Blue Wave Therapeutics

Executive Summary

Blue Wave Therapeutics GmbH is an early-stage radiopharmaceutical company founded in 2021 to develop novel treatments aimed at significantly improving the survival of cancer patients. Blue Wave Therapeutics is based in Switzerland, and has an R&D affiliate and laboratory in Norway.

Blue Wave's foundational work and first patent are based on the groundbreaking science from Michael Dornish, PhD and Jostein Dahle, PhD, both of whom spent many years developing radiopharmaceuticals in academia as well as in biotech companies. Michael Dornish, Blue Wave Therapeutics' co-founder and Chief Scientific Officer (CSO), is the former CSO of Algeta (now part of Bayer), where he led the scientific development of Xofigo®; he has over 15 years of experience in cancer drug development and 15 more years in biopolymers for drug delivery. Jostein Dahle, Blue Wave Therapeutics' co-founder and Chief Technology Officer, formerly co-founder and CSO at Nordic Nanovector, has 25 years of experience in cancer research and biotechnology.

Blue Wave Therapeutics' proprietary radioactive biopolymer platform can selectively kill tumor cells using alginate nanoparticles coated with a binding peptide to deliver a radionuclide payload to targeted tumor cells. The IP covers the use of alginate nanoparticles with various peptide sequences and different radionuclides, making the platform highly scalable for targeting a wide range of solid tumors.

Blue Wave Therapeutics is advancing its first product candidate, ^{225}Ac-RGD-Alginate nanospheres (ARAspheres), through preclinical development to demonstrate proof of concept in glioblastoma (GBM), the most common and deadliest type of brain cancer.

Blue Wave Therapeutics' first product candidate consists of radioactive nanoparticles targeted at integrin receptors overexpressed on GBM cells. The nanoparticles can be injected directly into the resection cavity following surgical resection or via a catheter for other tumors.

The company has raised to date approximately CHF 700k from founders, angel investors, and strategic partners, and in early 2024 received a NOK 16m (around CHF 1.3m) non-dilutive grant from the Norwegian Research Council, requiring matching external funding. These funds have initiated a robust R&D program at both the company's Norwegian R&D lab and in collaboration with partners Minerva Imaging in Denmark and SINTEF in Norway. The program aims to optimize ARAspheres, improve their manufacturing process, and evaluate toxicity, biodistribution, and therapeutic efficacy in rats with GBM, 3D models, and GBM patient-derived xenografts.

The company is currently seeking CHF 1.5m (also in tranches). A series of R&D milestones have been agreed upon with the Norwegian Research Council, including preliminary in vivo toxicity data in Q2, biodistribution data in Q3 and anticancer activity in Q4 2025.

Management Team:

Marco G. Renoldi, MD, Chief Executive Officer, linkedin.com/in/marcogrenoldi
Michael Dornish, PhD, co-founder and Chief Scientific Officer, linkedin.com/in/michaeldornish
Jostein Dahle, PhD, co-founder and Chief Technology Officer, linkedin.com/in/josteindahle
Luca Sereni, MBA, co-founder and Chief Operating Officer, linkedin.com/in/luca-sereni-b2915616
Stefania Poli, M.Psych., Chief Human Resources Officer, linkedin.com/in/stefania-poli-a2537271

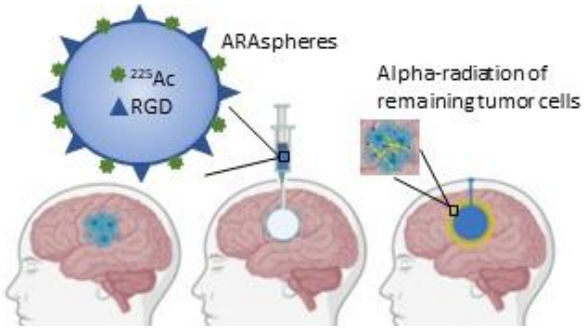
Company Structure:

Blue Wave Therapeutics GmbH is based in Switzerland, is owned 86% by founders and members of the management team and 14% by one strategic partner (5%) and angel investors (9%). Blue Wave Therapeutics GmbH wholly owns Blue Wave Therapeutics AS, a Norwegian subsidiary that is responsible for the execution of the research program.

BLUE WAVE THERAPEUTICS

Scientific Rationale

Glioblastoma multiforme (GBM) is the deadliest and most common type of brain cancer, with a median survival of only 14-16 months. Current GBM treatments are ineffective at significantly improving patient survival. These treatments include radiotherapy (RT) or RT combined with chemotherapy. Besides failing to significantly prolong overall survival, in particular since they are administered too late after surgery, these treatments are toxic as they lack targeted delivery.



Our goal is to address the primary cause of treatment failure: the recurrence of tumor growth around the resected area. Blue Wave's ^{225}Ac-RGD-Alginate nanospheres (ARAspheres), is the first product candidate originating from our radioactive biopolymer platform. It consists of a suspension of integrin-targeting alginate nanoparticles that can be delivered locally, immediately after surgery (Fig. 1). These nanoparticles specifically irradiate integrin-expressing glioblastoma tumor cells with highly effective, short-range alpha-particle radiation. Our aim is to potentially double the life expectancy of these severely ill patients.

