

Example Gene Expression Experiments

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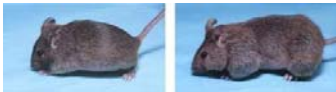
Gene Expression Experiments

- From a statistical point of view, gene expression experiments are experiments in which thousands of response variables (mRNA levels) are measured for each experimental unit.
- In microarray experiments, each of the thousands of response variables is modeled as a continuous random variable.
- In next generation sequencing experiments, each of the response variables is a count.

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Using Microarrays to Identify Genes Involved in Muscle Development

Wild-Type Mouse



Myostatin Knockout Mouse



Belgian Blue cattle have a mutation in the myostatin gene.

Steelman, C. A., Recknor, J. C., Nettleton, D., Reecy, J.M. (2006). *The FASEB Journal*. 10.1096/fj.05-5125fje.

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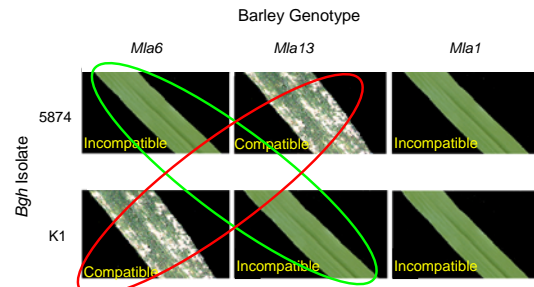


B73 F1 Mo17 B73 F1 Mo17

Swanson-Wagner, Jia, DeCook, Borsuk, Nettleton, Schnable (2006) *Proceeding of the National Academy of Science*. 103, 6805-6810.

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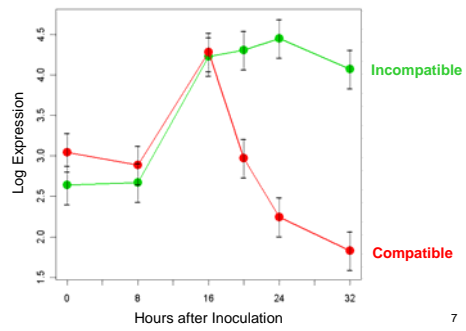
Identifying Genes Involved in Pathways That Distinguish Compatible from Incompatible Interactions



Caldo, Nettleton, Wise (2004). *The Plant Cell*. 16, 2514-2528.

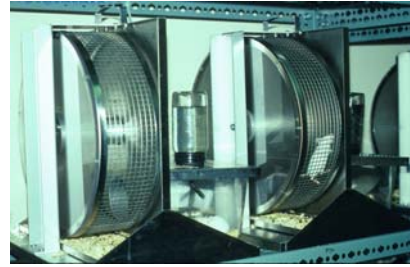
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An Example Gene of Interest



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Gene Expression in Brains of Mice Selected for High Voluntary Exercise



Bronikowski, Rhodes, Garland, Prolla, Awad, Gammie (2004) *Evolution* 58, 2079-2086.

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