

FINDING QUANTITATIVE TRAIT GENES THAT INFLUENCE MOUSE BEHAVIOUR

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ABSTRACT

Determining the genetic basis underlying individual differences in animal behaviour has largely resisted molecular characterization because of the small size of individual genetic effects and complex genetic architecture. Here we present a strategy that overcomes these problems and show that a regulator of G protein signaling (*rgs2*) is a quantitative trait gene influencing anxiety in mice. We show that it is possible to consider a commercially-available strain of outbred mice, MF1, as a mosaic of standard laboratory strains of mice, thereby providing much greater power and higher resolution than standard genetic association methods allow for mapping quantitative trait loci. We dissect a quantitative trait locus, previously mapped to a 4 megabase region on mouse chromosome 1, into three regions, one of which contains *rgs2*. We apply quantitative complementation testing in the mouse, to investigate whether *rgs2* is a quantitative trait gene. This combination of approaches is relatively quick and cheap to perform and should be applicable to the analysis of any quantitative trait.