

GENETICS

Supporting Information

<http://www.genetics.org/cgi/content/full/genetics.109.100362/DC1>

Expression Quantitative Trait Loci Mapping With Multivariate Sparse Partial Least Squares Regression

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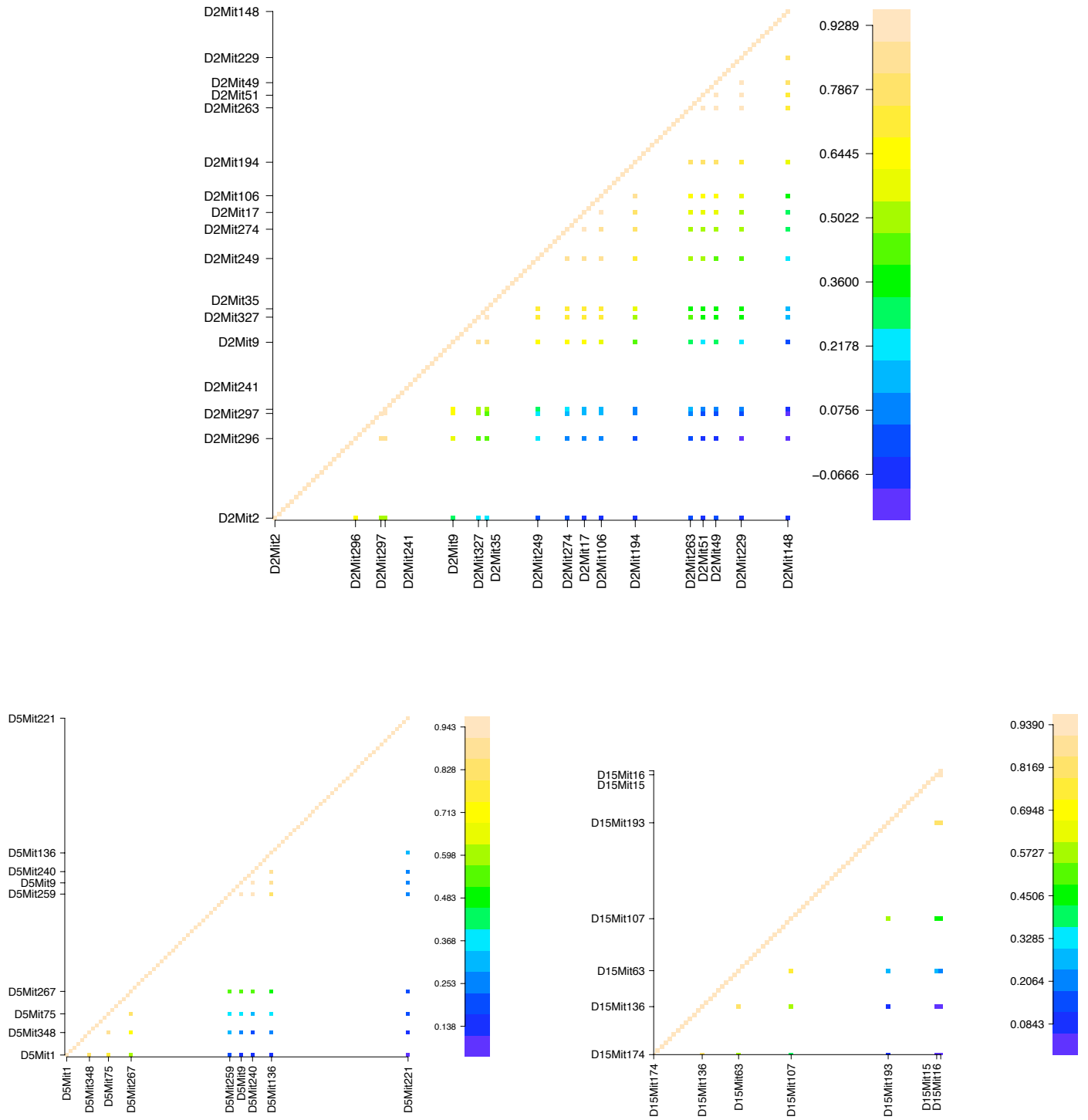


FIGURE S1.—Top: Pairwise correlations for 17 markers on chromosome 2. First marker starts at 0cM and the last one is at 121.6cM. Bottom: Pairwise correlations for 9 markers (starting at 0cM and ending at 90.1cM) on chromosome 5 (left) and 7 markers (starting at 0cm and ending at 70.6cM) on chromosome 15 (right).

