**Agent Summary – Vaccinia Virus**

* The vaccinia virus is a linear, double stranded DNA orthopoxvirus that is a member of the Poxviridae family. It is usually 320-380 by 260-340 nm in size.
* Vaccinia virus is used in the prevention of smallpox (to make the smallpox vaccine) and may occur as a rare zoonosis.
* The different strains of vaccinia virus used in research and clinical settings present different levels of risk:
* **Replication-deficient** poxvirus strains and vectors do not produce infectious virus in humans and therefore do not cause clinical infection. These include the following highly attenuated strains: modified vaccinia virus Ankara (MVA), attenuated vaccinia virus Copenhagen (NYVAC), attenuated derivatives of fowlpox virus (TROVAC) and canarypox virus (ALVAC)*.*
* **Replication-competent** poxvirus strains are capable of causing clinical infection in humans as well as producing infectious virus that can be transmitted to other people. Non-highly attenuated Vaccinia virus strains commonly used in laboratories include Western Reserve (WR), Copenhagen, New York City Board of Health (NYCBOH), Lister, and Temple of Heaven. Replication-competent strains **may or may not have a TK gene knockout**. Indeed, a majority of reported exposures to Vaccinia virus and subsequent infections involve a TK gene knockout strain. All wild-type orthopoxviruses are replication competent.
* Mode of transmission: The virus can be spread through the contact of a recently vaccinated individual with an unvaccinated person. Contact of a vaccinia virus lesion and broken skin is the most common mode of transmission between humans, although it has been shown that human-to-cattle and cattle-to-human transmission can occur, usually by touching the cow's teats.
* In laboratory settings, common exposures are through accidental inoculation (needle sticks), contact with broken skin, contact with mucous membranes (e.g., ocular splashes) or inhalation.
* Laboratory-acquired infections with standard, mutant, or bioengineered forms of vaccinia virus have occurred, even in previously vaccinated lab workers.
* **Replication-competent** strains of vaccinia virus are potentially pathogenic in humans. Therefore biosafety level 2 containment and vaccination of all lab workers (every 10 years) handling these non-highly attenuated strains are recommended. Infected animals require ABSL2 containment. Use personal protective equipment (PPE) as described in the associated SOP 2.0.
* Biosafety Level 1 practices and procedures are recommended for work with highly attenuated vaccinia strains in areas where no other human orthopoxviruses are being used. Use personal protective equipment (PPE) as described in the associated SOP 1.0.

Reference

<https://www.canada.ca/en/public-health/services/laboratory-biosafety-biosecurity/pathogen-safety-data-sheets-risk-assessment/vaccinia-virus.html>

<https://www.cdc.gov/poxvirus/occupational-exposures/index.html>

<https://www.sciencedirect.com/science/article/pii/S0042682208007976>

Enter the following information:

1. Name of the Principal Investigator: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_­\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. Applicable IBC protocol number(s) (approved or submitted): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. List the laboratory work locations (Building/room[s]) for vaccinia virus (WR strain), a BSL2 agent:

* Procedures:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Storage: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. List the animal facility building/room(s) for vaccinia virus (WR strain), ABSL2 containment:

* Procedures:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and Housing:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\*Note: confirm with ULAR that the rooms listed above are suitable for ABSL2 animals.

Date of Agent Summary form completion: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_