



Betulaceae Pharmaceuticals AB

Novel solutions for cancer disease and associated cachexia

Market Need And Potential

It may sound inaccurate, but is true never the less; thousands of patients die from starvation in Sweden. A starvation that is brought about by a cancer. Even in a patient with low tumor burden the cancer can trigger processes that can lead to both immune-suppression and induction of energy waste and weight loss, known as cancer cachexia, which ultimately lead to death if the symptoms cannot be reversed.

Both the suppression of the immune system and the management of cachectic patients are major clinical challenges, where unwanted weight loss (cachexia) is a problem without any therapeutic options that accounts for more than 15 % of all cancer deaths.

Treatments targeting the immune system, promoting the patient's own healing capacity, is often considered the future of cancer treatment. The market for oncology immunotherapy is dominated by biologics. Since this is the fastest growing pharmacological market segment a small molecule has a huge potential.

Immune reactivators, like PD-1/PD1/PDL1 targeted therapies have been blockbusters, but high therapy costs and inadequate companion diagnostics prevent them from being but of limited use.

Our Solution

The mechanisms behind cancer cachexia and cancer induced immune suppression intercept at the regulation and activation of the nervous system. Based on knowledge from research on cancer cachexia Betulaceae Pharmaceuticals innovative approach is to via structural similarities to (...) address two unmet clinical needs in cancer management; to reduce cancer induced cachexia and promote reactivation of the immune system.

Based on crystal structures and known backbones the company has developed novel chemical entities that can affect both these processes by preventing over activation of underlying signaling pathways. The novel chemical entities are modeled based on excising pharmaceuticals that are well tolerable and easy to produce, thereby offering a cost effective therapeutic compound.

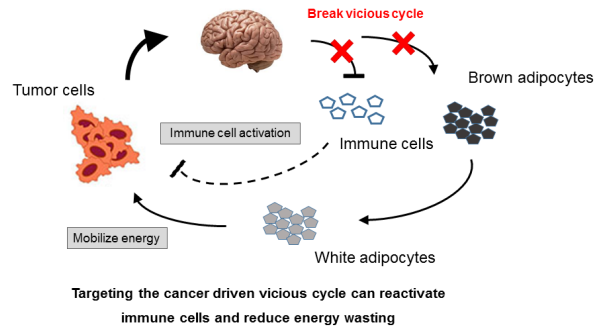
The aim is to will via a daily pill, targeting an undisclosed target, offer increased survival, improved quality of life and less suffering for many cancer patients. This will be a first in class drug that is predicted to have little side effects (known drug class used by millions of patients), addressing both cancer induced cachexia and suppression of the immune system.

Competitive Advantages

- Addressing two problems with one solution
- Cost effective
- Increased survival and quality of life
- Structural similarities with known substance used by millions hint towards :
 - o A straight forward pre-clinical development
 - o A well tolerable substance



Deregulated activation of the nervous system plays a crucial role in cancer induced cachexia and in suppression of the immune system



Competition

The development of small molecules in immune-oncology is an emerging area with most projects and compounds at an early stage, but at the present only a few have reached the clinic. We are not aware of any programs with a similar approach as ours. Furthermore, the interplay between the immune system and the tumor cells is complex and multifaceted requiring a multitude of approaches and combinations to effectively treat and potentially also cure the cancer.

IPR

Freedom to operate and novel chemical entities exists.

Current Status

Betulaceae Pharmaceuticals has conducted a needs and market analysis for this project. The market for oncology immunotherapy is dominated by biologics. Since this is the fastest growing pharmacological market segment a small molecule has a huge potential.

Novel chemical entities have been designed and synthesized in a chemistry design and synthesis program.

Regarding In vitro screening of novel chemical entities, Betulaceae Pharmaceuticals has screened the novel chemical entities for target interaction on human and murine receptors and confirmed high affinity binders.

In vivo testing of novel chemical entities in relevant animal models and mechanism of action studies is ongoing.

Partnerships/Collaborations Sought

We are looking for partners to help us accelerate our program to a major inflection point where collaboration or out-licensing becomes possible.

Team

- Nilsson, Jonas, CEO, PhD, Cancer expert
- Koehler, Konrad, Chemistry expert
- Öhman, Lars, Business development
- Anderson, Fredrick, PhD student

Betulaceae Pharmaceuticals AB was founded 2016 by researchers working with cancer induced cachexia, unwanted weight loss, at Umeå University. Based on crystal structures and known backbones the company has developed novel chemical entities affecting the immune system, ultimately fighting cancer and concomitant cachexia.

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