

Genetic Defects in Innate Immunity

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Systemic or Respiratory Infections

Variation among exposed pigs

Multiple infectious agents

*Bacteria: Strep suis, Haemophilus
Actinobacillus, Mycoplasma*

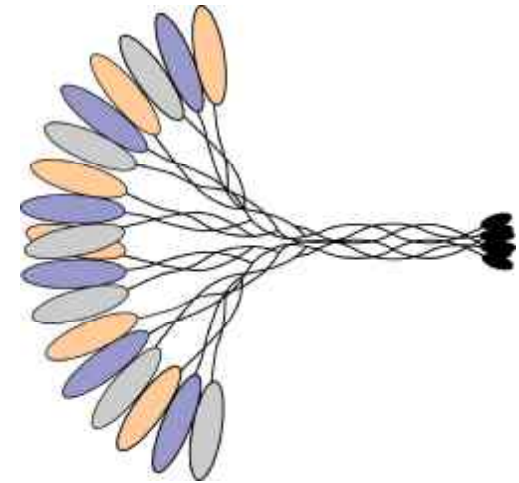
Viruses: PRRS virus, Circovirus 2

Major Innate Immune Lectins

Mannan-binding lectins (MBL)

Ficolins (FCN)

Surfactant binding proteins (SP)



Broad spectrum innate resistance

Antibacterial

Antiviral

Important in young

Approach

Identify gene defects in MBL, FCN, SPA

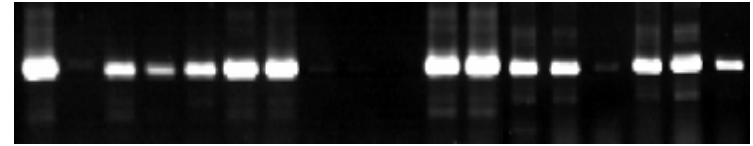
Develop genetic tests

Identify defects that impair health

