

Detection and confirmation of QTL for an adaptive immune response to KLH.

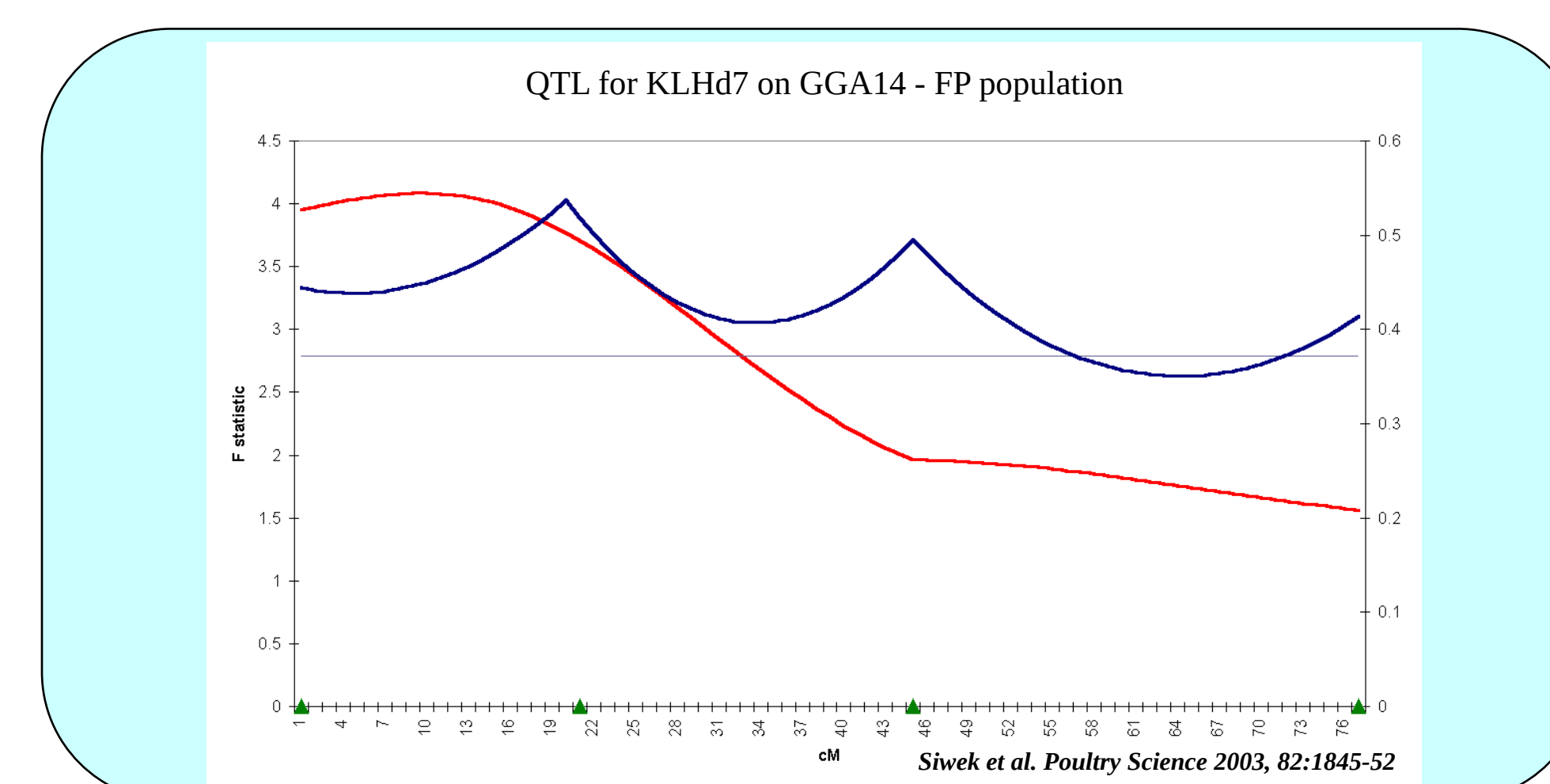
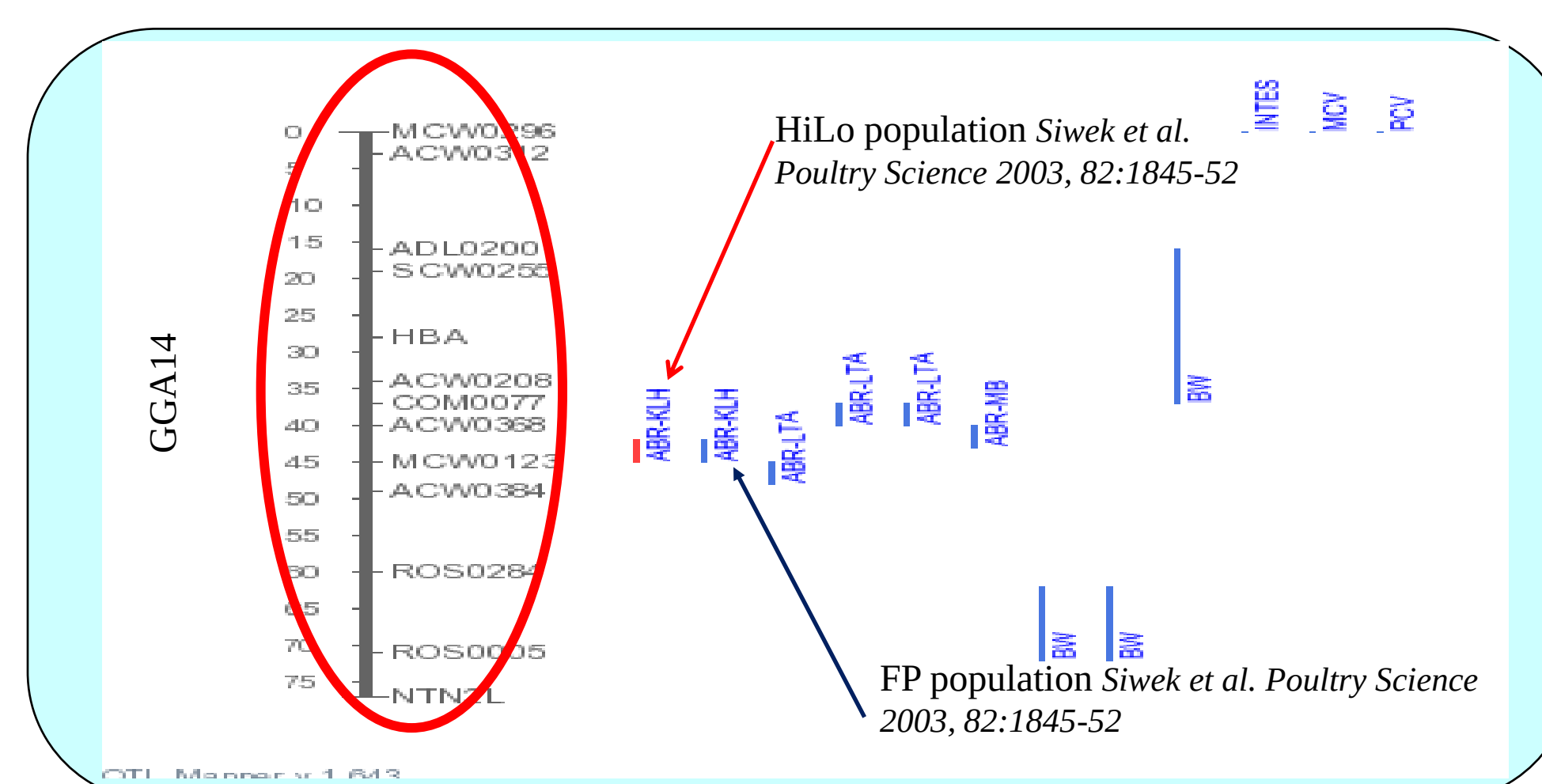
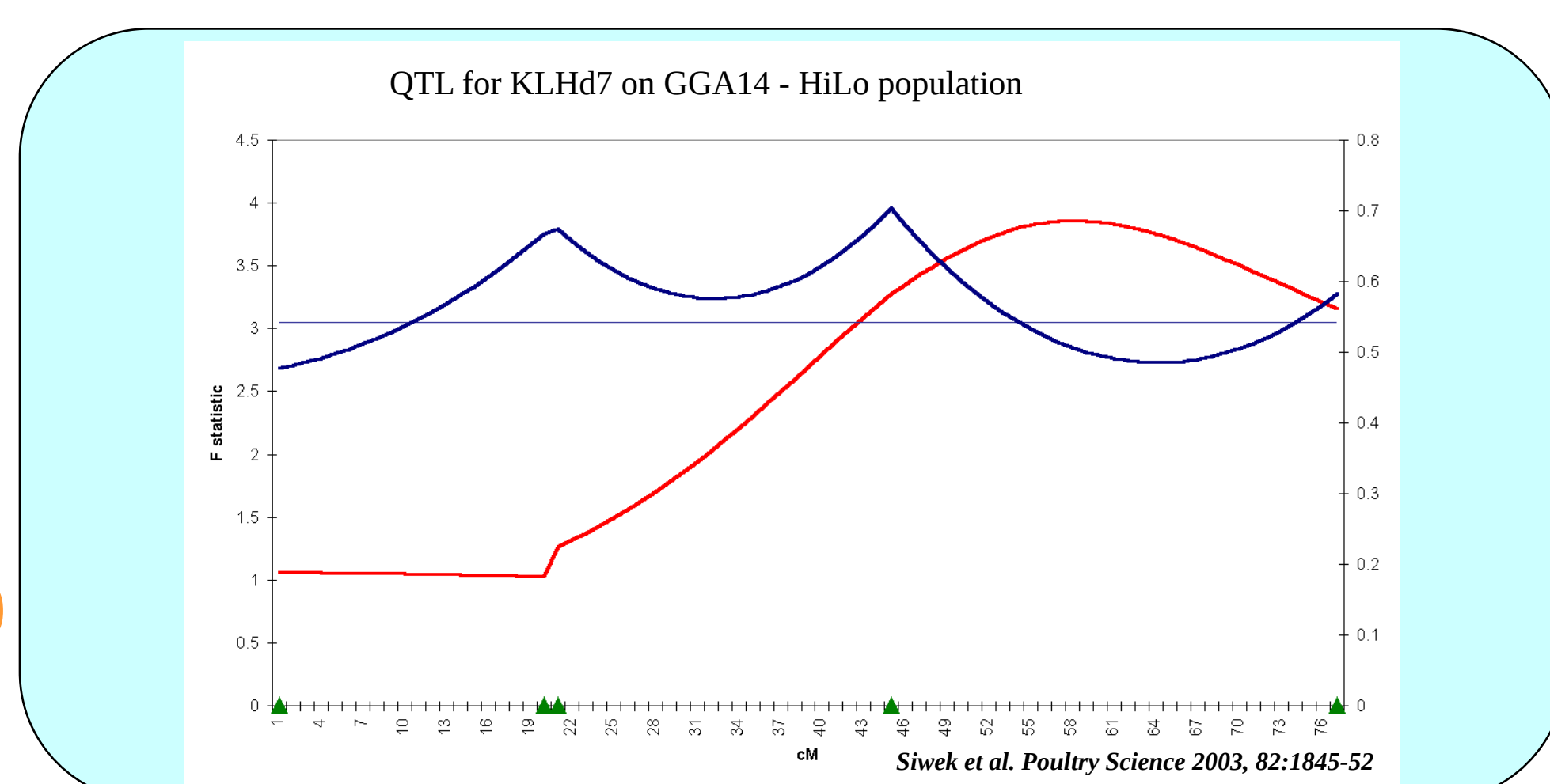
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Improvement of health of chickens by selection for enhanced general resistance to pathogens is an attractive alternative for veterinary health treatments. Quite often non pathogenic antigens (e.g. **Keyhole Lymphet Heamocyanin**) are applied as a selection criterion to increase overall immune response. Number of QTL to non pathogenic antigens which represents different type of immune responses has been already detected in various experiment.



