



Genetically Engineered Models & Services

GEMS

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GEMS – Key Facts



Global one-stop shopping for services



Over two decades of experience



Hundreds of clients, thousands of lines



Assigned, dedicated project manager



Unrivalled network of scientists

P R O B L E M

S O L V E D

Global GEMS Presence

- **North America (3)**
 - Wilmington, MA
 - San Diego, CA
 - Troy, NY
- **Europe (6)**
 - Lyon (Les Oncins) France
 - Châtillon France
 - Sulzfeld Germany
 - Kißlegg Germany
 - Calco Italy
 - Margate, UK
- **Japan (2)**
 - Yokohama
 - Osaka



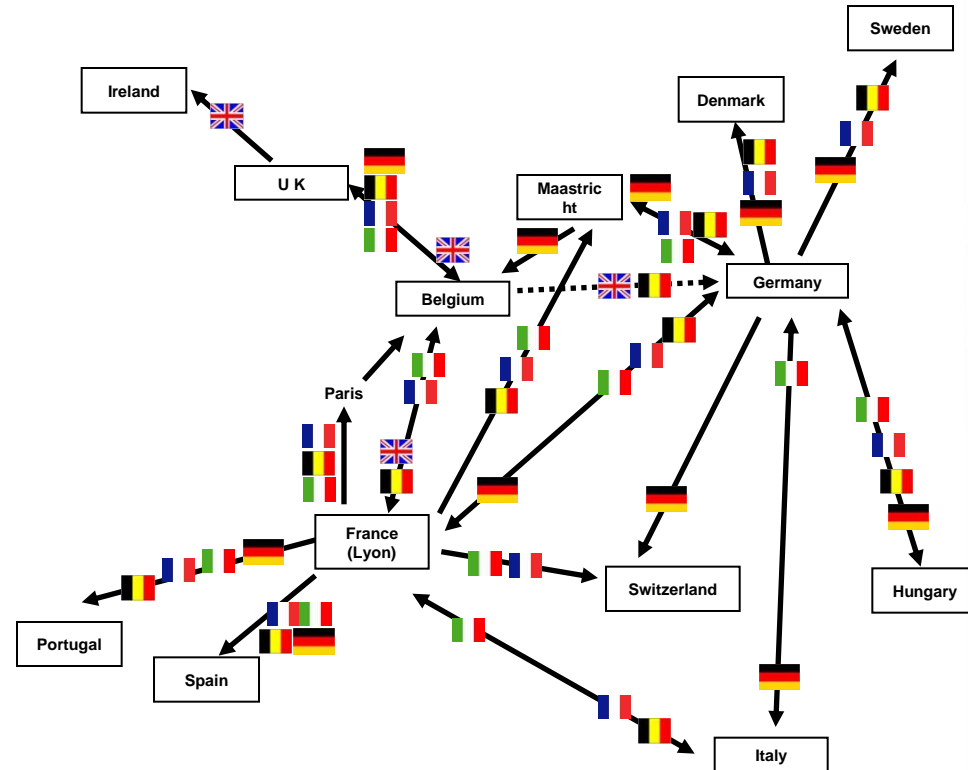
US Logistics Network

- Direct Services
- Nationwide Delivery Network
 - Local temperature monitoring in cab via gauges and alarms
 - Remote monitoring of long distance trucks for environmental parameters and location
 - Records kept for all trucks
- Driver Training
 - Animal handling and care
 - Disinfection procedures



European Logistic Network

- 98% of the deliveries to customers are done within 48 hours
- Harmonized transportation conditions:
 - Live animal transport agreement with subcontractors
 - Transit facility agreement (environmental conditions)
 - Standard practices:
 - Cleaning and disinfection of the vehicle
 - Temperature recording during transportation
 - Standards of delivery vehicles:
 - Dedicated vehicles
 - Controllable heating, cooling & ventilation
 - List of emergency contacts with telephone numbers in the vehicle
 - No advertising
 - Dedicated drivers trained by Charles River



Capacity: North America

- Wilmington
 - 60,000 ft² of isolator housing space
- San Diego
 - 20,000 ft² of finished isolator housing space
 - 10,000 ft² of shell space
- Troy
 - 7,000 ft² of lab space
- Flexible space
 - 3ft, 6ft, 8ft
 - Connectable Isolators
- Dedicated staff: >200



Capacity: Europe

- Europe (Total)
 - 1,552m²
- Flexible space
 - Isolators
 - FTCs
- Dedicated staff: >150
- JAX[®] Mice and GEMM[™] strains



