



Embryology Services

Comprehensive Capabilities Facilitate Flexible, Scalable Deliverables & Accelerated Timelines

Comprehensive embryology capabilities and capacity are cornerstones of Taconic Biosciences® colony management services and the Taconic Cage+™ ecosystem. This enables accelerated timelines, rapid health status resets, protection of critical animal models, and enhanced animal welfare. We currently manage embryology operations in both Europe (Denmark) and the United States (NY) with oversight from PhD-level embryologists.

COMPLETE EMBRYOLOGICAL SUPPORT

ACCELERATED CRYORECOVERY

- ▶ FRapid® provides accelerated rederivation using cryopreserved material
- ▶ Generate scalable study ready cohorts from 20 to >600 animals
- ▶ Rapidly produce age-matched animals at any health standard
- ▶ Simple pricing prevents unexpected overages

ACCELERATED REDERIVATION

- ▶ Rederive animal models using live gamete donors
- ▶ Generate scalable study ready cohorts from 20 to >600 animals
- ▶ Rapidly produce age-matched animals at any health standard
- ▶ Simple pricing prevents unexpected overages

ACCELERATED MODEL GENERATION

- ▶ ExpressMODEL® reduces project timelines by 3-5 months
- ▶ Reduce timelines without compromising quality control
- ▶ Directly generate custom models at any Taconic health standard
- ▶ Flexible, scalable deliverables

CRYOPRESERVATION

- ▶ Protect critical animal models
- ▶ Sperm and embryo cryopreservation available
- ▶ Robust quality control for confidence in recovery
- ▶ Dual-site storage for peace of mind

HEALTH STATUS RESET

- ▶ Reset the health status of any model to a Taconic health standard
- ▶ Enable breeding in Isolated Barrier Units™ (IBU™) or gnotobiotic isolators
- ▶ Resolve health status concerns quickly with scalable study ready cohorts

IVF MEDIATED INTERCROSS

- ▶ Utilize gametes from two lines in an IVF-expansion to immediately scale a genetic intercross
- ▶ Generate scalable study ready cohorts from 20 to >600 animals
- ▶ Save time (at least 3 months) compared to natural mating
- ▶ Archive intermediate genotypes during intercross with cryopreservation

Key Benefits

- ▶ Comprehensive capabilities: rederivation, cryopreservation, and cryorecovery
- ▶ Reduce timelines with multiple speed-to-cohort options without compromising genetic integrity
- ▶ Robust quality control with flexible, scalable deliverables
- ▶ Rederive or generate models directly at any Taconic health standard

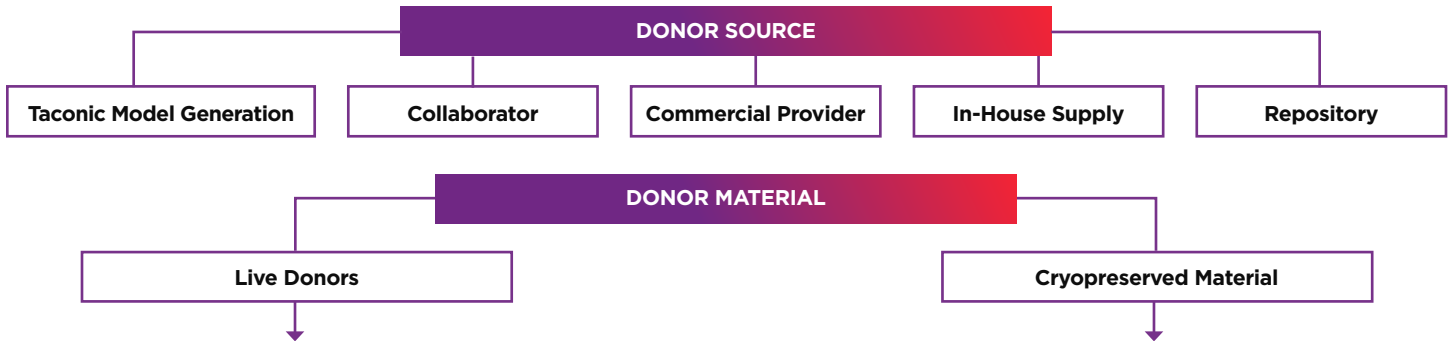
Get in touch for more information about our products and services.

