

# 4 - 1BB Receptor Agonist - Pipeline Review - 2019

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### **Abstracts**

Firstview Market Insight "4-1BB receptor Agonist - Pipeline Review-2019" provides an overview of the pipeline landscape for 4-1BB receptor Agonist - Pipeline Review-2019. It provides comprehensive insights of all the clinical and non-clinical therapeutics in development with detailed description about the collaborations; deals; designations; patent information etc. These reports encourage the clients in distinguishing the upcoming and existing competitors in their separate therapeutic spaces. The report provides detailed description of the competitor profiles with key milestones and evidence along with analysis by mechanism of action; route of administration; molecule type; stage of development. Information obtained from multiple sources will be used to triangulate and update the profiles. The report also provides key events in the last year related to the indication. This report provides detailed analysis of all the products along with the companies involved.

Under pathological conditions, such as cancer, Ang/Tie signaling plays important and rate-limiting roles in the early stages of tumor vascularization. Many studies have demonstrated the importance of Ang-1 and Ang-2 in tumor growth and tumor-associated angiogenesis. Ang-2 is widely expressed in various cancers including stomach, colon, hepatocellular carcinoma, melanoma, and NSCLC, and plays a distinct role in tumor pathogenesis. In an Ang-2-transfected colon cancer xenograft model, Ang-2 led to increased angiogenesis and tumor growth . Moreover, the forced expression of Ang-2 promotes metastasis, while Ang-2 inhibition represses tumor angiogenesis and metastasis in mouse models of spontaneous carcinogenesis.

Immunotherapy is a rapidly expanding field of oncology aimed at targeting, not the tumor itself, but the immune system combating the cancerous lesion. Of the many approaches currently under study to boost anti-tumor immune responses; modulation of immune co-receptors on lymphocytes in the tumor microenvironment has thus far proven to be the most effective. Among these, the co-stimulatory receptor 4-1BB



(CD137/TNFSF9) possesses an unequaled capacity for both activation and proinflammatory polarization of anti-tumor lymphocytes. While functional studies of 4-1BB have focused on its prominent role in augmenting cytotoxic CD8 T cells, 4-1BB can also modulate the activity of CD4 T cells, B cells, natural killer cells, monocytes, macrophages, and dendritic cells. 4-1BB's expression on both T cells and antigen presenting cells, coupled with its capacity to promote survival, expansion, and enhanced effector function of activated T cells, has made it an alluring target for tumor immunotherapy. In contrast to immune checkpoint blocking antibodies, 4-1BB agonists can both potentiate anti-tumor and anti-viral immunity, while at the same time ameliorating autoimmune disease. Despite this, 4-1BB agonists can trigger high grade liver inflammation which has slowed their clinical development.

#### **Report Overview:**

Many of the newer therapeutics moving forward in the clinic are agonistic antibodies that target costimulatory receptors in the tumor necrosis factor receptor superfamily (TNFRSF) such as 4-1BB, OX40, CD40, GITR, and CD276. 4-1BB is not expressed on naive T cells but is rapidly upregulated after T-cell receptor engagement with cognate MHC:peptide complex expressed on antigen presenting cells. Upon binding to 4-1BB ligand (4-1BBL or TNFSF9), 4-1BB signaling results in increased expression of prosurvival molecules via NF-?B signaling12. Initial studies demonstrated antitumor effects of agonistic 4-1BB antibodies with pronounced tumor regression in mastocytoma and sarcoma mouse models, and required both CD4+ and CD8+ T cells13. Subsequently, agonistic antibodies against 4-1BB were found to be effective in reducing or eliminating multiple tumors in murine models of melanoma, glioblastoma, lymphoma, renal cell carcinoma, and colon cancer among others.

Based on these pre-clinical data, several companies have developed agonist 4-1BB antibodies. The two leading molecules in the clinic are utomilumab (PF-05082566) and urelumab (BMS-663513). Utomilumab is a ligand-blocking IgG2 antibody, and urelumab is a non-ligand-blocking IgG4 antibody. Both isotypes are characterized by generally lower Fc?R interaction, although IgG4 is known to engage with Fc?RI and Fc?RIIB more than IgG220. In addition, while there have been anecdotal reports of differences in activity in 4-1BB signaling and induction of NF-?B, both antibodies enhance T-cell function and promote antitumor activity in vitro and in vivo.

This part of report provides detailed description of mechanism of action which enables the client to understand the landscape of the 4-1BB receptor Agonist - Pipeline Review-2019. This report covers the detailed analysis of the pipeline landscape for this



mechanism of action, equipped with data from multiple sources with complete pipeline analysis by developmental stage, associated indications, route of administration and molecule type.

#### **Pipeline Overview:**

This report provides extensive scenario and growth prospects of the market. This section includes the graphical representations of the future treatment landscape based on various phases of development including the NDA/BLA Filing, Phase III, Phase II, Phase I, Pre-Clinical and the Discovery. It also includes details of products which have been dormant or discontinued during the trial stages of development.

#### **Drug Profile Overview:**

The pipeline section provides descriptive drug profiles for the pipeline products including product description, mechanism of action, route of administration, molecule type, technology involved, chemical information.

#### **Clinical Trial Overview:**

This section of the report focuses on the clinical activity of the molecule. It includes both clinical and pre-clinical activity which provides detailed information about the safety, efficacy, tolerability, toxicity of pipeline drugs. A graphical representation of the clinical trial landscape of pipeline therapy which includes information about phase of development, trial design, treatment arms, dosage and frequency, formulation of the drug, primary and secondary completion date, enrolment number, exclusion and inclusion criteria, line of therapy. This section also includes the clinical trial results and analysis based on those results.

#### **Product Development Activity:**

This section of the report focuses on detail information about designations, exclusivity details, technology, licensing and collaboration, funding and financing, key milestones and various other development activities.

#### Company Overview:

Company profile includes the detail about type of company, headquarter, global presence, research focus and key financial



#### Scope

The report provides a competitive landscape of 4-1BB receptor Agonist -Pipeline Review-2019

The report also provides clinical trial landscape of the pipeline drugs including status; trial phase; sponsor type and end-point status

The report provides the list of companies which are the most active in the pipeline

The report covers pipeline products based on various stages of development ranging from pre-registration till discovery

The report provides descriptive drug profiles which includes product description; comprising detailed mechanism of action (MoA); route of administration (RoA); Stage of development; clinical trial status; licensing and collaboration details & other developmental activities

The report features comparative analysis of product profiles based on molecule type; mechanism of action (MoA); route of administration (RoA)

The report summarizes all the dormant and discontinued pipeline projects

The report also provides latest news for the past one year

#### **Reasons To Buy**

To identifying prominent players in the 4-1BB receptor Agonist - Pipeline Review-2019treatment landscape

To determine the drivers; barriers and unmet need in the 4-1BB receptor Agonist - Pipeline Review-2019treatment space

Gain strategically significant competitor information; analysis; and insights to formulate effective R&D strategies



Define in-licensing and out-licensing strategies by identifying prospective partners with the most attractive projects to enhance and expand business potential and scope

To understand the composition of the pipeline in terms of molecule type; molecular target; mechanism of action and route of administration



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