

Exploring the statistical nature of independent chromosome segments



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BACKGROUND

- $r = \sqrt{\frac{Nh^2}{Nh^2 + M_e}}$ (Daetwyler et al., 2008)
- $M_e = 4N_eL$ (Stam, 1980)
 - Segment length $\approx \frac{1}{4}M$
- Dimensionality of $\mathbf{G} \approx 4N_eL$
- Independent chromosome segments (ICS) are additive; BV are a sum of these effects

OBJECTIVES

- Investigate statistical nature of ICS
- Estimate effects of hypothetical ICS to assess if all additive information can be explained in $4N_eL$ segments

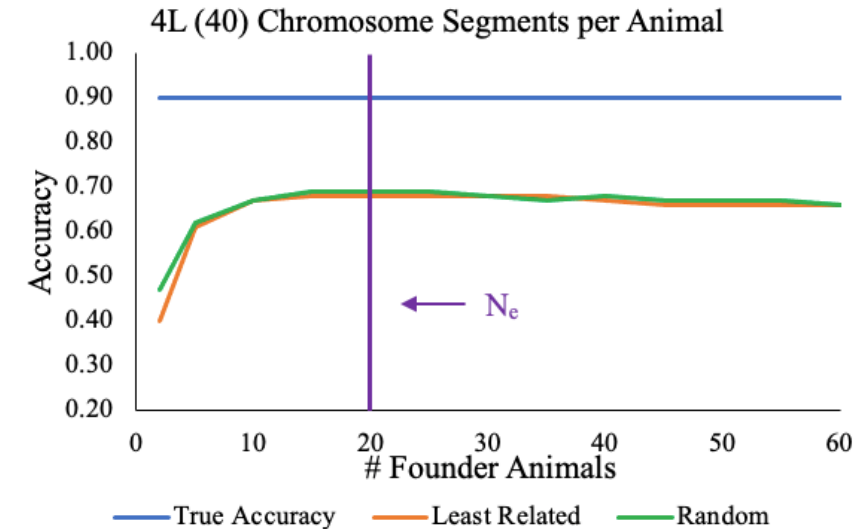
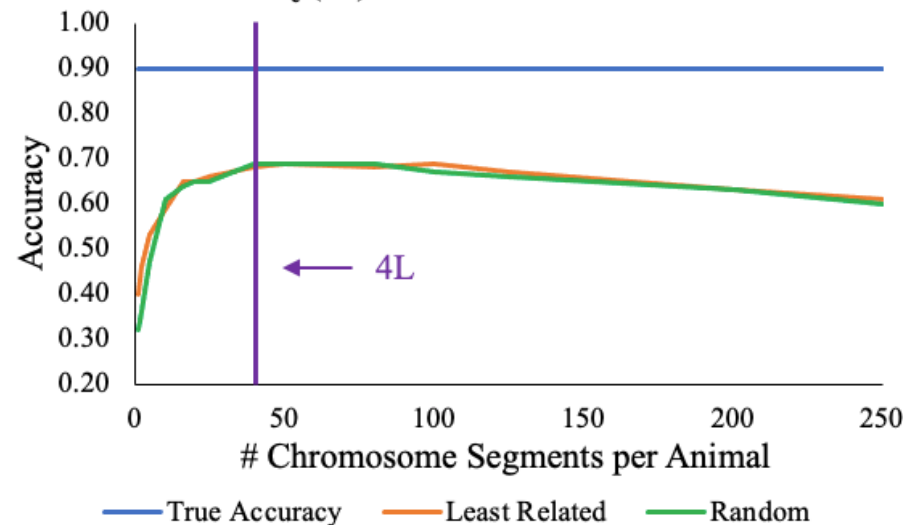
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METHODS

- QMSim
- $h^2 = 0.3, L = 10M, N_e = 20$
- $\mathbf{y} = \mathbf{1}'\boldsymbol{\mu} + \mathbf{Z}_s\mathbf{s} + \mathbf{e};$
 - $\mathbf{Z}_s\mathbf{s} =$ segment effects
- $cor(\mathbf{TBV}, \mathbf{Z}_s\hat{\mathbf{s}})$

RESULTS

N_e (20) Founder Animals



CONCLUSIONS

- Incorrect hypothesis
- Further investigation needed on definition of physical chromosome segments
- Research will continue with haplotypes and combinations of segments