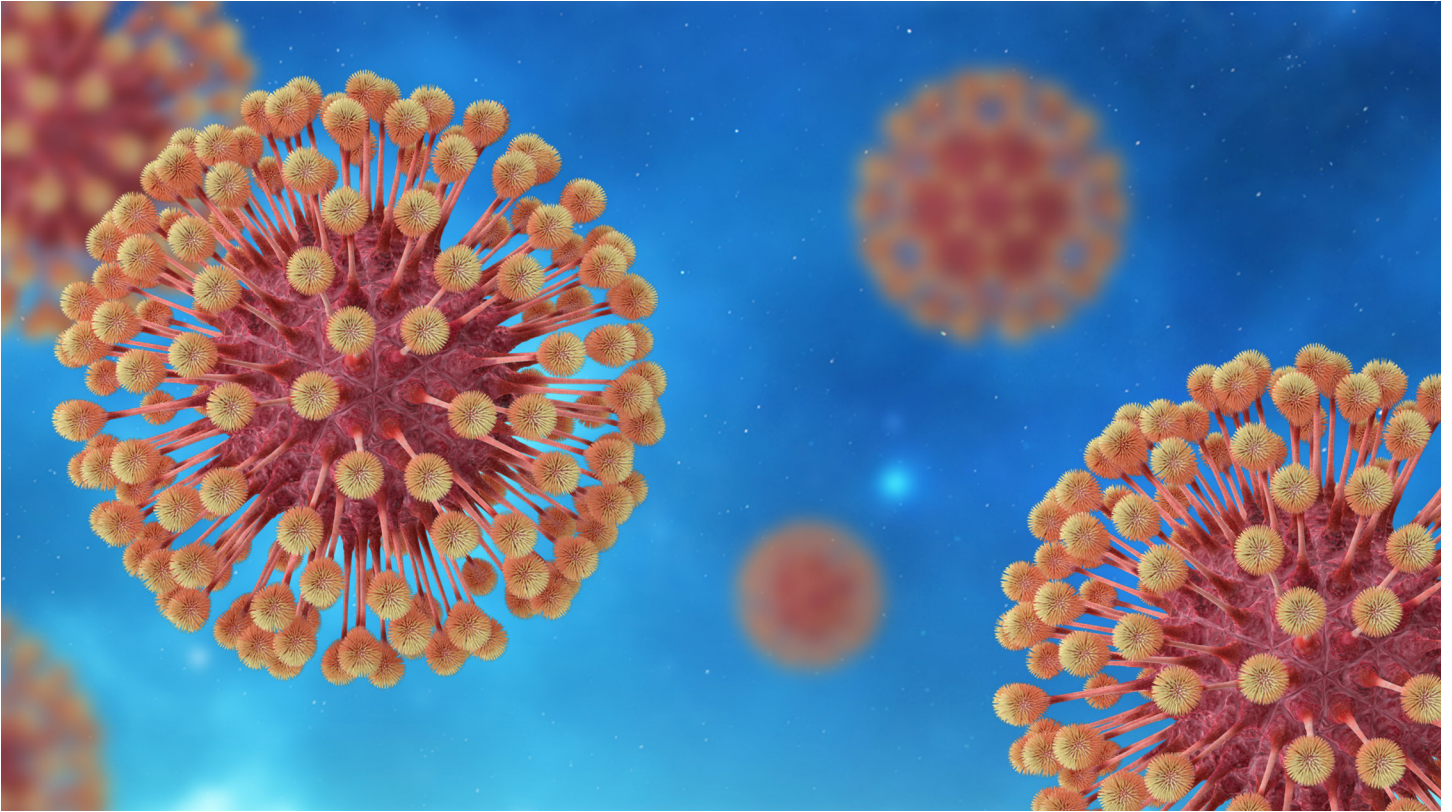


A Battelle White Paper



Oncolytic Viral Therapy Development

What to Look for in a Nonclinical Research Partner

BATTELLE



Interest in oncolytic viral therapies for cancer treatment is growing rapidly. Are labs equipped for the special challenges of conducting nonclinical studies using live viruses? Here are four things drug developers should look for in a nonclinical research partner or contract research organization (CRO).

Oncolytic viral therapies are among the most promising cancer treatments under development today. These innovative therapies use live, genetically modified viruses to target cancer cells and activate the body's own immune defenses against the cancer. Oncolytic viruses may be able to deliver more targeted treatments for specific types of cancer with fewer negative side effects than traditional chemotherapies.

While interest in the potential of viral therapies for cancer treatment goes back decades, it is only in the last few years that oncolytic viral therapies have begun to move through the pipeline of nonclinical studies, clinical trials and FDA approval. As of May 2020, only two oncolytic viral therapies have reached the market.

To accelerate time to market and move promising oncolytic viral therapies through the pipeline, researchers and drug developers need the right nonclinical partner to gather the toxicology and other data they need to prepare for clinical trials. Compared to traditional small molecule or biologic therapies, working with live viruses requires a unique set of capabilities and resources that most CROs are not equipped to provide. Here are the most critical elements to look for in selecting the right partner for nonclinical studies of oncolytic viral therapy candidates.

1. Staff Expertise



The Issue

Viral therapies use live viruses, which makes them fundamentally different from traditional small molecule and biologic drugs. Make sure that the people who will be working on your study understand the specifics of how to design and execute toxicology and nonclinical studies for viral therapies. Look for specific expertise in cancer biology and virology in addition to deep experience with general toxicology and nonclinical research. The team should also have extensive experience with virus handling and safety.

