

Accelerating Innovations into CarE – Validate Program (AICE-Validate)



Developing ice recrystallization inhibitors for the cryopreservation of cell therapies

PROJECT FAST FACTS

RECIPIENT: PanTHERA CryoSolutions Inc.

AWARD: \$180,616

AWARD DATE: May 16, 2023

PROJECT DURATION: 11.5 months

THE PROBLEM

Cryopreservation is the process of storing biological materials (cells, tissues, organs, vaccines) at low temperatures to prevent degradation. However, to take advantage of the protective effect of low temperatures, damage during freezing and thawing must be minimized. Currently, the use of cryoprotective agents (CPAs) is employed to protect the inside and outside of cells from the physical and chemical stresses that occur during freezing and thawing. Yet, these do not fully prevent the harmful effects of ice recrystallization. CPAs themselves are also known to be toxic and can cause damage to cryopreserved cells. Ineffective cryopreservation can, for example, force vaccine manufacturers to use expensive and complex transportation and storage equipment or prevent the proliferation of promising, potentially life-saving treatments. This translates into increased manufacturing, transportation and storage costs, hampering the advance of otherwise profitable industries.

THE SOLUTION

PanTHERA has developed a first-of-its-kind technology that improves the cryopreservation of biological material by inhibiting ice recrystallization. PanTHERA's ice recrystallization inhibitors (IRI) are novel small carbohydrate-based compounds that can control ice crystal size and growth during the cryopreservation processing of biological samples. In comparison to standard CPAs (e.g., glycerol, DMSO, HES) that do not control ice crystal growth, IRI compounds provide several critical advantages for the protection of cell and tissue products. These include the significant increase in post-thaw cell recovery and quality, and decreased required concentrations of CPAs to achieve stable storage which, in turn, reduces the toxicity caused by CPAs. PanTHERA's IRIs also have a notable impact on the protection of cells and tissues against the damage associated with transient warming and thawing that can occur during routine transport and storage. Lastly, the IRIs allow for higher-temperature sub-zero storage conditions and reduce the need for liquid nitrogen shipping canisters and storage containers, translating into significant cost savings.

PROJECT OBJECTIVES

PanTHERA is working to reach the following objectives:

- 1. Scale and optimize the product synthesis process and quality control testing methodology in order to manufacture a GMP-grade product; and*
- 2. Collaborate with organizations in the cell and gene therapy field to achieve validation of the product both from an efficacy perspective (to demonstrate our products' ability to improve cryopreservation) and from a business perspective (to demonstrate purchasing intent from end users).*

ABOUT THE AICE-VALIDATE PROGRAM

AICE-Validate is an opportunity for Alberta's health-tech innovators to accelerate commercialization of digital and data-enabled health technologies through the early validation phase. If you'd like to learn more, please check out [AICE Validate on the Alberta Innovates website](#).

Learn how

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