

genetic testing - essences and consequences

JT Epplen

human genetics chair, Ruhr university Bochum, Germany

VDH scientific commission

introduction

genetic structure of breeds

main

DNA test development

DNA test application: consequences

conclusions

reflections

- common diseases

Lundehund:



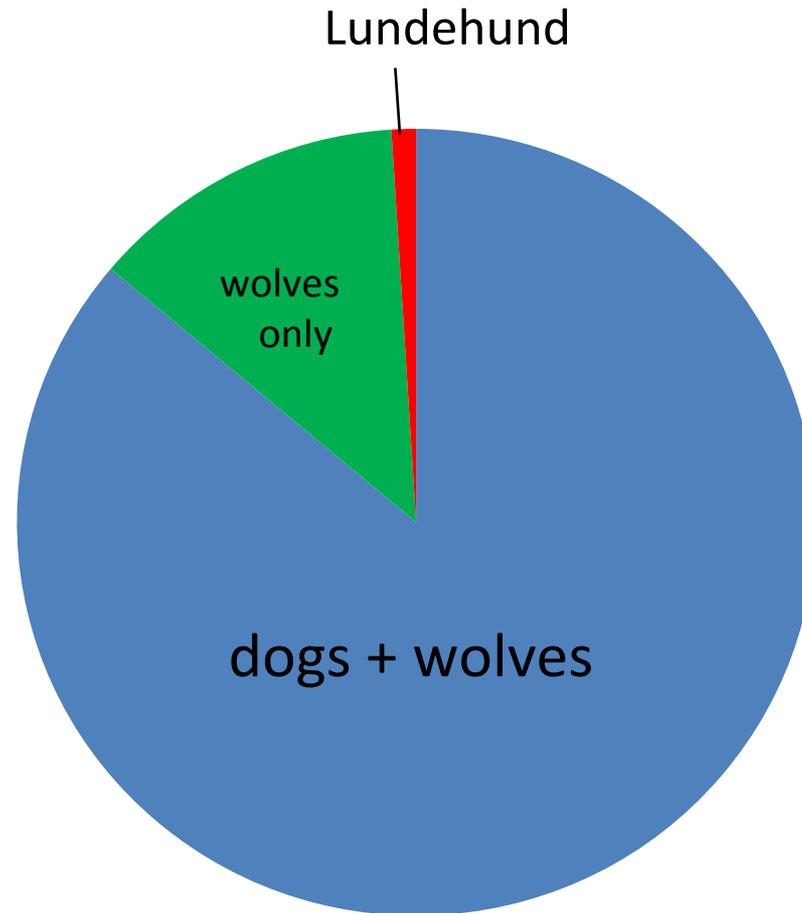
forebear each



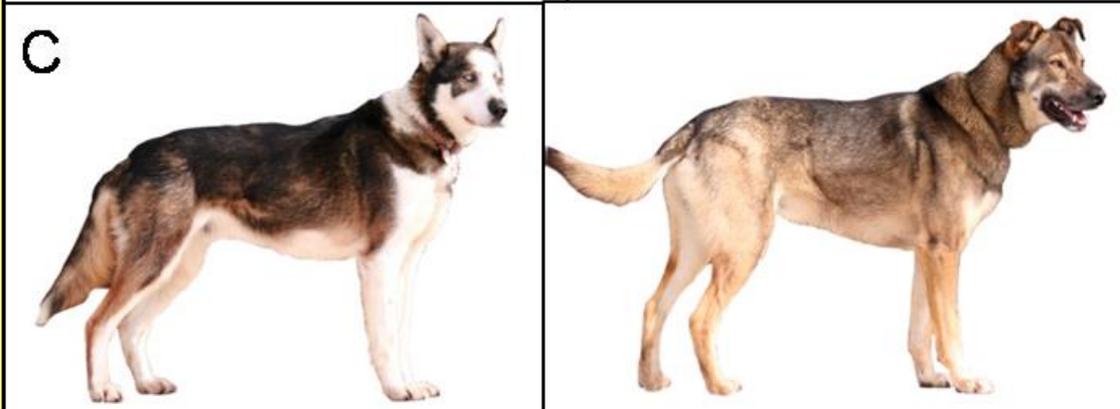
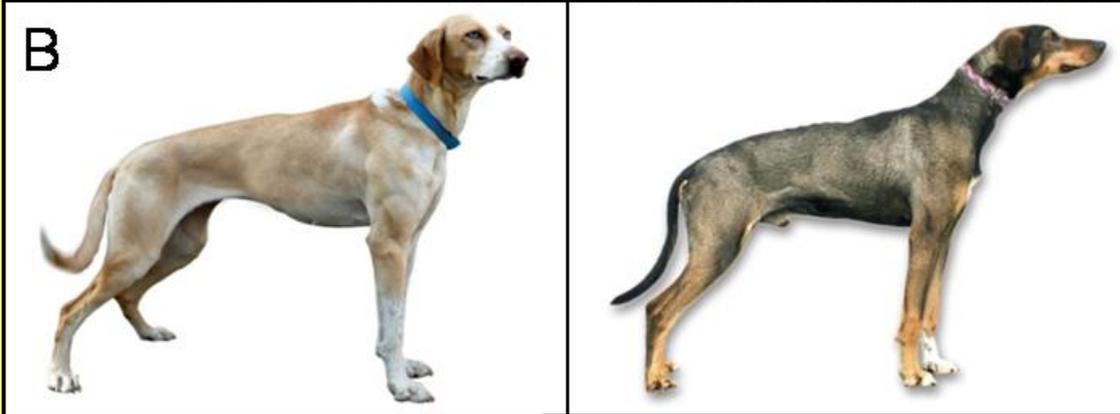
Low neutral genetic variability in a specialist puffin hunter: the Norwegian Lundehund

