

NON-TECHNICAL ABSTRACT

GL-ONC1 is a genetically stable attenuated Lister, LIVP, strain of vaccinia virus designed to enter, colonize, locate, and destroy cancer cells without harming healthy tissues or organs. Vaccinia virus strains were used safely in millions of people as the vaccine against smallpox. Researchers at Genelux Corporation have modified the LIVP strain of vaccinia virus to increase its safety by reducing its toxicity and to increase its tumor selectivity and anti-tumor activity without limiting its ability to replicate in cancer cells. GL-ONC1 carries a unique florescent/luminescent fusion protein, designed to provide non-invasive, real-time imaging capabilities, including tumor diagnosis and localization, microscopic analysis of tumor biopsies, cancer staging and follow-up treatment monitoring. Scientists developed this protein by combining two proteins, one from glowing sea pansies and one from jellyfish. After the virus finds and enters a tumor, it begins to replicate, proportionally emitting light throughout the viral amplification process. The combinatory effects of direct viral killing of tumor cells and immune activation by the host result in antitumor response by the virus while sparing normal tissue cells from harm.

GL-ONC1 has demonstrated both efficacy and safety in animal models as a single agent therapy and in combination with chemotherapy and other marketed products in eradicating or stabilizing tumors in over 25 different major types of human tumors.

Currently, an investigational trial is being conducted in the United Kingdom as a first-in-man phase I open-label, dose-escalating study of the safety, tolerability, and tumor-specificity of i.v. administration of GL-ONC1 in patients with solid organ tumors. The study is being conducted at the Royal Marsden Hospital in Surrey, United Kingdom. An additional endpoint of this trial is the recommendation of dose/schedule for future trials. Patients are treated for six planned cycles beginning with a dose of 1×10^5 particle forming units (pfu) and escalating to a final dose concentration of 5×10^9 pfu per cycle of treatment. Standard clinical procedures are conducted to follow patients through the course of treatment and post-treatment follow-up. Optional tumor biopsies are obtained to assess presence of virus in tumor tissue. GFP imaging is performed on suitable patients with superficial tumor lesions to also test for presence of virus. To date, 21 patients have been treated in cohorts 1 through 7 with no dose limiting toxicities (DLT) observed. Two patients in cohort 5 (1×10^9 pfu/cycle) experienced vaccinia-related skin rash which resolved without treatment at the end of cycle 1. Typical adverse reactions were flu-like symptoms. Only one serious adverse event was determined to be possibly related to treatment (arterial emboli). No deaths have been related to GL-ONC1 treatment. Minimal viral shedding occurred in one patient following cycle 1 only (cohort 5). Best response was RECIST stable disease > 6 months (n=1) and 3-6 months (n=5).

Based on the tolerability of GL-ONC1, the sponsor is initiating other early stage trials in Europe and in the U.S. in several oncology indications with different routes of GL-ONC1 administration.