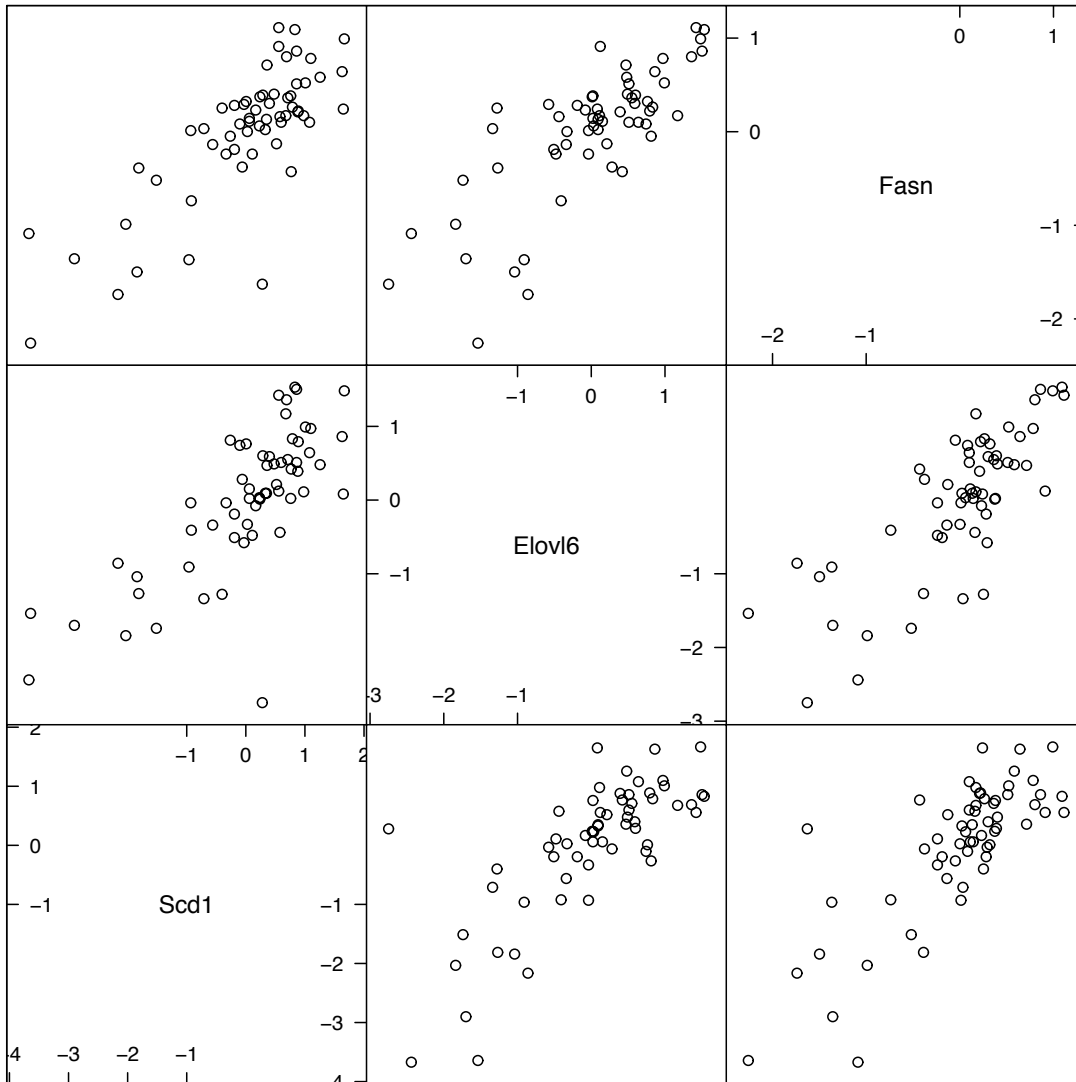


FIGURE S2.—Pair plots of the expression of three lipid metabolism transcripts across 60 mice.

FILE S1

Software: R package SPLS is available on <http://cran.r-project.org/web/packages/spls/>.

TABLE S1
Parameters for simulation B

	<i>B-1</i>	<i>B-2</i>
Nonzero comp. of	$(w_{20}, w_{31}, w_{39}, w_{78}, w_{90}, w_{110})$	$(w_{19}, w_{20}, w_{45}, w_{46}, w_{118}, w_{119})$
the direction vector	$= (0.343, 0.343, 0.514, 0.514, -0.343, -0.343)$	$= (0.343, 0.343, 0.514, 0.514, -0.343, -0.343)$
Control Size	transcripts 1-5: (3,3,2,2,5)	
	$Y_i = \gamma_i Y_3 + \epsilon_i, i = 6 \dots 30$	
	$Y_i = \gamma_i Y_5 + \epsilon_i, i = 31 \dots 50$	
	$\gamma_i \sim \mathcal{N}(0.8, 0.1), \epsilon_i \sim \mathcal{N}(0, 0.04)$	

Expression measurement of transcript i is represented by Y_i . Transcripts 1-5 are directly controlled by an architecture, and the remaining are trans-regulated by other transcripts.

TABLE S2**Components of the direction vectors for simulation C-1**

$r = 3$	$r = 10$
$w_j = 0.577, j = 11, \dots, 13.$	$w_j = 0.316, j = 11, \dots, 13, 40, \dots, 43, 74, 136, \dots, 137.$
$w_j = 0, j = 1, \dots, 10, 14, \dots, 145$	$w_j = 0, \text{everywhere else.}$

The final marker-specific regression coefficients are obtained by multiplying the direction vectors with weak ($c = 1$) or strong ($c = 2$) control sizes.

TABLE S3**Components of the direction vectors for simulations C-2 and C-3**

	w^1	c^2	w^2	c^2
C-2.1	$w_j^1 = 0.577,$ $j = 11, 12, 13.$ $w_j^1 = 0$ $j = 1, \dots, 10, 14, \dots, 145.$	0.5	$w_j^2 = 0.707,$ $j = 136, 137.$ $w_j^2 = 0$ $j = 1, \dots, 135, 138, \dots, 145.$	1.5
C-2.2	same as above	1	same as above	3
C-3	same as above	$\sim \text{Unif}(-0.3, 0.3)^*$	same as above	1.5

Direction vectors for the first and second hidden components (i.e., eQTL mechanisms) are represented by w^1 and w^2 and the corresponding control sizes are by c^1 and c^2 , respectively. *: The control size is set to 0.5 for transcript number 30.