Claudia Melis*, Åsa A. Borg*, Ingvild S. Espelien† and Henrik Jensen*

ad genetic variability

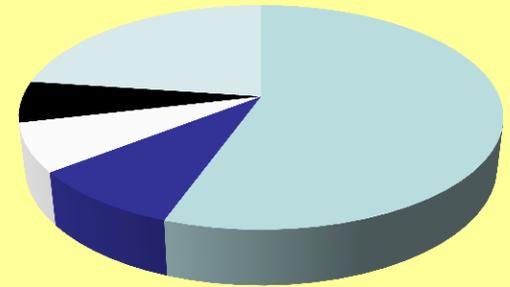


Alaska sled dog – „breed“

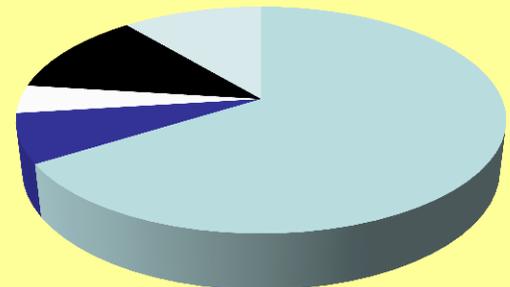


- ancient/asian group
- herding/sight hounds
- mountain group
- Mastiff/Terrier group
- hunting group

sprint



distance



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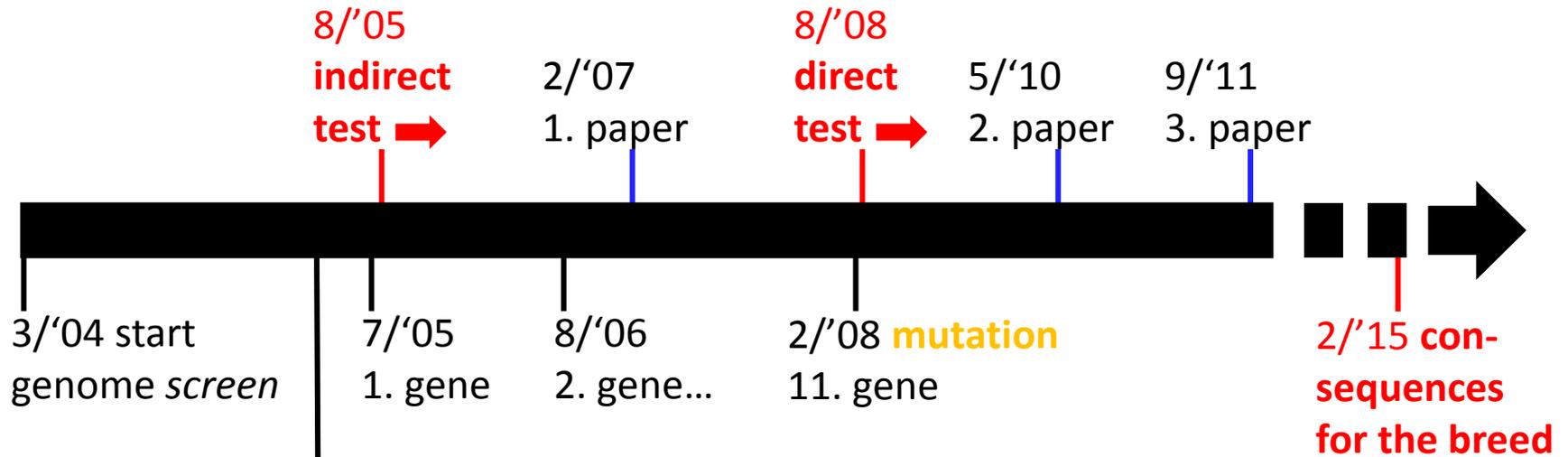
DNA test application: consequences