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RapidEXPANSION™ & FRapid®

NOVEL SOLUTIONS TO ACCELERATE TIMELINES

When time to data is critical, naturally expanding a breeding colony to generate study cohorts often presents the greatest challenge. Taconic employs *in vitro* fertilization and large-scale embryo transfer methodologies to rapidly expand your colony from donor animals to full-production breeding within weeks, saving up to 5 months' time to study cohort.



RapidEXPANSION™

ACCELERATED REDERIVATION

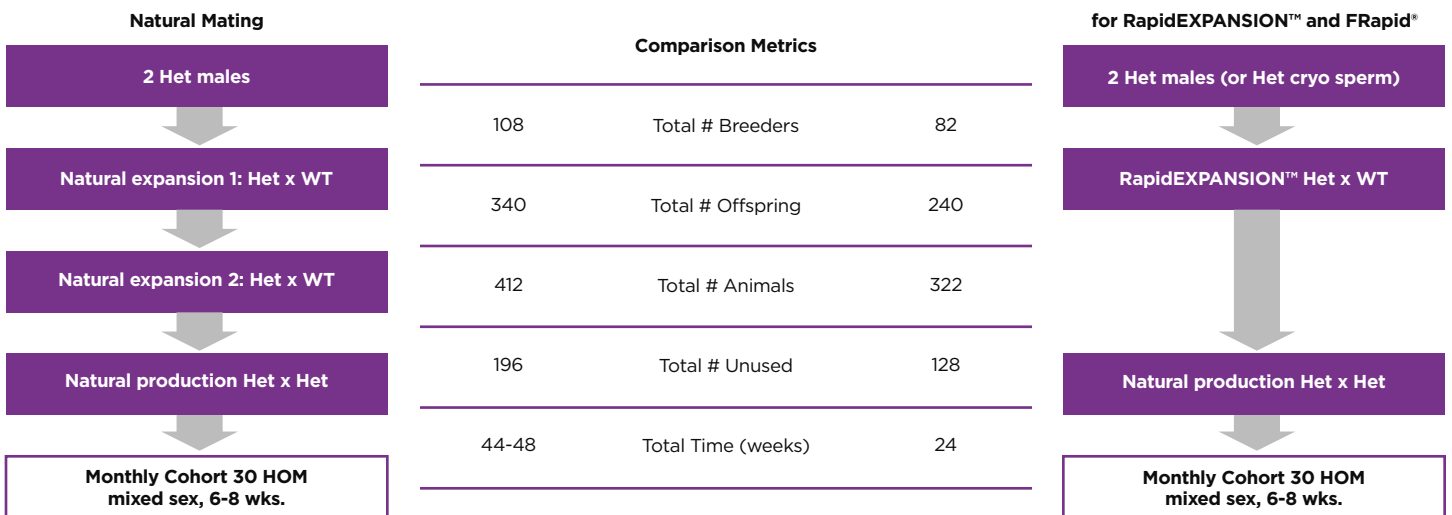
- ▶ Requires only a few donor male mice
- ▶ Rederive your model to any Taconic health standard
- ▶ Generate cohorts of 20 to >600 animals all with the same week of birth
- ▶ Save significant time to study cohort
- ▶ Generate study cohorts “on demand” from a small donor colony (no running production colony needed)
- ▶ Immediately scale a genetic intercross via IVF
- ▶ Improve animal welfare: Reduce total animals used, breeders used, and unused animals
- ▶ Gamete donors may be sourced from Taconic, other commercial providers, or customer

FRapid®

ACCELERATED CRYORECOVERY

- ▶ Easy shipping of donor materials: No need to ship live animals
- ▶ Recover cryopreserved models to any Taconic health standard
- ▶ Generate study cohorts “on demand” from a cryo-repository (no running production colony needed)
- ▶ Generate cohorts of 20 to >600 animals all with the same week of birth
- ▶ Save significant time to study cohort
- ▶ Improve animal welfare: Reduce total animals used, breeders used, and unused animals
- ▶ Cryopreserved material may be sourced from Taconic, other commercial providers, or customer

COMPARISON OF NATURAL MATING EXPANSION VS. RapidEXPANSION™/FRapid®



The hypothetical example shown above compares the timeline and animal burden to generate a cohort of 30 HOM GEM animals, mixed sex at 6-8 weeks of age. The metrics for RapidEXPANSION™ and FRapid® are better on all measures, including producing 22% less animals and 34% less animals produced but unused.

