PWD/PhJ is an inbred mouse strain of the subspecies Mus musculus musculus. PWD/Ph mice exhibit differences that are genetically distinct from common laboratory mice for a number of complex phenotypic characteristics. This strain is an excellent tool for mapping both single-gene (Mendelian) traits and quantitative trait loci (QTL) contributing to complex phenotypes.
PWD/PhJ is an inbred mouse strain of the subspecies *Mus musculus musculus*. *M. m. musculus* is estimated to have diverged approximately 1 million years ago from *M. m. domesticus*, the subspecies from which derives most of the genome of practically every laboratory mouse strain. However, the extent of polymorphism for randomly selected microsatellite markers between the two subspecies (70-80%) is nearly as great as between *M. m. domesticus* and *Mus spretus* (84%), which diverged about 3 million years ago (Montagutelli et al. 1991; Gergorova and Forejt 2000).

PWD/Ph mice exhibit differences are genetically distinct from common laboratory mice for a number of complex phenotypic characteristics, including body mass, distribution of adipose tissue, serum concentrations of intermediary metabolites, susceptibility to type I diabetes and various behavioral traits (Gregorova and Forejt 2000).

Male, but not female, F1 hybrid offspring of crosses between mice of most laboratory strains and PWD/PhJ are sterile. Known exceptions are male (C3H x PWD)F1 and (CBA x PWD)F1 mice. The locus responsible for this difference in fertility of male PWD hybrids, called hybrid sterility 1 (symbol Hst1), has been mapped to a 580 kb region of *M. m. domesticus* Chr 17, approximately 8.4 cM distal to the centromere, wherein reside 10 potential candidate genes that are expressed in the testes (Forejt et al. 1991; Trachtulec et al. 1997). It has been estimated that no more than 3-4 loci contribute to the sterility phenotype of laboratory strain x *M. m. musculus* hybrid males (Gregorova and Forejt 2000).

Typing of PWD/Ph for 37 biochemical markers revealed numerous allelic differences with standard laboratory mouse strains (von Deimling et al. 1988). Electrophoretic alleles of 25 enzymes examined were shared between PWD and laboratory strains; nine of these markers were previously analyzed in wild-caught *M. m. musculus* mice, whose prevalent allele of all except one marker, *Mod1*, was fixed in PWD. PWD exhibited alleles at three loci that were uncommon among laboratory mice, but were identified in wild-caught *M. m. musculus*. Six esterase genes were identified in PWD that had also been detected in *Mus molossinus* but whose products were absent from laboratory strains. Unique alleles were identified in PWD for three enzymes.

Genome-wide microsatellite typing for 248 loci of PWD/Ph, PWK/Ph (distributed as PWK/PhJ, Stock No. 0003715) and/or PWB/Ph - very similar inbred strains derived from *M. m. musculus* pairs caught in the central Czech Republic - versus mice of three inbred laboratory strains revealed up to 80% of the loci to be polymorphic between at least one PW strain and at least one inbred strain analyzed.

The high level of both phenotypic variation and DNA sequence polymorphism between PWD/PhJ and inbred laboratory strains and the fertility of hybrid offspring of both sexes from crosses between PWD/PhJ and some laboratory strain mice make this strain an excellent tool for mapping both single-gene (Mendelian) traits and quantitative trait loci (QTL) contributing to complex phenotypes. Polymorphism at the RNA level permits investigation of monoallelic expression, e.g., from parentally imprinted genes (Forejt and Gregorova 1992; Forejt et al. 1999) or in cancer cell lines (Forejt et al. 1999). Sterility of male hybrid offspring of crosses between PWD and most inbred laboratory strains provides a tool for analysis of the genetic bases for interspecies hybrid sterility.

In 2019-2020, researchers at The Jackson Laboratory discovered this inbred strain contains the *Trem2<sup>S148E</sup>* allele - a naturally occurring variant at position 48351151-48351152 on Chr 17 (<code>rs108080490</code> and <code>rs107649577</code>; Ensembl GRCm38.p6). This TC to GA transition results in a serine to glutamic acid substitution at amino acid 148 (S148E).
Breeding Considerations

These mice are still very wild after 80 generations of inbreeding, and special care is needed to prevent their escape during handling. PWD/Ph mice breed well. Females produce their first litters at about 8 weeks of age and will give birth approximately every 4 weeks. The average litter size is 7. Females continue breeding until at least 8 months old; the average number of litters produced during their reproductive lifetimes has been reported to be 6-7.

Additional Breeding and Husbandry Support

Mating System
Sibling x Sibling

Appearance
agouti

Related Genotype: A/A

Citation
When using the PWD/PhJ mouse strain in a publication, please include JAX stock #004660 in your Materials and Methods section.

Animal Health Reports
Facility Barrier Level Descriptions

AX10 (Standard)
## Pricing & Availability

Live mice available in varying quantities. Ask Customer Service for details.

Available

### Domestic

Pricing effective for USA, Canada and Mexico shipping destinations

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### International

- Pricing effective for USA, Canada and Mexico shipping destinations.

### RELATED PRODUCTS AND SERVICES

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