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DNA tests for gPRA in Schapendoes



6/'05
linkage
identified



*Quidquid agis, prudenter
agas et respice finem.*

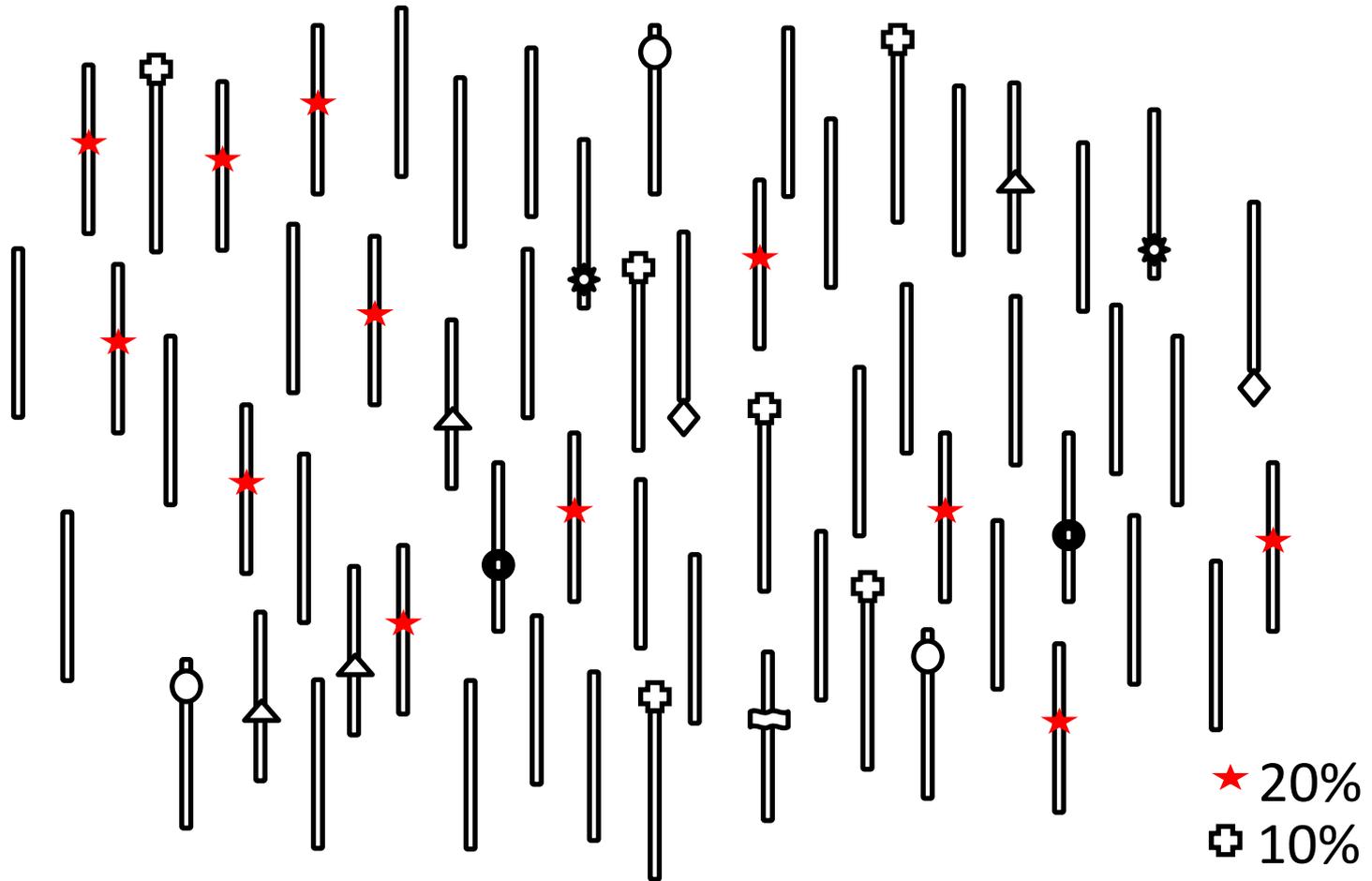
·58

MERCHANT OF VENICE.

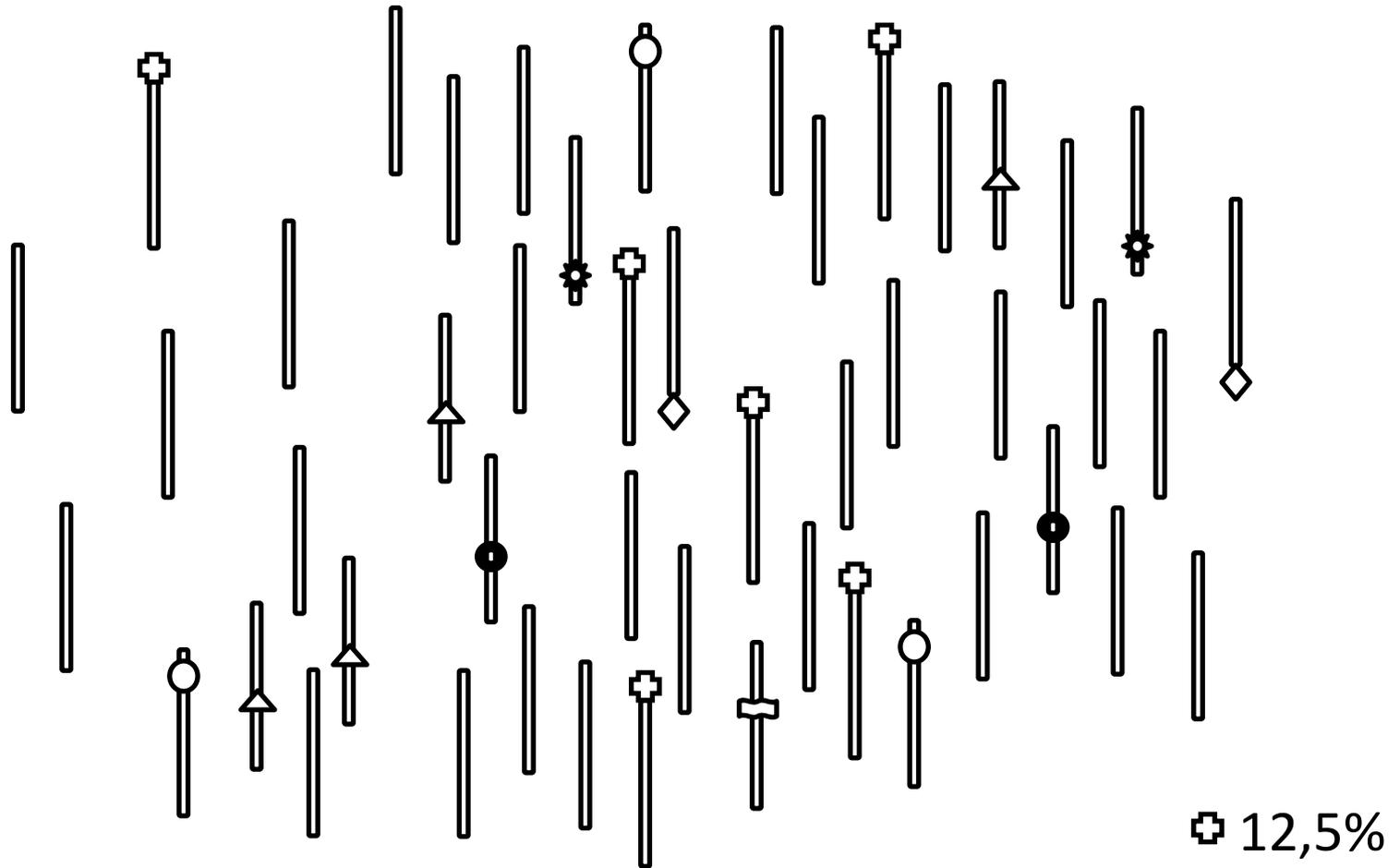
Thy plainness moves me more than eloquence².
And here choose I; Joy be the consequence!