GOAL: Verification of QTL for an adaptive immune response to KLH detected on GGA14

Materials & Methods: animals

F₀: Green-legged Partridge-like (GP) x White Leghorn (WL)

→ Birds challenged with KLH antigen



→ Parents selection based on response to KLH at day 7 (High /Low)

F₁: (GP x WL) x (GP x WL)



F₂: 500 animals



Materials & Methods: genotypes

7 microsatellite markers located on GGA14

Materials & Methods: phenotypes

specific immune response to Keyhole Lymphet Hemocyanin antigen (KLH)

Materials & Methods: statistical analysis

- Line cross model (GridQTL)
- Half sib model (GridQTL)
 - Paternal analysis (HS paternal)
 - Maternal analysis (HS maternal)
- LDLA analysis (Grid/LDLA)
 - Additive model
 - Dominant model

Results

Line / cross	KLHd0	KLHd7
WL	9.20 ± 1.58 ^a	12.62 ± 1.75 ^{ab}
GP	9.58 ± 1.21 ^a	12.64 ± 3.64 ^{ab}

a-b: Means in the same column and with no common letter differed significantly ($P \leq 0.05$)

Table 1. Antibody response to KLH day 0 and KLH day 7 in White Leghorn (WL) and Green-legged Partridge-like (GP)

