

Rederivation and cryopreservation options

This document outlines options for preserving mouse strains. These services are available from the VGER.

Keywords: [sperm cryopreservation](#) [embryo cryopreservation](#) [embryo retrieval](#)

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Each of these services requires careful coordination between the PI laboratory and the VGER. This coordination is crucial for success. The responsibilities of both parties are outlined here.

- 1. Rederivation by Embryo Retrieval and Transfer:** The investigator notifies the VGER regarding how many singly housed males are planned for rederivation matings (there is a minimum of 2 males and a maximum of 8 males for rederivation matings per line). The VGER orders wild-type females and superovulates them for embryo production. The investigator will mate the females with the males and return the females to the VGER (9410 MRB IV) the following day by 10 AM.
- 2. Sperm Cryopreservation:** The investigator provides VGER with 2 proven breeder males between 2 months and 6 months of age. The VGER performs sperm cryopreservation and stores the straws in liquid nitrogen until future use.
- 3. *In vitro* fertilization (IVF):** The VGER performs sperm cryopreservation as above, and subsequently performs *in vitro* fertilization using frozen sperm at a later date, or performs an IVF at the same time as the sperm cryopreservation with fresh (non-frozen) sperm. The investigator provides the VGER with 2 males between 2 months and 6 months of age. The VGER performs the sperm cryopreservation and an IVF to generate fertilized embryos. The fertilized embryos may be cryopreserved, or be transferred to a recipient female for rederivation.
- 4. Embryo Cryopreservation:** The investigator provides 8 to 10 (or more, if available) singly housed male mice. The VGER provides wild-type females for superovulation and mates them to the males on a weekly basis until sufficient embryos are obtained. Embryos are retrieved from the mated females, frozen in straws and stored in liquid nitrogen. The goal is to obtain and cryopreserve approximately 250 embryos.

Factor	Embryo	Sperm
Cost to Freeze	Medium to High	Low
Cost to Recover	Low	Medium to High
Time to Freeze	Low to High	Low
Time to Recover	Low	Medium
Reliability	High	Variable
Ease of Use	High	Low to Medium
Genotype Produced	Heterozygous/Homozygous	Heterozygous
Advantages	Can be quickly rederived	Only requires 2 males
Limitations	Requires up to 10 females and males to maintain homozygous lines per cryopreservation	Pups from IVF rederivation will be heterozygous
Optimal for	Strains with multiple mutations	Strains with single mutations