GENOMOUSE™ SERVICE

Speed Congenics

PolyGene offers a microsatellite-based genotyping and backcrossing service for users of genetically modified mice, and mouse breeders.

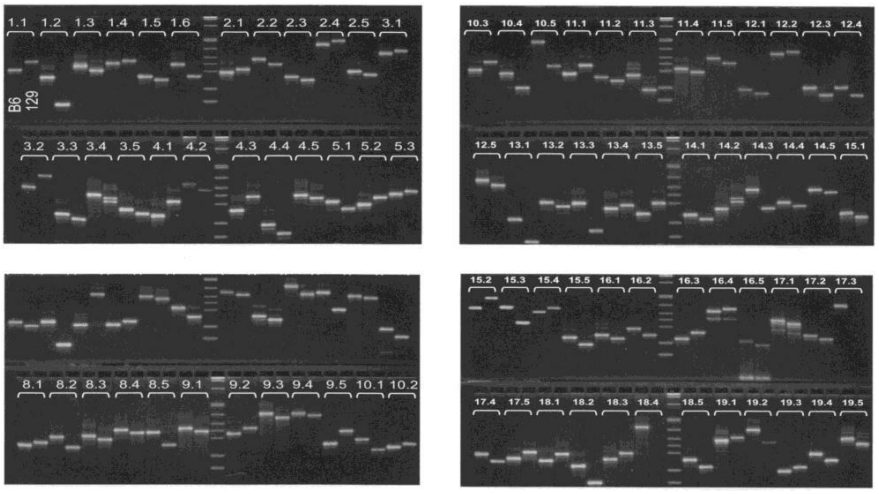
High quality, cost effective alternative

The genetic background can be an important parameter in a mouse model. In some instances, background variations rather than intentional, specific genetic modifications are the cause of an observed phenotype. To reliably interpret the results of an experiment, it can be necessary to backcross a mouse model into a given background. This process is expensive and time-consuming.

GenoMouse™ service is a carefully established and flexible tool for optimizing the backcrossing process in congenic mouse breedings. Its main advantage lies in the shortened span for obtaining congenically inbred mouse strains, typically saving 1-1.5 years of breeding time.

Mouse breeders and mouse researchers alike profit from PolyGene's GenoMouse™ service, both for the sake of congenic breedings, and for genetic background testing in strain quality control. PolyGene's GenoMouse service is readily available for five commonly used mice combinations (differentiating B6 versus DBA2, B6/129, B6/BalbC, B6/NOD, and B6/FVB) and can be customized for additional mouse strain pairs in 3-8 weeks.

PolyGene offers this service for customer-delivered genomic samples, as well as within a breeding program at the PolyGene laboratories. For the latter, PolyGene can accommodate the embryo transfer into its own unit, and subsequent breeding, genotyping and health control according to FELASA protocols.



96 polymorphic micro-satellite markers for the mouse strains B6 and 129; for each pair B6 is the first and 129 the second.
Markers 1.1-1.6 are on chromosome 1, etc.

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Speed Congenics

GenoMouse reduces the time consuming endeavor of classical congenic strain production from 10-15 generations of backcrosses (an average of 2 - 2½ years) down to five generations (average 10-12 months). GenoMouse achieves these fast results utilizing 96 polymorphic microsatellite markers and patented high resolution hydrogels for optimization of the breeding scheme, and thereby selecting progeny containing the highest percentage of the recipient genome for further backcrossing.

Generation	Conventional	Speed Congenics
F1	50.00 %	50.00 %
F2	75.00 %	78-81 %
F3	87.50 %	92-94 %
F4	93.75 %	97-99 %
F5 (at 1-1.5 years)	96.88 %	> 99.9 %
…	…	
F10 (at 2-2.5 years)	99.90 %	

With conventional breeding, about 99.9% of congenicity can be achieved after 10 generation ($1-2^{-10}$). Given the large number of genes and the high recombination rates in eukaryotes, this number is given and will only marginally deviate. Using speed congenics and clever breeding schemes (elaborate choice of pups/generation analyzed, and good choice of breeding parents), the same result is obtained after 4 effective breeding generations.

Quality Control

When used as QC/QA procedures, PolyGene's GenoMouse service confirms genetic integrity of the mice. This allows clearer interpretation of experimental results because of its assurance that the mouse model used are genetically well defined. GenoMouse identifies and validates strains and sub strains.

Customized Solutions

Should you have a project with different criteria (number of animals, other mouse strains, timelines, etc.), PolyGene is flexible to accommodate your specific needs. For example, in a speed congenic project, it may not be required to analyze the full panel of markers in every generation. PolyGene offers the GenoMouse service for subsets of the full panel (24, 36 or 48 markers), as well.

We custom develop genome background testing for other animal species. Please contact us for an estimation of costs for your project.