

Phenotyping: Embryonic Lethal Panel

Genetically-modified rodent models are sometimes unable to produce homozygote offspring due to embryonic or neonatal lethality. Charles River Laboratories can screen these colonies and definitively establish and characterize the lethality.

Customized Characterization

We recognize that your research goals vary. Our team of laboratory animal professionals is available to work with you to customize a model characterization plan that meets your specific needs. We are committed to helping you achieve your goals quickly and efficiently.

Factors to Consider

- *Embryonic vs. Neonatal Lethality:* Establishing the exact time of death is critical and serves as the basis for determining the pathogenesis leading to lethality. For example, neonatal death does not rule out a disease process that originates during embryonic development.
- *Pre-Implantation vs. Post-Implantation Lethality:* Our team of laboratory professionals can determine if embryonic development is abnormal or delayed. We can also determine if abnormalities occur before or after uterine implantation (gestational day 4.5).
- *Determining the Stage of Post-Implantation Lethality:* Our staff scientists will work with you to understand the system of interest targeted by the particular mutation. Using developmental time lines, we can focus further investigation to a particular embryonic stage.
- *Superovulation vs. Natural Mating:* The use of exogenous hormones to evaluate a potentially lethal phenotype is a consideration. The advantages and disadvantages of this procedure will be discussed with you in order to design the best possible approach.

Representative Phenotyping Panels

Charles River Laboratories will establish a small breeding colony consisting of heterozygous x heterozygous matings. All females will be observed for the presence of copulation plugs. All data is analyzed for zygosity and expected Mendelian segregation ratio for a lethal mutant model.

- *Pre-Implantation Stage:* One- or two-cell stage embryos collected from plug-positive females are cultured to hatching blastocysts (gestational day 4.5) *in vitro*. Embryos are examined at least twice daily to determine if normal morphological development occurs. Representative embryos (normal and abnormal) are photographed and genotyped.

Minimum recommended sample size: Embryo collection from eight timed-pregnant heterozygous females (mated to heterozygous males), or a minimum of 30 embryos are cultured.

- *Early Post-Implantation Stage:* Plug-positive females are euthanized at 7.5 or 9.5 days of gestation. Embryos are collected, evaluated, and genotyped.

Minimum recommended sample size: Embryo collection from three timed-pregnant females of each gestational stage (days 7.5 and 9.5), or a minimum of 15 embryos per group.

- *Middle to Late Post-Implantation Stage:* Plug-positive females are palpated to confirm pregnancy 10 days after mating. Pregnant females are euthanized at each of the following days of gestation: 11.5, 13.5, 15.5, and 17.5 days. Embryos are collected, evaluated, and genotyped.

Minimum recommended sample size: Three timed-pregnant females at each gestation stage (days 11.5, 13.5, 15.5, and 17.5), or a minimum of 15 embryos per gestational time point.

Services Available to Further Characterize Embryonic Lethality in Your Animal Model

Once the stage of developmental lethality is determined, histopathology and molecular genetic testing are recommended for further characterization.

Available Panels

Please click here to view a complete list of available panels.

For more information, please call 1.877.CRIVER.1 or e-mail askcrl@crl.com.



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