CRYOPRESERVATION SOLUTIONS

PROTECT YOUR MODELS WITH QC EMPOWERED CONFIDENCE

Sperm & Embryo Cryopreservation

We understand that cryopreservation requirements can be dictated by downstream and long-term needs such as large-scale recoveries. Taconic approaches cryopreservation accordingly with a strategic, expert led, planning driven approach that protects and supports your critical models and research.

Summary of Service

- ▶ Sperm cryopreservation (mouse only) includes 15–20 straws
- ▶ Embryo cryopreservation includes 250 embryos
- ▶ Includes supporting *in vitro* QC data
- ▶ Includes dual-site storage of cryopreserved material
- ▶ Trial recovery to live born also available

Service Benefits

- ▶ Protect models from catastrophic loss and genetic drift
- ▶ Archive intermediate genotypes
- ▶ View status and inventory through our online customer portal: eTACONIC®

CRYOPRESERVATION: SPERM VS. EMBRYO

METHOD SELECTION GUIDE

Method	Embryo	Sperm
Single gene modification	✓	✓✓
Multiple gene modification	✓✓✓	✓
Mixed genetic background	✓✓✓	✗
X linked mutation	✓✓✓	✓
Y linked mutation	✗	✓✓✓
Mitochondrial DNA mutations/Polymorphism	✓✓✓	✗

✓=good ✓✓=better ✓✓✓=best ✗=not advised or not feasible

REQUIREMENT & DELIVERABLES

Description	Embryo	Sperm Cryo
# Donors required for cryopreservation	25-30 female & 2 male donors	2 male donors
Pre-expansion breeding required	Maybe	No
Timeline to complete cryopreservation with live recovery QC	16-20 weeks*	4-6 weeks**
Cryopreserved material stored per line	250-300 embryos	15-20 straws
# Pups can be recovered from cryopreserved material per line	Tens	Hundreds

*16-20 weeks include pre-expansion breeding

**4-6 weeks exclude live recovery

DESCRIPTION OF CRYOPRESERVATION QUALITY CONTROL ASSESSMENTS

QC Check Description	Pass Criteria
Fert Rate: Measure of % fertilization for cryopreserved sperm in an <i>in vitro</i> fertilization assay	>15% Fertilization
QC1: Measure of embryo progression from 2-cell to blastocyst for an aliquot of the embryo pool <u>prior</u> to cryopreservation	≥80% Progress to Blastocyst (of total embryos cultured)
QC2: Measure of embryo progression from 2-cell to blastocyst for an aliquot of the embryo pool <u>post</u> -cryopreservation	≥65% Progress to Blastocyst (of total embryos thawed)
QC3: Measure of recovery to live born following IVF (sperm only) or thaw (embryo only) and implantation of 2-cell embryos	≥15% Live Born rate (of total embryos implanted)

Fertilization rate data sufficient to assign pass/fail in absence of QC3 data for sperm cryopreservation. For embryo cryopreservation, QC1/Q2 may be omitted at the discretion of Taconic staff depending on available embryos and QC3 results. Please speak with your Project Manager or Scientific Program Manager for additional details.

