Personal Automation™ for Increased Productivity

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THE CASE FOR PERSONAL AUTOMATION™

Bench scientists and technicians in basic research, clinical diagnostics or forensic laboratories can spend up to one-third of their time and labor on sample preparation, most commonly nucleic acid or recombinant protein extraction and purification. While highly pure biomolecules are critical for successful results, the number of current and backlogged samples, breadth of sample types, and need to improve consistency of results has many laboratories seeking ways to increase sample preparation efficiency without sacrificing quality.

Personal Automation™ technology offers improved laboratory productivity while maintaining reproducible, high-quality results. Traditionally, automation has referred to large, expensive and complicated instrumentation designed for high-throughput use or for multiple users. These systems typically require significant method development or optimization of reagents and instrumentation from multiple suppliers. In contrast, Personal Automation™ technologies are integrated solutions that combine compact, low-cost and easy-to-use instruments with optimized reagents and methods, technical support and hardware service. Personal Automation™ can maximize reliability, flexibility and productivity for an individual or small group of users, and it is all available from one source.

Maxwell® 16 System — Personal Automation™.

PERSONAL AUTOMATION™ — WHAT TO LOOK FOR

Integrated Personal Automation™ systems are characterized by five main elements:

- Reproducible, high-quality results
- Reliable operation
- Flexible protocols
- Simple installation and use with minimal training required
- Low cost

There are two main purification methods for automated nucleic acid or recombinant protein sample preparation: vacuum membranes or paramagnetic particles. Both vacuum-membrane and magnetic particle systems that use liquid handling can become clogged or drip reagents. They also may not be capable of processing viscous lysates or large amounts of sample. In contrast, magnetic particle-handling instruments are inherently immune to clogging or dripping. These instruments, which may incorporate flat-surface magnetic "plungers", can also integrate tissue or other solid-sample grinding with the extraction method, thereby eliminating sample preprocessing with protease or mechanical grinding prior to extraction and purification. This saves time and allows researchers to focus on their work, not sample preparation. Paramagnetic particles, together with automated magnetic particle handling, provide reliable operation and consistent results.

Choosing the best automation option involves weighing the costs and benefits of a single-purpose system compared to one that offers flexibility. For sample preparation, flexibility means having a broad range of applications (e.g., DNA, RNA and recombinant protein purification) across a broad variety of sample types, with the ability to upgrade hardware and firmware as needs change. Any system that allows multiple uses and upgrades can be more valuable to the laboratory over time.

When considering automation, smaller laboratories or individual researchers often have space, budget and other practical concerns. Personal Automation™ systems generally are compact, some taking no more bench space than a laptop computer. They also cost less than comparable large systems and offer throughput that better fits the needs of small laboratories and individual researchers.

MAXWELL® 16 SYSTEM — PERSONAL AUTOMATION™ FOR THE SCIENTIFIC LABORATORY

The Maxwell® 16 System is the only Personal Automation™ system that offers basic research, clinical diagnostic and forensic testing users the ability to purify DNA, RNA and recombinant protein. The Maxwell® 16 Instruments give you the choice of standard-elution volume (300 µl) or low-elution volume (30–100 µl) reagent kit formats. Both instrument formats offer the flexibility of multiple kits that are compatible with a broad range of sample types and applications. The Maxwell® 16 Instruments can process up to 16 samples at one time and provide consistent, reliable purifications of nucleic acid and recombinant proteins in 30–45 minutes. This issue of *Promega Notes* highlights the broad variety of uses for the Maxwell® 16 Systems, including extraction of DNA from model organisms, fungi and food, high-yield DNA extraction from buffy coat and high-concentration extraction of total RNA from cultured cells and tissue. Personal Automation™, as exemplified by Maxwell® 16, will help keep laboratories as close to their work as possible, while giving them more capability and control without great expense.