Shakespeare 1600

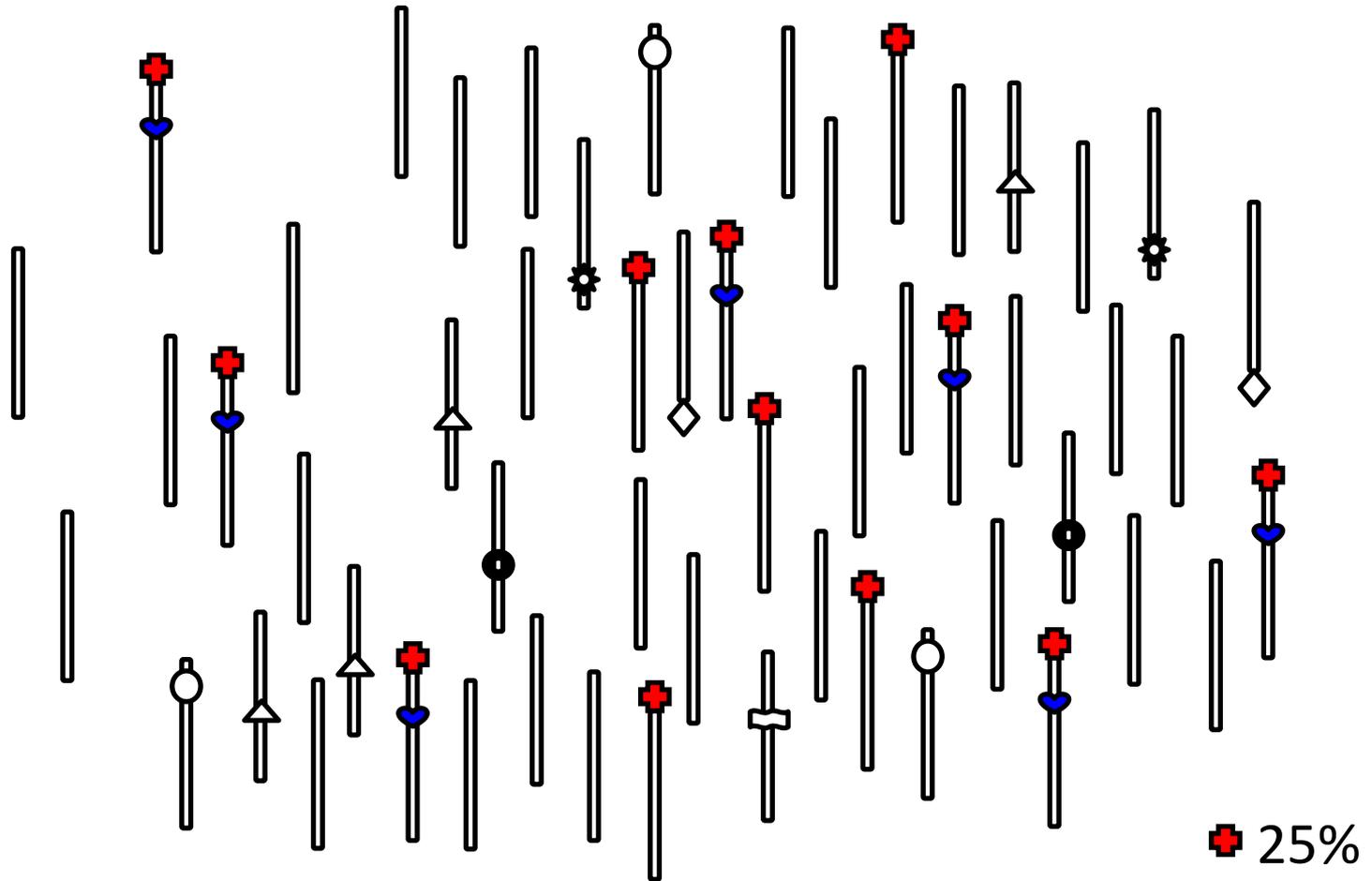
all chromosomes 20 before DNA testing