Project Management – Client View

Project Updates

- Colony Event Updates
- Result Reporting
- Animal Status

Animal Transfer

- Coordinates incoming transfers with shipping partners and global colleagues
- Schedules outgoing shipments via Direct Services

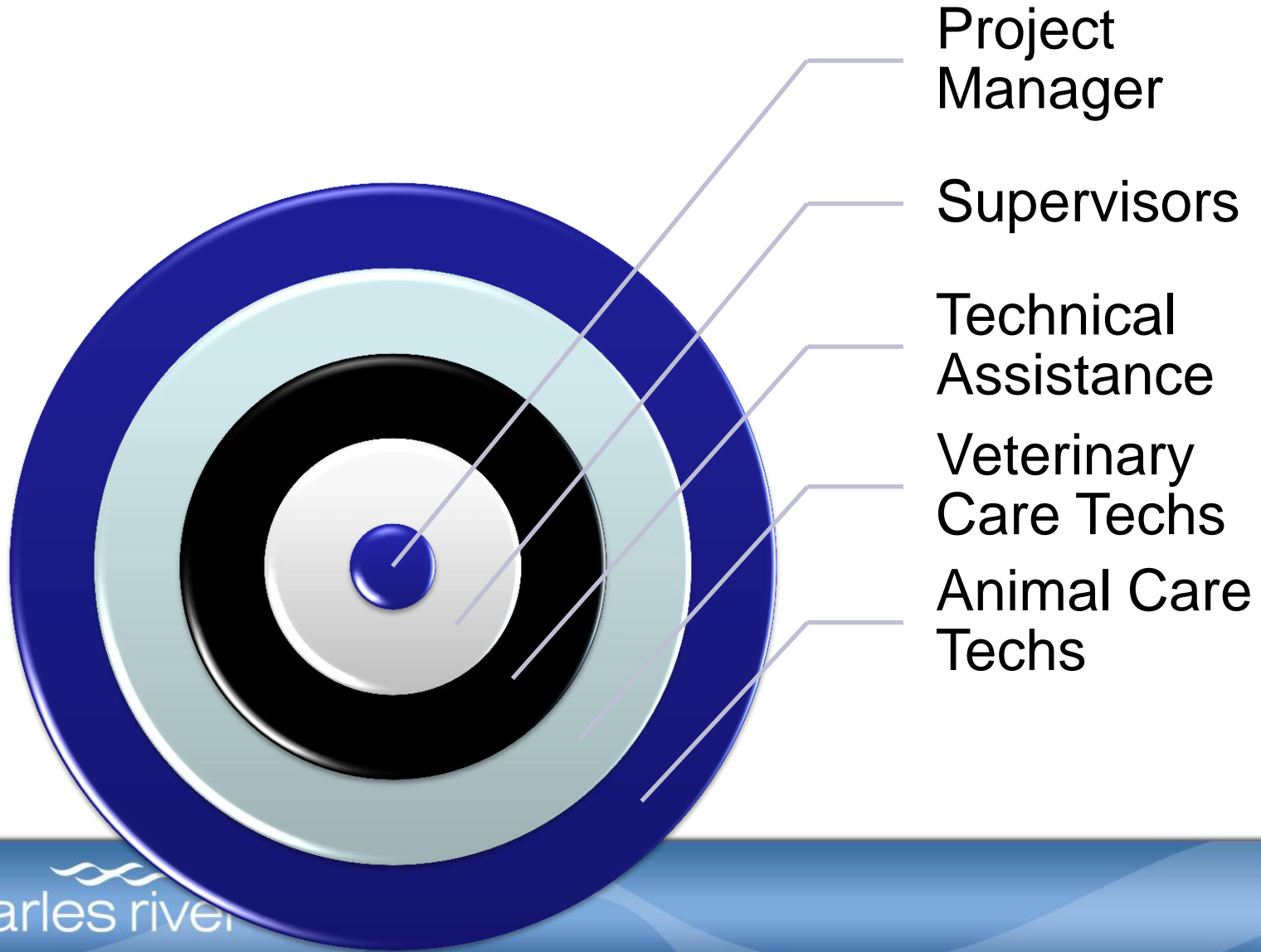
Invoicing

- Enters cage counts
- Task entry
- Invoice review

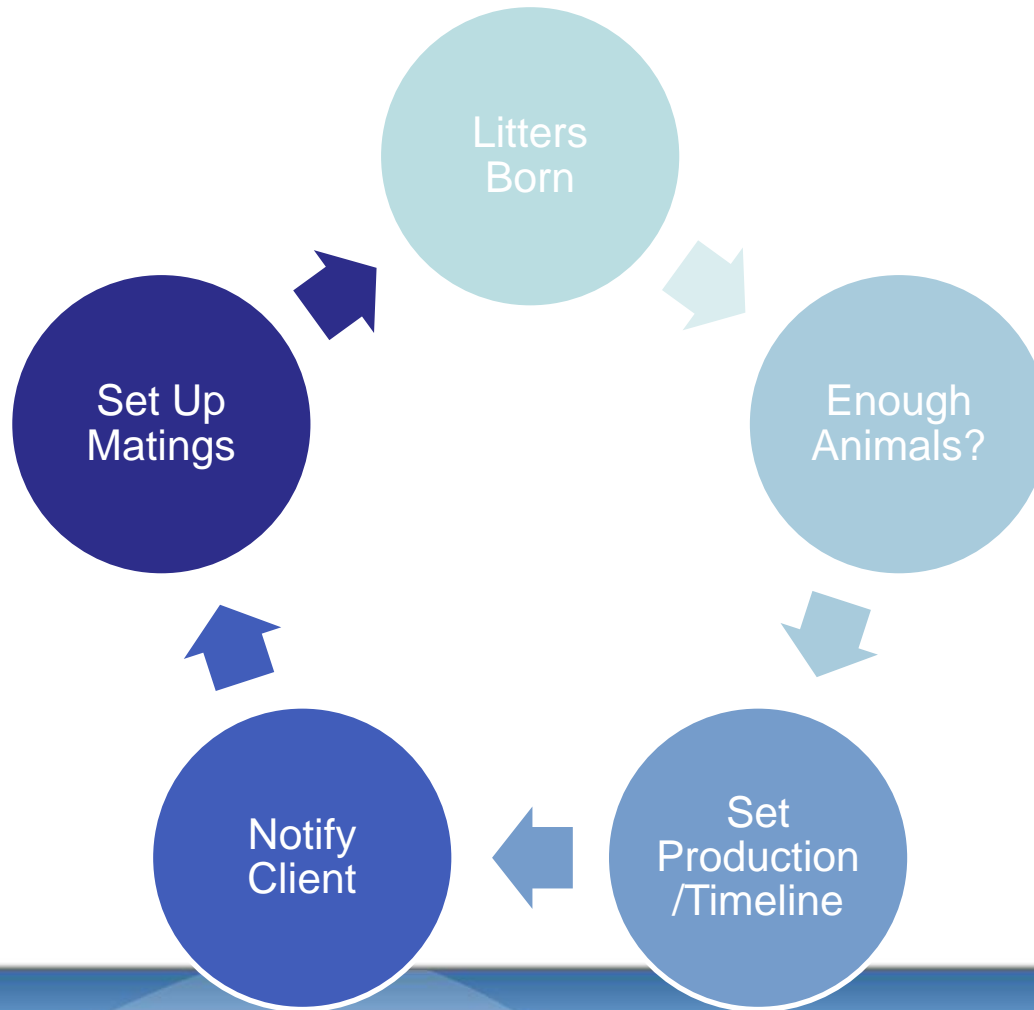
Support Team

- Veterinarians
- Geneticists
- Embryologists

Project Management - Support



Project Management - Monitoring



GEMS Isolator Technology

Highlights

- Strong biosecurity
- Import animals from anywhere without rederivation
- Multiple sizes to match project needs
- Emergency backups

Experience

- Thousands of isolators globally
- Developed by Charles River in the mid-80's
- Used for commercial immunodeficient production
- 100% of U.S. GEMS animals are in isolators



Quarantine

Highlights

- Acceptance of animals with as little as one week notice from locations worldwide
- Breeding allowed during quarantine
- Flat fee, multiple option packages
- On-site, world renowned diagnostic lab

Experience

- Dedicated quarantine site for over 100 U.S. institutions
- Over 50 unique protocols
- Diagnostic lab processes over 55,000 live animals annually



