscience Inc.

Therapeutic antibodies without core fucosylation (afucosylated antibodies) are of particular interest to the pharmaceutical industry. In contrast to its fucosylated counterpart, afucosylated versions exhibits higher clinical efficacy, thereby enhancing Antibody Dependent Cellular Cytotoxicity (ADCC), the critical factor in anti-tumor activity. Carbaform Bioscience Inc., a GlycoNet start-up company founded in 2019, have developed a new class of carbohydrate analogues as fucosylation inhibitors. Compared to existing inhibitors, Carbaform's proprietary compounds are more potent, scalable in their synthesis, and highly effective at inhibiting antibody core fucosylation, making them amenable to the industrial production of therapeutic antibodies.

Key Benefits

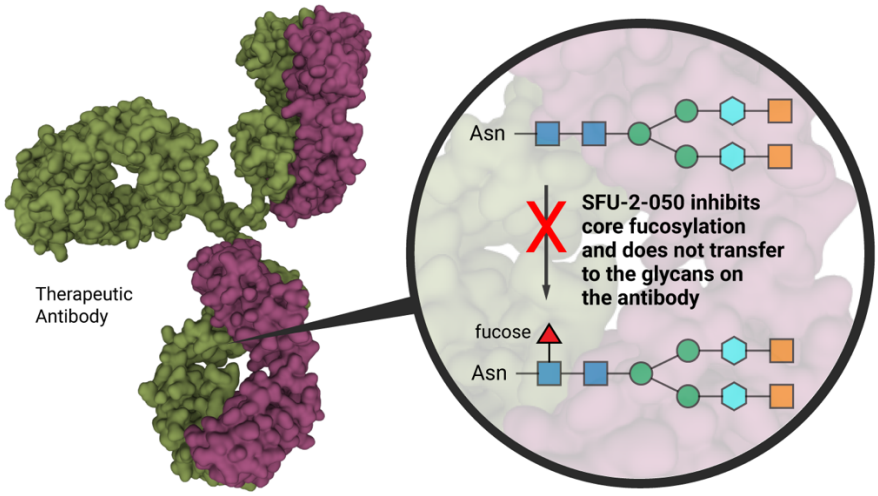
- High potency (IC_{50} = 15 μM)
- > 70% reductions in core fucosylation
- No side reactions resulting in contamination of end-product

Global Impact & Market

The global monoclonal antibodies market is estimated at $179.6 billion in 2025. Because antibodies lacking fucose are shown to have 50-fold improved efficacy, several major pharma companies are seeking industrially applicable strategies to control the level of therapeutic antibody fucosylation in order to produce therapeutics exhibiting both fixed quality and efficacy.

Current Strategies

Existing methods to reduce fucosylation include: 1) using *FUT8*-knockout cell lines, which are often expensive, yield low antibody titer, and requires additional development time; or 2) adding fucosylation inhibitors for GMD or FUT8 in the production pipeline, which often results in inhibitors being incorporated into the final therapeutic antibodies.



The Technology

The fucosylation inhibitors developed by Carbaform Bioscience are a series of carbohydrate analogues that can easily be integrated into existing antibody production pipeline as additives. Unlike other inhibitors that are structural mimics of fucose (hence getting transferred to the antibodies instead of inhibiting fucosylation), Carbarform's compounds are designed specifically to prevent undesired reactions. Carbaform's lead compound SFU-2-050 is also 7.3-fold more potent than conventional fucosylation inhibitor 2-fluorofucose.

Application

Therapeutic monoclonal antibodies are the fastest growing class of biological therapeutics for the treatment of various cancers and inflammatory disorders. The new class of fucosylation inhibitors developed by Carbaform could provide a solution to optimizing and maximizing clinical efficacy and production consistency across different batches, lowering the cost of biomanufacturing and potentially reducing the dose or duration of the treatment.