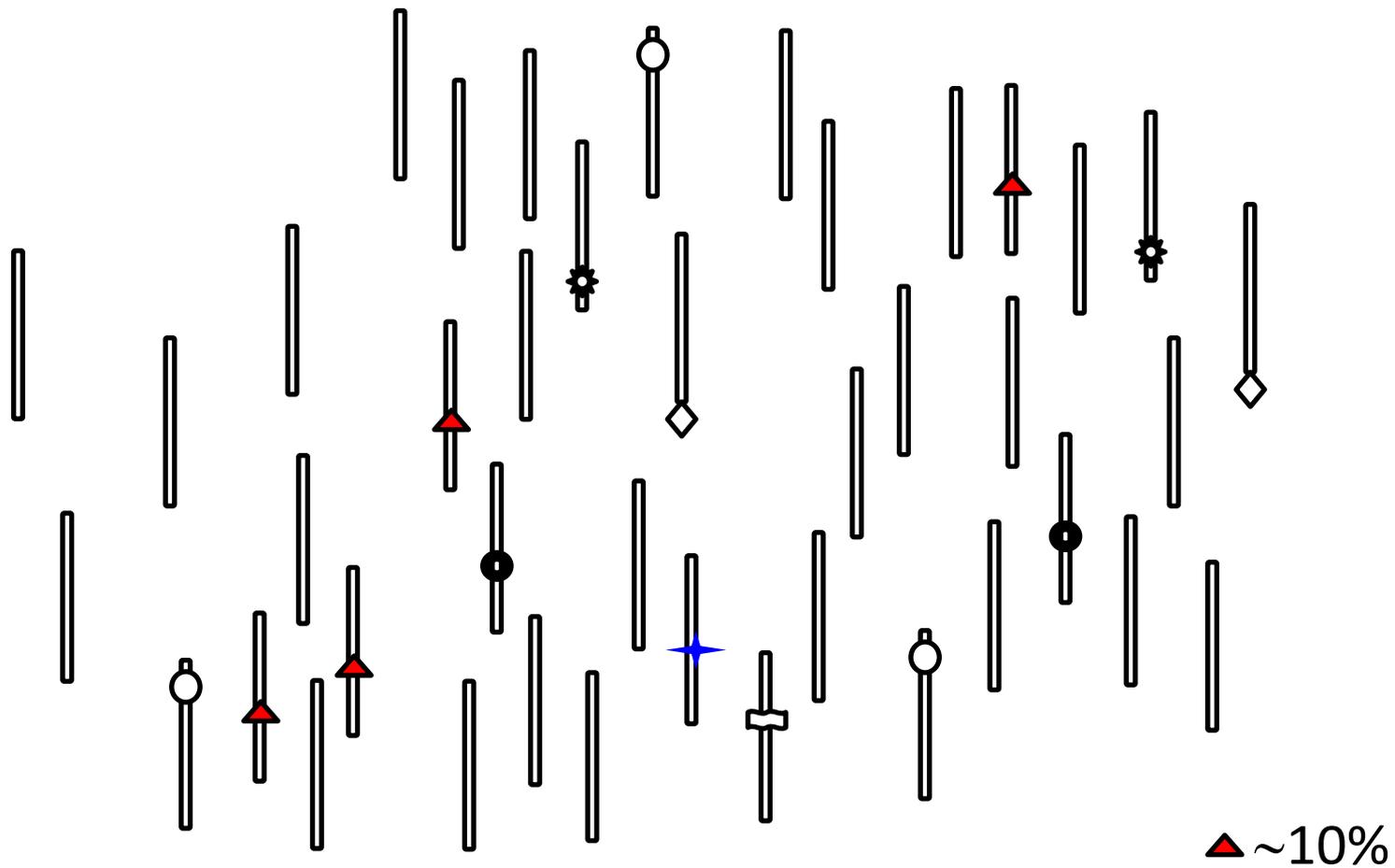
all chromosomes 20 after selective breeding