Provide tests for breeding

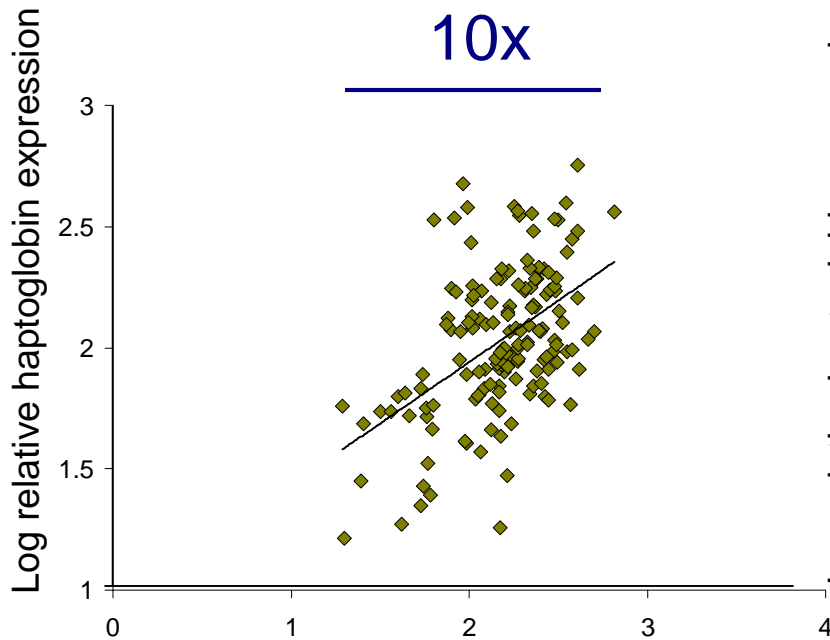
Variation in MBL production in pigs

Some pigs are very low in MBL-C



MBL-A

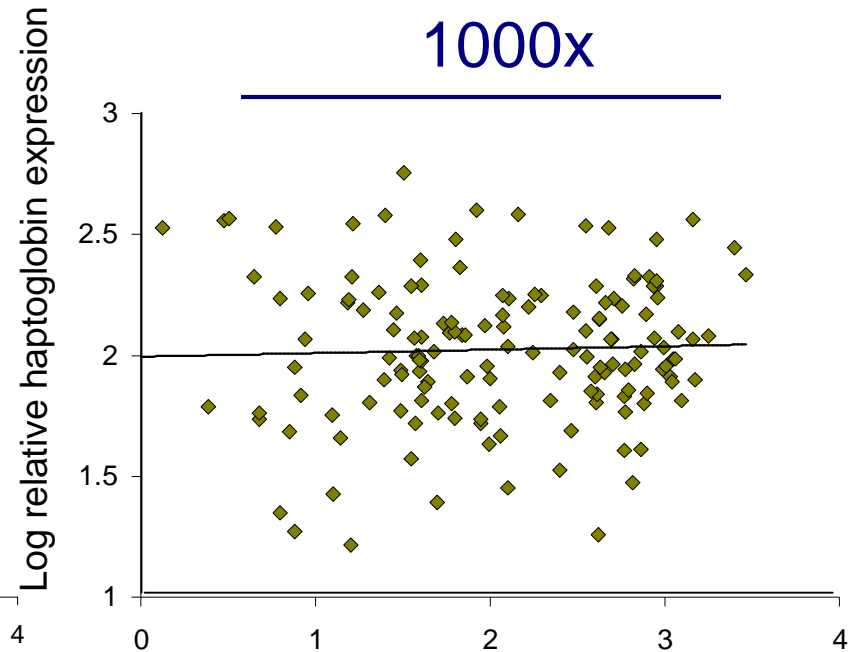
10x



Log relative MBL-A expression
n=152

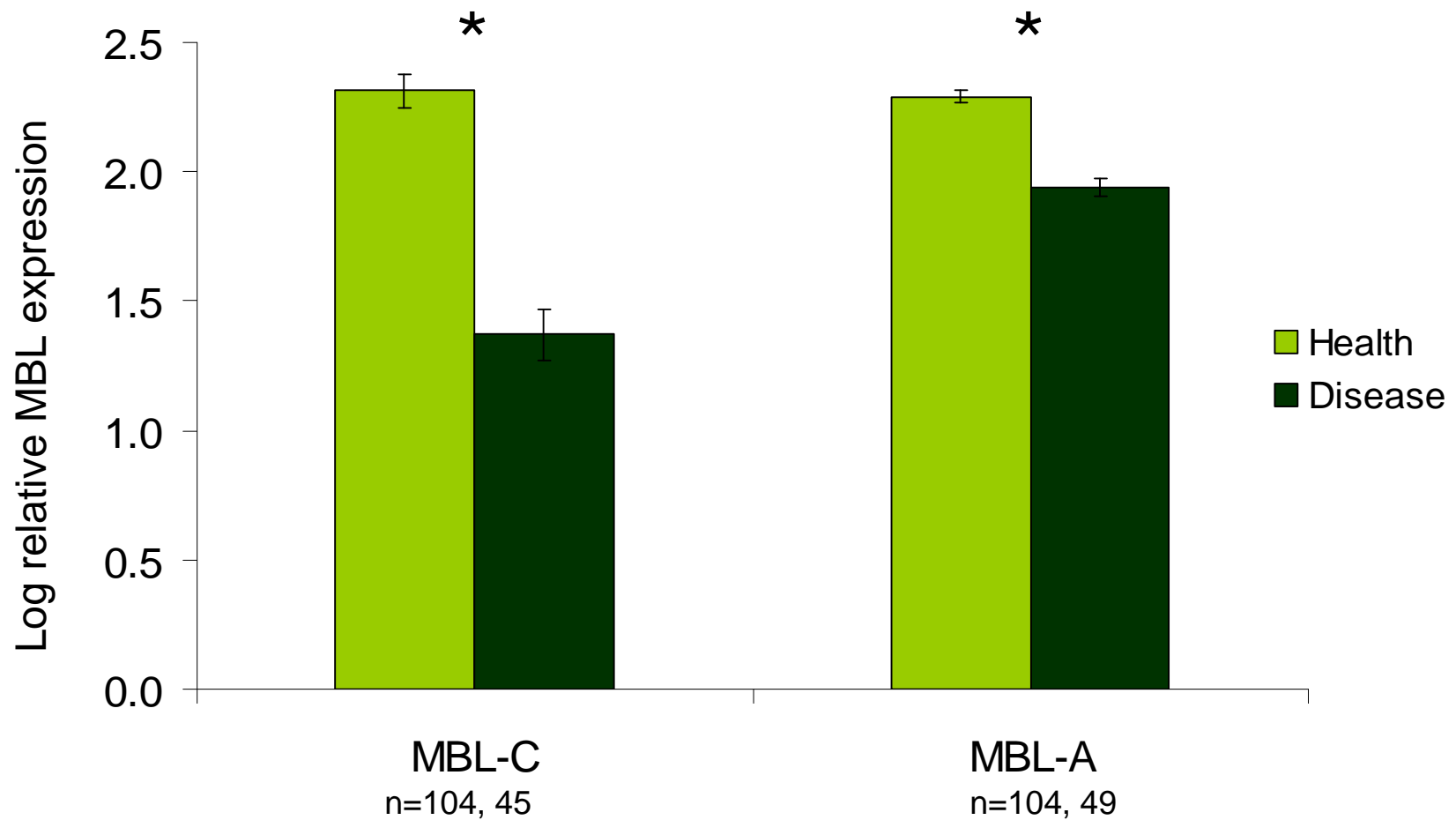
MBL-C

1000x

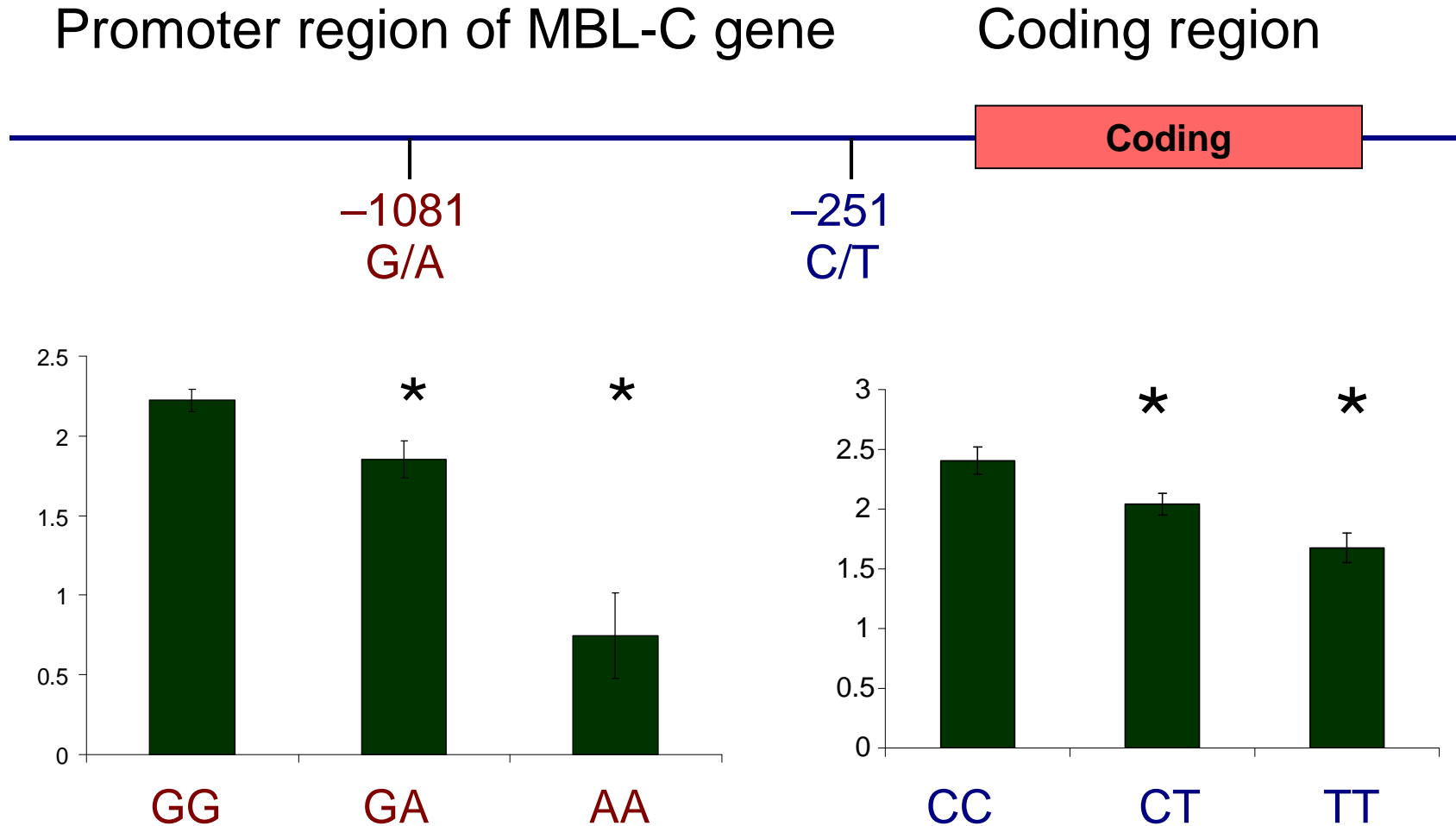


Log relative MBL-C expression