Results to date:

Blue Wave's R&D laboratory was established at Nova Matrix's premises in Sandvika, Norway (Nova Matrix supplies ultrapure alginate to the medical industry), with the goal of advancing Blue Wave's biopolymer-based nanoparticle technology. During the latest 12 months, nanoparticle size was reduced from 10 µm to less than 200 nm, therefore enhancing potential therapeutic efficacy. Prototypes of alginate nanoparticles have been bound to RGD peptide and labeled with alpha radiation emitters, and their stability has been tested with success; decay daughter radionuclides were also bound by the alginate carrier.

Blue Wave initiated in April 2024 its preclinical research program by signing an R&D collaboration agreement with Minerva Imaging, a contract research organization (CRO) specialized in molecular imaging and radionuclide therapy research, located in Denmark. The goal is to investigate the biodistribution, toxicity, and therapeutic effects of ARAspheres in animal models of glioblastoma.

Blue Wave also collaborates with SINTEF's Department of Nanomedicine in Trondheim, Norway, which has long experience with nanomaterials and biopolymers. SINTEF is one of Europe's largest independent research institutes. The goal is to optimize the characteristics and production methods of ARAspheres with respect to binding to brain tumor cells.

Project Differentiation

Blue Wave's first product candidate ARAspheres is differentiated in several ways: (1) Alginate nanospheres are exceptionally effective chelators for radionuclides, thanks to the flexible properties of alginate and the abundance of chelating molecules; (2) ARAspheres employ alpha-particle radiation, which is more efficient at cell killing and has a shorter range than beta particles because alpha particles are 8000 times heavier and have a 2+ charge, compared to the -1 charge of beta particles; (3) Alginate nanospheres can stably chelate both the alpha-emitting radionuclide and its daughter radionuclides for more than 30 days; (4) ARAspheres leverage an anti-integrin peptide (RGD) conjugated to the nanoparticles, enabling targeting and binding of integrin-expressing tumor cells. Integrins are a clinically validated target. The integrin αvβ3 is overexpressed in brain tumor cells but has low expression in normal brain cells. A series of other preclinical and clinical projects for glioblastoma are targeting integrins as a potential brain cancer treatment.

R&D Milestones

The NOK 16 million non-dilutive grant from the Norwegian Research Council enabled the launch of a comprehensive R&D program, leading to the following milestones:

- In vivo toxicity data in mouse models by Q2 2025
- Biodistribution data of ARAspheres and tissue radioactivity by Q3 2025
- Therapeutic efficacy study of ARAspheres in human glioblastoma model by Q4 2025
- Effect of ARAspheres in 3D model for glioblastoma and GBM-derived xenograft by Q4 2026

Funding requirements

Blue Wave is currently seeking a seed investment of CHF 1.5 million to complete the preclinical validation and advance towards IND.

IP

Blue Wave has a patent family application titled "Peptide-Coupled Alginate Gels Comprising Radionuclides," with Michael Dornish and Jostein Dahle as inventors. The Norwegian patent (NO 347755) was granted on March 18, 2024, with priority from October 21, 2021. Additionally, Blue Wave entered the national application phase of the PCT application (WO2023066994A1) in April 2024. Blue Wave has strategically managed the application process in key global regions to ensure broad and effective protection of its innovations.

Targeted Market Need

Blue Wave was established with a mission to offer improved treatment options to patients suffering from underserved forms of cancer. The first area of focus, serving as a proof of concept for the first product candidate, is on glioblastoma (GBM), a medical condition with significant unmet needs. GBM, the most common primary malignant brain tumor, represents an aggressive form of cancer with few available treatment choices, marked by a grim prognosis and limited overall survival rates. Annually, there are over 80,000 cases of glioblastoma reported by Global Data across the largest 16 countries, with the majority of patients succumbing to the disease. Due to the aggressive nature of the disease, patients with a diagnosis of GBM suffer severe neurological deficits, and the disease can be rapidly fatal. GBM patients have a median survival of 14-16 months, a 2-year overall survival rate of less than 30% and a 5-year survival rate of less than 10% with the current standard of care. Blue Wave's aspiration is to improve the lives of brain cancer patients substantially.

Glioblastoma also presents a substantial business opportunity. The forecasted market value for treatments targeting this condition is estimated by GlobalData to reach USD 3 billion by 2031 in the eight largest markets. This market growth is expected to be propelled by the introduction of new therapeutic options, including enzyme inhibitors, cytotoxic T-cells, peptide inhibitors, and radiopharmaceuticals. New therapies that can prolong overall survival are expected to command a price premium compared to currently approved drugs.

Current treatments for glioblastoma have significant limitations. Temozolomide, the standard chemotherapy, suffers from low efficacy and resistance, while standard radiotherapy causes off-target toxicity, damaging healthy tissues. New therapies in development also fall short. Small molecules struggle with blood-brain barrier penetration, making them non-selective and prone to resistance. Cell therapies, though promising, are often impractical, slow-acting, and immunosuppressive. ARAspheres provides targeted precision therapy, higher tumor selectivity, and is administered directly to the brain for highly localized radiation with minimal off-target effects. Unlike cell therapies, ARAspheres are scalable, not dependent on immune activation, a one-shot and done treatment, thus ensuring broad applicability. Even existing radiopharmaceuticals lack a glioblastoma-focused approach. ARAspheres stand out with their proprietary delivery technology, setting a new standard in precision oncology.