QUESTIONS TO ASK

1. Has your organization handled viral therapies before?
2. Do you have cancer biology and virology expertise on staff?
3. Will we have access to subject matter experts to discuss the unique needs of our study and develop an appropriate study plan?
4. Will you be able to help us interpret the results of the study?



Did You Know?

- Battelle has been working with viral therapies since 2013.
- To augment the deep experience on the nonclinical team, we reach into the rest of Battelle for specific expertise in a broad range of related disciplines such as virology. That helps us meet unique needs and solve problems more effectively.
- When you work with Battelle, you have access to our top experts and Principal Investigators. We will work with you every step of the way to understand and design a study around your needs, execute it safely and efficiently, and help you understand the results.



CASE STUDY: BRIGHAM AND WOMEN'S HOSPITAL

- A sponsor developed a novel oncolytic viral therapeutic of genetically engineered herpes simplex type 1 (HSV-1) targeted to treat glioblastoma. Battelle was contracted to complete a GLP investigational new drug (IND) enabling study evaluating the toxicity, biodistribution and efficacy of the therapeutic in a human orthotopic xenograft model.
- Battelle developed and validated a qPCR assay in mouse blood and tissue matrices using a plasmid construct containing the target as a positive control. The validated assay detected as few as five target copies per microgram of DNA with 95% confidence and met other strict criteria for specificity, accuracy and precision.
- The results demonstrated low or no biodistribution of the oncolytic virus outside of the target brain tissue. The FDA approved the IND application and allowed progression of the oncolytic viral therapeutic into Phase 1 clinical trials.

2. Infectious Agent Readiness



The Issue

Working with live viruses requires trained staff and specialized facilities. Depending on the virus that you are working with, that may include a BSL2 or BSL3 high-hazard containment facility and experience in handling procedures for biohazards and infectious agents. These facilities and skill sets are not available in-house through most CROs. The staff working with your therapy may also need to be vaccinated against the infectious agents used as components of viral therapies.

QUESTIONS TO ASK

1. Do you have BLS2 and/or BSL3 facilities?
2. Are staff trained in safe handling for infectious agents?
3. Are staff vaccinated against the agents that will form the backbone of the therapy?



Did You Know?

- Battelle has decades of experience in working with highly dangerous and infectious agents.
- We own and operate BSL2 and BSL3 labs. In fact, we have the largest privately owned BSL3 facility in the United States
- Our staff have received hard-to-obtain vaccinations for many of the viruses used in viral therapies and are ready to work on your project now.

3. Breadth of Capabilities Under One Roof



The Issue

Many CROs are specialized, performing only very specific kinds of toxicology studies or other nonclinical work. For example, they may perform only *in vivo* or *in vitro* studies but not both, or they may be highly limited in toxicology endpoints. That means you may have to contract with multiple providers for different aspects of your study. This approach drives up development costs and timelines and creates headaches when preparing the final report for regulatory approval.

QUESTIONS TO ASK

1. Can you conduct both *in vivo* and *in vitro* studies?
2. How many toxicology endpoints can you research in-house?
3. What analytical capabilities do you have?
4. Will the bulk of my study be conducted on a single campus?
5. Which parts of the study would you have to outsource?
6. If you do outsource, how will you manage the process to ensure a smooth, coordinated implementation of the complete study?



You Know?

- Battelle has the expertise and facilities to perform most common toxicology and nonclinical studies in-house and on a single campus.. This streamlines development timelines and simplifies the process for your team.
- We conduct both *in vivo* and *in vitro* studies and can address most common toxicology endpoints, including neurobehavioral, neuro-virulence, cardiopulmonary, development and reproductive (DART), clinical and anatomic pathology.
- Our analytical capabilities include ELISA, qPCR, cytokine/chemokine analysis, antibody response, TCID50/infectivity assay and others to evaluate biodistribution, shedding and immunology parameters.
- We'll manage your entire nonclinical study program for you to provide a comprehensive package for regulatory submission.

4. Regulatory Experience



The Issue

Regulatory considerations for oncolytic viral therapy studies are more complex than for small molecules and biologics. Because this is a newer type of therapy, study guidelines are not as well established with the FDA. You need a lab with experience in navigating novel regulatory pathways to ensure a smooth path to regulatory approval. Make sure your nonclinical partner understands the regulatory process and is prepared to help you through it.

QUESTIONS TO ASK

1. How much experience do you have with FDA submissions for novel therapies?
2. Have you successfully navigated the regulatory process for an oncolytic viral therapy toxicology study?
3. Do you have experience in navigating alternate regulatory pathways for cutting-edge treatments?
4. Are you able to perform this study using GLP processes and provide documentation according to GLP guidelines?



Did You Know?

- Battelle has deep experience with the regulatory process going back decades, with a strong track record of successful submission for many types of drugs, vaccines and therapies. We understand how to design a study and present findings in the manner that the FDA needs for efficient regulatory approval.
- Our staff is fully trained in GLP procedures and documentation.
- Battelle can prepare SEND files and a user guide of raw data collected during a study.
- We also have experience in navigating alternate regulatory pathways, such as the FDA animal rule for therapies that cannot be ethically or safely tested in humans.
- We will work with you to ensure that your study is set up for success and you can proceed to next step (clinical trials) as efficiently as possible.

Building a Partnership for Success with Oncolytic Viral Therapy Submissions

For efficient nonclinical studies and a smooth regulatory submission, it's important to choose a partner with the right experience. Battelle can work with you to design and implement an oncolytic viral therapy study that will meet your needs and the expectations of the FDA. Our goal is to help you get to market sooner, so more of these promising treatments can reach the people who are waiting for them.

Contact us to learn how we can
help you get your oncolytic
viral therapy to market.

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It can be done