n=149

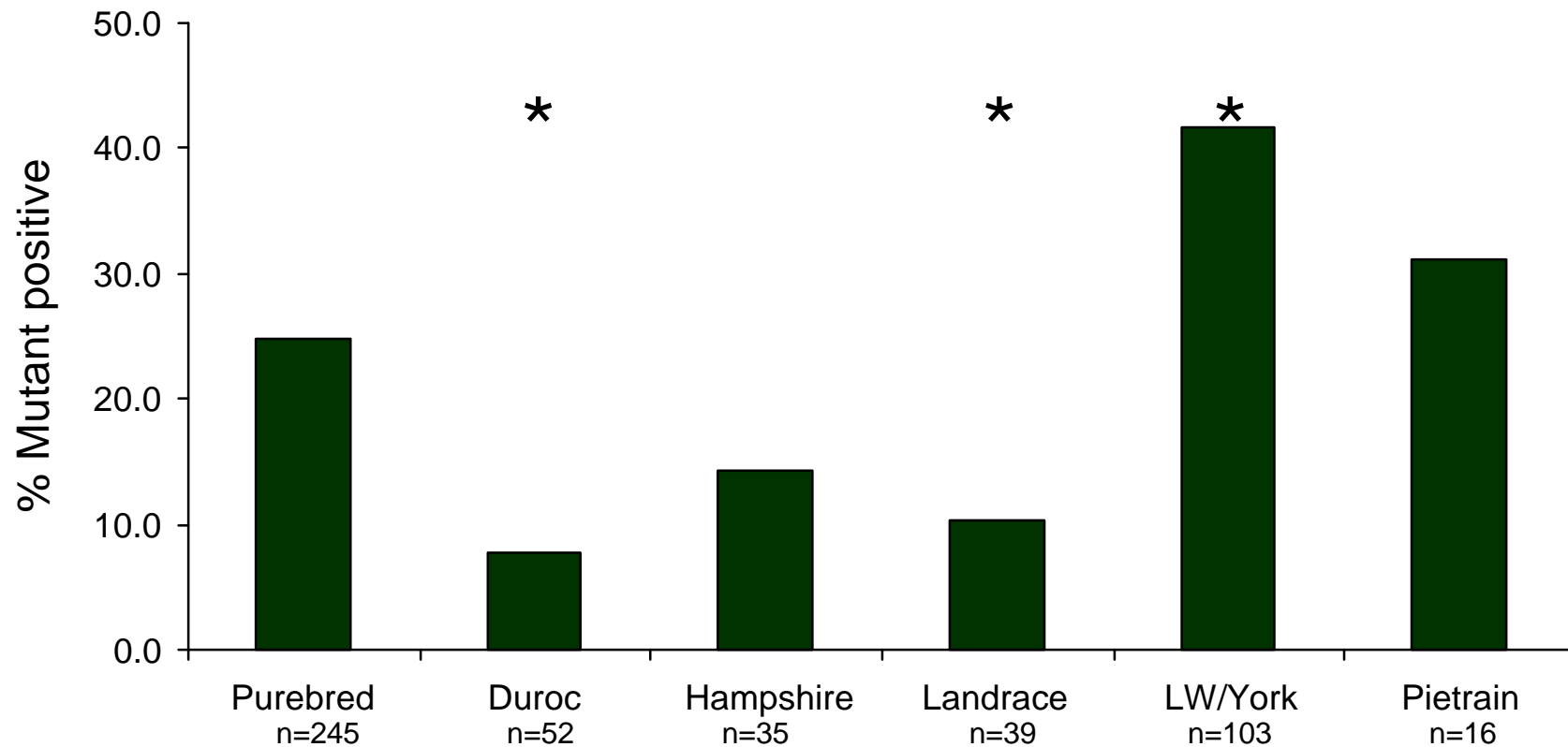
Reduced MBL-C and MBL-A in sick pigs



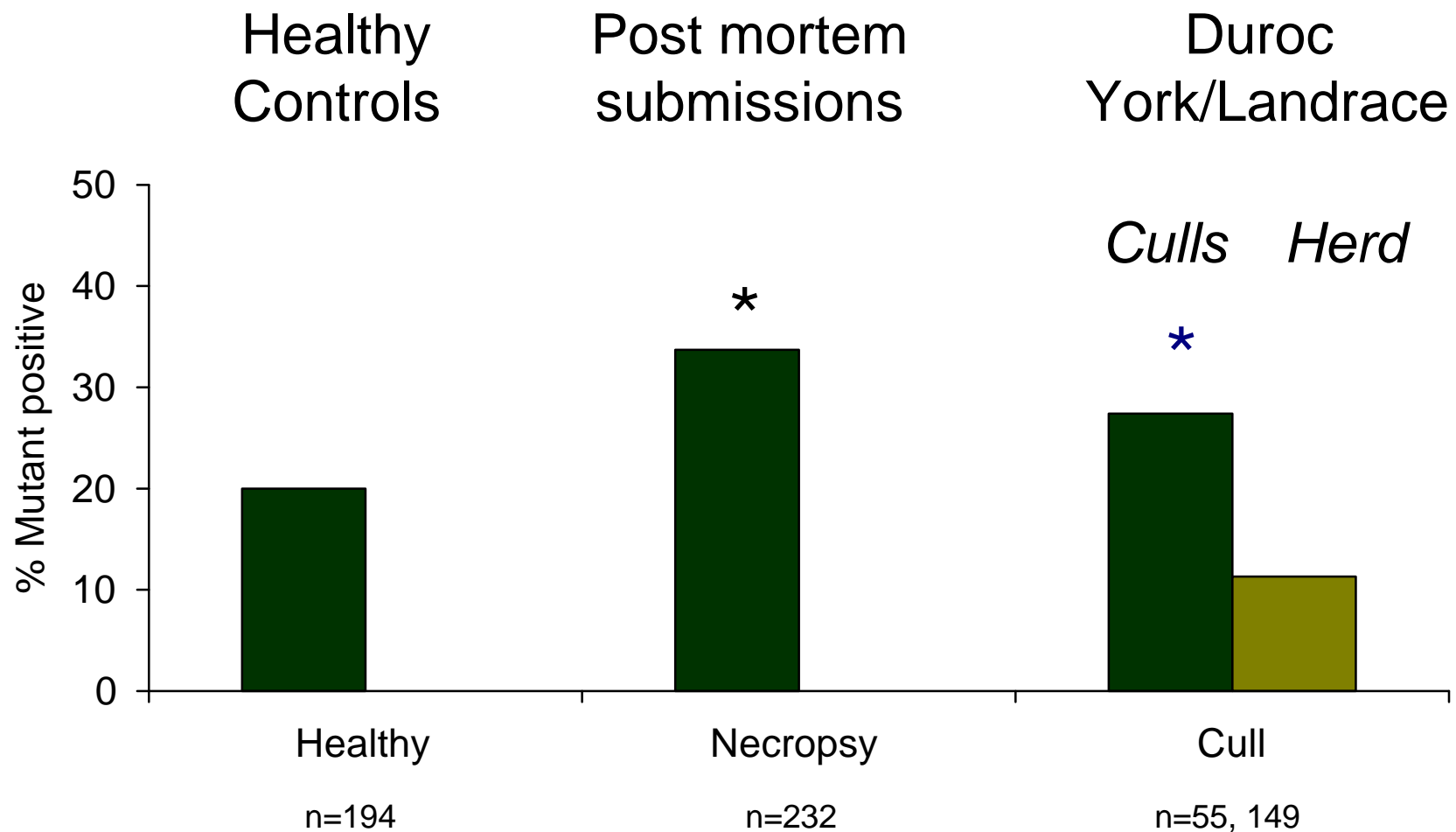
Two Mutations that Reduce Pig MBL-C



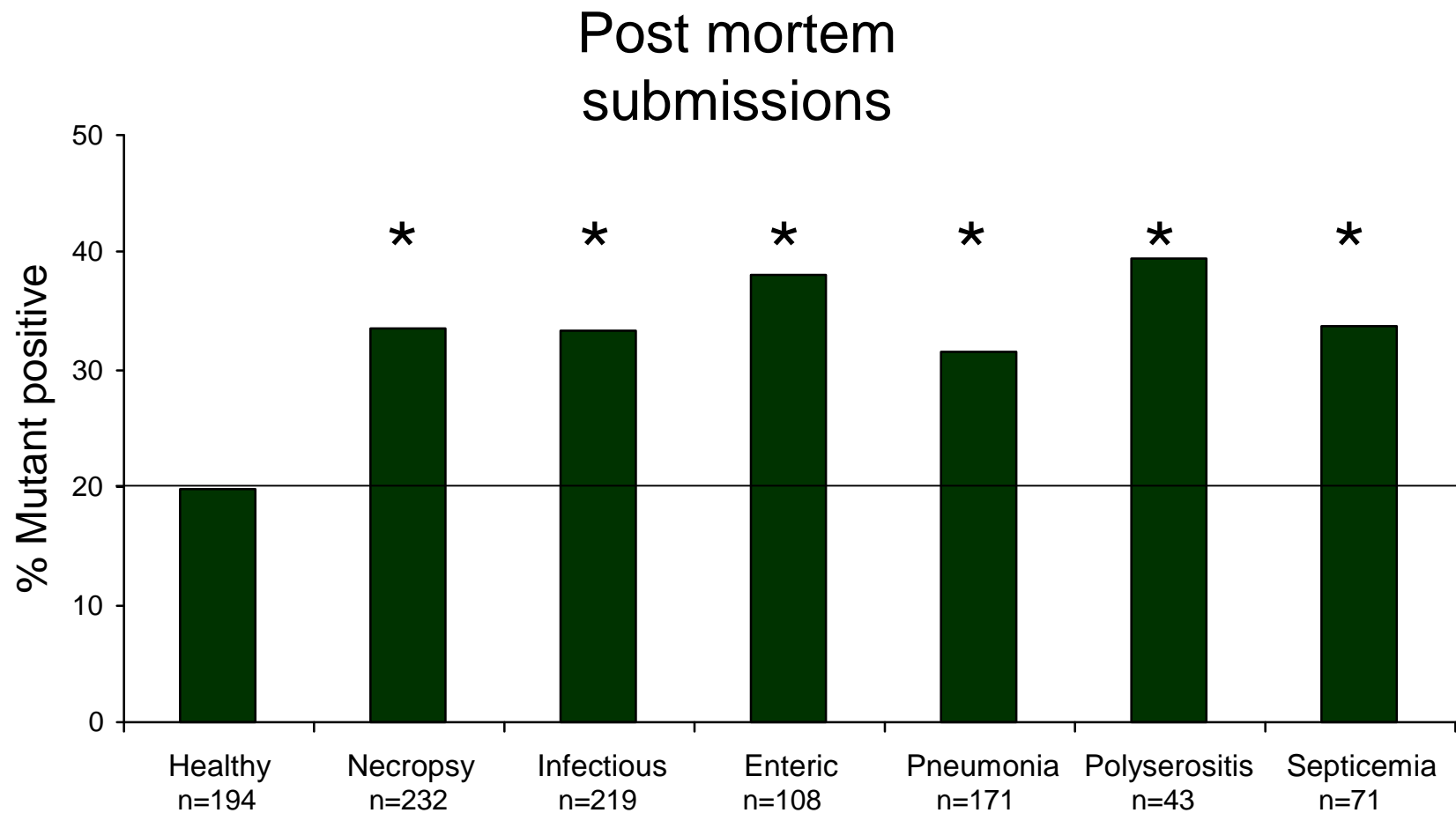
-1081 MBL-C Mutation in Major Breeds



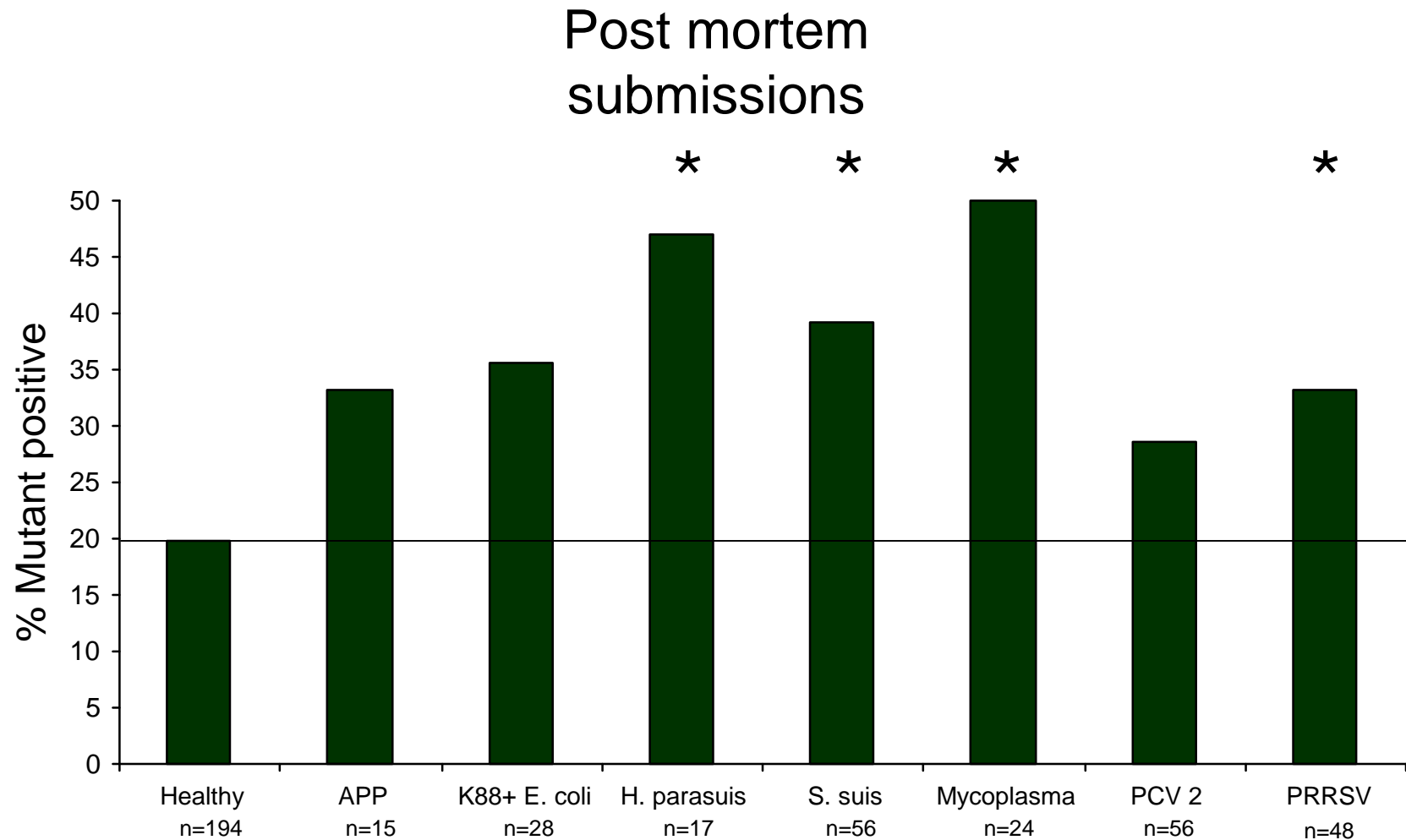
-1081 MBL-C Mutation in Cull Pigs