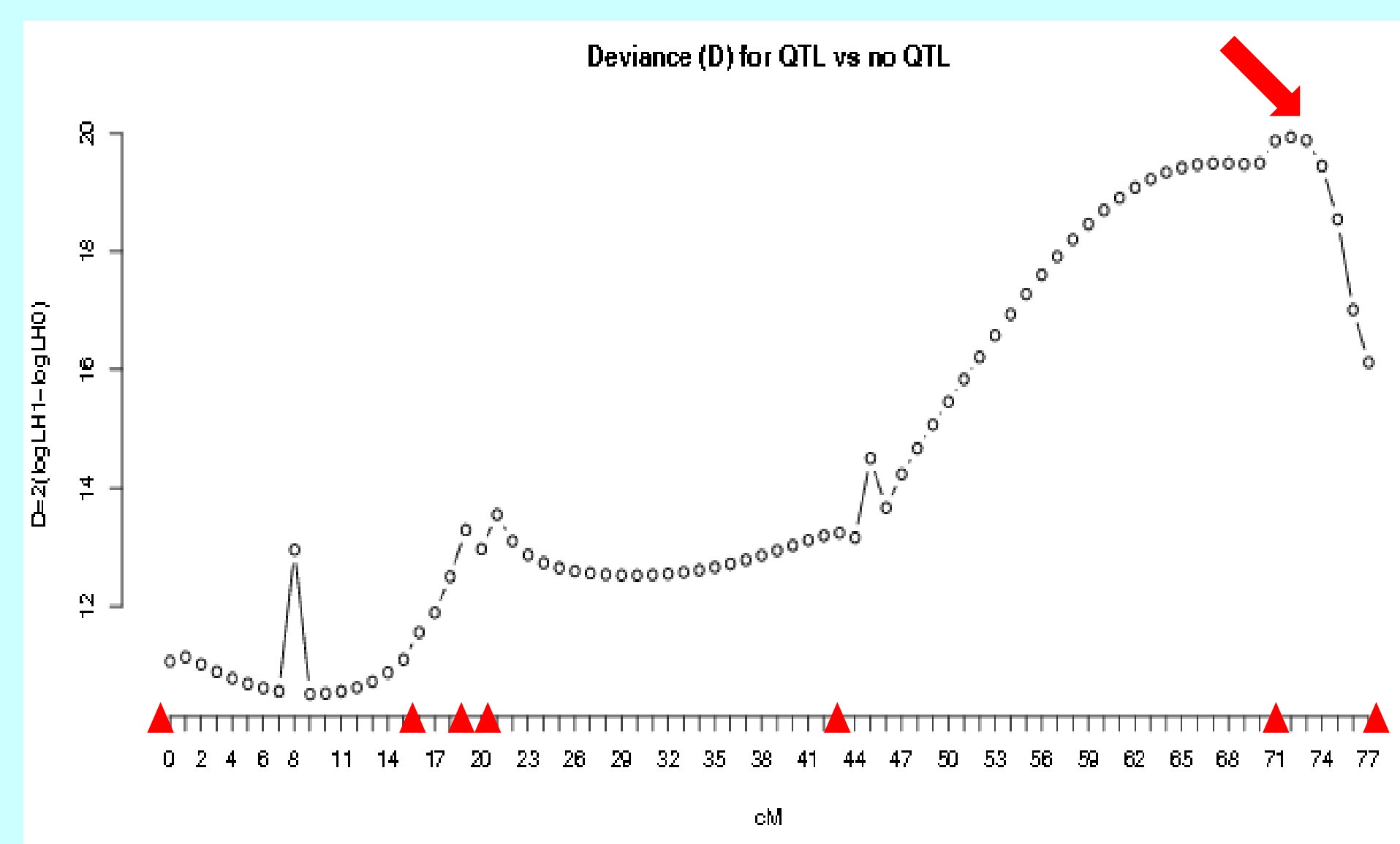


Figure 1. QTL for KLHd7 detected on GGA14 with LDLA additive model

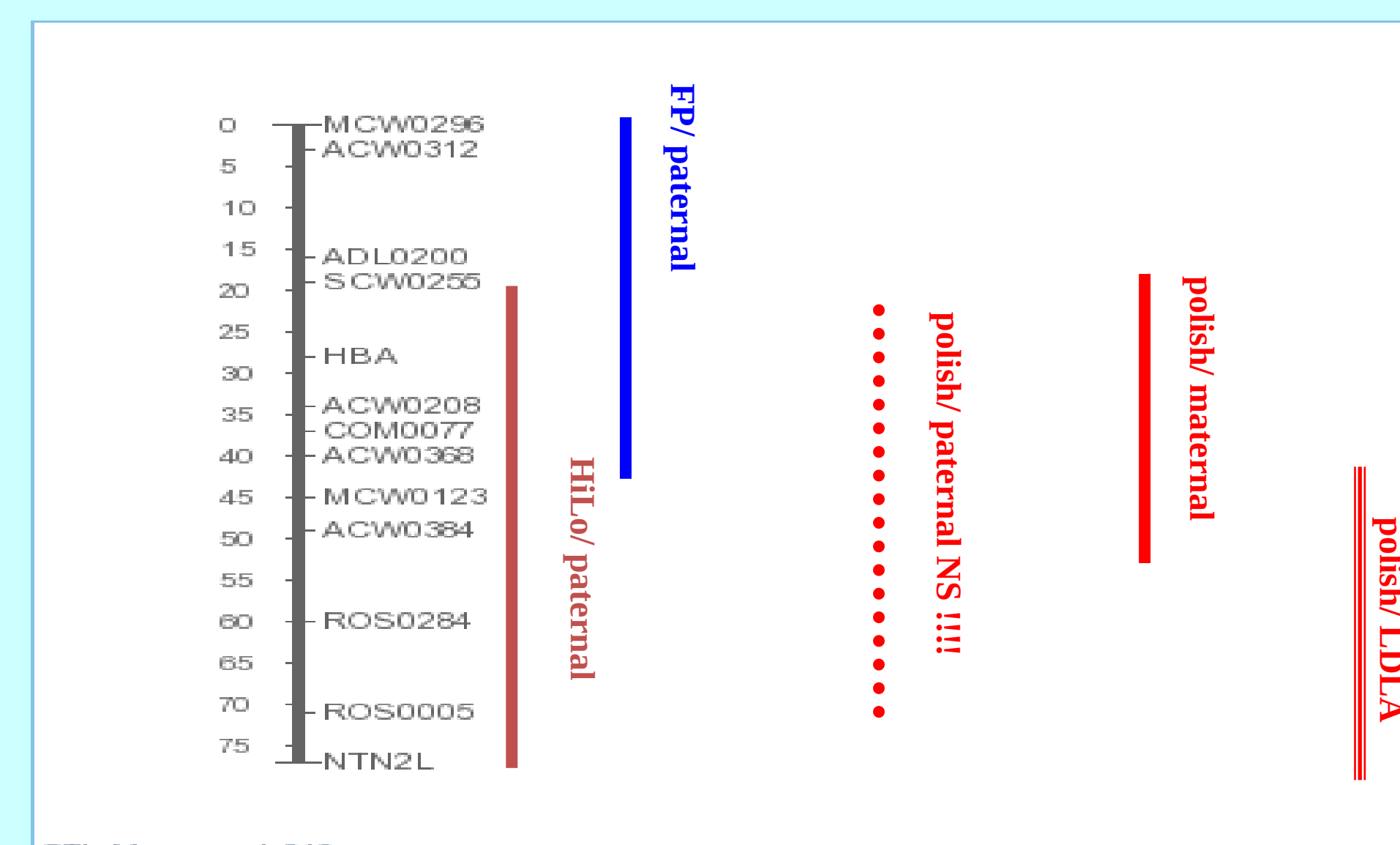


Figure 2. Summary of QTLs for KLHd7 detected on GGA14

Conclusions

1. There was no difference in antiobody response to KLHd7 (selection criterion) between two parental lines WL and GP.
2. Distal region of GGA14 was validated to harbour a quantitative trait loci linked to antibody response to KLH antigen in chicken, previously detected in HiLo and FP chicken populations. For the validation study an independent chicken experimental cross (WL x GP) was used.
3. LDLA (linkage analysis linkage disequilibrium) proved to be most powerful statistical tool for QTL detection.