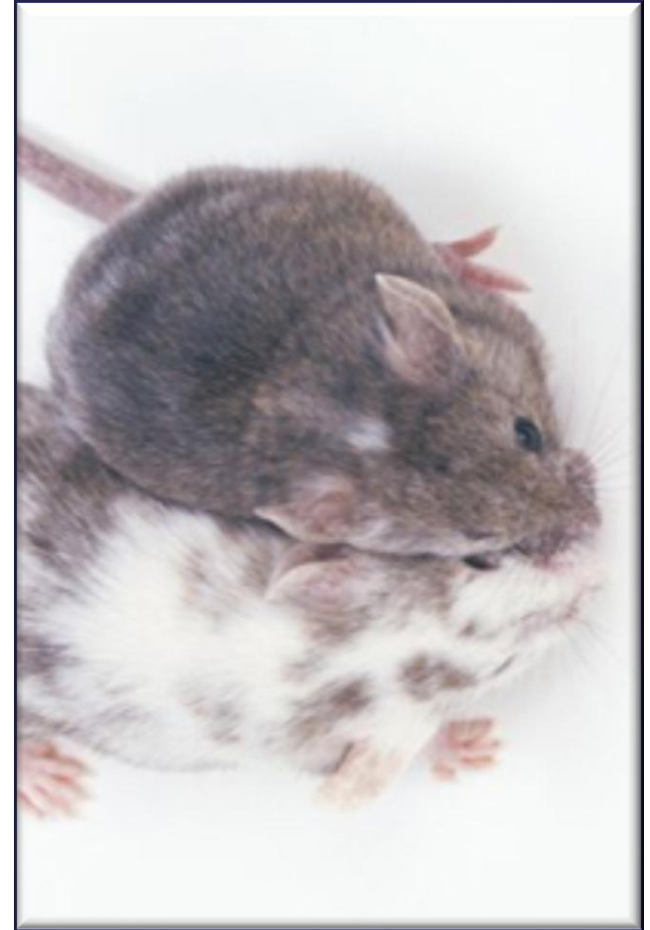
Breeding

Highlights

- World's largest rodent breeder
- Health status not important
- Hands on or hands off
- Use space most effectively

Experience

- Breeding genetically engineered animals for more than two decades
- Thousands of unique lines, many with multiple mutations
- Ship hundreds of crates per week globally



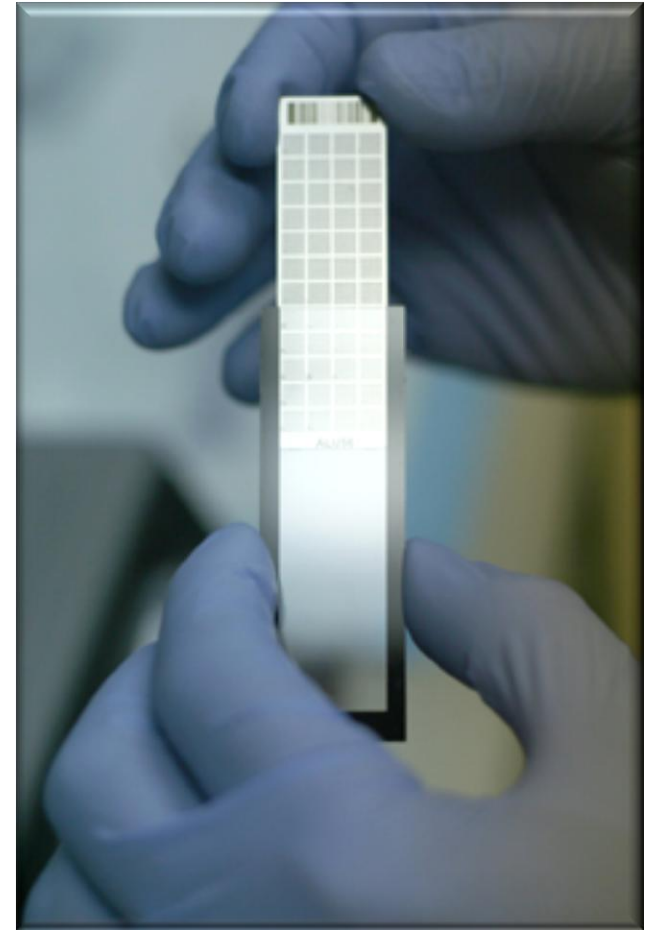
Genetic Testing

Highlights

- Multiple platforms
- Multiple species
- Speed congenics
- Highly automated
- Complimentary retests

Experience

- Process thousands of samples per week
- Multiple Ph.D. level scientists designing assays and scoring results
- Multi gene assay development
- Database of protocols



