AN AUTOMATED APPROACH TO GENETIC MAPPING WITH RANDOM AMPLIFIED POLYMORPHIC DNA MARKERS

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Abstract.-- At least 10000 Random Amplified Polymorphic DNA (RAPD) reactions are required to complete a modest RAPD-based genetic mapping effort. Most molecular genetics laboratories are not equipped to handle this level of production in a time-efficient manner; and efforts to scale up are costly when considering equipment acquisition and personnel needs. We describe a RAPD laboratory of our own design that is capable of completing 2304 RAPD reactions per 2.0 technician-work-days and minimal space requirements (approximately 500 square feet). The laboratory features a robotic pipettor, custom designed electrophoresis rigs, and a customized database management system. Exhibits of several recently completed RAPD-based maps are included, along with estimates of the times required to complete each map. Future plans for enhancing the throughput of the laboratory are also briefly described.

Key words: linkage mapping, genetic markers, Random Amplified Polymorphic DNA (RAPD), Polymerase Chain Reaction (PCR), automation.

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