



Genetically-Modified Animal Programs

Overview Sheet

In 18 years of providing transgenic services, Caliper Discovery Alliances & Services (CDAS) has developed more than 9,000 founder mice and rats from over 3,000 gene constructs, with a 97% success rate.

Transgenic Production Programs

Altering the gene expression in a mammalian model system and examining the biological effects of the genetic alteration is a method commonly used to evaluate gene function. Transgenic production programs from CDAS are state-of-the-art means by which the generation of mice and rats carrying additional copies of normal and mutant genes is accomplished.

This program is made possible by the use of a patented pronuclear microinjection process (U.S. patents 4,873,191 and 6,872,868). The models generated and characterized by our scientists have been used to study the effects of gene function in labs around the world.

Technology

The pronuclear microinjection process creates mouse or rat lines in which a gene(s) is inserted at random into the mouse or rat genome. CDAS holds the exclusive license to this technology, considered to be the industry standard for transgenic animal model development and production.

Transgenic Production Programs (Pronuclear Microinjection)

Transgenic Production (Mouse)

Standard Package

- B6SJL / F2 or FVB strain of mouse
- DNA microinjection
- Transgene integration analysis

Specialty Strain Packages

- C57BL/6 and CD1 strains of mice
- DNA microinjection
- Transgene integration analysis

BAC Transgenic Package

- DNA microinjection of fragments over 40KB in size
- Transgene integration analysis
- Available in all mouse and rat strains

Transgenic Production (Rat)

Standard Package

- Outbred Sprague Dawley rat strain
- DNA microinjection
- Transgene integration analysis

Specialty Strain Packages

- Lewis, Fischer 344, Dahl-S, Long-Evans and other strains of rats
- DNA microinjection
- Transgene integration analysis

Additional Services

- Design and construction of transgenes
- Breeding / maintenance of transgenic founder lines (mice and rats)
- Transgene expression analysis and phenotypic characterization
- Custom programs available
- Other strains considered upon evaluation

Custom Gene Targeting Programs

The mouse knockout (standard and conditional) programs from CDAS utilize homologous recombination and positive/negative selection. Through these gene modification processes, CDAS is able to produce a large variety of gene specific mutation models including standard and conditional knockout and knockin models with tissue and time-specific modifications. CDAS has more than a decade's worth of experience in using ES cell technology to design, produce, and characterize hundreds of knockin / knockout and conditional models.

Technology

The mutations are created in our extremely robust germline-competent cells, and are then isolated using positive/negative selection techniques. Targeted clones are injected into blastocysts to produce chimeric founders.

Custom Gene Targeting Programs and Services

Package 1: GT Complete

Characterization of Gene Through Blastocyst Injection; Intended Deliverable: Three High-Percentage Chimeric Founders

Key Steps:

- In silico cloning and characterization of mouse genomic target DNA
- Design and construction of targeting vector
- Transfection of Embryonic Stem (ES) cells
- Screening of up to 200 individual drug resistant clones
- Injection of up to two (2) targeted ES clones
- Generation of chimeras from injected blastocysts
- Optional breeding to hetero/homozygosity

Package 2: GT Production

Transfection Using Targeting Construct Through Blastocyst Injection; Intended Deliverable: Three High-Percentage Chimeric Founders

Key Steps:

- Transfection of Embryonic Stem (ES) cells with client's construct
- Screening of up to 200 individual drug resistant clones
- Injection of up to two (2) targeted ES clones
- Generation of chimeras from injected blastocysts
- Optional breeding to hetero/homozygosity

Gene Targeting Services

ES Cell Transfection

- Transfection of construct into ES cells
- Screening of drug resistant ES cell clones (Client may also elect to perform screen)
- Expansion of up to six (6) targeted clones

Blastocyst Injection

- MAP, Mycoplasma and Karyotype analysis of client ES cell clones
- Injection of up to two (2) targeted clones

Available ES Cell Lines

- C57BL6
- 129/SvJ
- 129/SvEv
- FVB/N

ES Cell Lines in Development

- Balb/c
- B6 Albino

Custom Programs Available

Contact Information

For all transgenic or genetically-modified animal production inquiries, please call:

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