

# Marshmallow-like silicone gels used as insulation in containers for cryopreserved embryos

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Photograph of the container packing a MG. Credit: Gen Hayase

As the genetic modification of mice is increasingly prevalent in medical and biological research, so, too, is the need for an efficient way to transport cryopreserved embryos and sperm.

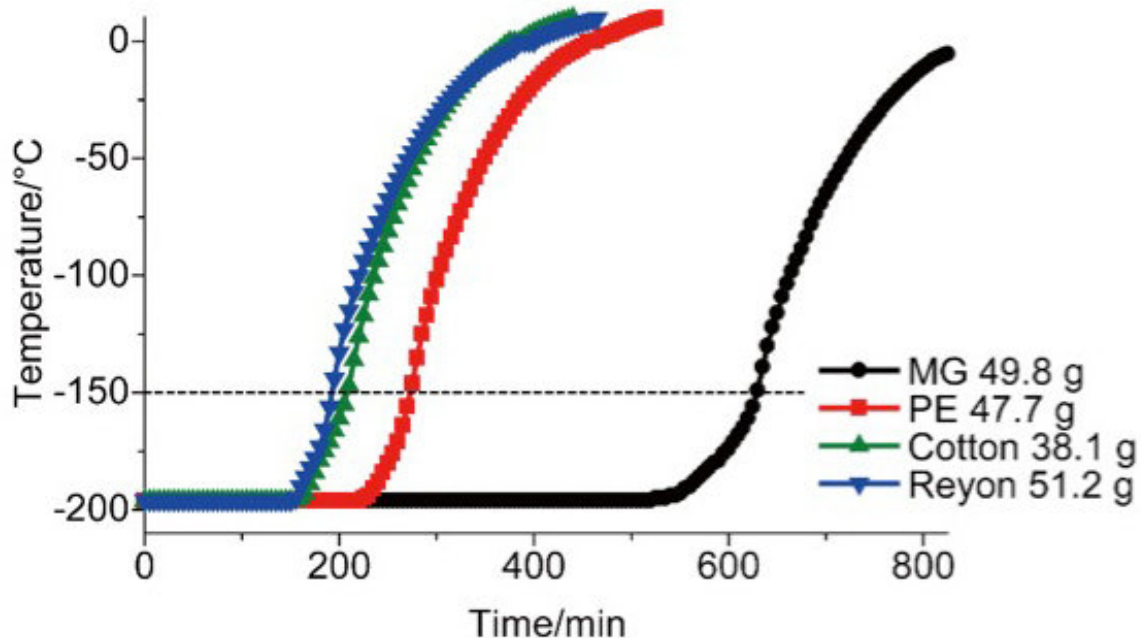
For the preservation of the frozen embryos/sperm, liquid nitrogen is used to keep the temperatures in the transport containers below  $-150^{\circ}\text{C}$ . These containers, which are like a dry sipper with liquid nitrogen absorbers embedded inside, are heavy and often expensive, especially

when used for short distance transportation.

In this study, a macroporous silicone gel was tested for its ability to retain liquid nitrogen and its properties. Researchers packed the marshmallow-like gel (MG) into a commercially available vacuum-insulated water bottle and tested its absorption of liquid nitrogen. They found that the gel was able to keep the temperature inside the container below  $-150\text{ }^{\circ}\text{C}$  for 10 hours (Figures 1 and 2).

As a further test, the researchers placed [mouse embryos](#) in the container with the gel for nine hours and found no clear decrease in the embryos' survival rate.

Since the marshmallow-like gel showed little deterioration after exposure to the [liquid nitrogen](#), the container can be used repeatedly. The process of fabricating MGs is also simple and can be prepared DIY-style by users without experience in chemical synthesis.



This graph shows temperature change of a container made with a MG, compared with containers packed with a cloth. Credit: Gen Hayase

**More information:** Gen Hayase et al, Marshmallow-like silicone gels as flexible thermal insulators and liquid nitrogen retention materials and their application in containers for cryopreserved embryos, *Applied Materials Today* (2017). [DOI: 10.1016/j.apmt.2017.10.004](https://doi.org/10.1016/j.apmt.2017.10.004)

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Provided by Tohoku University

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