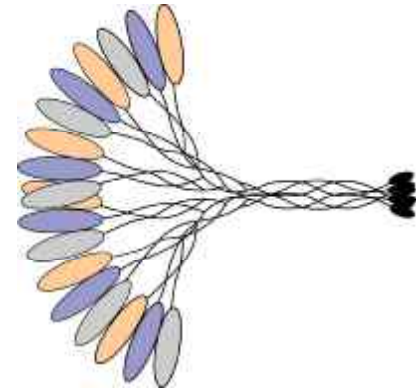
-1081 MBL-C Mutation in Diseases



-1081 MBL-C Mutation in Diseases



Summary



Several SNPs for reduced MBLs

- Present in various breeds
- Correlated with infectious diseases
- Correlated with reduced production
- Genetic tests available for DNA

SNPs in other lectins

Genetics and PRRS or PCV2

Line differences in PRRS infection

A.L. Vincent et al., J. Anim Sci 84:49-5, 2006.

Breed differences in PCV2 infection

T. Opriessnig et al., Vet Pathol 43: 281-293, 2006

Line differences in PCV2 infection

Mortality (%) in finishing units before and after PCV2

	Line A	Line B
Before PMWS	2.5%	3.5%
After PMWS	3.0%	7.5%

From R. Desrosiers Pig Letter vol 26, 2006

Anticipated benefits

Genetic tests for breeder selection
Eliminate those with defective MBL-C
Reduce impact of various diseases
Higher value breeders

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ONTARIO PORK



Ministry of Agriculture,
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