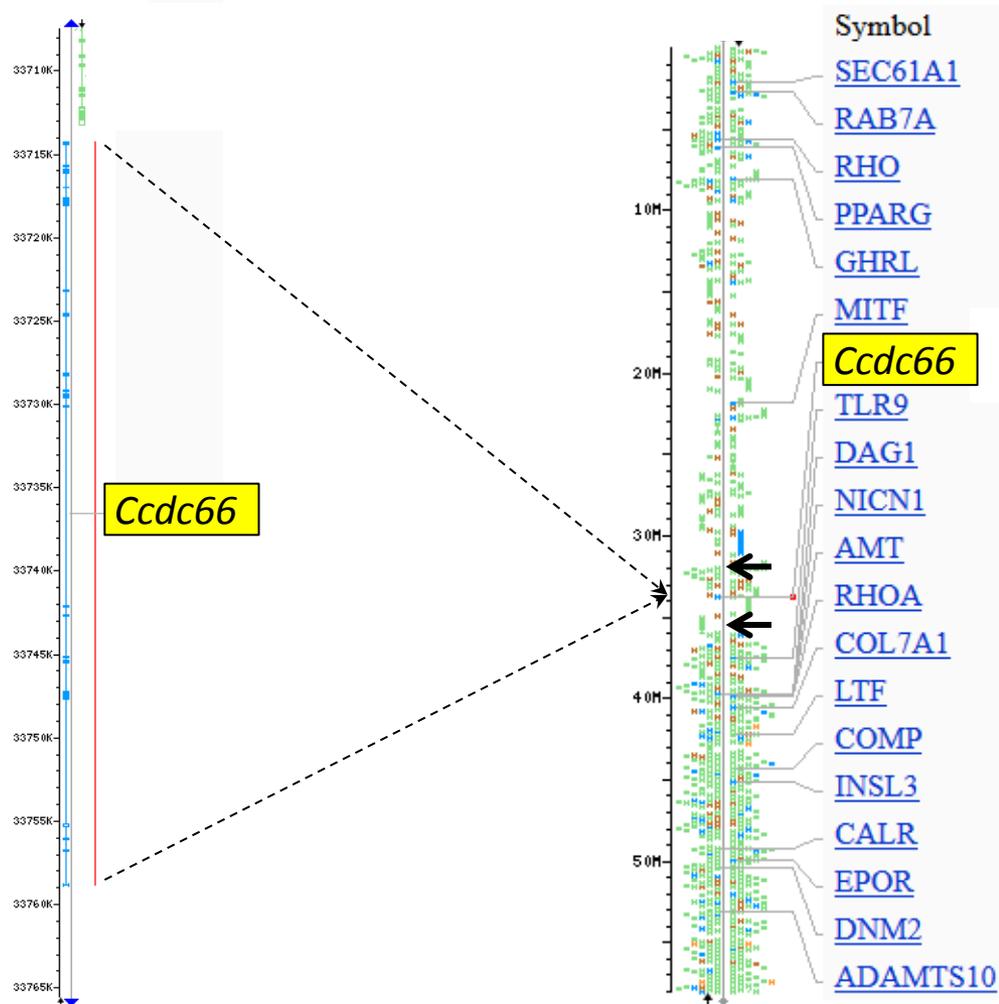
all chromosomes 20 selecting exterior



chromosome 20 → variable ↓



Ccdc66 gene and chromosome 20



variable markers flanking *Ccdc66* gene

→ new haplotypes in the population, variability ↑

consequences of eradication policy for a gPRA mutation in Schapendoes

- ▶ mutation frequency ↓
- ▶ paradoxon: genet. variability not ↓ **but** ↑ - why ?
- ▶ *secondary morbid gain*, breeding strategy changed:

lines used not used before (inbreeding coeff. 30→20)

