

# Enhancing QTL detection power in multiparental populations

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We present a strategy to enhance power to detect QTL in multiparental populations. We demonstrate our approach in studies with Diversity Outbred and Collaborative Cross mice. A key element in our procedure is the inference of QTL allelic series in a multiparental cohort. We then use the allelic series in QTL detection in a distinct cohort. Specifically, we use the inferred number of QTL alleles (which may be less than the number of founders) when mapping in the second cohort. We complement our analyses with simulation studies in which we know the true allelic series. We also discuss implications for experimental design with multiparental populations.