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Wisconsin Fast Plants and Inquiry Based Laboratories

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Wisconsin Fast Plants provide a variety of possibilities for inquiry based laboratory experiences. We will discuss several examples with demonstration materials available for examination and look forward to a lively exchange of ideas. Fast Plants make it possible for students to examine phenotypes and the associated genotypes by following plants through multiple generations. Selection for any one of a number of traits can be accomplished at a population level to evaluate inheritance. For example, students observe the expression of pigments; specific plants are selected for intensity of pigment expression. Students cross-pollinate selected plants and observe offspring to measure gain from selection. Students also engage in other guided and independent research projects—often focused on plant environmental response—with Fast Plants. Fast Plants are being used to launch an exercise with PCR. The water potential of fast plants is being measured as part of a water relations laboratory comparing water stressed Fast Plants with Kalanchoe (a member of the Crassulaceae). Yet another system using Fast Plants is looking at variation in disease expression in two populations of Fast Plants that differ in resistance. In one population (*Brassica juncea*) all plants in the population are susceptible to white rust caused by *Albugo candida*. The variation in disease scores is relatively low. In the second population (*B. rapa*) there is a major resistance gene. Nevertheless there is considerable variation between plants including some intermediates. The examination of disease severity on plants in these two populations provides a departure point for discussing genetics of resistance and formulating hypotheses about the observed variation between plants.

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