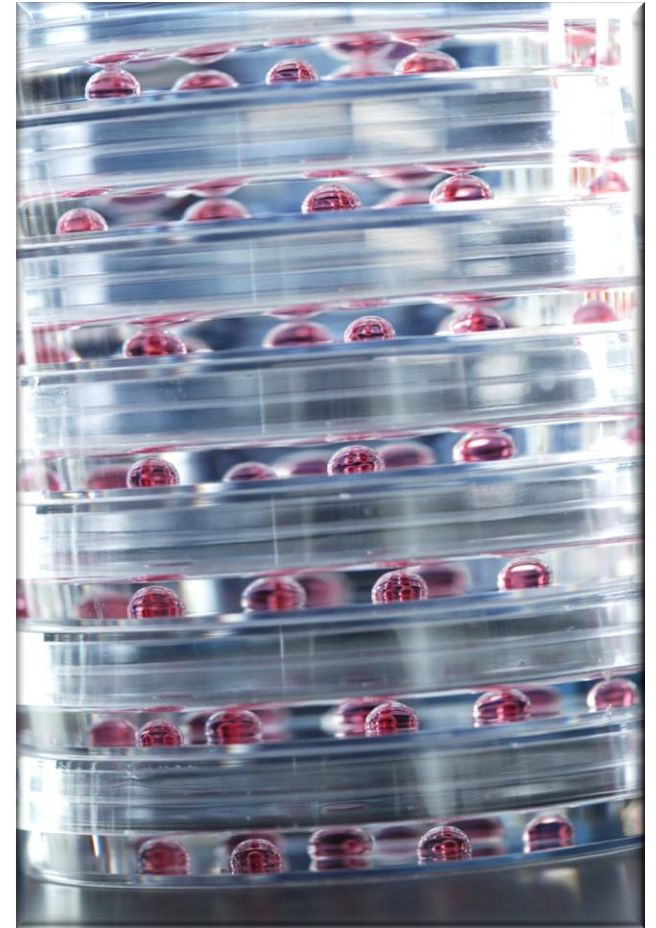
Rederivation

Highlights

- Multiple service options
- IVF available for large deliverables
- Guaranteed success
- Can accept an entire facility, typically within a week

Experience

- Over 7,000 unique lines rederived
- Projects with deliverables of up to ~1,000 offspring completed
- Success with all genetic backgrounds
- 100% success rate



Cryopreservation

Highlights

- Sperm or embryos
- Strain by strain consultation
- One fee service packages
- Secure, split on-site storage
- Guaranteed recovery

Experience

- Over 10,000 unique lines cryopreserved
- Over 25 years experience with embryos
- Nearly 10 years experience with sperm
- 100% recovery success rate



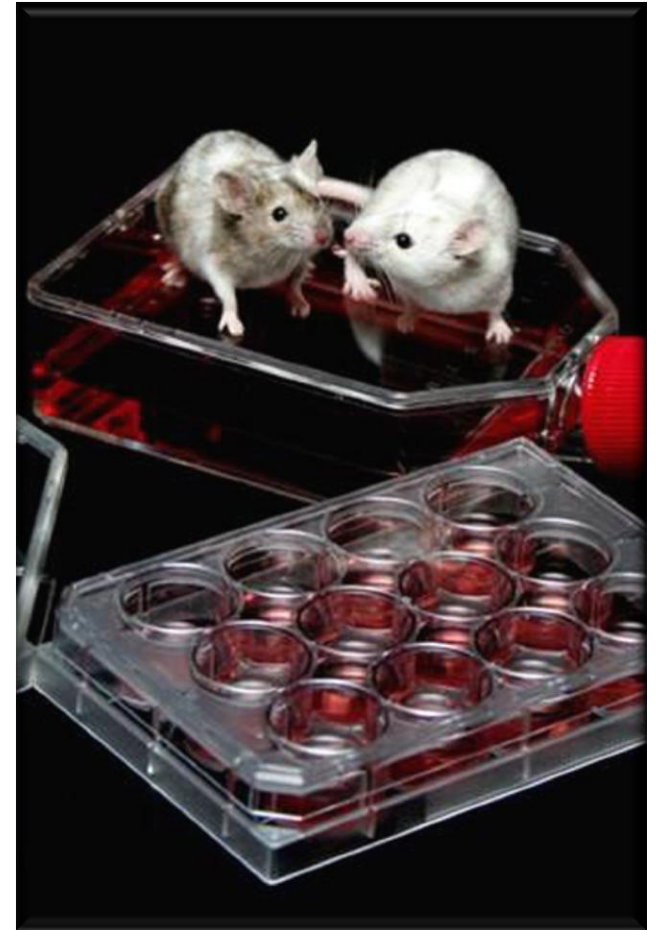
Line Rescue

Highlights

- Multiple techniques
- Problem analysis for future prevention
- Flat fee rescue
- Immediate animal acceptance

Experience

- Successfully recovered:
 - Physical handicaps
 - Subfertility
 - Delivery/lactation limitations
 - Dead animals



In Summary



Over 20 years experience in Genetically Engineered model management with core competencies in breeding, embryology, genetics & health monitoring



Processes in place to prevent, catch, and correct discrepancies BEFORE they impact the colony



Single point of contact for all inquiries, updates, and project related information with a secured database containing all project information



Scientific oversight of all activities



Complete service provider for the management of live animals and germplasm

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