Tested Studies for Laboratory Teaching
Proceedings of the Association for Biology Laboratory Education
Vol. 36, Article 40, 2015

Use of Molecular Markers to Map a Trait in *Arabidopsis thaliana*

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Genetic linkage mapping is initially taught to students in lectures using morphological traits. Many genetics lecture courses also introduce students to the idea of linkage mapping with molecular markers, but students struggle to understand that bands on gels are just another segregating phenotype used for linkage analysis. In this laboratory exercise students perform PCRs with a series of different mapped primers on small populations of Arabidopsis plants to map a mutation with an obvious visual phenotype to a physical location on a chromosome. The different primers tested amplify different SSLP (short sequence length polymorphism) alleles segregating in the F2 plants tested. The PCR results are easily visualized on agarose gels. Students are able to analyze their data and powerfully show where crossovers had to have occurred in the F1 parent to create the recombinants they observe in the F2. Students demonstrate an understanding of the interconnected concepts of meiosis, segregation, crossing over and linkage. In this workshop, participants will have an opportunity to analyse real student data to both estimate the location of the mutation on a specific chromosome and, tell the story of where specific crossovers occurred in the parents of some individual plants. By being able to do both these tasks participants will understand why this lab exercise works so well, not just to teach molecular markers, but to have students take ownership of the fundamental genetic principles we want them to know as biologists.

Mission, Review Process & Disclaimer

The Association for Biology Laboratory Education (ABLE) was founded in 1979 to promote information exchange among university and college educators actively concerned with teaching biology in a laboratory setting. The focus of ABLE is to improve the undergraduate biology laboratory experience by promoting the development and dissemination of interesting, innovative, and reliable laboratory exercises. For more information about ABLE, please visit **http://www.ableweb.org/**

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Citing This Article

Klenz, J. 2015. Use of Molecular Markers to Map a Trait in *Arabidopsis thaliana*. Article 40 in *Tested Studies for Laboratory Teaching,* Volume 36 (K. McMahon, Editor). Proceedings of the 36th Conference of the Association for Biology Labora-tory Education (ABLE). http://www.ableweb.org/volumes/vol-36/?art=40