→ kidney problems ↑

 brain teaser: prudent breeding policies



Public Health Genomics

learning from man: DNA tests *via* internet

DTC testing: discuss with your vet (genetic counselor)

health-related

- current tests provide partial picture of risks + pieces of genetic puzzles
- interactions (lifestyle, environment)
- results may falsely reassure or needlessly alarm

nutrigenetic

- tests for individualized diet plans misleading/harmful

non-medical

- tests for exterior, ancestry, personality have no implications for health;
validity / reliability questionable / inadequate

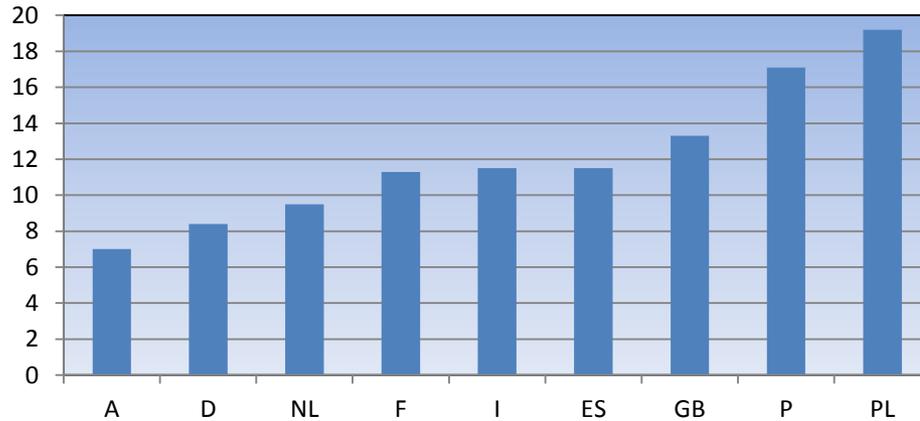
complex DNA tests

jurisdiction: *A dog is a product.*

dogs/costs in Europe

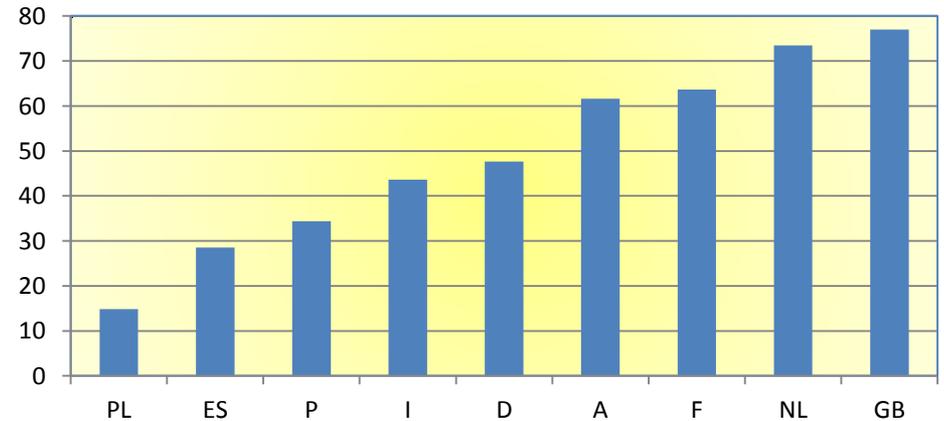
keeping dogs 2012

/100 inhabitants (FEDIAF)



pet costs 2013

€/inhabitant (ZZF)



DNA tests for common diseases

multifactorial traits (hip dysplasia, atopic dermatitis, epilepsy, cancer,
autoimmune diseases, bloat)

>250 growth genes in man

need of *genetic counselling* before DNA test

Müssen alle Hunde bald zum DNA-Test?

Current Biology



Available online 12 February 2015

In Press, Corrected Proof — Note to users

Report

Dogs Can Discriminate Emotional Expressions of Human Faces

Corsin A. Müller¹ ·  · , Kira Schmitt¹, Anjuli L.A. Barber¹, Ludwig Huber¹ ·  · 

genetic testing work shop

subject priorities to be voted on

DNA biobanking

„simple“ DNA testing

DNA test batteries / arrays

whole exome / genome analyses

breed (population) characterisation

additional issues

- identification
- DNA test-accompanied crossing
- top priority research themes
- DNA and (breeding club politics)
- commercial aspects