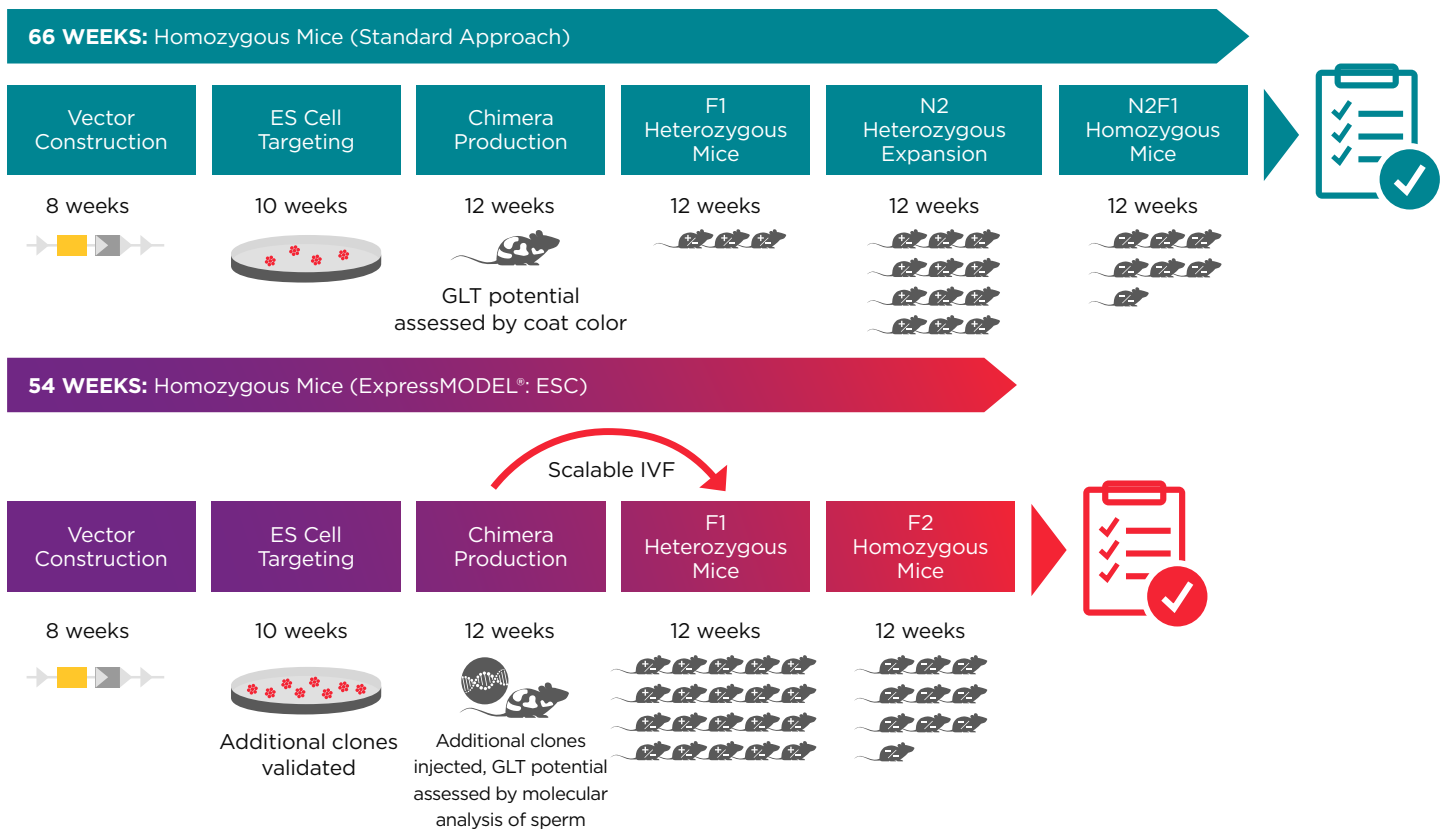


LEVERAGING EMBRYOLOGY TO ACCELERATE CUSTOM MODEL GENERATION

INTRODUCING TACONIC'S ExpressMODEL® SERVICE

- ▶ Reduce project timelines without impacting the genetic integrity of your model
- ▶ Maintains all controls and robust QC
- ▶ Directly generate models at any Taconic health standard with flexible, scalable, cohort sizes
- ▶ Reduce project timeline by 3-4 months without compromising quality
- ▶ Enhance animal welfare by improving adherence to the 3Rs through reduced animal usage
- ▶ Learn more about ExpressMODEL® at taconic.com/expressmodel

ExpressMODEL®: EMBRYONIC STEM CELL (ESC)



ExpressMODEL®: RANDOM INTEGRATION TRANSGENIC (RITg)

- ▶ Reduce time to data by 3-5 months while eliminating added costs and timeline of breeding and characterizing multiple founder lines
- ▶ Assess transgene expression, fertility, and RNA expression of founder animals, providing the optimal founder for use in generating your line
- ▶ Directly generate your model at any Taconic health standard with flexible, scalable, cohort sizes

ExpressMODEL®: CRISPR

- ▶ Reduce time to data by 3-4 months
- ▶ Directly generate your model at any Taconic health standard with flexible, scalable, cohort sizes

LEVERAGING EMBRYOLOGY FOR YOUR NEXT PROJECT

ACCELERATE & PROTECT YOUR RESEARCH

Whether you simply need to protect existing lines, scale an existing project, reset the health of your line, or generate a novel model, Taconic's robust embryology and cryopreservation capabilities can complement virtually any project. Learn how embryology can be leveraged to accelerate discovery by talking with a Taconic expert today.